Pritchett, Jacob A.

From: Romaine, Chris
Sent: Thursday, October 2, 2014 6:35 PM
To: Carter, Sally
Subject: Accepted: USS

Patel, Minesh

From: Colin Campbell <campbell@rtpenv.com>
Sent: Thursday, October 6, 2022 3:45 PM
To: Patel, Minesh
Cc: Gurinder (Gary) Saini; Christopher Hardin - U.S. Steel (CWHardin@uss.com)
Subject: [External] Updated Construction Permit Revision Application for USS Granite City Works
Attachments: GCW expansion - Updated Application (2).pdf

Minesh,

An updated copy of the application for revision of PSD/construction permit no. 95010001 for USS Granite City Works was shipped to your attention, via FedEx, for delivery tomorrow (Oct. 7, 2022). The package includes the final application and appendices; we will get in touch with Sarah Ray and will transmit the dispersion modeling files electronically.

Attached is the electronic version of the revised application package.

Please let me know if you have any questions.

Thank you
Colin Campbell

Granite City Works
United States Steel
20th & State Street
Granite City, IL 62040
(618) 451-3456

October 3, 2022

Bill Marr
Manager, Permit Section
Bureau of Air
Illinois Environmental Protection Agency
1021 North Grand Avenue
PO Box 19276
Springfield, IL 62794

RE: United States Steel Corporation - Granite City Works
Facility I.D. No. 119813AAI
Construction Permit No. 95010001

Dear Mr. Marr:

In March of 2020, United States Steel Corporation - Granite City Works ("U. S. Steel") submitted an application to revise Construction Permit No. 95010001. U. S. Steel and Illinois EPA have been in discussions regarding this application. U. S. Steel has updated the permit application to reflect those discussions. Due to the nature of revisions throughout the application, the Illinois EPA should refer to this application revision for permit processing.

U. S. Steel appreciates Illinois EPA's attention to this matter. If you should have any questions about this, please contact Chris Hardin at cwhardin@uss.com, or (412) 433-5904.

Sincerely,

Michael Patton
General Manager
Granite City Works

Application for Revisions to the Construction Permit / Prevention of Significant Deterioration (PSD) Approval for The 1996 Expansion of the Granite City Works Permit Number 95010001

U. S. Steel

Submitted to:

Division of Air Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794

Prepared by:

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Submitted by:

U. S. Steel Corporation
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February 2020
Revised October 2022

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APPENDICES

Appendix A	Application Forms (Copies of Previously Submitted Versions)
Appendix B	Emissions Calculations (Including Calculations from the 1995 Application)
Appendix C	Air Quality Modeling Report
Appendix D1	Copy of the Current Construction Permit No. 95010001 Issued in 2012
Appendix D2	Copy of the Original Construction Permit No. 95010001 Issued in 1996
Appendix E	Copies of EPA Determinations
Appendix F	Cost Spreadsheets for Control Technology Analysis

1. Introduction

United States Steel Corporation Granite City ("USS Granite City") owns and operates an integrated iron and steel manufacturing facility in Granite City, Madison County, Illinois ("Granite City Works," ID # 119813AAI). The prior owner of this facility was National Steel Corporation. U.S. Steel acquired the assets of the National Steel Granite City facility on May 20, 2003. On January 25, 1996, prior to U.S. Steel acquiring these assets of National Steel Corporation, the Illinois Environmental Protection Agency ("Illinois EPA") issued Construction Permit No. 95010001, which also serves as a Prevention of Significant Deterioration ("PSD") approval, to National Steel Corporation. Construction Permit No. 95010001 authorized increases in the allowable production rate of iron and steel at the Granite City facility (the "1996 Project" or "Project"). This permit has been revised several times. The most recent revision was made on December 17, 2012, when the permit was revised to accommodate a proposed improvement to the air pollution control systems serving the Basic Oxygen Furnace ("BOF") Shop Operations at the facility, *i.e.*, the addition of a fabric filter baghouse and associated capture system to improve control of particulate matter emissions from charging and tapping the BOFs.[1]

Requirements of Construction Permit No. 95010001 are also incorporated in the Clean Air Act Permit Program ("CAAPP") (Permit Number 96030056 or "CAAPP Permit") for the facility that was issued on March 4, 2013. USS Granite City timely appealed some of the terms of the CAAPP Permit.[2]

This application requests several revisions to Construction Permit No. 95010001 to address correction of emission data for several emissions units involved in the 1996 Project. Most significantly, this application requests that the Illinois EPA revise certain permit conditions relating to emissions of carbon monoxide ("CO") and arising under the PSD permitting regulations at 35 Illinois Administrative Code ("IAC") Part 204.[3] The application includes updated control technology analyses and impact analyses in support of those requested revisions.

In 1996, at the time of Construction Permit No. 95010001 was initially issued, the Granite City area was designated nonattainment for ozone and particulate matter with aerodynamic diameter of 10 micrometer or less ("PM_{10}") national ambient air quality standards ("NAAQS"). The area was designated attainment or unclassifiable for all other regulated New Source Review ("NSR") pollutants. The permit included limitations on emissions sufficient to ensure that the Project did not trigger applicability of the Illinois Nonattainment New Source Review ("NNSR") program codified at 35 IAC Part 203 for oxides of nitrogen ("NOx") and volatile organic matter ("VOM") (both as precursors for ozone) and PM_{10} and did not trigger PSD permitting requirements for

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[1] The improvements to the BOF Shop were authorized under Construction Permit No. 11050006, issued by Illinois EPA on August 31, 2011.

[2] CAAPP Permit Appeal IPCB No. 2013-053, pending before the Illinois Pollution Control Board ("Board").

[3] The 1996 Construction Permit is a PSD permit with respect to increases in emissions of two pollutants – CO and sulfur dioxide ("SO_2"). The PSD permit was issued pursuant to the federal PSD regulation at 40 CFR § 52.21, which Illinois EPA was then implementing under a delegation of authority from U.S. EPA. The federal PSD rule is no longer applicable, as the Illinois PSD regulation was approved by U.S. EPA in 2021 as a part of the Illinois State Implementation Plan ("SIP"), and the authority to administer and enforce federal PSD permits was fully transferred to Illinois EPA. See, 86 Fed. Reg. 50459 at 50464 (Sept. 9, 2021). This permit application does not request any changes relating to the PSD approval for SO_2 emissions from the Project.

particulate matter ("PM"), nitrogen dioxide ("NO_2"), or lead. Certain emission limits in Construction Permit No. 95010001 that were considered by Illinois EPA in making NNSR and PSD non-applicability determinations for the 1996 Project are the subject of revisions requested by USS Granite City in this application. The revisions requested by USS Granite City in this application are designed to ensure the continued non-applicability of the NNSR program for ozone precursors and PM_{10}, and the continued non-applicability of the PSD program for emissions of PM and NO_2, to the Project.[4] The application includes revised Project emission increase calculations, updated net emissions increase analyses, and discussion of compliance requirements in support of those non-applicability determinations.

The requested changes will resolve the issues raised in the CAAPP permit appeal filed by USS Granite City.

USS Granite City also requests that Illinois EPA process the revisions to Construction Permit No. 95010001 in accordance with the integrated processing procedures and issue the revised permit utilizing procedures and compliance requirements that are substantially equivalent to those utilized for issuance of a CAAPP permit, including a public notice period for the revised permit. See 35 IAC 270.302(e). USS Granite City understands that the CAAPP permit would be modified by means of the administrative amendment process to address the revisions that have been made to the applicable requirements in Construction Permit No. 95010001.[5]

No physical changes are proposed in conjunction with the requested revisions to Construction Permit No. 95010001.

1.1 Description of Facility

The Granite City Works is an integrated steel mill employing raw material handling, processing, and preparation; iron production; steel production; steel finishing; and boilers and other ancillary operations. In 1996, at the time of the Project, National Steel Corporation, owner of the Granite City Works produced metallurgical coke in a by-product coke plant. The by-product coke plant was among the assets acquired by USS Granite City in 2003 and continued to operate until 2015 at which time it was permanently idled. Coke is now obtained from the heat recovery coke batteries located adjacent to the steel mill, which are owned and operated by Gateway Energy and Coke Company, and from other sources.

1.2 Application Organization

This application contains the following analyses and supporting information for requested updates and revisions of Construction Permit No. 95010001.

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[4] Madison County is currently designated attainment for all criteria pollutants except ozone. For the 2015 ozone standard, the County is designated marginal nonattainment. Alton Township in Madison County is designated nonattainment for SO_2. However, USS Granite City is outside the Alton Township.

[5] A similar process was followed for the issuance of Construction Permit No. 11050006, for the emission reduction project serving the BOF Shop Operations, in 2011.

- Section 2 presents an overview of the requested permit revisions.
- Section 31 presents a discussion of permit conditions used to restrict potential to emit ("PTE") and the consideration of such conditions in determining applicability of the PSD and NNSR programs.
- Section 4 presents a discussion of proposed changes pertaining to carbon monoxide (CO) emissions. The demonstrations and analyses required under the PSD regulations in conjunction with these proposed changes are addressed in Sections 8, 9, and 10.
- Section 5 provides details of requested changes to permit terms for PM and PM_{10} emissions and updated emissions increase analyses.
- Section 6 addresses requested changes to permit terms for NOx emissions and updated emissions increase analysis.
- Section 7 addresses requested changes to permit terms relating to the VOM emissions and updated emissions increase analysis.
- Section 8 contains a best available control technology (BACT) demonstration for CO for the emissions units for which BACT is required.
- Section 9 summarizes the source impacts analyses, including air dispersion modeling, for CO.
- Section 10 provides analyses of additional impacts, including impacts of the Project's CO emissions on soils, vegetation, and visibility.
- Section 11 summarizes pertinent regulatory applicability and changes thereto.

2. Overview of Requested Permit Revisions

2.1 Background on Construction Permit No. 95010001

National Steel Corporation submitted an application on January 3, 1995 for a construction permit for a proposed increase in production at the Granite City Works ("1995 Application"). Illinois EPA issued Construction Permit and PSD Approval No. 95010001 on January 25, 1996. The permit authorized National Steel Corporation to increase throughput and fuel use at the Granite City Works as follows:

(a) The limits on production of hot metal (*i.e.*, iron) from the two blast furnaces were increased to 9,849 net tons per day, calendar month average, and 3,165,000 net tons per calendar year. [Permit Conditions 2(a) and (b).]

(b) The limits on production of liquid steel from the two BOFs were increased to 11,000 net tons per day, calendar month average, and 3,580,000 net tons per calendar year. [Permit Conditions 6(a) and (b).]

(c) The limits on use of blast furnace gas ("BFG") at the units in which BFG was burned (*i.e.*, boilers #1 through #12, blast furnace stoves, BFG flare #1, and ladle drying preheaters) were increased to 30,800 million cubic feet (MMcf) per calendar month and 185,030 MMcf per calendar year. [Permit Condition 21(b).]

(d) Construction Permit No. 95010001 also includes limits on use of natural gas at the project-affected units in which natural gas could be burned (*i.e.*, boilers #1 through #12, blast furnace stoves, BFG flare #1, and ladle drying preheaters.[6,7] The limits in the original Construction Permit No. 95010001 issued in 1996 were 190 MMcf per calendar month and 1,145 MMcf per calendar year. [Permit Condition 21(a).] These limits did not represent increases, as the same limits had previously been in effect in Construction Permit No. 95090167. As most recently revised in 2012, the natural gas consumption limits in Construction Permit No. 95010001 are 225 MMcf per calendar month and 1,346 MMcf per calendar year. [Permit Condition 21(a).]

These increases in permitted production and fuel usage resulted in increases in emissions from the various project-affected emissions units. The net emissions increase analysis for the Project as summarized in Construction Permit No. 95010001 are presented in Table 2-1 below.

For PM, PM_{10}, NOx, and VOM, the net emissions increases, including contemporaneous changes, were below the applicable significant emission rates for these pollutants. For lead, the

[6] Construction Permit No. 95010001 also includes limits on use of fuel oil in the units in which fuel oil could be burned. Fuel oil is no longer burned at Granite City Works. .With this application, USS Granite City is requesting that Construction Permit No. 95010001 be revised to remove all permit conditions relating to the use of fuel oil in the project-affected combustion units.

[7] Construction Permit No. 95010001 did not address the use of coke oven gas or the emissions resulting from burning that gas as fuel in boilers #1 through #12 and in the blast furnace stoves. (Coke oven gas is a by-product fuel produced in by-product coke oven batteries.)

project emissions increase was below the significant emission rate. Finally, for SO_2 and CO, the project resulted in net emissions increases that were greater than the significant emission rates. As the 1996 Project was a major modification for SO_2 and CO, the PSD review requirements for these pollutants were addressed by National Steel Corporation in the 1995 Application and by Illinois EPA in Construction Permit No. 95010001.

Table 2-1. Summary of Net Emissions Increase Analysis for the Project

	Emissions (tons/year)						
	PM	PM_{10}	NO_X	SO_2	CO	VOM	Lead
Project Emissions Increases	-52.0	51.6	238.8	476.0	5,685.0	59.3	0.54
Contemporaneous Decreases	-58.0	-58.0	-226.5	-0.38	-23.31	-32.8	n/a
Contemporaneous Increases	20.3	20.7	26.0	0.25	11.8	1.6	n/a
Net Emissions Increases	**-89.2**	**14.3**	**38.3**	**475.9**	**5,673**	**28.1**	**0.54**
Significant Emission Rate	25.0	15.0	40.0	40.0	100.0	40.0	0.6

2.2 General Description of Requested Permit Revisions

This application proposes five categories of changes as described in Sections 2.2.1 through 2.2.5 below. USS Granite City is requesting neither authorization for changes to emissions units nor increases in the limits on hot metal production rate and liquid steel production rate. This permit application also does not request any changes to the SO_2 and lead emission limits established in Construction Permit No. 95010001, so SO_2 and lead emissions will not be discussed further.

2.2.1 Requested Changes Relating to CO Emissions

The Project was a major modification for CO and was subject to PSD review for this regulated NSR pollutant. USS Granite City is requesting revisions to Construction Permit No. 95010001 associated with the PSD review and approval. These changes are briefly summarized below and are discussed in detail in Section 4 of this permit application.

The primary changes requested by USS Granite City relating to CO emissions are (1) requested increases in the permitted emissions from burning of BFG and natural gas and (2) provisions to address CO emissions from the blast furnace casthouse. The emission limits established in Construction Permit No. 95010001 were based upon information in the 1995 Application submitted by National Steel Corporation, which in turn was based on published emission factors and other literature information. However, actual emissions testing data generated since the original PSD application was submitted and updated literature information indicate that corrections to the emission factors and corresponding limits are necessary and appropriate. Because these revisions are not necessitated by or associated with any changes to emissions units subsequent to the Project, these changes would be revisions to the original PSD permit based upon better emissions information; accordingly, updates to the substantive PSD reviews presented in the 1995 Application are provided in Sections 8, 9 and 10 herein. In addition, revisions are requested with respect to certain other permit terms to clarify compliance demonstration requirements and to improve operational flexibility .

2.2.2 Cleanup of Labeling & Organization of Individual Units (Independent of Emissions)

USS Granite City is requesting changes to the names of certain emissions units and control devices in Construction Permit No. 95010001 to reflect more accurately their functions within the process. In addition, USS Granite City is requesting changes to the groupings of emissions units. The requested organizational changes with respect to material handling operations are generally consistent with the approach that Illinois EPA used when issuing the CAAPP permit for the facility, to address material handling operations separately from the iron- and steelmaking operations and continuous casting operations as discussed in Section 5.3 of this permit application. Other organizational changes are requested in order to ensure the BOF Shop Operations grouping is consistent with federal emission standards for those operations as discussed in Section 11.1.2 herein.

2.2.3 Requested Changes Relating to PM, PM_{10}, NO_X, and VOM Emissions from Project-Affected Emissions Units

Construction Permit No. 95010001 includes a number of emission limitations and other permit conditions that are not explicitly required by any regulation. These emission limitations and permit conditions were included in the permit in order to restrict the PTE of certain operations at the Granite City Works and thereby memorialize non-applicability determinations under the PSD and NNSR permitting programs with respect to net emissions increases of PM, PM_{10}, NO_X, and VOM resulting from the Project. USS Granite City is requesting that certain permit conditions addressing individual emissions units or points, including both limits on annual emissions and provisions addressing emission factors, be removed or revised.

In this regard, the annual emission limitations for the various processes and activities at the Granite City facility listed in Table 5 of Construction Permit No. 95010001, referred to herein as "emissions caps," can address the PTE and serve to limit the net emissions increases of PM, PM_{10}, NO_X, and VOM to less than the corresponding significant emission rates under the PSD and NNSR permitting programs. The support for these revisions is provided in Section 1 of this permit application. USS Granite City anticipates that these revisions will enable settlement of the permit appeals currently before the Board because they involve provisions of the permit addressing emission factors.

For PM and PM_{10}, USS Granite City is requesting minor revisions to the emissions caps both to accommodate the revised grouping of material handling operations as discussed in Section 2.2.2 above and to reflect updated emissions information. The specific requested changes to permit terms relating to PM and PM_{10} emissions, accompanied by demonstrations that the net emissions increase for these pollutants remain below the corresponding significant emission rates, are discussed in Section 5 herein.

For NO_X and VOM, USS Granite City is requesting increases in permitted emissions from the BOF Shop Operations based upon updated emissions information and not related to any post-1996 changes at the source. The specific requested changes to permit terms relating to NO_X and VOM emissions, respectively, accompanied by demonstrations that the net emissions increase for these pollutants remain below the corresponding significant emission rates, are discussed in Sections 6 and 7 herein.

USS Granite City is also requesting revision/elimination of gaseous fuel usage limits for project-affected combustion units. In 2015, USS Granite City shut down its by-product coke oven batteries. This eliminated the ability to use coke oven gas ("COG") as a fuel at the mill. In addition, ten of the twelve boilers that existed at the mill at the time of the Project in 1996 have been retired. These actions have greatly reduced the emissions from fuel combustion in project-affected emissions units and obviate the need to preserve limits to restrict PTE of the remaining units.

2.2.4 New Net Emissions Increase Calculations Pursuant to "Source Obligation" Provisions of PSD and NNSR Rules

The emissions caps for PM, PM_{10}, NOx, and VOM in Construction Permit No. 95010001 and certain other permit terms, and the resultant restrictions on PTE, appear to have been deemed by Illinois EPA to be necessary to prevent the Project from being a major modification.[8] Because the requested revisions to Construction Permit No. 95010001 include increases in certain emissions caps and other changes to permit terms that could allow increases in emissions of these four pollutants, the following "source obligation" provisions of the PSD and NNSR regulations are pertinent to this permit application:

> At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in, or expiration of, any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of this Part shall apply as though construction had not yet commenced on the source or modification. 35 IAC 203.210(b).

> At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation, established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of Sections 204.810, 204.820, 204.830, 204.840, 204.850, 204.1100, 204.1110, 204.1120, 204.1130, 204.1140, 204.1200, and 204.1400 shall apply to the source or modification as though construction had not yet commenced on the source or modification. 35 IAC 204.850.

In Sections 5 through 7 of this permit application and in Appendix B of this permit application, USS Granite City presents updated net emissions increase calculations for PM, PM_{10}, NOx, and VOM. Unlike the calculations in the 1995 Application submitted by National Steel Corporation, these calculations address all emissions from fuel burning units affected by the Project, including emissions from the burning of COG. (See Sections 5.2.2.15, 6.2.2.1, and 7.2.2.1.) These updated calculations demonstrate that the changes to permit terms requested by USS Granite City will not

[8] USS Granite City does not agree with this interpretation. The definitions of "major modification" and related provisions in the PSD and NNSR rules in effect in 1996 were based on increases in actual emissions, except in the narrow circumstances where the emissions unit at issue had not begun normal operations at the time of the project. *See, e.g.*, 56 *Fed. Reg.* 27630 (June 14, 1991). Nonetheless, for purposes of this permit application, USS Granite City has demonstrated that the Project, as it would be addressed by the revised construction permit that is requested herein, is not a major modification even under use of what Illinois EPA and U.S. EPA refer to as the "actual-to-potential" test.

trigger after-the-fact PSD or NNSR permitting for emissions of PM, PM_{10}, NOx, or VOM under the "source obligation" provisions because the Project will not become a major modification for these pollutants by virtue of those changes to permit terms.

2.2.5 Requested Removal of Requirements for Roads at the Former South Plant at the Granite City Works

Construction Permit No. 95010001 includes requirements for control of fugitive dust emissions from roads at Granite City Works. These requirements extend to certain road segments at the site of what was formerly the South Plant of Granite City Works during the period when the mill was owned and operated by National Steel Corporation. Specifically, Permit Condition 26a requires periodic application of chemical dust suppressant to road segments B and C and Permit Condition 27a requires periodic sweeping and flushing of road segment A.[9] Because the South Plant property, including these road segments, is not under the control of USS Granite City, or any person under common control with USS Granite City, pollutant-emitting activities at these properties are not a part of the Granite City Works stationary source.[10] Accordingly, requirements relating to these road segments should not be included in the revised construction permit issued to USS Granite City. USS Granite City requests that Attachment B of the construction permit be revised to omit the diagram for the South Plant and that Permit Conditions 26a and 27b be revised so that they no longer address road segments A, B, and C.

[9] Attachment B of the permit shows that these road segments are at the site of what was formerly the South Plant.
[10] The South Plant property, which comprises three parcels, was not among the assets acquired by U.S. Steel in 2003 or at any time thereafter. Based on information from the Madison County Chief Assessment Office (https://gis.co.madison.il.us/madco/viewer/index.html, last accessed June 24, 2022), the parcels at issue are currently owned by Cara Metals Illinois LLC and R W T Holdings LLC.

3. Discussion of Permit Conditions Used to Restrict PTE

As noted in Section 2.2 above, USS Granite City is proposing to retain, with no changes, the currently effective limits on hot metal production rate and liquid steel production rate in Construction Permit No. 95010001. As discussed in greater detail in Sections 5 through 7 of this permit application, USS Granite City also is proposing that the revised construction permit continue to include annual emissions caps, with certain revisions to reflect updated emissions information, and that the Illinois EPA include appropriate testing, operational monitoring, and recordkeeping requirements in the revised permit to ensure that the emission caps would be legally and practicable enforceable. Collectively, under the following provisions in the pertinent definitions in the PSD and NNSR rules, these proposed limitations and permit terms will restrict the PTE of the affected emissions units:

> Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design only if the limitation or the effect it would have on emissions is federally enforceable. 35 IAC 203.128.
>
> Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable or legally and practicably enforceable by a state or local air pollution control agency. 35 IAC 204.560.

Under the provisions above, what is required for restricting PTE is that the limits be enforceable as a practical matter.[1] Practical enforceability is a matter of technical judgment of the permitting authority – Illinois EPA – but there is a substantial body of policy and precedent regarding preferred forms for emissions caps that are enforceable as a practical matter. These policies can be summarized as follows:

- If not used to restrict emissions over a period shorter than one year, emissions caps should be expressed in terms of tons per year on a 12-month rolling sum basis or on a more frequent basis.
- If the emissions cap will cover multiple activities or emissions units, the permit should require at least monthly emissions calculation and recordkeeping.

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[1] *See, e.g.*, Administrative Order, *In the Matter of Orange Recycling and Ethanol Production Facility, Pencor-Masada Oxynol, LLC*, Petition No.: II-2000-07, C.T. Whitman, U.S. EPA Administrator, May 2, 2001, upholding use of annual emission caps with a rolling cumulative total methodology and rejecting petitioners' "concern that the permit appears to rely on after-the-fact monitoring, rather than engineering practices, test data, or vendor guarantees" to establish restrictions on PTE. U.S. EPA based its findings on the fact that "[i]f the source has no room to operate under the PTE limiting emissions cap, it must cease operation or face a violation" and that "all PTE limits rely on after the fact monitoring of some kind."

- The permit should prescribe methods of calculating actual emissions for each unit and each pollutant and should prescribe how monitoring and recordkeeping of relevant parameters will be used in those calculations.
- Where the permit prescribes an emission factor to be used in conjunction with operational data in demonstrating compliance, the permitting authority should describe the basis for its determination that the emission factor is representative.
- Where the permit requires development and use of a site-specific emission factor to be used in conjunction with operational data in demonstrating compliance, the permit should prescribe the method by which the emission factor will be developed, such as through performance testing with a specified frequency.

Two recent and significant examples of these policies are U.S. EPA's final agency actions in issuing the permits for construction of a drilling operation in the Beaufort Sea off the North Coast of Alaska in March 2012 and installation of new stationary reciprocating internal combustion engines at an existing power plant in Arizona in December 2018.[12,13] The Alaska permit, issued by U.S. EPA Region 10, includes annual emissions caps for NOx and CO, with compliance determined on a 365-day rolling sum basis, and annual emissions caps for SO_2 and greenhouse gases, with compliance determined on a 12-month rolling sum basis. The Arizona permit, issued by the Pima County Department of Environmental Quality pursuant to a delegation of authority from U.S. EPA, includes an annual NOx emissions cap with compliance determined on a 12-month rolling sum basis. Copies of the Alaska and Arizona documents referred here are provided in Appendix E.

Each of these permits includes some emissions units for which the emission factor used to quantify that unit's contribution to the emissions cap over a particular time period is directly prescribed in the permit and also some emissions units for which the permit prescribes the method by which the emission factor will be developed. In each instance where the emission factor is directly prescribed in the permit, this approach was used because the permitting authority determined the emission factor to be sufficiently representative of actual emissions, provided that required monitoring of operating parameters shows the process and control device to be operating within ranges or conditions established during the permitting process. (For example, in the Alaska permit, the NOx and CO emission factors for periods when the control devices are operating assume control efficiencies of 90 percent and 80 percent, respectively; in the Arizona permit, the NOx emission factor for engine startup events, during which the air pollution control equipment does not operate, is based on the estimate provided by the engine manufacturer.) In each instance where emission factors are developed through site-specific testing subsequent to permit issuance, the permit carefully prescribes the testing conditions that will be followed, the frequency of that testing, and the calculations to be used to derive the emission factor.

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[12] *In re: Shell Offshore, Inc., OCS Permit No. R10 OCS030000*, OCS Appeal Nos. 11-05, 11-06 & 11-07. Mar. 30, 2012. Docket available on the U.S. EPA internet web site at https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa852571140054 2d23/f24b9734e6894b9385257958006dad34!OpenDocument (last accessed May 9, 2022).

[13] *In re: Tucson Electric Power, PSD Permit No. 1052*, PSD Appeal No. 18-02. Dec. 3, 2018. Docket available on the U.S. EPA internet web site at https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa852571140054 2d23/64a7840f0e968b9b852583050073ebe5!OpenDocument (last accessed May 9, 2022).

The approach proposed by USS Granite City with respect to the PM, PM_{10}, NO_X, and VOM emissions caps to be used in any revised Construction Permit No. 95010001, including the proposed revisions to certain emissions limitations, compliance demonstration requirements, and other permit conditions as discussed in detail in Sections 5 through 7 of this permit application, is consistent with this policy and precedent and will improve the enforceability of the PTE limitations in Construction Permit No. 95010001. In particular, USS Granite City emphasizes that removal or revision of certain permit conditions addressing individual emissions units or points, including both limits on annual emissions and provisions addressing emission factors, will not result in impairment of the enforceability of the PTE limitations.

4. Changes to Provisions for CO Emissions

This section of the permit application describes the changes to Construction Permit No. 95010001 requested by USS Granite City pertaining to CO emissions from fuel burning emissions units and from the blast furnace casthouse. These requested changes are not based upon any post-1996 Project changes but are based on updated information regarding CO emissions.

Construction Permit No. 95010001 also set a CO emissions limitation for the BOF electrostatic precipitator ("ESP") Stack. No changes are being proposed to this CO emission limitation in Table 2 of the permit.

The Project was permitted in 1996 as a major modification for CO and was subjected to PSD review by Illinois EPA; with the proposed changes, the project continues to be subject to PSD review with respect to CO emissions.

4.1 Process Background and Project

4.1.1 Blast Furnace Casthouse

The blast furnaces produce molten iron from iron ore pellets through a reduction reaction with metallurgical coke. In this reaction, carbon monoxide (CO) is formed along with hydrogen and other gases as a byproduct. The tapping of the blast furnaces, which takes place within a structure known as the casthouse, results in emissions of CO. These emissions are a consequence of the relatively small amount of BFG that leaves the furnaces with the molten metal and slag during the tapping process.

The Project involved increases in the production rate for the blast furnaces as outlined in subsection 2.1. The Project is also presumed by USS Granite City to have resulted in increases in CO emissions from the casthouse.

4.1.2 Fuel Combustion

Most of the gas that is formed in the blast furnace rises to the top of the furnace. At the top of the blast furnace, the BFG generated in the furnace is collected and routed to a BFG pretreatment system. BFG has a relatively low heating value (80-110 Btu/scf) and is preferentially used as fuel in the stoves that heat the blast air for the blast furnace. Each blast furnace at the Granite City Works has a set of three stoves. BFG is also used as a fuel in the boilers used to produce steam for use at the Granite City Works, including steam to power the turboblowers that supply blast air to the blast furnaces. Any excess BFG is flared.

The configuration of the Granite City Works in 1996, at the time of the Project, as it relates to fuel combustion in the Project-affected units differed considerably from the current configuration. In 1996, the mill had twelve boilers, all of which used BFG as fuel. Only two of these boilers – Boiler 11 and Boiler 12 – remain in existence. One flare, now known as BFG

flare #1, was used for flaring of excess BFG.[14] In 1996, the boilers used BFG, COG, natural gas, and fuel oil; currently, Boiler 11 and Boiler 12 use only BFG and natural gas. In 1996, the stoves used COG as supplemental fuel; currently, they use natural gas as supplemental fuel.

The 1996 Project involved increases in BFG generation and usage as outlined in subsection 2.1. The CO net emissions increase from the 1996 Project was significant and the project was subject to PSD review for CO emissions. The BACT-affected fuel burning emissions units identified and addressed in the 1995 Application were the blast furnace stoves, the ladle drying preheaters, and miscellaneous ancillary natural gas burning units in the BOF shop and at the continuous casters. In the 1995 Application, on page 1-3, National Steel Corporation stated that the boilers were not undergoing any changes as part of the project. Pursuant to 40 CFR § 52.21(j)(3) and 35 IAC 204.1100(c), because these emissions units were not changed as part of the project, they are not subject to BACT requirements.

4.2 Provisions of the Construction Permit Relating to CO Emissions from Fuel Combustion

Table 4 of Construction Permit No. 95010001 contains CO emission factors and emission limitations for the fuel burning emissions units affected by the Project. Table 4-1 below presents information from Table 4 of the permit pertaining to the CO emissions limitations from 'certain fuel burning emissions units,' *i.e.*, Boilers #1 through #12, Blast Furnace Flare 1, Blast Furnace Stoves, ladle drying preheaters, and continuous casters.[15] Copies of the original and current versions of the construction permit are provided in Appendices D1 and D2 of this permit application.

Table 4-1. Table 4 of Construction Permit – CO Emissions

Fuel Used for Boilers, Stoves, Flare, Ladle Drying Preheaters, and Ancillary Natural Gas Burning Units[16]	CO Emission Factor	Maximum CO Emissions (tons/year)	
		Original (1996) Permit	Current (2012) Permit
Natural Gas	40 lb/MMcf	22.90	26.92
Blast Furnace Gas	13.7 lb/MMcf	1,267.46	1,267.46
Fuel Oil[17]	5.0 lb/10^3 gal	0.91	0.91

[14] Granite City Works currently includes a second BFG flare, known as BFG flare #2, and a cogeneration boiler used to produce electricity and process steam. Construction of the boiler and flare was authorized under Construction Permit No. 06070023 issued in January 2008.

[15] The Construction Permit omits the ancillary fuel burning units at the continuous caster under Table 4. However, emissions from fuel combustion at these units are appropriately accounted for in the natural gas combustion rates.

[16] As discussed in Section 2.2.3 of this permit application, although the boilers and stoves burned COG, Construction Permit No. 95010001 did not include any terms relating to combustion of this byproduct fuel. As it pertains to CO emissions, this omission is now moot because the shutdown of the by-product coke oven batteries in 2015 eliminated the ability to use COG as a fuel. The current and future CO emissions from burning of COG in Project-affected combustion units are zero and are not addressed further in this permit application.

[17] As indicated in footnote 6, fuel oil is no longer used as fuel at Granite City Works.

4.3 Updated CO Emissions Information for Fuel Combustion

For natural gas combustion, the CO emission factor included in Construction Permit No. 95010001 was from Chapter 1.4 AP-42 as updated in August 1982. The U.S. EPA revised Chapter 1.4 of AP-42 in July 1998 and updated the CO emission factor for natural gas combustion to 84 lb per million cubic feet. For natural gas combustion in Boiler 11, Boiler 12, blast furnace stoves, ladle drying preheaters, and ancillary fuel burning units at the continuous casters, the updated CO emission factor has been used to calculate the CO emission rates in this permit application, including in the dispersion modeling analysis provided in Appendix C of this permit application.[18]

As previously explained, BFG is combusted as fuel in the boilers and blast furnace stoves at the site and excess BFG is flared. The CO emission factor for BFG burning in the 1995 Application and in Construction Permit No. 95010001 was from the U.S. EPA's AIRS 1990 database (WebFIRE). However, based on recent performance tests for boilers burning BFG, engineering evaluations of BFG burning in blast furnace stoves, and updates to AP-42 Section 13.5, this factor is not representative. Updated CO emission factors for BFG burning in the blast furnace stoves, Boiler 11, Boiler 12, and BFG flares are being proposed for purposes of this revision to the CO emission rates. The proposed CO emission rates are as follows:

- Based on the information regarding CO emission rates from another blast furnace stove, and engineering evaluations of BFG burning in the blast furnace stoves at Granite City Works, the CO emission factor for burning of BFG in the blast furnace stoves is 322 pounds per million cubic feet.[19]
- Based on CO stack testing performed at Boiler 11 and Boiler 12, the emission factor for burning of blast furnace gas in these boilers is 32.2 pounds per million cubic feet.[20]
- The CO emission factor for BFG flaring is calculated using a CO concentration of 24 percent in BFG and a destruction efficiency of 96 percent.[21, 22] This results in a CO emission factor of 698 pounds per million cubic feet.

Table 4-2 presents the updated maximum annual CO emissions from burning of fuel in the blast furnace stoves, Boiler 11, Boiler 12, Blast Furnace Flare 1, ladle drying preheaters, and ancillary

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[18] Boilers #1 through #10, which were Project-affected emissions units, have been permanently shut down. The current and future CO emissions from these boilers are zero and are not addressed further in this permit application.
[19] CO emission factor for AK Steel Dearborn / Severstal Dearborn Michigan permit for C Blast Furnace Stoves in the PTI 182-05C was specified as 328.9 lb/MMcf of BFG. See https://www.deq.state.mi.us/aps/downloads/permits/finpticon/2005/182-05C.pdf (accessed on August 17, 2022). In addition, USS Granite City evaluated CO emissions from the blast furnace stove stacks using non-reference method to compare against data from other furnaces. The Granite City Works blast furnace stoves stack configuration did not allow for application of a reference method for measuring CO emissions. Therefore, as part of an engineering evaluation, USS used a non-reference method to collect CO concentration in the stove stack exhaust.
[20] Boiler 11 tests were conducted in July 2011. Boiler 12 tests were conducted in May 2011.
[21] Data from the quarterly BFG component analyses for 2019 for USS Granite City shows CO concentration in BFG ranging from 20% to 22%.
[22] U.S. EPA's *Compilation of Air Pollutant Emission Factors, AP-42, Volume I: Stationary Point and Area Sources*, Section 13.5, April 2015 ("Properly operated flares achieve at least 98 percent destruction efficiency in the flare plume").

fuel burning units at the continuous casters. Emissions calculations for CO from fuel combustion are provided in Appendix B of this permit application.

Table 4-2. Updated CO Emissions from Burning of Gaseous Fuels

Unit/Fuel	Future Throughput		Emission Factor		Emissions (TPY)
BFG in stoves	68,755	MMcf/year	321.83	lb/MMcf	11,064
BFG in boilers	76,327	MMcf/year	32.19	lb/MMcf	1,228
Natural gas in boilers	1,640	MMcf/year	84.0	lb/MMcf	69
BFG in BFG flare	39,947	MMcf/year	697.6	lb/MMcf	13,934
Natural gas in ladle preheaters	340	MMcf/year	84.0	lb/MMcf	14

4.4 Updated CO Emissions Information for Blast Furnace Casthouse

National Steel Corporation did not identify the blast furnace casthouse as a source of CO emissions in the 1995 Application, and Illinois EPA did not address those emissions in Construction Permit No. 95010001. Subsequent testing at Granite City Works and other integrated iron and steel mills indicates there are CO emissions from blast furnace casthouse operations. CO emissions measured during testing performed at the casthouse baghouse and the iron spout baghouse at Granite City Works in 2012 were 0.10 lb per ton of hot metal and 0.01 lb per ton of hot metal, respectively. As discussed in Section 8.2.3.7 of this permit application, USS Granite City is proposing a CO BACT emission limit of 70 lb/hr based on total emissions from these two baghouses. Assuming 95% capture efficiency for the capture system associated with the casthouse baghouse, as discussed in Section 5.2.2.3 of this permit application, the fugitive CO emissions from the casthouse roof monitor are 3.1 lb/hr. Total CO emissions from the blast furnace casthouse, including both baghouses and fugitive emissions, are 73.1 lb/hr and 320 tons per year ("TPY").

4.5 CO PSD Review Requirements

As previously explained, the 1996 Project was subject to PSD review for CO because the CO net emissions increase was greater than the significant emission rate of 100 tons per year. Sections 8 through 10 of this permit application address the requested changes to Construction Permit No. 95010001 relating to CO emissions under the PSD review requirements of 35 IAC 204.1100 through 204.1140, as applicable for the blast furnace casthouse and certain fuel burning emissions units.

5. Proposed Changes to Permit Terms for PM and PM_{10} Emissions Increases Analyses

This section describes the proposed changes to Construction Permit No. 95010001 requested by USS Granite City related to PM and PM_{10} emissions. It also provides a demonstration that, even with the requested revisions, the Project would still not be a major modification under the PSD program at 35 IAC Part 204 with respect to emissions of PM and under the NNSR program at 35 IAC Part 203 with respect to emissions of PM_{10}. The net emissions increase calculations for PM and PM_{10} from the 1995 Application submitted by National Steel Corporation are reproduced in Appendix B of this permit application.

5.1 Construction Permit No. 95010001 Applicability and Requirements

Table 5-1 summarizes the provisions from Construction Permit No. 95010001 pertaining to PM and PM_{10} emissions limitations from the project-affected emissions units. Copies of the relevant permits are provided in Appendices D1 and D2 of this application.

Table 5-1. Construction Permit Conditions Addressing PM and PM_{10}

Permit Condition	Requirements
5	Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.
18	Emissions from the BOF Shop operations shall not exceed the limits in attached Tables 2 and 5.
20	Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5
22	Emissions from the listed fuel combustion units shall not exceed the limits in Tables 4 and 5.

The annual PM and PM_{10} emissions caps listed in Table 5 of Construction Permit No. 95010001 are presented in Table 5-2 below. These annual PM and PM_{10} emissions caps cover all emissions units affected by the Project. These emissions units are grouped into four main processes or activities (as listed in Table 5-1). Each emissions cap is calculated as the sum of the unit-specific emissions limitations in Tables 1 through 3 and fuel specific limitations in Table 4 of the permit. Table 5 also includes limitations for PM and PM10 emissions from roadways and material handling activities at the facility.

Table 5-2. PM and PM_{10} Emissions Information from Table 5 of Construction Permit No. 95010001

Processes and Activities	Emissions Caps (tons/year)	
	PM	PM_{10}
Blast Furnace Operations	218	194
BOF Shop Operations	510	451
Continuous Casting Operations	71	71
Certain Fuel Combustion Units	273	273
Roadways	27	27
Material Handling	2	2
Total	1,101	1,018

The PM and PM_{10} emissions caps restricted the PTE of the project affected-emissions units. The project emissions increases for PM and PM_{10} were calculated by subtracting pre-project actual emissions (August 1992 to July 1994, 24-month period) from the PTE as restricted by the limitations in the permit. Table 6 of Construction Permit No. 95010001 summarized the net emissions increases from the project and summarized Illinois EPA's determination that the project was not a major modification with respect to PM or PM_{10} emissions. Because the net emissions increases for PM and PM_{10} were below the applicable significant emission rates, these pollutants were not subject to PSD or NNSR review.

5.2 Pre-Project Actual Emissions for 1996 Project

This section presents the pre-project actual emissions and USS Granite City's updates/revisions to some of the PM and PM_{10} emission factors and emission estimates. Corrections to the emissions factors are the result of updated information available regarding some of the operations affected by the project as discussed in Section 5.2.2 below.

5.2.1 Historical Throughput Rates

The PM and PM_{10} net emissions increase calculations presented in Table 6 of Construction Permit No. 95010001 were based on the calculations provided by National Steel Corporation in Tables 3-4, 3-5, and 3-7 of the 1995 Application. Those tables from the prior permit application are reproduced in Appendix B to this permit application.

The pre-project annual emissions were recalculated in this permit application using the same production and operating rates as the 1995 Application as shown in Table 5-3 below.

Table 5-3. Pre-Project Production and Operating Rates for PM and PM_{10}

Parameters	Units	1995 Application
Blast Furnace Production	Net tons of hot metal/year	2,059,557
Blast Furnace Charging	Charge Material tons/year	2,803,241
BOF Shop	Molten steel tons/year	2,413,406
Combined BFG Combustion	MMcf/year	121,039
Combined NG Combustion	MMcf/year	1,145
Combined Fuel Oil Combustion	Mgal/year	16

5.2.2 PM and PM_{10} Emission Factors Basis and Revisions

USS Granite City has reviewed the PM and PM_{10} emission factors used to calculate pre-project actual emissions from the project-affected emissions units based on stack testing and updated literature-based information. As a result of this review, emission factors for two operations were revised as described below. The updated pre-project actual emissions for PM and PM_{10} for the project are presented in Table 5-5 and Table 5-6 of this permit application, respectively; explanations are provided in the following paragraphs.

5.2.2.1 A&B Blast Furnace Charging Fugitive Emissions (PM_{10} Revised)

The Blast Furnace charging fugitive PM emissions were calculated using the emission factor of 0.0024 lb/ton from the U.S. EPA's AIRS 1990 database (WebFIRE). For PM_{10}, the 1995 Application assumed PM_{10} was the same as PM. However, based on particle size distribution data in AP-42 Table 12.5-2, which indicates 51% of PM is PM_{10}, the PM_{10} emission factor for this operation was lowered. The new PM_{10} emission factor is 0.0012 lb/ton.

5.2.2.2 A&B Blast Furnace Casthouse Stack (Baghouse) Emissions (No Change)

The pre-project actual emissions for the A and B Blast Furnaces Casthouse (baghouse) stack as presented by National Steel Corporation in the 1995 Application were calculated using the design outlet concentration of 0.010 grains per dry standard cubic foot in the baghouse exhaust gas and an exhaust gas flow factor of 49,000 dry standard cubic feet per ton of hot metal. PM_{10} was assumed to be same as PM. No changes are necessary for this emission factor.

5.2.2.3 A&B Blast Furnace Casthouse Roof Monitor Emissions (PM_{10} Revised)

The Blast Furnace Casthouse roof monitor actual emissions were calculated using the AP-42 Section 12.5 Table 12.5-1 PM emission factor of 0.6 lb per ton for the uncontrolled casthouse. A 95% capture efficiency, which has been recognized by U.S. EPA as representative for this source type,[23] was applied for the A&B Blast Furnace Casthouse capture systems. The PM emission factor for this operation was revised from 0.031 lb/ton to 0.030 lb/ton. Based on the particle size distribution in AP-42 Table 12.5-2, 51% of PM was assumed to be PM_{10}. The new PM_{10} emission factor is 0.0153 lb/ton vs 0.0155 lb/ton in the 1995 Application.

5.2.2.4 A&B Blast Furnace Iron Spout Baghouse Emissions (No Change)

The pre-project actual emissions for the A and B Blast Furnaces Iron Spout baghouse stack as presented by National Steel Corporation in the 1995 Application were based on an emission factor of 0.02548 lb per ton of hot metal. All PM was assumed to be PM_{10}. This emission factor appears to have been developed based on the results of stack testing conducted in 1992. No changes are necessary for this emission factor.

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[23] See, for example, "Technology Review for the Integrated Iron and Steel NESHAP," memorandum from D.L. Jones, U.S. EPA, *et al.*, to the Integrated Iron and Steel (II&S) Residual Risk and Technology Review (RTR) Project File, May 1, 2019. Available in the electronic docket at www.regulations.gov/document?D=EPA-HQ-OAR-2002-0083-0964.

5.2.2.5 Blast Furnace Slag Pits Emissions (No Change)

The pre-project actual emissions for the A and B Blast Furnaces slag pits as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.00417 lb per ton of hot metal. This emission factor is the sum of PM and PM_{10} emissions rate of 0.0026 lb per ton for slag quenching (derived from EPA assessment) for slag quenching and 0.00157 for slag transfers (using AP-42 Section 13.2.4 equation for aggregate handling). For purposes of emissions calculations, PM was assumed to be same as PM_{10}. No changes are necessary for this emission factor.

5.2.2.6 BOF ESP Stack (BOF 2 Vessels) Emissions (No Change)

The pre-project actual emissions for the BOF ESP stack as presented by National Steel Corporation in the 1995 Application were calculated using data from the stack tests conducted during 1989 to 1993 timeframe on the BOF ESP exhaust. PM and PM_{10} was assumed to be identical for this operation. No changes are necessary for this emission factor.

5.2.2.7 BOF Roof Monitor Emissions (No Change)

The BOF roof monitor actual emissions were calculated using the information from AP-42 Chapter 12.5 and AIRS database. For pre-change actual PM and PM_{10} emissions, National Steel used 90% capture efficiency during the charging and tapping steps and 99% capture efficiency during the refining step for the BOF operations. A detailed description of the baseline roof monitor PM and PM_{10} emission factors is provided in Appendix C of the 1995 Application. For the BOF operations, per particle size distribution in AP-42 Table 12.5-2, 67% of PM is PM_{10}. No changes are necessary for this emission factor.

5.2.2.8 Desulfurization Station & Transfer Pit Baghouse Stack Emissions (No Change)

The pre-project actual emissions for the Desulfurization Station and Transfer Pit Baghouse stack as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.03721 lb per ton of hot metal. No new information is available that would require any revisions to this emission factor.

5.2.2.9 Hot Metal Charging and Ladle Skimming Stack Emissions (No Change)

The pre-project actual emissions for the Hot Metal Charging and Ladle Skimming Baghouse stack as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.005 lb per ton of hot metal. No new information is available that would require any revisions to this emission factor.

5.2.2.10 Baghouse 2 for Argon Stirring and Ladle Metallurgy Emissions (No Change)

The pre-project actual emissions for Baghouse 2 for Argon Stirring and Ladle Metallurgy Facility (previously known as "Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)") as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.00715 lb per ton of steel. No new information is available that would require any revisions to this emission factor. It is now included with the BOF shop .

5.2.2.11 Caster Mold Process Emissions (No Change)

The pre-project actual emissions for the Caster Mold as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from the Illinois EPA 1991 EIS PM/PM_{10} report. No changes are necessary for this emission factor.

5.2.2.12 Continuous Caster Spray Chamber Emissions (No Change)

The pre-project actual emissions for the Continuous Caster Spray Chamber as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from a stack test in the 1980s. PM and PM_{10} emissions are assumed to be identical. No changes are necessary for this emission factor.

5.2.2.13 Slab Cut Off Casters Emissions (No Change)

The pre-project actual emissions for the Slab Cut Off Casters as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from the Illinois EPA 1991 EIS PM/PM_{10} report. No changes are necessary for this emission factor.

5.2.2.14 Slab Ripping Casters Emissions (No Change)

The pre-project actual emissions for the Slab Ripping Casters as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from the Illinois EPA 1991 EIS PM/PM_{10} report. No changes are necessary for this emission factor.

5.2.2.15 Fuel Burning Emissions Units Emissions (Revised)

The pre-project actual emission for various fuels used in certain fuel burning emissions units affected by the project were calculated using the emission factors presented in Table 5-4.

Table 5-4. PM and PM_{10} Emission Factors for Fuel Burning

Fuel	Emission Factor and Units	Basis
Blast Furnace Gas	2.9 lb/MMcf	AIRS 1990
Natural Gas	1.9 lb/MMcf *(revised)*	AP-42 Table 1.4-2 (Based on updated AP-42 information)
Coke Oven Gas (added)	16.56 lb/MMcf in stoves and 43.13 lb/MMcf in boilers *(both added)*	Stoves – Stack test (date unknown) Boilers – "A" battery stack test 1989
Fuel Oil (*Shown for historical purposes. USS Granite City no longer uses fuel oil.*)	9.72 lb/1000 gallon	AP-42 Page 1.3-2

In addition to the emission factors changes noted here, the emission calculations for each pollutant have been updated to reflect all emissions from boilers #1 through #12and from the blast furnace stoves, both pre-project and post-project. (The emission calculations performed by National Steel Corporation and included in the 1995 Application had improperly excluded the emissions from the boilers and stoves resulting from COG use; as a result, as noted in Section 2.1 of this permit application, Construction Permit No. 95010001 did not address the use of coke oven gas or the emissions resulting from burning that gas in the project-affected units.) For the pre-project emissions, the updated calculations include emissions from combustion of 2,584 MMcf of COG in these units during the baseline period; for the post-project emissions, the updated calculations reflect zero COG use.

5.2.2.16 Iron Pellet Screen Emissions (Revised)

The pre-project actual emissions for the Iron Pellet Screen were revised to be based on AP-42 Chapter 11.19.2 for crushed stone screening under Table 11.19.2-2. A control efficiency of 85% was applied for this operation.[24]

5.2.2.17 BOF Hopper Baghouse Emissions (No Change)

The pre-project actual emissions for the BOF Hopper baghouse stack were based on transfer point calculations using AP-42 Chapter 13.2.4 for aggregate handling. A control efficiency of 99.9% was applied for the baghouse used in this operation. No changes are necessary for this emission factor.[25]

5.2.2.18 Flux Conv and Transfer Points Baghouse Emissions (No Change)

The pre-project actual emissions for the Flux Conv and Transfer Points baghouse stack were based on transfer point calculations using AP-42 Chapter 13.2.4 for aggregate handling. A control efficiency of 99.3% was applied for the baghouse used in this operation. No changes are necessary for this emission factor.[26]

5.2.2.19 Baghouse 1 for Material Handling Emissions (No Change)

The pre-project actual emissions for the Baghouse 1 for Material Handling (previously known as "Deslagging Station and Material HS") as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.00355 lb/ton of hot metal. No new information is available that would require any revisions to this emission factor.[27]

5.2.2.20 Material Handling Emissions Changes (Revised)

The 1995 Application included emissions changes associated with the material handling and transfers for coke, pellets (other than screen), and limestone from the project under Table F-3. These emissions changes were accounted for in the contemporaneous emissions changes table for PM and PM_{10} along with the haul roads emissions changes. Construction Permit No. 95010001 accounted for the material handling emissions changes as "creditable contemporaneous actual emission decreases" in Table 6. With this application, the material handling and transfer operations for coke, pellets, and limestone are included in the project emissions calculations.

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[24] CAAPP Permit moved this operation to Material Handling and Processing.
[25] Same as above.
[26] Same as above.
[27] This unit is addressed twice in the CAAPP Permit. However, it is a single operation now included in Material Handling and Processing.

Table 5-5. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project PM Emission Factors for Affected Emissions Units

Emission Point[a]	Emission Factors[b]		Units	Basis	Baseline Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Fugitives	0.031	0.030	lb/ton of hot metal	No change	31.92	30.9
A & B Blast Furnace Charging	0.0024	0.0024	lb/ton of material	No change	3.36	3.4
A & B Blast Furnace Casthouse Baghouse	0.07026	0.07026	lb/ton of hot metal	No change	72.35	72.4
Blast Furnace Slag Pits	0.00417	0.00417	lb/ton of hot metal	No change	4.29	4.3
Iron Spout Baghouse	0.02548	0.02548	lb/ton of hot metal	No change	26.24	26.2
Blast Furnace Operations					***138.17***	***137.1***
BOF 2 Vessels	0.16	0.16	lb/ton of steel	No change	193.07	193.1
BOF Roof Monitor	0.428	0.428	lb/ton of steel	No change	516.72	516.7
Desulfurization Station [inside BOF shop] & Transfer Pit	0.03721	0.03721	lb/ton of hot metal	No change	38.32	38.3
Hot Metal Charging Ladle Slag Skimmer	0.00502	0.00502	lb/ton of hot metal	No change	5.17	5.2
Baghouse 2 for Argon Stirring and Ladle Metallurgy	0.00715	0.00715	lb/ton of steel	No change	8.63	8.6
BOF Shop Operations					***761.9***	***761.9***
Caster Mold – Casters #1 & #2	0.006	0.006	lb/ton of steel	No change	7.24	7.2
Continuous Casters #1 & #2 – Spray Chamber	0.00852	0.00852	lb/ton of steel	No change	10.28	10.3
Slab Cutoff Casters #1 & #2	0.0071	0.0071	lb/ton of steel	No change	8.57	8.6
Slab Ripping Casters #1 & #2	0.00722	0.00722	lb/ton of steel	No change	8.71	8.7
Continuous Casting Operations					***34.8***	***34.8***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	2.90	2.90	lb/MMcf	No change	175.51	175.5
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	5.10	1.90	lb/MMcf	Note [c]	2.92	1.1
Combined COG in stoves, B11 & B12		16.56 & 43.13	lb/MMcf	Added		50.8
Combined FO in stoves, boilers, ladle drying preheaters, and BFG flares	9.72	9.72	lb/Mgal	No change	0.08	0.1
Certain Fuel Burning Units					***178.51***	***227.4***
Material handling for Coke, Pellets, Limestone	Table F-3 of 1995 Application					17.2
Iron Pellet Screen[a]	0.00270	0.00375	lb/ton of material	Note [d]	3.91	5.3
BOF Hopper Baghouse[a]	0.00032	0.00032	lb/ton of steel	No change	0.39	0.4
Flux Conv. & Transfer Points Bin Flo r - BOP[a]	0.0016	0.0016	lb/ton of steel	No change	1.93	1.9
Baghouse 1 for Material Handling	0.00355	0.00355	lb/ton of steel	No change	4.28	4.3
Material Handling Operations					***10.51***	***29.0***
Total					***1,123.90***	***1,190.3***

(a) Emission unit groupings have been revised slightly. The identified line items associated with material handling operations were grouped with the blast furnace operations or BOF shop in Construction Permit No. 95010001. Material handling for coke, pellets, limestone are now included in the project emissions. Baghouse 1 for Material Handling is also now grouped with material handling operations. In addition, the Baghouse 2 for Argon Stirring and Ladle Metallurgy is now grouped with BOF Shop operations.

(b) Except as noted in subsequent sections of this permit application, the same emission factors used to calculate pre-project actual emissions are also used to calculate post-project actual emissions. The BOF Roof Monitor is a notable exception, as the 1996 Project included measures to improve PM control efficiency.

(c) Updated AP-42 emission factor for natural gas combustion.

(d) Calculated using AP-42 emission factor for crushed stone, assuming 85% control efficiency.

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Table 5-6. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project PM_{10} Emission Factors for Affected Emissions Units

Emission Point[a]	Emission Factors[b]		Units	Basis	Baseline Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Fugitives	0.0155	0.0153	lb/ton of hot metal	Correction to calculation	15.96	15.8
A & B Blast Furnace Charging	0.0024	0.0012	lb/ton of materialIte [c]	3.36	1.7	
A & B Blast Furnace Casthouse Baghouse	0.07026	0.07026	lb/ton of hot metal	No change	72.35	72.4
Blast Furnace Slag Pits	0.00417	0.00417	lb/ton of hot metal	No change	4.29	4.3
Iron Spout Baghouse	0.02548	0.02548	lb/ton of hot metal	No change	26.24	26.2
Blast Furnace Operations					***122.21***	***120.3***
BOF 2 Vessels	0.16	0.16	lb/ton of steel	No change	193.07	193.1
BOF Roof Monitor	0.287	0.287	lb/ton of steel	No change	346.20	346.2
Desulfurization Station [inside BOF shop] & Transfer Pit	0.03721	0.03721	lb/ton of hot metal	No change	38.32	38.3
Hot Metal Charging Ladle Slag Skimmer	0.00502	0.00502	lb/ton of hot metal	No change	5.17	5.2
Baghouse 2 for Argon Stirring and Ladle Metallurgy	0.00715	0.00715	lb/ton of steel	No change	8.63	8.6
BOF Shop Operations					***591.39***	***591.4***
Cas-er Mold - Casters #1 & #2	0.006	0.006	lb/ton of steel	No change	7.24	7.2
Continuous Casters--#1 & #2 - Spray Chamber	0.00852	0.00852	lb/ton of steel	No change	10.28	10.3
Slab Cutoff Casters #1 & #2	0.0071	0.0071	lb/ton of steel	No change	8.57	8.6
Slab Ripping Casters #1 & #2	0.00722	0.00722	lb/ton of steel	No change	8.71	8.7
Continuous Casting Operations					***34.80***	***34.8***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	2.90	2.90	lb/MMcf	No change	175.51	175.5
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	5.10	1.90	lb/MMcf	Note [d]	2.92	1.1
Combined COG in stoves, B11 & B12		14.21 & 41.48	lb/MMcf	Added		48.5
Combined FO in stoves, boilers, ladle drying preheaters, and BFG flares	9.72	9.72	lb/Mgal	No change	0.08	0.1
Certain Fuel Burning Units					***178.51***	***225.2***
Material handling for Coke, Pellets, Limestone	Table F-3 of 1995 Application					17.2
Iron Pellet Screen [a]	0.00279	0.00131	lb/ton of materI	Note [c]	3.91	1.8
BOF Hopper Baghouse [a]	0.00032	0.00032	lb/ton of steel	No change	0.39	0.4
Flux Conv. & Transfer Point - Bin Floor - BOF [a]	0.0016	0.0016	lb/ton of steel	No change	1.93	1.9
Baghouse 1 for Material Handling	0.00355	0.00355	lb/ton of steel	No change	4.28	4.3
Material Handling Operations					***10.51***	***25.6***
Total					***937.42***	***997.3***

(a) Emission unit groupings have been revised slightly: The identified line items associated with material handling operations were grouped with the blast furnace operations or BOF shop in Construction Permit No. 95010001. Material handling for coke, pellets, limestone are now included in the project emissions. Baghouse 1 for Material Handling is also now grouped with material handling operations. In addition, the Baghouse 2 for Argon Stirring and Ladle Metallurgy is now grouped with BOF Shop operations.

(b) Except as noted in subsequent sections of this permit application, the same emission factors used to calculate pre-project actual emissions are also used to calculate post-project actual emissions. The BOF Roof Monitor is a notable exception, as the 1996 Project included measures to improve PM_{10} control efficiency.

(c) Applied PM to PM_{10} ratio from AP-42, Chapter 13.2.4.

(d) Updated AP-42 emission factor for natural gas combustion.

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(c) Calculated using AP-42 emission factor for crushed stone, assuming 85% control efficiency.

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5.3 Post-Project PM and PM_{10} Emissions Limitations

As noted in Sections 2.2.3 through 2.2.5 herein, and as discussed further below, for each pollutant, the project emissions increase and/or net emissions increase from the 1996 Project was calculated using the difference between the pre-project actual emissions (August 1992 to July 1994, 24-month period) and the post-project emissions cap for each major operational group of affected emissions units. The post-project emissions caps and emissions increases from the 1996 Project, respectively, were listed in Tables 5 and 6 of Construction Permit No. 95010001.

This Section 5.3 presents a discussion of the post-project PM and PM_{10} emissions caps and a summary of the updated emissions increase calculations for the 1996 Project, reflecting the proposed changes to the emissions caps. Section 5.4 of this permit application presents a summary of the updated net emissions increase calculations and Section 5.5 of this permit application presents certain permit terms proposed by USS Granite City for purposes of ensuring the emissions limitations are enforceable as a practical matter. As already discussed, USS Granite City is proposing that the revised permit no longer include limitations for the PM and PM_{10} emissions of individual emission points or emissions units.

The proposed emissions caps for the project-affected emissions units were developed by USS Granite City using the operating rates shown in Table 5-7. Other than the natural gas usage, which is proposed to increase, and the oil usage, which is proposed to be deleted entirely, these rates are unchanged from the operating rates in Construction Permit No. 95010001. USS Granite City shut down the by-product coke oven batteries in 2015. The shutdown of the Coke Plant eliminated coke oven gas as process fuel at the facility for use in the various fuel burning units. This resulted in increased use of natural gas for certain Project-affected fuel burning units. The emissions effects of the natural gas usage increase is also being addressed in this permit application.

Table 5-7. Projected Post-Project Operating Rates for PM and PM_{10}

Parameters	Units	Post Project Rates
Blast Furnace Production	Net tons of hot metal/year	3,165,000
BOF Shop	Molten steel tons/year	3,580,000
Combined BFG Combustion	MMcf/year	185,030
Combined NG Combustion	MMcf/year	1,980
Combined COG Combustion	n/a	0
Combined Oil Combustion	n/a	0

A comparison of the PM and PM_{10} emissions caps from Table 5 of Construction Permit No. 95010001 and the proposed revisions to these emissions caps is provided in Table 5-8. USS Granite City is proposing only minor changes to the emissions limitations as part of this permit application. (The changes are primarily attributable to the redistribution of the emission caps, including establishment of a separate emissions cap for certain material handling operations.)

The proposed revisions to the post-project PM and PM_{10} emissions caps reflect three categories of changes: corrections of certain emission factors used to calculate both pre-project and post-

project emissions, as shown in Table 5-5 and Table 5-6 herein; [28] changes to post-project operating rates as shown in Table 5-7; and changes to emissions unit groups for certain material handling and other operations, as discussed in footnote (a) of both Table 5-5 and Table 5-6 herein. A separate group for material handling builds upon the approach taken by Illinois EPA in the CAAPP permit for the USS Granite City facility.

Table 5-8. PM and PM_{10} Emissions Caps

Processes and Activities	Emissions Caps (TPY) from Table 5 of Construction Permit No. 95010001		Proposed Revised Emissions Caps (TPY)	
	PM	PM_{10}	PM	PM_{10}
Blast Furnace Operations	218	194	215	190
BOF Shop	510	451	525	462
Continuous Casting Operations	71	71	52	52
Certain Fuel Burning Units*	273	273	273	273
Roadways	27	27	27	27
Material Handling (coke, pellets (other than screen), limestone)	2	2	n/a	n/a
Material Handling Operations (New group accounts for emissions from material handling operations previously grouped under the BF and BOF Shop operations and material handling line shown above)	n/a	n/a	30	19
Total	1,101	1,018	30	19
* Emission rates for "certain fuel burning units" represent the potential to emit for these operations. No emissions caps are proposed for this category of affected units.				

Updated project emissions increase analyses for PM and PM_{10}, reflecting proposed revisions to the emissions increase calculations in Table 6 of Construction Permit No. 9501001, are provided in Table 5-9. This table incorporates the effects of the corrected pre-project emission factors and annual emissions as shown in Table 5-5 and Table 5-6 and the requested updates to the emissions caps as shown in Table 5-8. In addition, adjustments to the emissions caps reflect reorganization of material handling operations affected by the project under a separate operational group for Material Handling Operations (similar to the approach in the CAAPP Permit) and regrouping of some of the operations under the BOF Shop.

[28] In the 1995 Application, for post-project PM and PM_{10} emissions from the BOF roof monitor, National Steel proposed lower emission factors reflecting the implementation of measures to improve capture and control efficiency in the BOF. Illinois EPA agreed with this proposal, incorporated the lower emission factors into the 1996 Construction Permit, and recognized the PM and PM_{10} emission reductions in the netting analyses for these pollutants. No changes are proposed by USS Granite City to the post-project PM and PM_{10} emission factors for the BOF Shop roof monitor.

Table 5-9. PM and PM_{10} Project Emissions Increase Analyses

Processes and Activities	Pre-Project Actual Emissions (TPY)		Proposed Revised Emissions Caps (TPY)		Change (TPY)	
	PM	PM10	PM	PM10	PM	PM10
Blast Furnace Operations	137	120	215	190	78	70
BOF Shop	762	591	525	462	-237	-129
Continuous Casting Operations	35	35	52	52	17	17
Certain Fuel Burning Units	227	225	273	273	46	48
Material Handling Operations	29	26	30	19	1	-7
Total*					-95	-1

*Roadways were addressed as contemporaneous decreases in the 1995 Application. Table 5 of Construction Permit No. 95010001 includes the requisite emission limit for PM and PM10 emissions for the roadways. No changes are proposed to those emission limitations.

5.4 Changes to Net Emissions Increases for PM and PM_{10}

As part of the requested revisions to Construction Permit No. 95010001, USS Granite City is also proposing updates to the analyses for net emissions increases in emissions of PM and PM_{10} for the 1996 Project. Table 5-10 shows the updated net emissions increases calculations for PM and PM_{10} based on the updated project emissions increase calculations shown in Table 5-9.

In the 1995 Application, the calculations relating to contemporaneous decreases in actual emissions associated with fugitive dust controls for roadways and material handling were presented together. For increased clarity, those calculations are presented separately in this permit application and emissions changes for the material handling operations are now shown in the project emissions increase calculations in Table 5-9 herein. Further, in the 1995 Application and in Construction Permit No. 95010001, the calculations supporting those creditable and contemporaneous decreases in emissions of were performed using PM_{10} emissions data (see Attachment C of the permit). The estimated decreases in emissions of PM from fugitive dust controls for roadways were based on the highly conservative assumption that pre-project PM emissions from roadways were equal to pre-project PM_{10} emissions. (See Appendices E and F of the 1995 Application and see Tables 5 and 6 of the permit.) Information available now is not sufficient to develop revised calculations of fugitive pre-project PM emissions from roadways or to calculate what the PM emissions decrease would have been due to the implementation of fugitive dust controls, but it is known that both the pre-project actual PM emissions and the decrease in PM emissions would have been greater than the corresponding PM_{10} values shown in the 1995 Application and in the permit.[29] Because the Project clearly does not result in a significant net increase in PM emissions even with this conservative assumption, USS Granite City is conservatively retaining the estimated PM emissions decrease of 17.1 TPY (same as PM_{10}).

[29] Based on the most recent emission inventory for the Granite City Works, actual PM emissions from paved and unpaved roadways are approximately 3.6 times the PM_{10} emissions. This is generally consistent with U.S. EPA's AP-42 emission factor compilation: PM emissions from paved roads are 5.2 times PM_{10} emissions (see AP-42 Table 13.2.1-1) and PM emissions from unpaved industrial roads are 3.3 times PM_{10} emissions (see AP-42 Table 13.2.2-2).

Table 5-10. Updated Net Emissions Increases for PM and PM_{10} for the Project

		PM	PM10
Start of Contemporaneous Period		Jan 1991	Jan 1990
End of Contemporaneous Period		Jan 1996	Jan 1996
		Emissions (TPY)	
Project Emissions Increases (not including project decreases)		141.6	134.7
Significant Emission Rates		25	15
Whether Significant?		Yes	Yes
Project Emissions Changes (includes decreases at BOF shop operations)		-95	-1
Contemporaneous Emissions Increases	Date		
Remove Blast Furnace Slag Spout Hood	Jan-1990	n/a	4.9
#2 Caster Production	Dec-1990	n/a	11.7
Installation of #8 Galvanizing Line	Mar-1996	n/a	n/a
Contemporaneous Emissions Decreases			
Ingot Teeming Shutdown	Apr-1991	-22.4	-22.4
Blooming Mill Shutdown	Apr-1991	-3.4	-3.4
NESHAP Controls Coke By-product	Jul-1991	-	-
Batch Annealing Shutdown	Dec-1991	-0.2	-0.2
Roadways Fugitive Dust Controls	Nov-1991	-17.1	-17.1
Net Emissions Increases		**-138.4**	**-27.8**
Whether Significant?		No	No

The net emissions increases calculations also incorporate changes due to corrections to the contemporaneous period:

- The contemporaneous period for PM emissions from the project was established using the definition in 40 CFR § 52.21(b)(3)(ii). The start of the contemporaneous period was January 25, 1991, five years prior to the date on which construction of the project commenced. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered changes involving the removal of the blast furnace slag spout hood, startup of #2 caster, and the #8 Galvanizing Line to be contemporaneous. However, the removal of the blast furnace slag spout hood and the startup of the #2 caster occurred prior to the beginning of the contemporaneous period and the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period. Therefore, these changes were not contemporaneous for PM for the 1996 Project. USS Granite City has updated the netting analysis to reflect the fact that the PM emissions increase from installation of the #8 Galvanizing Line did not occur within the contemporaneous period.
- The contemporaneous period for PM_{10} emissions from the project was established using the definition in 35 IAC 203.208.[30] The start of the contemporaneous period was January 4, 1990, five years prior to the date of submittal of a timely and complete application on

[30] The USS Granite City facility was located in area that was designated as nonattainment for PM_{10} at the time of 1996 Construction Permit issuance.

January 3, 1995. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered the #8 Galvanizing Line to be contemporaneous. However, the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period and this project was not contemporaneous for PM_{10} for the 1996 Project. USS Granite City has updated the netting analysis to reflect the fact that the PM_{10} emissions increase from installation of the #8 Galvanizing Line did not occur within the contemporaneous period.

Net emissions increases for PM and PM_{10} remain below the applicable significant emission rates. Therefore, the 1996 Project remains a non-major modification under PSD and NNSR.

5.5 Requested Changes to Permit Terms Relating to PM and PM_{10} Emissions

As part of this application for revision to Construction Permit No. 95010001, USS Granite City is proposing the following revisions to the emission limitations and other permit terms relating to PM and PM_{10} emissions from the processes or activities affected by the 1996 Project.

5.5.1 Blast Furnace Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the blast furnace operations. The permit grouped the Iron Pellet Screen as part of the Blast Furnace Operations under Table 1. With this revision, USS Granite City is proposing to move the Iron Pellet Screen, previously listed under the Blast Furnace Operations, under a new Material Handling Operations Group discussed later in this Section.

5.5.1.1 Proposed PM and PM_{10} Emission Limitations for Blast Furnace Operations

USS Granite City proposes the following to replace Condition 5 in Construction Permit No. 95010001.

> *5.a Particulate matter emissions from the Blast Furnace Operations (A & B Blast Furnaces Casthouse Roof Monitor and Casthouse Baghouse stack, A & B Blast Furnace Charging, Iron Spout Baghouse, and Blast Furnace Slag Pits) shall not exceed 215 tons per year for PM and 190 tons per year for filterable PM10, each on a monthly rolling 12-month total.*

As the emission limitations would be in Condition 5.a itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations for specific emissions points and emissions units from Table 1 of Construction Permit No. 95010001 as they would be redundant.

5.5.1.2 Prescribed Emission Factors for Certain Blast Furnaces Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing the following prescribed emission factors for the

emissions points for which emissions testing is not feasible.[31] Each of these emission factors is the same as the corresponding emission factor used to calculate pre-project actual emissions as shown in Table 5-5 and Table 5-6.

(a) For Blast Furnace Casthouse Roof Monitor, use PM emission factor of 0.030 lb/ton and PM_{10} emission factor of 0.0153 lb/ton.
(b) For Blast Furnace charging, use PM emission factor of 0.0024 lb/ton and PM_{10} emission factor of 0.0012 lb/ton.
(c) For slag pits, use PM and PM_{10} emission factor of 0.00417 lb/ton.

USS Granite City recognizes that the annual emission limitations in the revised permit must now address a running total of 12-consecutive months of emissions, so that compliance with the annual limitations can be assessed 12 times per calendar year. Monthly emissions would be determined as the product of monthly throughout rate and applicable emission factor except if there are process upsets or malfunctions, that are accompanied by higher emissions. For such events, the additional emissions would be determined in accordance with the principles of credible evidence.

5.5.2 Basic Oxygen Furnace Shop Operations

This section of the permit application addresses the proposed changes to the requirements under Construction Permit No. 95010001 for the BOF Shop operations. The permit grouped the BOF Additive with BOF Hopper Baghouse and Flux Conveyor & Transfer Pits Bin Floor as part of the BOF Shop Operations under Table 2. With this revision, USS Granite City is proposing to address these units in a new group for Material Handling Operations. That group is discussed in Section 5.5.4 of this permit application. In addition, with this revision, USS Granite City is proposing to move the permit terms relating to the Baghouse 2 for Argon Stirring and Ladle Metallurgy (previously Argon Stirring and Material Handling Tripper (Ladle Metallurgy)) which was previously listed under the Continuous Casting Operations, in the BOF Shop Operations Group.

5.5.2.1 Proposed PM and PM_{10} Emission Limitations for BOF Shop Operations

USS Granite City proposes the following to replace Condition 18 in Construction Permit No. 95010001.

18.a Particulate matter emissions from the BOF Shop Operations (BOF ESP, BOF Baghouse, BOF Shop Roof Monitor, Desulf/ Soda Ash and Hot Metal Charging Baghouse, Slag Skimming Baghouse, and Baghouse 2 for Argon Stirring and Ladle Metallurgy shall not exceed 525 tons per year for PM and 462 tons per year for filterable PM_{10}, each on a monthly rolling 12-month total.[32]

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[31] PM and PM_{10} emissions factors are appropriately determined from the results of emissions testing per 40 CFR 63 Subpart FFFFF to determine PM and PM_{10} emission rates for the Blast Furnace Casthouse baghouse and the Iron Spout baghouse.
[32] USS installed a capture system for the BOF vessels in the BOF Shop operations. This system captures emissions from charging and tapping of the BOF vessels and routes it to a baghouse. For compliance with the BOF Shop emission caps, emissions from the BOF ESP and baghouse exhausts are included here.

As the emission limitations would be in Condition 18.a itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations for specific emissions points and emissions units from Table 2 and Table 3 of Construction Permit No. 95010001 as it would be redundant.

5.5.2.2 Prescribed Emission Factors for Certain BOF Shop Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing prescribed emission factors for the BOF Shop Roof Monitor for which emissions testing is not feasible.[33] For BOF Shop Roof Monitor, use PM emission factor of 0.0296 lb/ton and filterable PM_{10} emission factor of 0.0198 lb/ton.

5.5.3 Continuous Casting Operations

This section addresses the proposed changes to the requirements of Construction Permit No. 95010001 for the Continuous Casting operations.

5.5.3.1 Proposed PM and PM_{10} Emission Limitations for Continuous Casting Operations

USS Granite City proposes the following to replace Condition 20 in Construction Permit No. 95010001.

> *20.a Particulate matter emissions from the Continuous Casting Operations Caster Mold, Continuous Caster Spray Chamber, Slab Cutoff, and Slab Ripping shall not exceed 52 tons per year for PM and 52 tons per year for filterable PM_{10}, each on a monthly rolling 12-month total.*

As the emission limitations would be in Condition 20.a itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations for specific emissions points and emissions units from Table 3 of Construction Permit No. 95010001 as they would be redundant.

5.5.3.2 Prescribed Emission Factors for Continuous Casting Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing the following prescribed emission factors for the emissions points for which emissions testing is not feasible.

(a) For Caster Mold, use PM/PM_{10} emission factor of 0.006 lb/ton.
(b) For Slab Cutoff, use PM/PM_{10} emission factor of 0.0071 lb/ton.
(c) For Slab Ripping, use PM/PM_{10} emission factor of 0.00722 lb/ton.

5.5.4 Material Handling Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the material handling operations associated with the Blast Furnace and BOF Shop operations. As previously noted, material handling equipment in the Blast Furnace Operations and the BOF

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[33] PM and PM_{10} emissions factors are appropriately determined from the results of emissions testing per 40 CFR 63 Subpart FFFFF to determine PM and PM_{10} emission rates for the BOF ESP and baghouse, Desulf/ Soda Ash and Hot Metal Charging Baghouse, Slag Skimming Baghouse, and Baghouse 2 for Argon Stirring and Ladle Metallurgy.

Shop Operations are now proposed to be included in this new section. This also includes emissions associated with material handling and transport of coke, pellets, and limestone. In addition, emissions from Baghouse 1 for Material Handling operation are also included in this section. In addition, USS identified a small silo used to store Mag-Lime at the BOF that used an integrated filter that exhausts inside the building. This emissions from this silo are also included in this group.[34]

5.5.4.1 *Proposed PM and PM_{10} Emission Limitations for Material Handling Operations*

USS Granite City proposes the following new Condition 42 in Construction Permit No. 95010001.

> *42. Particulate matter emissions from the Material Handling Operations shall not exceed 30 tons per year of PM and 19 tons per year of filterable PM_{10}, each on a monthly rolling 12-month total.*

As the emission limitations would be in Condition 42 itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations from Table 1, Table 2, and Table 3 of Construction Permit No. 95010001 as they would be redundant.

5.5.4.2 *Prescribed Emission Factors for Material Handling Operations*

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing the following prescribed emission factors for the emissions points for which emissions testing is not feasible.

(a) For Iron Pellet Screen fugitives, use PM/PM_{10} emission factor of 0.00131 lb/ton.
(b) For material handling and transfer operations for coke, pellets, and limestone, use AP-42 Chapter 13.2.4 to calculate applicable emission factors.
(c) For Mag-Lime silo with filter, use PM/PM10 emission rate of 0.009 lb/hour.

[34] PTE of the Mag-Lime silo is less than 0.1 TPY. Therefore, USS did not quantify any baseline for this operation and conservatively included this operation in the emission cap for the Maerial Handling Operations.

6. Proposed Changes to Permit Terms for NOx Emission Increase Analysis

This section describes the proposed changes to Construction Permit No. 95010001 being requested by USS Granite City related to NOx emissions. It also provides a demonstration that, even with the requested revisions, the Project would still not be a major modification under the PSD program at 35 IAC 204 with respect to emissions of NO_2 and under the NNSR program at 35 IAC Part 203 with respect to emissions of NOx. The emissions calculations for NOx from the 1995 Application submitted by National Steel Corporation are reproduced in Appendix B.

6.1 Construction Permit No. 95010001 Applicability and Requirements

Table 6-1 below summarizes the provisions from Construction Permit No. 95010001 pertaining to NOx emissions limitations from the project affected emissions units. Copies of the relevant permits are provided in Appendix D1 and D2 of this application.

Table 6-1. Construction Permit Conditions Addressing NOx

Permit Condition	Requirements
5	Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.
18	Emissions from the BOF Shop operations shall not exceed the limits in attached Tables 2 and 5.
20	Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5
22	Emissions from the listed fuel combustion units shall not exceed the limits in Tables 4 and 5.

The annual NOx emissions caps listed in Table 5 of Construction Permit No. 95010001 are presented in Table 6-2 below. These annual NOx emissions caps cover all emissions units affected by the Project. The emissions units are grouped in the four main processes or activities at the USS Granite City facility, each calculated as the sum of the unit-specific NOx emissions limitations in Tables 1 through 3 and fuel specific in Table 4 of the permit.

Table 6-2. NOx Emissions Information from Table 5 of Construction Permit No. 95010001

Processes and Activities	NOx Emissions Caps (tons/year)
Blast Furnace Operations	24
BOF Shop Operations	70
Continuous Casting Operations	90
Certain Fuel Combustion Units	674
Total	858

The NOx emissions caps restricted the PTE of the project-affected emissions units. The project emissions increase for NOx was calculated by subtracting pre-project actual emissions (August 1992 to July 1994, 24-month period) from the PTE as restricted by the limitations in the permit. Table 6 of Construction Permit No. 95010001 included the emissions increase from the project

and major modification applicability determinations for NOx. The NOx net emissions increase was below the applicable significant emission rates and as a result, NOx emissions were not subject to PSD or NNSR review.

6.2 Pre-Project Actual Emissions for 1996 Project

This section presents the updated pre-project actual emissions with proposed corrections to some of the NOx emission factors. Corrections to the NOx emissions factors are the result of more recent performance tests and updated information as discussed in 6.2.2.

6.2.1 Historical Throughput Rates

The NOx net emissions increase calculations presented in Table 6 of Construction Permit No. 95010001 were based on the calculations provided by National Steel Corporation in Table 3-2 of the 1995 Application. That table from the prior construction permit application is reproduced in Appendix B of this permit application.

The pre-project actual emissions were calculated using the same production and operating rates as the 1995 Application shown in Table 6-3.

Table 6-3. Pre-Project Production and Operating Rates for NOx

Parameters	Units	Pre-Project Rates
Blast Furnace Production	Net tons of hot metal/year	2,059,557
BOF Shop	Molten steel tons/year	2,413,406
Combined BFG Combustion	MMcf/year	121,039
Combined NG Combustion	MMcf/year	1,145
Combined Fuel Oil Combustion	Mgal/year	16

6.2.2 NOx Emission Factors Basis and Revisions

USS Granite City has corrected some of the NOx emission factors used to calculate pre-project actual emissions from the project-affected emissions units based on stack testing and updated literature-based information. USS Granite City has also validated the remaining emissions factors. The results are presented in Table 6-5; explanations are provided in the following paragraphs.

6.2.2.1 Fuel Burning Emissions Units Emissions (Revised)

The pre-project actual emissions for various fuels used in fuel burning emissions units affected by the project are calculated using the emission factors presented in Table 6-4.

Table 6-4. NOx Emission Factors for Fuel Burning

Fuel	Emission Factor and Units	Basis
Blast Furnace Gas[35]	5.28 lb/MMcf	February 1993 stack test
Natural Gas	306 lb/MMcf	November 1992 stack test
Coke Oven Gas (added)	80 lb/MMcf in stoves and 403.69 lb/MMcf in boilers *(both added)*	Stoves – Stack test (date unknown) Boilers – "A" battery stack test 1989
Fuel Oil (*Shown for historical purposes. USS Granite City no longer plans to use fuel oil.*)	55 lb/1000 gallon	AP-42 Page 1.3-2

Section 5.2.2.15 includes discussion of inclusion of emissions from the COG combustion for applicability calculations here including the fuel usage information for the affected units.

6.2.2.2 A&B Blast Furnace Casthouse Stack (Baghouse) Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnace Casthouse stack (baghouse), as presented by National Steel Corporation in the 1995 Application, were calculated using data from a stack test conducted in July 1993. Other than the test results, USS Granite City has no information regarding this stack test, which was conducted by National Steel. In March 2012, USS Granite City performed NOx stack tests at the Blast Furnace Casthouse stack. This test indicated a lower NOx emission factor for this operation than previously used (0.0144 lb/ton in the original analysis vs 0.0027 lb/ton based on the March 2012 stack test). In Table 6-5, both the original and updated NOx emission factors are shown for the Blast Furnace Casthouse stack.

6.2.2.3 A&B Blast Furnace Casthouse Roof Monitor Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnace Casthouse roof monitor, as presented by National Steel Corporation in the 1995 Application, were calculated using the emission factor as 0.00072 lb/ton. This value was developed using the July 1993 stack test result of 0.0144 lb/ton for the casthouse baghouse stack and an assumption of 95% capture efficiency as described in Section 5.2.2.3 herein. As discussed in Section 6.2.2.2 above, subsequent testing indicated a lower NOx emission factor for the stack emissions of 0.0027 lb/ton. Assuming a 95% capture efficiency for the casthouse baghouse collection system, the uncaptured portion (5% of NOx generated) is emitted through the roof monitors at the rate of 0.00014 lb/ton. In Table 6-5, both the original and updated NOx emission factors are shown for the Blast Furnace Casthouse roof monitor emissions.

6.2.2.4 A&B Blast Furnace Iron Spout Baghouse Emissions (Revised)

The 1995 Application and Construction Permit No. 95010001 did not identify any NOx emissions from the Blast Furnace Iron Spout Baghouse. However, a stack test conducted in March 2012 indicated a NOx emission factor of 0.0016 pound per ton of hot metal for this emission point. In Table 6-5, the revised analysis includes pre-project actual NOx emissions from the Blast Furnace Iron Spout Baghouse stack.

[35] BFG is a low Btu fuel that results in a cool flame during combustion. This results in relatively low NOx emission rate for this fuel for all types of applications.

6.2.2.5 BOF ESP Stack (BOF 2 Vessels) Emissions (Revised)

The pre-project actual emissions for the BOF ESP stack, as presented by National Steel Corporation in the 1995 Application, were calculated using data from the average of three runs from one stack test conducted in August 1993. As discussed below, the results of this 1993 stack test have been shown by subsequent data not to be representative of emissions from the BOF ESP stack. The 1996 Project involved increases in the production limits for the Granite City blast furnaces and BOF Shop operations. The project did not involve any physical changes or changes in the method of operation for the BOF Shop. The BOF Shop operations do not use any add-on NOx control devices. Thus, variability in NOx emissions for the BOF process are inherent to the process operation. Beginning in 2012, USS Granite City performed several NOx stack tests at the BOF ESP stack. This testing provided an updated NOx emission factor for the BOF ESP stack (0.0389 lb/ton in the original analysis vs 0.14 lb/ton based on the average of April 2012, July 2012, and November 2014 stack test results). In Table 6-5, both the original and updated NOx emission factors are shown for the BOF ESP stack.

6.2.2.6 BOF Baghouse - Secondary Emissions (New)

At the time of the 1995 Application, the BOF Shop did not include a baghouse to capture secondary emissions. Secondary emissions were released to the atmosphere through the BOF Shop roof monitor. No information was available at the time about the NOx emissions from the BOF Shop roof monitor. Since then, the BOF Shop includes a capture system for secondary emissions that are routed to a baghouse. NOx emission testing for the BOF Shop baghouse, completed in 2019-2020 timeframe, shows an average NOx rate of 0.0075 lb/ton for the BOF Shop Baghouse stack. USS Granite City added the BOF Shop secondary NOx emissions baseline based on the result of the stack test for the BOF Shop Baghouse stack.

6.2.2.7 Continuous Caster Mold Process Emissions (Revised)

The pre-project actual emissions for the Continuous Caster Mold – Caster #1 and Caster #2 process, as presented by National Steel Corporation in the 1995 Application listed NOx emissions from this operation. USS Granite City evaluated this analysis and determined that there is no NOx formation in this operation. Any NOx emissions from this operation are due to combustion of natural gas and are already accounted for under the gaseous fuel burning activities listed above. Therefore, in the revised analysis, NOx emissions are not included from this operation.

Table 6-5. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project NOx Emission Factors for Affected Emissions Units

Emission Point	Emission Factors[a]		Units	Reason for Change	Pre-project Actual Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Stack (Baghouse)	0.0144	0.0027	lb/ton of hot metal	Revised based on 3/2012 stack test	14.83	2.78
A & B Blast Furnace Casthouse Roof Monitor	0.0007	0.0001	lb/ton of hot metal	3/2012 test assuming no NOx control and 5% roof monitor fraction	0.74	0.15
Iron Spout Baghouse		0.0016	lb/ton of hot metal	Based on 3/2012 stack test		1.6
Blast Furnace Operations					***15.6***	***4.6***
BOF ESP Stack (2 Vessels)	0.0389	0.14	lb/ton of steel	Revised based on average of 2012-2014 stack tests	46.94	170.8
BOF Secondary Emissions (2 Vessels)		0.0075	lb/ton of steel	Based on 2019-20 stack test		9.1
BOF Shop Operations					***46.94***	***179.8***
Continuous Caster Mold - Casters #1 & #2	0.05	0.00	lb/ton of steel	All NOx formed from natural gas combustion. No additional NOx	60.34	0.00
Continuous Casting Operations					***60.34***	***0.00***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	5.28	5.28	lb/MMcf	No change	319.54	319.54
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	306.00	306.00	lb/MMcf	No change	175.19	175.19
Combined COG in stoves, B11 & B12		80 and 404	lb/MMcf	Added		461.18
Combined FO in stoves, B11 & B12, ladle drying preheaters, and BFG flares (*shown here for historical purposes*)	9.72	9.72	lb/Mgal	No change	0.44	0.44
Certain Fuel Burning Units					***495.17***	***956.4***
Total					***618.01***	***1,140.8***

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6.3 Post-Project NO_X Emissions Limitations

As described in subsection 5.3, the post-project emissions caps and emissions increases from the 1996 Project were, respectively, listed in Tables 5 and 6 of Construction Permit No. 95010001. Similar to PM and PM_{10}, this subsection 6.3 presents a discussion of the post-project NO_X emissions caps and summary of the updated emissions increase calculations for the 1995 Project, reflecting the proposed changes in the emissions caps.

The post-project emissions caps for the project affected emissions units are developed by USS Granite City using the operating rates shown in Table 6-6. Other than the natural gas usage, which is proposed to increase, and the oil usage, which is proposed to be eliminated, these rates are unchanged from the operating rates in the permit. As previously noted in Section 5.3, due to 2015 shutdown of the Coke Plant this application addresses increase in natural gas usage for the fuel burning units affected by the project and also addresses elimination of COG at the affected units.

Table 6-6. Projected Post-Project Operating Rates for NO_X

Parameters	Units	Post Project Rates
Blast Furnace Production	Net tons of hot metal/year	3,165,000
BOF Shop	Molten steel tons/year	3,580,000
Combined BFG Combustion	MMcf/year	185,030
Combined NG Combustion	MMcf/year	1,980
Combined COG Combustion	n/a	0
Combined Oil Combustion	n/a	0

A comparison of the NOx emissions caps from Table 5 of Construction Permit No. 95010001 and the proposed revisions to these emissions caps is provided in Table 6-7. Detailed emissions calculations are provided in Appendix B. The proposed revisions to the post-project NOx emissions caps reflect changes to some of the emission factors presented in Table 6-5 and changes in post-project operating rates as shown in Table 6-6. USS Granite City also revised NOx emission factors for boilers to reflect the currently applicable emission limitations for boilers under 35 IAC 217.164(b).

Table 6-7. NO_X Emissions Caps

	NO_X Emission Caps (TPY) from Table 5 of Construction Permit No. 95010001	Proposed Revised NOx Emissions Caps (TPY)
Blast Furnace Operations	24	24.0
BOF Shop	70	400
Continuous Casting Operations	90	0.0
Certain Fuel Burning Units*	674	706
Total	858	1130
* Emission rates for "certain fuel burning units" represent the potential to emit for these operations. No emissions caps are proposed for this category of units.		

Updated project emissions increase analysis for NOx reflecting proposed revisions to the emissions increase calculations in Table 6 of Construction Permit No. 95010001, is provided in Table 6-8. This table incorporates the effects of the corrected pre-project emission factors as shown in Table 6-5 and the requested updates to the emission caps as shown in Table 6-7.

Table 6-8. NOx Project Emissions Increase Analysis

	NOx Pre-Project Actual Emissions (TPY)	Proposed Revised NOx Emissions Caps (TPY)	NOx Change (TPY)
Blast Furnace Operations	4.6	24.0	19.4
BOF Shop	179.8	400.0	220.2
Continuous Casting Operations	0.0	0.0	0.0
Certain Fuel Burning Units	956.3	706.0	-250.3
Total	1140.7	1130	-10.7

6.4 Changes to Net Emissions Increase Calculation for NOx

In conjunction with the requested revisions to Construction Permit No. 95010001, USS Granite City is also updating the analysis for net increases in emissions of NOx for the 1996 Project.

Table 6-9 shows the updated net emissions increases calculations for NOx based on the updated project emissions increase calculations shown in Table 6-8. This table includes a correction to the contemporaneous period for NOx emissions from the project as established using the definition in 35 IAC 203.208.[36] The start of the contemporaneous period was January 4, 1990, five years prior to the date of submittal of a timely and complete application on January 3, 1995. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered the #8 Galvanizing Line to be contemporaneous. However, the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period and this project was not contemporaneous for the 1996 Project.

Net emissions increase for NOx remains below the applicable significant emission rate. Therefore, the 1996 Project remains a non-major modification under PSD and NNSR.

[36] Granite City Works is located in area that was designated as nonattainment for ozone at the time Construction Permit No. 95010001 was originally issued. Accordingly, the applicability provisions of the Illinois NNSR rule under 35 IAC 203 were addressed for the Project at that time.

Table 6-9. Updated Net Emissions Increases for NOx for the 1996 Project

		NO_x
Start of Contemporaneous Period		Jan 1990
End of Contemporaneous Period		Jan 1996
Project Emissions Increases		239.6
Significant Emission Rates		40
Whether Significant?		Yes
Project Emissions Changes (includes decreases at the fuel combustion units)		-10.7
Contemporaneous Emissions Increases	Date	
Installation of #8 Galvanizing Line	Mar-1996	n/a
Contemporaneous Emissions Decreases		
Blooming Mill Shutdown	Apr-1991	-217.8
Batch Annealing Shutdown	Dec-1991	-8.7
Net Emissions Increase		**-237.3**
Whether Significant?		No

6.5 Requested Changes to Permit Terms Relating to NO_x Emissions

As part of this application for revision to Construction Permit No. 95010001, USS Granite City is proposing the following revisions to the emission limitations and other permit terms relating to NOx emissions from the processes or activities affected by the 1996 Project.

6.5.1 Blast Furnace Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the blast furnace operations under Table 1.

6.5.1.1 Proposed NO_x Emission Limitations for Blast Furnace Operations

USS Granite City proposes the following as Condition 5.b in Construction Permit No. 95010001.

> *5.b NO_x emissions from the Blast Furnace Operations (A & B Blast Furnaces Casthouse Roof Monitor, Casthouse Baghouse stack, Iron Spout Baghouse stack) shall not exceed 24.0 tons per year on a monthly rolling 12-month total.*

As the NOx emission limitations are to be incorporated in Condition 5.b itself, USS Granite City also proposes the deletion of the NOx emission limitations for specific emissions points and emissions units from Table 1 of Construction Permit No. 95010001 as they would be redundant.

6.5.1.2 Prescribed Emission Factors for Blast Furnaces Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing a prescribed emissions calculation methodology for NOx emissions from the blast furnace casthouse roof monitor based on application of 95% capture efficiency to the NOx stack test result for the blast furnace casthouse baghouse.

6.5.2 Basic Oxygen Furnace Shop Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the BOF Shop operations under Table 2.

6.5.2.1 Proposed NO_X Emission Limitations for BOF Shop Operations

USS Granite City proposes the following as Condition 18.b in Construction Permit No. 95010001.

> *18.b NO_X emissions from the BOF ESP and BOF Baghouse stacks shall not exceed 400 tons per year on a monthly rolling 12-month total.*

As the NOx emission limitations are to be incorporated in Condition 18.b itself, USS Granite City also proposes the deletion of the NOx emission limitations for specific emissions points and emissions units in Table 2 of Construction Permit No. 95010001 as they would be redundant.

7. Proposed Changes to Permit Terms for VOM Emission Increase Analysis

This section describes the proposed changes to Construction Permit No. 95010001 requested by USS Granite City related to VOM emissions. It also provides a demonstration that, even with the requested revisions, the Project would still not be a major modification under the NNSR program at 35 IAC Part 203 with respect to emissions of VOM. The emissions calculations for VOM from the 1995 Application submitted by National Steel Corporation are reproduced in Appendix B.

7.1 Construction Permit No. 95010001 Applicability and Requirements

Table 7-1 below summarizes the provisions from Construction Permit No. 95010001 pertaining to VOM emissions limitations from the project-affected emissions units. Copies of the relevant permits are provided in Appendix D1 and D2 of this application.

Table 7-1. Construction Permit Conditions Addressing VOM

Permit Condition	Requirements
5	Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.
18	Emissions from the BOF Shop operations shall not exceed the limits in attached Tables 2 and 5.
22	Emissions from the listed fuel combustion units shall not exceed the limits in Tables 4 and 5.

The annual VOM emissions caps listed in Table 5 of Construction Permit No. 95010001 are presented in Table 7-2 below. These annual VOM emissions caps cover all emissions units affected by the Project. The emission units are grouped in the three main processes or activities at the USS Granite City facility, each calculated as the sum of the unit specific VOM emissions limitations in Tables 1 through 3 and the fuel specific limitations in Table 4 of the permit.

Table 7-2. VOM Emissions Information from Table 5 of Construction Permit No. 95010001

Processes and Activities	VOM Emissions Caps (tons/year)
Blast Furnace Operations	157
BOF Shop Operations	12
Certain Fuel Combustion Units	2
Total	171

The VOM emissions caps restricted the PTE of the project affected emissions units. The VOM project emissions increase was calculated by subtracting pre-project actual emissions (August 1992 to July 1994 24-month period) from the PTE as restricted by the 1996 Construction Permit limitations. Table 6 of Construction Permit No. 95010001 included the emissions increase from the project and major modification applicability determinations for VOM. VOM net emissions increases were below the applicable significant emission rates and as a result, VOM emissions were not subject to NNSR review.

7.2 Pre-Project Actual Emissions for 1996 Project

This section presents the updated pre-project actual emissions with proposed corrections to some of the VOM emission factors. Revisions to the emissions factors are the result of more recent performance tests and updated information as discussed in 7.2.2.

7.2.1 Historical Throughput Rates

The VOM net emissions increase calculations presented in Table 6 of Construction Permit No. 95010001 were based on the calculations provided by National Steel Corporation in Table 3-6 of the 1995 Application. That table from the prior construction permit application is reproduced in Appendix B to this permit application.

The pre-project annual emissions were calculated using the same production and operating rates as the 1995 Application shown in Table 7-3.

Table 7-3. Pre-Project Production and Operating Rates for VOM

Parameters	Units	Pre-Project Rates
Blast Furnace Production	Net tons of hot metal/year	2,059,557
BOF Shop	Molten steel tons/year	2,413,406
Combined BFG Combustion	MMcf/year	121,039
Combined NG Combustion	MMcf/year	1,145
Combined Fuel Oil Combustion	Mgal/year	16

7.2.2 VOM Emission Factors Basis and Revisions

USS Granite City has corrected some of the VOM emission factors used to calculate pre-project actual emissions from the project affected emissions units based on stack testing and updated literature-based information and has validated the remaining emissions factors. The results are presented in Table 7-5; explanations are provided in the following paragraphs.

7.2.2.1 Fuel Burning Emissions Units Emissions (Revised)

The pre-project actual emissions for various fuels used in fuel burning emissions units affected by the project are calculated using the emission factors presented in Table 7-4.

Table 7-4. VOM Emission Factors for Fuel Burning

Fuel	Emission Factors and Units	Basis
Blast Furnace Gas	0.24 lb/MMcf *(revised)*	Updated based on the CoGen Boiler Permit No. 06070023
Natural Gas	5.5 lb/MMcf *(revised)*	Based on AP-42 Chapter 1.4
Coke Oven Gas (added)	0.18 lb/MMcf in stoves 1.22 lb/MMcf in boilers (both added)	Stoves – literature based factor Boilers – AIRS 1990
Fuel Oil	0.28 lb/1000 gallon	AP-42 Page 1.3-2

Section 5.2.2.15 includes discussion of inclusion of emissions from the COG combustion for applicability calculations here including the fuel usage information for the affected units.

7.2.2.2 A&B Blast Furnace Casthouse Baghouse Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnaces Casthouse stack (baghouse) as presented by National Steel Corporation in the 1995 Application were calculated using data from a stack test conducted in July 1993. Other than the test results, USS Granite City has no information regarding this stack test, which was conducted by National Steel. In March 2012, USS Granite City performed VOM stack tests at the Blast Furnace Casthouse stack. This test indicated a lower VOM emission factor for this operation than previously used (0.09458 lb/ton in the original analysis vs 0.014 lb/ton based on the March 2012 stack test). In Table 7-5, both the original and updated VOM emission factors are shown for the Blast Furnace Casthouse stack.

7.2.2.3 A&B Blast Furnace Casthouse Roof Monitor Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnace Casthouse roof monitor, as presented by National Steel Corporation in the 1995 Application, were calculated using an emission factor of 0.0047 lb/ton. This value was developed using the July 1993 stack test result of 0.09548 lb/ton for the casthouse baghouse stack and an assumption of 95% capture efficiency described in Section 5.2.2.3 herein. As discussed in 7.2.2.2 above, subsequent testing indicated a lower VOM emission factor for the stack emissions of 0.014 lb/ton. Assuming a 95% capture efficiency for the casthouse baghouse collection system, the uncaptured portion (5% of VOM generated) is emitted through the roof monitors at the rate of 0.00073 lb/ton. In Table 7-5, both the original and updated VOM emission factors are shown for the Blast Furnace Casthouse roof monitor emissions.

7.2.2.4 A&B Blast Furnace Iron Spout Baghouse Emissions (Revised)

The 1995 Application Construction Permit No. 95010001 did not identify any VOM emissions from the Blast Furnace Iron Spout Baghouse. However, a stack test conducted in March 2012 indicated a VOM emission factor of 0.0037 pounds per ton of hot metal for this emission point. In Table 7-5, the revised analysis includes pre-project actual VOM emissions from the Blast Furnace Iron Spout Baghouse stack.

7.2.2.5 BOF ESP Stack (BOF 2 Vessels) Emission (Revised)

The pre-project actual emissions for the BOF ESP stack, as presented by National Steel Corporation in the 1995 Application, were calculated using data from the average of three runs from one stack test conducted in August 1993. As discussed below, the results of this 1993 stack test have been shown by subsequent data to be non-representative of the emissions from the BOF ESP stack. The 1996 Project involved increases in the production limits for the Granite City blast furnaces and BOF Shop operations. The project did not involve any physical changes or changes in the method of operation for the BOF Shop. The BOF Shop operation does not use any add-on VOM control devices. Thus, variability in VOM emissions for the BOF process is inherent to the process operation. Beginning in 2012, USS Granite City performed several VOM stack tests at the BOF ESP stack. This testing provided an updated VOM emission factor for the BOF ESP stack (0.006 lb/ton in the original analysis vs 0.019 lb/ton based on the average of April 2012, July 2012, and November 2014 stack test results). In Table 7-5, both the original and updated VOM emission factors are shown for the BOF ESP stack.

7.2.2.1 BOF Baghouse - Secondary Emissions (New)

At the time of the 1995 Application, the BOF Shop did not include a baghouse to capture secondary emissions. Secondary emissions were released to the atmosphere through the BOF

Shop roof monitor. No information was available at the time about the VOM emissions from the BOF Shop roof monitor. Since then, the BOF Shop includes a capture system for secondary emissions that are routed to a baghouse. VOM emission testing for the BOF Shop baghouse, completed in 2019-2020 timeframe, shows an average NOx rate of 0.0035 lb/ton for the BOF Shop Baghouse stack. USS Granite City added the BOF Shop secondary VOM emissions baseline based on the result of the stack test for the BOF Shop Baghouse stack.

7.2.2.2 Desulfurization Station & Transfer Pit Baghouse Emission Factor (Revised)

The pre-project VOM baseline emissions for the Desulfurization Station & Transfer Pit Baghouse stack as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor from the U.S. EPA's AIRS 1990 database (WebFIRE). In May 2012, USS Granite City performed VOM stack tests at the Desulfurization Station & Transfer Pit Baghouse stack. This testing has provided an updated VOM emission factor for this emission point (0.0010 lb/ton in the original analysis vs 0.00019 lb/ton based on a May 2012 stack test). In Table 7-5, both the original and updated VOM emission factors are shown for the Desulfurization Station & Transfer Pit Baghouse stack.

7.2.2.3 Hot Metal Charging and Ladle Skimming Stack Emissions (New)

The 1995 Application and Construction Permit No. 95010001 did not quantify any VOM emissions from the Hot Metal Charging and Ladle Skimming baghouse exhaust. USS Granite City conducted a stack test in May 2012 and based on this stack test, included a VOM emission rate of 0.00015 lb/ton for this stack.

Table 7-5. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project VOM Emission Factors for Affected Emissions Units

Emission Point	Emission Factors		Units	Basis	Baseline Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Stack (Baghouse)	0.09458	0.014	lb/ton of hot metal	Revised based on 3/2012 stack test	97.40	14.3
A & B Blast Furnace Casthouse Roof Monitor	0.00469	0.00073	lb/ton of hot metal	3/2012 test assuming no VOM control and 5% roof monitor fraction	4.83	0.8
Iron Spout Baghouse	0.0000	0.0037	lb/ton of hot metal	Revised based on 3/2012 stack test	0.00	3.8
Blast Furnace Operations					***102.23***	***18.8***
BOF Stack (2 Vessels)	0.0060	0.0190	lb/ton of steel	Revised based on average of 2012-2014 stack tests	7.24	22.40
BOF Secondary Emissions (2 Vessels)		0.0035	lb/ton of steel	Based on 2019-20 stack test		4.2
Desulfurization Station [inside BOF shop] & Transfer Pit	0.00100	0.00019	lb/ton of hot metal	Revised based on 5/2012 stack test	1.03	0.2
Hot Metal Charging and Ladle Skimming		0.00015	lb/ton of hot metal	Based on 5/2012 stack test		0.2
BOF Shop Operations					***8.27***	***27.0***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	0.0	0.24	lb/MMcf	Updated from Cogen Boiler permit	0	14.52
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	2.8	5.5	lb/MMcf	1998 update to AP-42 Section 1.4	1.60	3.15
Combined COG in stoves, B11 & B12		0.18 and 1.22	lb/MMcf	Added		1.38
Combined FO in stoves, B11 & B12, ladle drying preheaters, and BFG flares	0.28	0.28	lb/Mgal	No change	0.00	0.00
Certain Fuel Burning Units					***1.61***	***19.1***
Total					***112.10***	***64.9***

R004505

7.3 Post-Project VOM Emissions Limitations

As described in subsection 5.3, the post-project emissions caps and emissions increases from the 1996 Project were, respectively, listed in Tables 5 and 6 of Construction Permit No. 95010001. Similar to PM and PM_{10}, this subsection 6.3 presents a discussion of the post-project VOM emissions caps and summary of the updated emissions increase calculations for the 1995 Project, reflecting the proposed changes in the emissions caps.

The post-project emissions caps for the project affected emissions units are developed by USS Granite City using the operating rates parameters shown in Table 7-6. Other than the natural gas usage, which is proposed to increase, and the oil usage, which is proposed to be deleted entirely, these rates are unchanged from the operating rates in Construction Permit No. 95010001. As previously noted in Section 5.3, due to 2015 shutdown of the Coke Plant this application addresses increase in natural gas usage for the fuel burning units affected by the project and also addresses elimination of COG at the affected units.

Table 7-6. Projected Post-Project Operating Rates for VOM

Parameters	Units	Post Project Rates
Blast Furnace Production	Net tons of hot metal/year	3,165,000
BOF Shop	Molten steel tons/year	3,580,000
Combined BFG Combustion	MMcf/year	183,030
Combined NG Combustion	MMcf/year	1,980
Combined COG Combustion	n/a	0
Combined Oil Combustion	n/a	0

A comparison of the VOM emissions caps from Table 5 of Construction Permit No. 95010001 and the proposed revisions to these emissions caps is provided in Table 7-7. Detailed emissions calculations are provided in Appendix B. The proposed revisions to the post-project VOM emissions caps reflect changes to some of the emission factors presented in Table 7-5 and changes in post-project operating rates as shown in Table 7-6.

Table 7-7. VOM Emissions Caps

	VOM Emission Caps (TPY) from Table 5 of Construction Permit No. 95010001	Proposed Revised VOM Emissions Caps (TPY)
Blast Furnace Operations	157	45.0
BOF Shop	12	45.20
Certain Fuel Burning Units*	2	40
Total	171	130
* Emission rates for "certain fuel combustion units" represent the potential to emit for these operations. No emissions caps are proposed for this category of units.		

Updated project emissions increase analysis for VOM reflecting proposed revisions to the emissions increase calculations in Table of Construction Permit No. 95010001, is provided in

Table 7-8. This table incorporates the effects of the corrected pre-project emission factors as shown in Table 7-5 and the requested updates to the emission limitations as shown in Table 7-7.

Table 7-8. Revised VOM Project Emissions Increase Analyses

	VOM Pre-Project Emissions (TPY)	VOM Revised Emission Limitations (TPY)	VOM Change (TPY)
Blast Furnace Operations	18.8	45.0	26.2
BOF Shop	27.0	45.0	18.0
Certain Fuel Burning Units	19.1	40.0	20.9
Total	64.9	130	65.1

7.4 Changes to Net Emissions Increase Calculation for VOM

In conjunction with the requested revisions to Construction Permit No. 95010001, USS Granite City is also updating the analysis for net increases in emissions of VOM for the 1996 Project. Table 7-9 shows the updated net emissions increases calculations for VOM based on the updated project emissions increase calculations shown in Table 7-8. This table includes a correction to the contemporaneous period for VOM emissions from the project as established using the definition in 35 IAC 203.208.[37] The start of the contemporaneous period was January 4, 1990, five years prior to the date of submittal of a timely and complete application on January 3, 1995. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered the #8 Galvanizing Line to be contemporaneous. However, the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period and this project was not contemporaneous for the 1996 Project.

Table 7-9. Updated Net Emissions Increases for VOM for the 1996 Project

		VOM
Start of Contemporaneous Period		Jan 1990
End of Contemporaneous Period		Jan 1996
Project Emissions Increases		65.1
Significant Emission Rates		40
Whether Significant?		Yes
Contemporaneous Emissions Increases	Date	
Installation of #8 Galvanizing Line	Mar-1996	n/a
Contemporaneous Emissions Decreases		
Blooming Mill Shutdown	Apr-1991	-0.9
NESHAP Controls for Coke By-Product Operations	Jul-1991	-31.6
Batch Annealing Shutdown	Dec-1991	-0.3
Net Emissions Increase		**32.3**
Whether Significant?		No

[37] The USS Granite City facility was located in area that was designated as nonattainment for ozone at the time of 1996 Construction Permit issuance. Therefore, NNSR provisions under 35 IAC 203 applied for the project at the time.

Net emissions increase for VOM remains below the applicable significant emission rate. Therefore, the 1996 Project remains a non-major modification under NNSR.

7.5 Requested Changes to Permit Terms Relating to VOM Emissions

As part of this application for revision to Construction Permit No. 95010001, USS Granite City is proposing the following revisions to the emission limitations and other permit terms relating to VOM emissions from the processes or activities affected by the 1996 Project.

7.5.1 Blast Furnace Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the blast furnace operations under Table 1.

7.5.1.1 Proposed VOM Emission Limitations for Blast Furnace Operations

USS Granite City proposes to add the following as Condition 5.c in Construction Permit No. 95010001.

> *5.c VOM emissions from the Blast Furnace Operations (A & B Blast Furnaces Casthouse Roof Monitor, Casthouse Baghouse stack, Iron Spout Baghouse stack) shall not exceed 45.0 tons per year on a monthly rolling 12-month total.*

As the VOM emission limitations are to be incorporated in Condition 5.c itself, USS Granite City also proposes the deletion of the VOM emission limitations from for specific emissions points and emissions units Table 1 of Construction Permit No. 95010001 as they would be redundant.

7.5.1.2 Prescribed Emission Factors for Blast Furnaces Operations

Prescribed emission factors consistent with the approach described in Section 3 herein. USS Granite City is proposing a prescribed emissions calculation methodology for NO_X emissions from the casthouse roof monitor based on application of 95% capture efficiency to the NO_X stack test result for the blast furnace casthouse baghouse.

7.5.2 Basic Oxygen Furnace Shop Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the BOF Shop operations under Table 2.

7.5.2.1 Proposed VOM Emission Limitations for BOF Shop Operations

USS Granite City proposes to add the following as Condition 18.c in Construction Permit No. 95010001.

> *18.c VOM emissions from the BOF Shop Operation (BOF ESP and BOF Baghouse, Desulf/Soda Ash and Hot Metal Charging Baghouse, and Hot Metal Charging and Ladle Skimming baghouse) shall not exceed 45.0 tons per year based on a monthly rolling 12-month total.*

As the VOM emission limitations are to be incorporated in Condition 18.c itself, USS Granite City also proposes the deletion of the VOM emission limitations for specific emission points and emissions units in Table 2 of Construction Permit No. 95010001 as they would be redundant.

8. Best Available Control Technology for CO

In accordance with 35 IAC 204.1100(c), the BACT requirement under the PSD program generally applies for each regulated NSR pollutant for which the major modification resulted in a significant net emission increase at the source. This requirement specifically applies to each emission unit that, as part of the Project, will have a net emissions increase as a result of a physical change or change in the method of operation in the unit. As previously noted, the boilers at Granite City Works, including the existing Boiler 11 and Boiler 12, were not subject to BACT as the Project does not involve physical changes or changes in the method of operation of these units.

8.1 Historical BACT Evaluation

In the 1995 Application, National Steel Corporation provided a CO BACT analysis for the blast furnace stoves, the ladle drying preheaters, and the continuous casters. Use of CO add-on control technology (*i.e.*, direct combustion in a flare, thermal oxidation, and catalytic oxidation) were proposed to be rejected on the basis of a lack of technical feasibility. National Steel proposed that good combustion practices be determined to be BACT for CO emissions from these emissions units. The ladle drying preheaters and continuous casters use NG fuel, which is inherently lower emitting practice. No add-on controls were demonstrated for these operations. Therefore, the use of NG was determined to be BACT.

Illinois EPA released a "Project Summary for Proposed Issuance of a Construction Permit" in November 1995 along with a draft construction permit. This document included a section "Additional Requirements for Major Projects" that addressed BACT requirements for the 1996 Project. BACT for CO was determined to be use of 'work practice' standards. Specifically, Illinois EPA stated the following with respect to CO BACT.

> *The requirements of PSD include a demonstration that best available control technology (BACT) will be used for SO_2 and CO emissions at affected units, an analysis of air quality impacts, and an analysis of the impacts of the project on visibility, vegetations [sic], and soils. The Agency has determined that these requirements have been met.*
>
> *GCD [Granite City Division of National Steel] has shown that* ***work practices*** *used for SO_2 and CO constitute BACT as used by other steel mills for these pollutants. [emphasis added]*

During the original PSD permitting process for the Project in 1996, neither National Steel Corporation nor Illinois EPA evaluated BACT for CO emissions from the blast furnace casthouse. As discussed in Section 4.4 of this permit application, available information at the time did not recognize that such emissions occurred, but subsequent emissions testing indicates that the blast furnace casthouse is a source of CO emissions.

8.2 Updated BACT Evaluations

USS Granite City is providing updated CO BACT evaluations for the subject fuel burning emissions units (*i.e.*, blast furnace stoves, ladle drying preheaters, blast furnace flare No. 1, and miscellaneous ancillary natural gas burning units in the BOF shop and at the continuous casters) and for the blast furnace casthouse operations.

8.2.1 BACT General Approach

This section presents a proposed BACT analysis for the subject units for CO.

8.2.1.1 Best Available Control Technology Definition

The definition of BACT in the Clean Air Act [at 42 U.S.C. § 7479(3)] is as follows:

> *The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to section 7411 or 7412 of this title. Emissions from any source utilizing clean fuels, or any other means, to comply with this paragraph shall not be allowed to increase above levels that would have been required under this paragraph as it existed prior to November 15, 1990.*

The meaning of the term "emission limitation" used in the BACT definition is broad, as Congress expressed no preference for numeric limits rather than non-numeric requirements in the definition of this term in the Clean Air Act [at 42 U.S.C. § 7602(k)]:

> *The terms "emission limitation" and "emission standard" mean a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this chapter.*

The regulatory definition of BACT in the PSD rules is similar, although it allows for non-numeric requirements only in limited circumstances. In particular, 35 IAC 204.280 provides:

> *"Best Available Control Technology" means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant that would be emitted from any proposed major stationary source or major modification that the Agency, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel*

combustion techniques for control of such pollutant. In no event shall application of BACT result in emissions of any pollutant that would exceed the emissions allowed by any applicable standard under 40 CFR 60, 61, 62 and 63 (incorporated by reference in Section 204.100). If the Agency determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means that achieve equivalent results.

8.2.1.2 Methodology for the BACT Analysis

In a memorandum dated December 1, 1987, the U.S. EPA stated its preference for a "top-down" analysis.[38] U.S. EPA outlined the BACT determination methodology following the top-down approach.[39] Accordingly, the BACT analyses presented in this application utilize the top-down approach. Under the "top-down" approach, progressively less stringent control technologies are analyzed until a level of control considered BACT is determined, based on the most effective control option that is determined to result in acceptable environmental, energy, and economic impacts. More specifically, the top-down BACT analysis methodology consists of five steps as follows:

1. Identify all "available" control options that might be utilized to reduce emissions of the subject pollutant for the type of unit subject to BACT.
2. Eliminate those available options that are technically infeasible to apply to the specific unit under consideration.
3. Rank the remaining feasible control options by control effectiveness.
4. Evaluate economic, energy and/or environmental impacts of each control option as applied to the subject units, rejecting those options for which the adverse impacts are inappropriate.
5. Based on the most effective control option not rejected in Step 4, select an emission limit or work practice standard as BACT, reflecting the level of control continuously achievable with the selected control option.

[38] Memorandum from J.C. Potter to the Regional Administrators; U.S. EPA, Office of Air and Radiation; Washington, D.C.; December 1, 1987.

[39] See: *1990 New Source Review Workshop Manual, DRAFT*, at page B.2. (Environmental Appeals Board in *Prairie State Generating Station*, PSD Appeal No. 05-05, August 24, 2006, in footnote 2, noted that "[t]he NSR Manual has been used as a guidance document in conjunction with new source review workshops and training, and as a guide for state and federal permitting officials with respect to PSD requirements and policy. Although it is not a binding Agency regulation, the NSR Manual has been looked to by this Board as a statement of the Agency's thinking on certain PSD issues.")

8.2.1.3 Baseline Emission Rate

As used in the BACT analyses presented herein, the term "baseline emission rate" refers to the legal floor established in the definition of BACT, *i.e.*, applicable standards under 40 CFR parts 60, 61, 62 and 63.

8.2.1.4 Available Control Options

In the first step of the BACT analysis, all potentially "available" control strategies are identified for further consideration. In the context of the first step of a top-down BACT analysis, U.S. EPA's guidance describes "available" control strategies as:

> *Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation.*[40]

In the BACT analyses herein, the term "available" is used, consistent with the U.S. EPA guidance, to refer to any control strategy that is potentially applicable to the source type in question (*i.e.*, a technology or control option that has a practical potential for application to the source category in general). These may include fuel cleaning or treatment, inherently lower polluting processes, and end of pipe control devices. All identified control strategies that are not inconsistent with the fundamental purpose and basic design of the proposed facility are listed in this step.

The second step of the BACT analysis addresses source-specific or unit-specific factors that would prevent an otherwise available technology from being applied in the particular case. The criteria for "technical feasibility" are separate and distinct from the criteria used to determine whether a control option is considered to be "available" for purposes of BACT.

8.2.1.5 BACT Technical Feasibility Criteria

In the second step of a top-down BACT analysis, potentially available control strategies are evaluated for technical feasibility. A technically feasible control strategy is one that has been demonstrated to function efficiently on an emissions unit that is identical or similar to the emissions unit under review.[41] For the purposes of assessing technical feasibility of an add-on control technology, the determination of whether an emissions unit should be considered to be identical or similar is usually based on the physical and chemical characteristics of the gas stream to be controlled. An add-on control technology applicable to one emissions unit may not be technically feasible for application to an apparently similar unit depending on differences in physical and chemical gas stream characteristics, and rejection of a control option based on technical infeasibility for BACT purposes is appropriate if "it is uncertain the control device will work in the situation currently undergoing review."[42]

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[40] See: *1990 New Source Review Workshop Manual, DRAFT*, at page B.5.

[41] See, *Prevention of Significant Deterioration Workshop Manual*, EPA-450/2-80-081, October 1980, at pp. I-B-6 through I-B-7.

[42] See, *PSD and Title V Permitting Guidance for Greenhouse Gases*, EPA-457/B-11-001, March 2011, at p. 34.

For control strategies that are not demonstrated, the analysis of technical feasibility is somewhat more involved. Two key concepts are important in determining whether an undemonstrated technology is feasible: "availability[43]" and "applicability." A technology is considered "available" if it can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term. An available technology is "applicable" if it can reasonably be installed and operated on the source type under consideration. A technology that is both available and applicable is technically feasible.

8.2.2 CO BACT Evaluation for Fuel Burning Units

This section presents the CO BACT analyses for the subject fuel burning emissions units. CO emissions from these units result primarily from incomplete combustion during the firing of BFG and natural gas. Therefore, the most direct approach for reducing these emissions is efficient combustion in the fuel burning emissions units, *i.e.*, appropriate combustion temperatures, adequate excess air, and good air/fuel mixing during combustion. Measures taken to reduce the formation of NOx during combustion can increase CO emissions. In particular lowering combustion temperatures through staged combustion to reduce NOx emissions can be counterproductive with regard to CO emissions. The existing boilers (Boiler 11 and Boiler 12) did not undergo any physical change or change in the method of operation as a result of the 1996 Project. Therefore, pursuant to 40 CFR § 52.21(j)(3Ind 35 IAC 204.1100(c), the boilers were not and are not subject to the BACT requirement for CO emissions.

8.2.2.1 Purpose and Design of Subject Fuel Burning Emissions Units

The fundamental purpose of the blast furnace stoves is to provide heat needs for the ironmaking process preferentially using the BFG fuel, as this fuel is produced as a byproduct at the facility. Any excess BFG unable to be used in the stoves and boilers at Granite City Works is flared through the BFG flares. Use of natural gas or other higher-Btu fuel in the blast furnace stoves as supplemental fuel, for purposes of flame stabilization, also is a necessary and inherent part of the design.

The fundamental purpose of the ladle drying preheaters and ancillary fuel burning units is to provide heat needs for the mill's processes using readily available gaseous fuels.

Alternative production processes that would be inconsistent with these fundamental objectives would impermissibly redefine the source and are not a part of the BACT analyses presented herein.

8.2.2.2 CO BACT Baseline

There are no federal emissions standards applicable to CO emissions from the fuel burning emission units.

[43] In Step 2 of a top-down BACT analysis, the term "availability" has a different meaning than the term "available" in Step 1. Control strategies that are not "available" in Step 1 are not considered in Step 2.

8.2.2.3 Step 1– Identify Available CO Control Options

Based on a review of recent BACT determinations in U.S. EPA's RBLC database and other literature, the control options (individually and in certain combinations) that are being used to limit CO emissions from emissions units burning gaseous fuels include:

- CO Oxidation Catalysts;
- Thermal Incineration;
- Work Practice Standards, including good combustion practices.

CO oxidation catalysts have previously been applied to natural gas fired boilers located in CO and/or ozone nonattainment areas but are primarily used on large combustion turbines. The oxidation catalyst is typically a precious metal catalyst (e.g., platinum) that has been applied over a metal or ceramic substrate. The catalyst lowers the activation energy for the oxidation of CO so that it is oxidized at lower flue gas temperature (range of 650 - 1,100 °F). The CO removal efficiency in natural gas-fired systems at which CO oxidation catalysts are used is typically greater than 90 percent.

Other technology used for the control of CO for other sources include thermal incineration. Incineration requires the exhaust gas containing CO to be heated up to a temperature sufficiently high enough (> 1,300 °F) to thermally destroy CO. Typical methods used include regenerative thermal oxidizers, recuperative incinerators, and direct flame incinerators. These devices are typically employed to control sources with high levels of CO and VOM requiring less supplemental fuel for reheating the exhaust gas. Additionally, the exhaust gas CO concentrations from these devices would be similar to that expected from a gaseous fuel combustion device with good combustion design and operation.

Good combustion practices, as the name implies, are based upon maintaining good fuel/air mixing, a proper fuel/air ratio, and adequate time at an appropriate combustion temperature. These practices are an inherent part of the routine operation of the units, as maintaining good combustion is essential for efficient use of fuel.

8.2.2.4 Step 2– Eliminate Technically Infeasible CO Control Options

Technical feasibility of the CO emissions controls identified in Step 1 for the subject gaseous fuel burning emissions units is addressed in this section.

Blast Furnace Stoves
There are no known applications of add-on CO controls to blast furnace stoves. These control options are not feasible for this application for several reasons as discussed below.

First, the temperature of the exhaust gases from the blast furnace stoves averages around 500 °F, which is below the operating range for CO oxidation catalyst. Second, the CO concentration in the stove exhaust is relatively low at less than 0.3%. As the lower explosive limit for CO is 12.5%, the exhaust from the blast furnace stoves will not have enough CO to combust in thermal incineration.[44] Third, there is significant variation, both in exhaust flow and temperature, due to

[44] See, *e g* , www.cdc.gov/niosh/idlh/630080.html (last accessed Sept. 23, 2022).

cycling of the individual stoves between blow and heat steps. Fourth, oxidation catalyst would create unacceptable back-pressure on the stoves. These factors make add-on CO emissions controls infeasible.

Use of good combustion practices for the stoves is a technically feasible control option.

Other Fuel Burning Emissions Units
The No. 1 Flare, ladle drying preheaters, and fuel burning units at the continuous casters do not have specific stacks but exhaust through building ventilation or an open flame. It is not feasible to enclose the ladle drying preheaters or the ancillary fuel burning units in the BOF shop and at the continuous casters as the vessels containing molten steel need to be moved using overhead cranes in the building. Therefore, use of post-combustion control devices, such as CO oxidation catalyst, are not technically feasible for these operations.

Use of good combustion practices for the listed fuel-burning units is a technically feasible control option.

8.2.2.5 Steps 3 & 4– Rank and Evaluate CO Control Options

No add-on control devices options are technically feasible for CO emissions from the fuel burning emissions units. The only remaining control option is to follow good combustion practices. No further evaluation of control options is necessary.

Emissions from the fuel burning emissions units using good combustion practices are as described in Section 4.3 of this permit application.

8.2.2.6 Step 5 – Establish CO BACT

USS Granite City is proposing work practice requirements rather than numeric limits as BACT. Numeric emission limitations are not proposed because direct measurement of emissions—*i.e.*, use of U.S. EPA reference test methods—is not feasible for any of the fuel burning emissions units subject to the BACT requirement for CO emissions. In particular, for the stack serving the blast furnace A stoves, there is no sampling port,[45] and for the stack serving the blast furnace B stoves, there is no sampling port satisfying the location criteria in U.S. EPA Reference Method 1.[46] Each stack is refractory lined and is believed to be approximately one hundred years old.

For the reasons presented above, numeric CO emission standards are not feasible for the blast furnace stoves. USS Granite City is proposing that Illinois EPA define and impose work practice requirements, *i.e.*, good combustion practices, as BACT for the subject fuel burning emissions units. For the blast furnace stoves, USS Granite City proposes the following specific practices.

- Conduct annual adjustment and tune-up to include, at a minimum, inspecting, adjusting, cleaning, or replacing instrumentation and operational control system components and

[45] For the one-time exhaust gas sampling event discussed in footnote 19 of this permit application, USS Granite City inserted a sampling probe into the stack through a pipe used to inject steam into the stack.
[46] Appendix A-1 to 40 CFR part 60.

inspecting the air-to-fuel ratio control system and adjusting as appropriate for proper operation.

- Inspect burners at least once per calendar quarter and make repairs as appropriate.

- Continuously monitor dome temperature and flue gas oxygen level for each stove during periods of fuel burning and adjust air-to-fuel ratio as necessary to maintain instantaneous temperature in the dome—the area at the top of the stove where hot gases from the combustion chamber are distributed into the regenerative checkers—of 2,300 °F ± 100 °F.

8.2.3 BACT Evaluation for Blast Furnace Casthouse

This section presents the CO BACT analysis for the blast furnace casthouse.

8.2.3.1 Purpose and Design of Subject Blast Furnace Casthouse

The fundamental purpose of the subject blast furnace casthouse is to facilitate transfer of molten iron produced in the process to the torpedo cars and separate slag produced in the process. This operation is inherent to production of molten iron in blast furnaces, and use of coke as reductant and fuel is inherent in the design and operation of the blast furnaces at Granite City Works. Any alternative production process that would be inconsistent with these fundamental objectives would impermissibly redefine the emissions unit and is not a part of the BACT analyses presented herein.

8.2.3.2 CO BACT Baseline

There are no federal emissions standards applicable to CO emissions from the blast furnace casthouse.

8.2.3.3 Step 1– Identify Available CO Control Options

Based on a review of BACT determinations in U.S. EPA's RBLC database and other literature, the control options that are potentially available to control CO emissions from the blast furnace casthouse are:

- Capture system and thermal Incineration and
- Capture system and catalytic Incineration

These control technologies have not been applied to a blast furnace casthouse; they are technologies developed and used to control CO emissions in exhaust streams that are substantially higher than those from blast furnace casthouses. As such, it is uncertain whether they are properly considered as available control options, but they are conservatively assumed to be available for purposes of this analysis.

8.2.3.4 Step 2– Eliminate Technically Infeasible CO Control Options

For purposes of this BACT analysis for CO emissions, both of the control options identified in Step 1—use of a capture system with either thermal incineration or catalytic incineration—are

conservatively assumed to be technically feasible for the blast furnace casthouse and will be carried on to Step 4 of the BACT analysis.

8.2.3.5 Step 3 – Rank CO Control Options

For purposes of this BACT analysis for CO emissions, both of the control options identified in Step 1—use of a capture system with either thermal incineration or catalytic incineration—are conservatively assumed to be capable of achieving 90 percent control of non-fugitive CO emissions from the blast furnace casthouse at Granite City Works.

8.2.3.6 Step 4 – Evaluate Impacts of CO Control Options

The casthouse is equipped with capture systems that were installed in the 1980's in conjunction with baghouses for control of PM emissions. The capture system associated with the casthouse baghouse is estimated to achieve 95% capture efficiency, as discussed in Section 5.2.2.3 of this permit application. It is therefore assumed for purposes of this analysis that there are no energy, environmental, or economic impacts with the portion of each control option involving use of a 95% efficient capture system.

A portion of the CO that is generated in the casthouse is not captured and routed through the baghouses but rather is emitted to atmosphere as fugitive emissions through the casthouse roof monitor. Neither of the identified and available CO control options will have any effect on these emissions, so they will not be discussed further in this analysis.

The mechanically exhausted gas streams from the blast furnace casthouse are characterized by low CO concentration: The CO concentrations in the exhaust gases from the casthouse baghouse and the iron spout baghouse are approximately 43 parts per million by volume ("ppmv") and 16 ppmv, respectively.

Both thermal incineration and catalytic incineration would require combustion of significant quantities of auxiliary fuel in order to raise the temperature of the blast furnace casthouse exhaust gas streams to the temperatures necessary for oxidation (and therefore requisite to achieve decreases in CO emissions). Based on U.S. EPA air pollution control device cost and design models, the outputs from which are shown in Appendix F to this permit application, the natural gas usage would be 38.1 MMBtu/hr for regenerative thermal oxidizers with 70 percent heat recovery or 191 MMBtu/hr for fixed-bed catalytic oxidizers with 50 percent heat recovery. Assuming 0.08 lb NOx per MMBtu heat input, the additional NOx emissions from this auxiliary fuel combustion would be 13 TPY from regenerative thermal oxidizers with 70 percent heat recovery or 67 TPY for fixed-bed catalytic oxidizers with 50 percent heat recovery. These are unacceptable, adverse energy and environmental impacts.[47]

Both control options also would impose significant economic cost. Regenerative thermal oxidizers with 70 percent heat recovery would require a capital cost of more than $15 million,

[47] The air quality impacts analysis presented in Appendix C of this permit application shows that the impact of the Project on ambient CO concentration is acceptable even in the absence of any add-on controls on the blast furnace casthouse. The beneficial environmental impacts of using add-on controls to reduce CO emissions would therefore be minimal.

total annualized cost of nearly $6 million, and cost effectiveness of nearly $29,000 per ton of CO emission reduction. Fixed-bed catalytic oxidizers with 50 percent heat recovery would require a capital cost of nearly $8 million, total annualized cost of nearly $16 million, and cost effectiveness of more than $76,000 per ton of CO emission reduction. These are excessive, adverse economic impacts.

Because the adverse impacts of the identified control options greatly outweigh the trivial environmental benefit that would result from installing controls to reduce CO emissions, these control options are not BACT.

8.2.3.7 Step 5 – Establish CO BACT

USS Granite City proposes a CO emission limit of 70 lb/hr, combined for the casthouse baghouse and iron spout baghouse, as BACT for the blast furnace casthouse. This proposed limit is as stringent as any identified limit for a blast furnace casthouse at any similar facility.[48]

[48] The only CO emission limit identified for a blast furnace casthouse is a limit of 56.25 lb/hr for the casthouse baghouse stack at the Dearborn (MI) Works, currently owned and operated by Cleveland Cliffs. This casthouse has a permitted iron production rate of 8,000 tons per calendar day. See https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Permits/AQD/PTI/applications-of-interest/PTI-182-05C-Severstal-Conditions-2014-05-12.pdf (last accessed Sept. 23, 2022).

9. CO Source Impact Analysis (Including Dispersion Modeling)

In accordance with 35 IAC 204.1110 through 204.1130, requirements to conduct ambient air impacts analysis apply to a major modification for pollutants which are subject to PSD review. In issuing Construction Permit 95010001, Illinois EPA addressed PSD requirements for CO as the project was a major modification for CO. The proposed changes to the CO emission factors for gaseous fuels used in fuel burning emissions units at the facility and the recognition of CO emissions from the blast furnace casthouse will result in increases in permitted CO emission rates. The air impacts analysis for the Project with these CO emission increases is provided in Appendix C of this application. This analysis includes all of the CO emitting operations at the USS Granite City facility (including certain units that were constructed since 1996 *e.g.*, Cogeneration Boiler) and offsite sources in the area (*e.g.*, Gateway Energy and Coke Company). Results of this analysis demonstrate that the CO emissions from the Project will not cause or contribute to an exceedance of the applicable NAAQS.

10. Additional Impacts Analyses for CO

An additional impacts analysis was performed consistent with the requirements of 35 IAC 204.1110 to determine potential air emissions impacts on soils, vegetation, visibility, and growth as part of this application. The 1996 Project was a major modification for CO as its increase was in excess of the PSD significant emission rates. This application includes increases in the permitted CO emission rates; therefore, CO emissions are considered in the additional impacts analyses.

10.1 Soils and Vegetation Surveys

The only pollutant included in this analysis of the potential impairment to soils is CO. The results of this analysis show that no material impairment will occur as a result of the proposed revisions.

10.1.1 Soil Survey

Over 66,000 acres surrounding the USS Granite City site were evaluated for the soils analysis using the U.S. Department of Agriculture ("USDA") Natural Resource Conservation Service Web Soil Survey application. The area evaluated encompasses parts of Madison and St. Clair Counties in Illinois and a portion of St. Louis County in Missouri.[49] As presented in Table 10-1, the primary soil type in this area is some variety of silt clay or sandy loam or silty clay loam. These soils account for over 70 percent of the total acreage in the study. The types of soil in significant quantities around the facility include Tice-Fluvents, Landes-Fluvents, Shafton-Fluvents. The pH of these soils ranged from 5.0 to 7.0.

[49] Source of data: U.S. Department of Agriculture, Natural Resource Conservation Service, Custom Soil Resource Report. February 18, 2020.

Table 10-1. Major Soil Types in Study Area

Map Unit Name	Acres	Percent of Total	pH	Cation Exchange Capacity (CEC) (milliequivalents per 100 grams of soil)
Darwin silty clay, 0 to 2 percent slopes	7,542.3	16.39%	7.1	32
Landes very fine sandy loam, 2 to 5 percent slopes, occasionally flooded	3,870.60	8.41%	6.9	9.4
Beaucoup silty clay loam, 0 to 2 percent slopes	3,473.80	7.55%	7	20
Nameoki silty clay loam, 0 to 2 percent slopes, frequently flooded	2,731.80	5.94%	6.8	19.5
Orthents loamy	2,415.5	5.25%	6.5	10.5
Shaffton clay loam, 0 to 2 percent slopes, occasionally flooded	2,222.60	4.83%	5.8	20
Shaffton-Fluvents-Urban land complex, 0 to 2 percent slopes, occasionally flooded	1,684.30	3.66%	5.6	16.2
Fults silty clay, 0 to 2 percent slopes, occasionally flooded	1,585.80	3.45%	6.7	21.3
Worthen silt loam	1,496.9	3.25%	6.8	16.1
Rocher loam, 2 to 5 percent slopes, frequently flooded	1,460.50	3.17%	7.8	7.8
Landes-Fluvents-Urban land complex, 2 to 5 percent slopes, occasionally flooded	1,323.70	2.88%	6.9	9.4
Dupo silt loam, 0 to 2 percent slopes, occasionally flooded	1,314.1	2.86%	6.6	26.8
Nameoki-Fluvents-Urban land complex, 0 to 2 percent slopes, occasionally flooded	1,215.40	2.64%	6.7	20
Menfro silt loam	1,173.2	2.55%	6	16
Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	1,164.90	2.53%	6.8	19
Sylvan-Bold silt loams	1,108.3	2.41%	7.1	16
Fishpot-Urban land complex, 0 to 5 percent slopes, rarely flooded	944.1	2.05%	6.5	14.2
Dozaville silt loam, 0 to 2 percent slopes, occasionally flooded	930.6	2.02%	6.6	13.3
Other soil types	8,367.3	18.18%	5.6-8.0	5.8-31.6

The cation exchange capacity ("CEC") is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality or a pH of 7.0. Soils having a low CEC hold fewer cations and may require more frequent applications of fertilizer than soils having a high CEC. The ability to retain cations reduces the hazard of ground water pollution. The CEC of the types of soil in significant quantities in the study range from 8.0 to 31.0 milliequivalents per 100g soil.

The USDA considers a significant part of this land to be prime farmland. Additional land would be considered prime farmland if drained and/or protected from flooding. Further, the USDA soil survey rated all of the soil types listed in Table 10-1 as having somewhat or very limited use for recreational activities such as camping, paths and trails, picnic areas, and playgrounds. None of the total study area is identified as having unlimited recreational value.

10.1.2 Vegetation Survey

The natural vegetation located in these counties is primarily deciduous forest consisting of oaks, hickory, eastern white and red pine, ash, and cottonwood varieties.[50] According to a 2017 U.S. Department of Agriculture Forests of Illinois survey, approximately 21% of Madison County is forest land. [51]

Information provided in the 2012 USDA Census reports for Illinois was used to identify commercial vegetation in the study area.[52] The major crops are presented in Table 10-2. As shown, approximately 60 percent of the land included in the study area is used for harvested crops. Of this total, 26 percent is used for corn for grain and 29 percent is used for soybeans. Other crops, each harvested from less than 3 percent of the harvested area include forage, wheat for grain, and vegetables. Specific locations for the farms for these harvested crops are not provided in the Census reports.

Table 10-2. Land Use for Commercially Significant Crops

Vegetation	Area (Acres)
Corn	121,675
Wheat	16,331
Forage	7,145
Soybeans	137,628
Vegetables	2,331
Total Cropland	285,110
Total Land Area of Study	474,240

10.2 Pollutant Impacts on Soils, Vegetation, and Visibility

As explained in Section 9 and Appendix C of this permit application, ambient CO impacts from the Project and the proposed revisions to the CO limitations are below the primary CO NAAQS. CO, at ambient concentrations, is not known to cause any soils or vegetation impacts.[53] Elevated

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[50] Forest Inventory and Analysis. Design and Analysis Toolkit for Inventory and Monitoring web application, Version November 30, 2018 10.0 c9ded9d. St. Paul, MN: U.S. Department of Agriculture, Forest Service, Northern Research Station. Available only on internet: https://www.fs.usda.gov/emc/rig/DATIM/index.shtml (last accessed August 17, 2022).

[51] Forests of Illinois 2017, https://www.fs.usda.gov/treesearch/pubs/55799 (last accessed on August 17, 2022).

[52] 2017 Census of Agriculture, Illinois State and County Data, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/cp17119.pdf (last accessed on August 17, 2022).

[53] Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings [https://www.epa.gov/criteria-air-pollutants/naaqs-table (last accessed on August 17, 2022)]. The U.S. EPA revoked the secondary NAAQS for CO in 1985 noting that "[c]arbon monoxide is a normal constituent of the plant environment. Plants can both metabolize and produce CO. This may explain the fact that relatively high levels of CO are necessary before damage occurs to vegetation. The lowest level for which significant effects on vegetation have been reported is 100 ppm for 3 to 35 days. The effect observed in this study was an inhibition of nitrogen fixation in legumes. Since CO concentrations of this magnitude are rarely if

CO may produce some impacts such as epinasty, chlorosis, and abscission. However, plant injury occurs at concentration over 100 ppm which is well over the CO primary NAAQS.[54] As noted in Section 9 and Appendix C, CO impacts from the facility are well below the CO primary NAAQS. Therefore, no adverse soil and vegetation impacts are expected as a result of the requested permit revisions relating to CO emissions.

In addition, CO emissions do not contribute to formation of the particulate that causes visibility impairment.[55]

10.3 Associated Growth

As stated in the 1995 Application, "The infrastructure surrounding the mill is already established due to the existing industrial nature of the area. Therefore, it is not anticipated that there will be secondary air quality impacts due to the increase in production." As part of its decision to issue Construction Permit No. 95010001 in 1996, Illinois EPA accepted this statement as part of its determination that National Steel Corporation had satisfied all requirements for impact analyses under the PSD program.

Because no physical changes are proposed, there will be no further industrial, commercial, or residential growth in the area in conjunction with the requested revisions to Construction Permit No. 95010001.

ever observed in the ambient air, it is very unlikely that any damage to vegetation will occur from CO air pollution. No other effects on welfare have been associated with CO exposures at or near ambient levels. Because no standards appear to be requisite to protect the public welfare from any known or anticipated adverse effects from ambient CO exposures, EPA is rescinding the existing secondary standards." 50 Fed. Reg. 37484, September 13, 1985.

[54] "The Effects of Air Pollutants on Vegetation and the Role of Vegetation in Reducing Atmospheric Pollution," Iuliana Florentina Gheorghe and Barbu Ion, September 26, 2011, https://www.intechopen.com/books/the-impact-of-air-pollution-on-health-economy-environment-and-agricultural-sources/the-effects-of-air-pollutants-on-vegetation-and-the-role-of-vegetation-in-reducing-atmospheric-pollu (last accessed on Sept. 23, 2022).

[55] https://www.epa.gov/visibility/basic-information-about-visibility (last accessed on Sept. 23, 2022).

11. Regulatory Applicability Review

USS Granite City reviewed the federal and Illinois air quality regulations to determine their applicability to the proposed revisions to Construction Permit No. 95010001. Federal regulations delegated to the Illinois EPA include New Source Performance Standards ("NSPS"), and National Emission Standards for Hazardous Air Pollutants ("NESHAP"). Illinois air quality regulations are found at Title 35 of the Illinois Administrative Code ("IAC") Subtitle B. Chapters I and II of 35 IAC Subtitle B contain rules administered by the Illinois EPA.

Requirements associated with federal and State air quality regulations found to be applicable to the requested revisions of Construction Permit No. 95010001 are presented in this section.

11.1 Federal Air Quality Regulations

Federal regulations delegated to the Illinois EPA were reviewed to determine their applicability to the requested revisions. USS Granite City's conclusions regarding applicability of these rules and the supporting rationale are presented below.

11.1.1 New Source Performance Standards (NSPS, 40 CFR Part 60)

The federal NSPS regulations are codified at 40 CFR Part 60. Illinois has been delegated the authority to administer the federal NSPS.

NSPS apply to new or modified "affected facilities" as defined in specific subparts of 40 CFR Part 60. None of the emissions units covered by Construction Permit No. 95010001 are affected facilities under any NSPS. The proposed changes to the permit do not trigger applicability of NSPS requirements.

11.1.2 National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR Parts 61 and 63)

The federal NESHAP regulations are codified at 40 CFR Part 61 and 40 CFR Part 63 (NESHAP for source categories also known as MACT standards). Illinois EPA has been delegated authority to administer the federal NESHAP programs.

The Part 61 NESHAPs apply to certain pollutants and/or area source types. None of the emissions units covered by Construction Permit No. 95010001 are affected facilities under any Part 61 NESHAPs. The proposed changes to the permit do not trigger applicability of Part 61 NESHAPs requirements.

The Part 63 NESHAPs apply to existing, new, or reconstructed affected sources at major sources of HAP emissions in accordance with applicability criteria specified in individual subparts. The following NESHAPs now apply to the extant units that were affected under the Project.

a) Boilers 11 and 12 at USS Granite City are parts of an existing affected source subject to 40 CFR Part 63 Subpart DDDDD.[56]
b) Blast furnaces A and B are each an existing affected source subject to 40 CFR Part 63 Subpart FFFFF.
c) The BOF shop is an existing affected source subject to 40 CFR Part 63 Subpart FFFFF. (The terminology used in Subpart FFFFF is "basic oxygen process furnace shop" or "BOPF shop.")

There will be no changes to the applicability of the Part 63 NESHAPs to the boilers or the blast furnaces in conjunction with the requested permit action. However, with this application, USS Granite City requests that Illinois EPA change the organization of Construction Permit No. 95010001 to be consistent with the affected source definition under Subpart FFFFF. Specifically, the emissions unit historically identified as "Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)" and grouped with the Continuous Casting Operations in the permit is part of the "BOPF shop ancillary operations" as that term is used in Subpart FFFFF; emissions from these BOPF shop ancillary operations are subject to the emission standards and compliance demonstration requirements for BOPF shops in Subpart FFFFF. Accordingly, for clarity and consistency with these federal rule provisions, USS Granite City requests that this operation be renamed as the "Baghouse 2 for Argon Stirring and Ladle Metallurgy Facility" and grouped with the BOF Shop operations. In addition, several material handling operations historically grouped with the Blast Furnace Operations and the BOF Shop in Construction Permit No. 95010001 are not parts of those affected sources under Subpart FFFFF. For similar reasons regarding clarity and consistency with federal rule provisions, USS Granite City is requesting that those emissions units be covered under a separate group for Material Handling Operations, as detailed in Sections 5.5.1, 5.5.2, and 5.5.4 of this permit application.

11.2 Illinois Air Quality Regulations

USS Granite City performed a review of 35 IAC Subtitle B regulations to determine the applicability of specific standards to the proposed revisions to Construction Permit No. 95010001. A summary of this review and associated regulatory applicability conclusions are documented below. Only those rules deemed potentially relevant to the proposed revisions request are addressed.

11.2.1 35 IAC Part 201.142 Construction Permit Required

The proposed revisions to Construction Permit No. 95010001 involve changes to an existing construction permit for the modifications of existing emissions sources. Therefore, a revised permit in accordance with 35 IAC 201.142 is required. This permit application, including the permit application forms contained in Appendix A, is intended to fulfill the requirements of 35 IAC 201.142.

[56] Boilers 11 and 12 are in the "units designed to burn gas 1 fuels" subcategory under Subpart DDDDD because the only regulated fuel burned in these boilers is natural gas, which falls within the definition of this term in 40 CFR § 63.7575. Blast furnace gas is expressly excluded from the definition of the term "gaseous fuel" and does not fall within any other fuel categories. These boilers previously burned COG and fuel oil but no longer do, so those fuels do not affect applicability of Subpart DDDDD to the boilers.

11.2.2 Prevention of Significant Deterioration (35 IAC Part 204) and Major Stationary Sources Construction and Modification [in Nonattainment Areas] (35 IAC Part 203)

The Illinois PSD regulations are codified at 35 IAC Part 204 and are applicable in attainment and unclassifiable areas within the State. The PSD regulations apply to new major stationary sources and to major modifications at an existing major stationary source. Emissions increases of PM, NOx, SO_2, and CO were evaluated under this program.

In nonattainment areas, Illinois EPA implements the requirements under 35 IAC Part 203 (NNSR program), with respect to major stationary sources and major modifications at major stationary sources for criteria pollutants for which the area is designated nonattainment. The area where Granite City Works is located was nonattainment for ozone and PM_{10} at the time of the 1996 Project. Therefore, emissions of NOx, VOM, and PM_{10} were evaluated under the requirements of this program.

As explained in Section 2.2 of this permit application, the revisions currently being requested to Construction Permit No. 95010001 addressed two sets of changes:

(a) Changes to the emission limits for PM, PM_{10}, NOx, and VOM, regulated NSR pollutants for which the 1996 Project was not subject to PSD or NNSR permitting requirements. (No changes are proposed to lead emissions.)
(b) Changes to the emissions rates for CO for some of the emissions units that were subject to PSD review. (The 1996 Project also was subject to PSD review for SO_2 emissions, but USS Granite City is not requesting changes to any emissions rates or permit terms relating to SO_2.)

As demonstrated in sections 5, 6, and 7, the net emissions increases for PM, PM_{10}, NOx, and VOM remain below the applicable significant emissions rates for these pollutants after the proposed revisions to the emissions limitations. Therefore, USS Granite City is not proposing any change to the applicability of PSD or NNSR requirements in regard to PM, PM_{10}, NOx, and VOM.

For CO, the 1996 Project was subject to the PSD requirements. Therefore, the proposed changes to the emissions limitations for CO have been evaluated per the PSD requirements. Sections 8, 9 and 10 herein address the PSD review requirements for CO.

11.2.3 35 IAC Part 270 CAAPP Permits

The CAAPP requirements are contained in Section 39.5 of the Illinois Environmental Protection Act and in 35 IAC Part 270. The Granite City Works is a major source subject to CAAPP requirements. As noted in Section 1 herein, this application package addresses the 'integrated processing' procedures for the proposed revisions to Construction Permit No. 95010001 for incorporation in the CAAPP permit via an administrative amendment.

11.2.4 Other State Regulations

There will be no change to the applicability of the limitations and requirements of other emissions standards under the Illinois Administrative Code that have already been addressed in the CAAPP permit for the USS Granite City facility.

Appendix A – Application Forms (Copies of Previously Submitted Versions)

Illinois Environmental Protection Agency

Bureau of Air • 1021 North Grand Avenue East • P.O. Box 19506 • Springfield • Illinois • 62794-9506

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY

ID Number: _____ Permit #: _____

☐ Complete ☐ Incomplete Date Complete: _____

Check Number: _____ Account Name: _____

This form is to be used to supply fee information that must accompany all construction permit applications. This application must include payment in full to be deemed complete. Make check or money order payable to the Illinois Environmental Protection Agency, Division of Air Pollution Control - Permit Section at the above address. Do NOT send cash. Refer to instructions (197-INST) for assistance.

Source Information

1. Source Name: United States Steel Corporation - Granite City Works
2. Project Name: 1996 Construction Permit Revision
3. Source ID #: (if applicable) 1191813AAI
4. Contact Name: Krista Armentrout
5. Contact Phone #: (618) 451-3013

Fee Determination

6. The boxes below are automatically calculated.

Section 1 Subtotal $0.00 + Section 2, 3 or 4 Subtotal $23,000.00 = $23,000.00 Grand Total

Section 1: Status of Source/Purpose of Submittal

7. Your application will fall under only one of the following five categories described below. Check the box that applies. Proceed to applicable sections. For purposes of this form:

- **Major Source** is a source that is required to obtain a CAAPP permit.
- **Synthetic Minor Source** is a source that has taken limits on potential to emit in a permit to avoid CAAPP permit requirements (e g.,FESOP).
- **Non-Major Source** is a source that is not a major or synthetic minor source.

☑ Existing source without status change or with status change from synthetic minor to major source or vice versa. Proceed to Section 2.

☐ Existing non-major source that will become synthetic minor to major source. Proceed to Section 4.

☐ New major or synthetic minor source. Proceed to Section 4.

☐ New non-major source. Proceed to Section 3.

☐ AGENCY ERROR. If this is a timely request to correct an issued permit that involves only an agency error and if the request is received within the deadline for a permit appeal to the Pollution Control Board. Skip Sections 2, 3 and 4. Proceed directly to Section 5.

$0.00 Section 1 Subtotal

This agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 ET SEQ. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Section 2: Special Case Filing Fee

8. **Filing Fee.** If the application only addresses one or more of the following, check the appropriate boxes, skip Sections 3 and 4 and proceed directly to Section 5. Otherwise, proceed to Section 3 or 4 as appropriate.

Addition or replacement of control devices on permitted units.

Pilot projects/trial burns by a permitted unit

Land remediation projects

Revisions related to methodology or timing for emission testing

Minor administrative-type change to a permit

Section 3: Fees for Current or Projected Non-Major Sources

9.	This application consists of a single new emission unit or no more than two modified emission units. ($500 fee)	9.
10.	This application consists of more than one new emission unit or more than two modified units. ($1,000 fee)	10.
11.	This application consists of a new source or emission unit subject to Section 39.2 of the Act (i.e., Local Siting Review); a commercial incinerator or a municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or an emission unit designated as a complex source by agency rulemaking. ($15,000 fee)	11.
12.	A public hearing is held (see instructions). ($10,000 fee)	12.
13.	Section 3 subtotal. (lines 9 through 12 - entered on page 1)	13. $0.00

Section 4: Fees for Current or Projected Major or Synthetic Minor Sources

Application contains modified emission units only	14. For the first modified emission unit, enter $2,000.	14. $2,000.00
	15. Number of additional modified emission units = 25 x $1,000.	15. $25,000.00
	16. Line 14 plus line 15, or $5,000, whichever is less.	16. $5,000.00
Application contains new and/or modified emission units	17. For the first new emission unit, enter $4,000.	
	18. Number of additional new and/or modified emission units = x $1,000.	18. $0.00
	19. Line 17 plus line 18, or $10,000, whichever is less.	19. $0.00
Application contains netting exercise	20. Number of individual pollutants that rely on a netting exercise or contemporaneous emissions decrease to avoid application of PSD or nonattainment area NSR = 4 x $3,000.	20. $12,000.00
Additional Supplemental Fees	21. If the new source or emission unit is subject to Section 39.2 of the Act (i.e. siting); a commercial incinerator or other municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or one or more other emission units designated as a complex source by Agency rulemaking, enter $25,000.	21.
	22. If the source is a new major source subject to PSD, enter $12,000.	22.
	23. If the project is a major modification subject to PSD, enter $6,000.	23. $6,000.00
	24. If this is a new major source subject to nonattainment area (NAA) NSR, enter $20,000.	24.
	25. If this is a major modification subject to NAA NSR, enter $12,000.	26.
	26. If the application involves a determination of MACT for a pollutant and the project is not subject to BACT or LAER for the related pollutant under PSD or NSR (e.g., VOM for organic HAP), enter $5,000 per unit for which a determination is requested or otherwise required. x $5,000.	26. $0.00
	27. If a public hearing is held (see instructions), enter $10,000.	27.
28. Section 4 subtotal (line 16 and lines 19 through 28) to be entered on page1		28. $23,000.00

Section 5: Certification

NOTE: Applications without a signed certification will be deemed incomplete.

29. I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the information contained in this fee application form is true, accurate and complete.

by: _____ General Manager - Granite City Works
Signature — Title of Signatory

Michael Patton — 2/25/2020
Typed or Printed Name of Signatory — Date

Illinois Environmental Protection Agency
Division Of Air Pollution Control -- Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

Construction Permit Application for a Proposed Project at a CAAPP Source

For Illinois EPA use only
ID No.:
Appl. No.:
Date Rec'd:
Chk No./Amt:

This form is to be used to supply general information to obtain a construction permit for a proposed project involving a Clean Air Act Permit Program (CAAPP) source, including construction of a new CAAPP source. Detailed information about the project must also be included in a construction permit application, as addressed in the "General Instructions For Permit Applications," Form APC-201.

Proposed Project

1. Working Name of Proposed Project:
1996 Construction Permit Revision

2. Is the project occurring at a source that already has a permit from the Bureau of Air (BOA)?
☐ No ☒ Yes If Yes, provide BOA ID Number: 119813AAI

3. Does this application request a revision to an existing construction permit issued by the BOA?
☐ No ☒ Yes If Yes, provide Permit Number: 95010001

4. Brief Description of Proposed Project:
This application proposes revisions to certain emission limits and other requirements in the 1996 Construction Permit for the U.S. Steel Granite City facility.

Source Information

1. Source name:* United States Steel Corporation - Granite City Works

2. Source street address:* 1951 State Street

3. City: Granite City	4. County: Madison	5. Zip code:* 62040

ONLY COMPLETE THE FOLLOWING FOR A SOURCE WITHOUT AN ID NUMBER

6. Is the source located within city limits? ☐ Yes ☐ No
If no, provide Township Name:

7. Description of source and product(s) produced:	8. Primary Classification Code of source: SIC: ____ or NAICS: ____
9. Latitude (DD:MM:SS.SSSS):	10. Longitude (DD:MM:SS.SSSS):

* Is information different than previous information? ☐ Yes ☐ No
If yes, then complete Form CAAPP 273 to apply for an Administrative Change to the CAAPP Permit for the source.

Identification of Permit Applicant

1. Who is the applicant? ☒ Owner ☐ Operator	2. All correspondence to: (check one) ☒ Source ☐ Owner ☐ Operator
3. Applicant's FEIN: 25-1897152	4. Attention name and/or title for written correspondence: Krista Armentrout - Environmental Manager

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Owner Information*		
1. Name: United States Steel Corporation		
2. Address: 600 Grant Street		
3. City: Pittsburgh	4. State: PA	5. Zip code: 15219

* Is this information idifferent than previous information? ☐ Yes ☐ No
If yes, then complete Form CAAPP 273 to apply for an Administrative Change to the CAAPP Permit for the source.

Operator Information (If different from owner)*		
1. Name		
2. Address:		
3. City:	4. State:	5. Zip code:

* Is this information different than previous information? ☐ Yes ☒ No
If yes, then complete Form CAAPP 273 to apply for an Administrative Change to the CAAPP Permit for the source.

Technical Contacts for Application	
1. Preferred technical contact: (check one) ☒ Applicant's contact ☐ Consultant	
2. Applicant's technical contact person for application: Christopher Hardin	
3. Contact person's telephone number(s) (412) 433-5904	4. Contact person's e-mail address: cwhardin@uss.com
5. Consultant for application: RTP Environmental Associates Inc. (Colin Campbell)	
6. Consultant's telephone number(s): (919) 845-1422, 20	7. Consultant's e-mail address: campbell@rtpenv.com

Other Addresses for the Permit Applicant	
ONLY COMPLETE THE FOLLOWING FOR A SOURCE WITHOUT AN ID NUMBER.	
1. Address for billing Site Fees for the source: ☐ Source ☐ Other (provide below):	
2. Contact person for Site Fees:	3. Contact person's telephone number:
4. Address for Annual Emission Report for the source: ☐ Source ☐ Other (provide below):	
5. Contact person for Annual Emission Report:	6. Contact person's telephone number:

Review Of Contents of the Application	
NOTE: ANSWERING "NO" TO THESE ITEMS MAY RESULT IN THE APPLICATION BEING DEEMED INCOMPLETE	
1. Does the application include a narrative description of the proposed project?	☒ Yes ☐ No
2. Does the application clearly identify the emission units and air pollution control equipment that are part of the project?	☒ Yes ☐ No
3. Does the application include process flow diagram(s) for the project showing new and modified emission units and control equipment, along with associated existing equipment and their relationships?	☒ Yes ☐ No
4. Does the application include a general description of the source, a plot plan for the source and a site map for its location?	☐ Yes ☐ No ☒ N/A* * Material previously provided
5. Does the application include relevant technical information for the proposed project as requested on CAAPP application forms (or otherwise contain all relevant technical information)?	☒ Yes ☐ No
6. Does the application include relevant supporting data and information for the proposed project as provided on CAAPP forms?	☒ Yes ☐ No
7. Does the application identify and address all applicable emission standards for the proposed project, including: State emission standards (35 IAC Chapter I, Subtitle B); Federal New Source Performance Standards (40 CFR Part 60)?	☒ Yes ☐ No
8. Does the application address whether the project would be a major project for Prevention of Significant Deterioration, 40 CFR 52.21?	☒ Yes ☐ No ☐ N/A
9. Does the application address whether the project would be a major project for "Nonattainment New Source Review," 35 IAC Part 203?	☒ Yes ☐ No ☐ N/A
10. Does the application address whether the proposed project would potentially be subject to federal regulations for Hazardous Air Pollutants (40 CFR Part 63) and address any emissions standards for hazardous air pollutants that would be applicable?	☒ Yes ☐ No ☐ N/A* * Source not major ☐ Project not major ☐
11. Does the application include a summary of annual emission data for different pollutants for the proposed project (tons/year), including: 1) The requested permitted emissions for individual new, modified and affected existing units*, 2) The past actual emissions and change in emissions for individual modified units* and affected existing units*, and 3) Total emissions consequences of the proposed project? (* Or groups of related units)	☒ Yes ☐ No ☐ N/A * The project does not involve an increase in emissions from new or modified emission units.
12. Does the application include a summary of the current and requested potential emissions of the source (tons/year)?	☒ Yes ☐ No ☐ N/A* * Applicability of PSD, NA NSR or 40 CFR 63 to the project is not related to the source's emissions.
13. Does the application address the relationships and implications of the proposed project on the CAAPP Permit for the source?	☒ Yes ☐ No ☐ N/A* * CAAPP Permit not issued
14. If the application contains information that is considered a TRADE SECRET, has it been properly marked and claimed and all requirements to properly support the claim pursuant to 35 IAC Part 130 been met? Note: "Claimed" information will not be legally protected from disclosure to the public if it is not properly claimed or does not qualify as trade secret information.	☐ Yes ☐ No ☒ N/A* * No information in the application is claimed to be a TRADE SECRET
15. Are the correct number of copies of the application provided? (See Instructions for Permit Applications, Form 201)	☒ Yes ☐ No
16. Does the application include a completed "FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION," Form 197-FEE, a check in the amount indicated on this form, and any supporting material needed to explain how the fee was determined?	☒ Yes ☐ No

Signature Block

Authorized Signature:

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete and that I am a responsible official for the source, as defined by Section 39.5(1) of the Environmental Protection Act.

BY: 

AUTHORIZED SIGNATORY

General Manager - Granite City Works
TITLE OF SIGNATORY

Michael Patton
TYPED OR PRINTED NAME OF SIGNATORY

02 25 2020
DATE

Appendix B – Emissions Calculations

Updated Emissions Calculations for the Construction Permit Revision Application

USS Granite City - 1996 Production Increase Project
Revised PM PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year tons of charge	0.03	lb/ton of hot metal	30.9			Minor correction to calculation (95.0% capture efficiency)
A & B Blast Furnace Charging	2,803,241	material/year	0.0024	lb/ton of material	3.4			No change
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.07026	lb/ton of hot metal	72.4			No change
Blast Furnace Slag Pits	2,059,557	tons of hot metal/year	0.00417	lb/ton of hot metal	4.3			No change
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.02548	lb/ton of hot metal	26.2			No change
Subtotal					137.1	215.0	77.9	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.16	lb/ton of steel	193.1			No change
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.428	lb/ton of steel	516.7			No change
BOF Hot Metal Transfer and Desulfurization Baghouse	2,059,557	tons of hot metal/year	0.03721	lb/ton of hot metal	38.3			No change
BOF Slag Skimming Baghouse	2,059,557	tons of hot metal/year	0.00502	lb/ton of hot metal	5.2			No change
Baghouse 2 for Argon Stirring Ladle Metallurgy	2,413,406	tons of molten steel/year	0.00715	lb/ton of steel	8.6			No change other than regrouping
Subtotal					761.9	525.0	-236.9	
Continuous Casting Operations								
Caster Mold - Casters #1 & #2	2,413,406	tons of molten steel/year	0.006	lb/ton of steel	7.2			No change
Continuous Casters #1 & #2 - Spray Chamber	2,413,406	tons of molten steel/year	0.00852	lb/ton of steel	10.3			No change
Slab Cutoff Casters #1 & #2	2,413,406	tons of molten steel/year	0.0071	lb/ton of steel	8.6			No change
Slab Ripping Casters #1 & #2	2,413,406	tons of molten steel/year	0.00722	lb/ton of steel	8.7			No change
Subtotal					34.8	52.0	17.2	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	2.90	lb/MMcf	65.2			No change
COG in stoves	374	MMcf/year	16.56	lb/MMcf	3.1			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	2.90	lb/MMcf	72.4			No change
COG in boilers	2,211	MMcf/year	43.13	lb/MMcf	47.7			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	9.72	lb/Mgal	0.1			No change
Natural gas in boilers	805	MMcf/year	1.9	lb/MMcf	0.8			Revised to use current AP-42 emission factor
BFG in BFG flare	26,132	MMcf/year	2.9	lb/MMcf	37.9			No change
Natural gas in ladle preheaters	340	MMcf/year	1.9	lb/MMcf	0.3			Revised to use current AP-42 emission factor
Subtotal					227.4	273.0	45.6	
Material Handling Operations at BF and BOF								
Material handling for Coke, Pellets, Limestone	Table F-3 of the 1995 Permit Application	tons of charge			17.2			This activity was previously listed only in the contemporaneous changes.
Iron Pellet Screen	2,803,241	material/year	0.00375	lb/ton of material	5.3			USS representation of 85% control to crushed stone EF
BOF Hopper Baghouse	2,413,406	tons of molten steel/year	0.00032	lb/ton of steel	0.4			No change other than regrouping
BOF Bin Floor Baghouse	2,413,406	tons of molten steel/year	0.0016	lb/ton of steel	1.9			No change other than regrouping
Baghouse 1 for Material Handling	2,413,406	tons of molten steel/year	0.00355	lb/ton of steel	4.3			No change other than regrouping
Subtotal					29.0	30.0	1.0	

R004538

USS Granite City - 1996 Production Increase Project
Revised PM PSD Net Emissions Increase Analysis

Contemporaneous Changes		
Remove Blast Furnace Slag Spout Hood	0.0	Removed from analysis because not contemporaneous
#2 Caster Production	0.0	Removed from analysis because not contemporaneous
Installation of #8 Galvanizing Line	0.0	Removed from analysis because not contemporaneous
Ingot Teeming Shutdown	-22.4	No change
Blooming Mill Shutdown	-3.4	No change
Batch Annealing Shutdown	-0.2	No change
Haul Roads emissions controls	-17.1	Revised to reflect only the haul road emissions changes
Subtotal	-43.1	
Total	-138.4	

R004539

USS Granite City - 1996 Production Increase Project
Revised PM10 PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year tons of charge	0.0153	lb/ton of hot metal	15.8			Minor correction to calculation (95.0% capture efficiency) USS representation includes basis
A & B Blast Furnace Charging	2,803,241	material/year	0.0012	lb/ton of material	1.7			for EF
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.07026	lb/ton of hot metal	72.4			No change
Blast Furnace Slag Pits	2,059,557	tons of hot metal/year	0.00417	lb/ton of hot metal	4.3			No change
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.02548	lb/ton of hot metal	26.2			No change
Subtotal					120.3	190.0	69.7	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.16	lb/ton of steel	193.1			No change
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.287	lb/ton of steel	346.2			No change
BOF Hot Metal Transfer and Desulfurization Baghouse	2,059,557	tons of hot metal/year	0.03721	lb/ton of hot metal	38.3			No change
BOF Slag Skimming Baghouse	2,059,557	tons of hot metal/year	0.00502	lb/ton of hot metal	5.2			No change
Baghouse 2 for Argon Stirring Ladle Metallurgy	2,413,406	tons of molten steel/year	0.0071S	lb/ton of steel	8.6			No change other than regrouping
Subtotal					591.4	462.0	-129.4	
Continuous Casting Operations								
Caster Mold - Casters #1 & #2	2,413,406	tons of molten steel/year	0.006	lb/ton of steel	7.2			No change
Continuous Casters #1 & #2 - Spray Chamber	2,413,406	tons of molten steel/year	0.00852	lb/ton of steel	10.3			No change
Slab Cutoff Casters #1 & #2	2,413,406	tons of molten steel/year	0.0071	lb/ton of steel	8.6			No change
Slab Ripping Casters #1 & #2	2,413,406	tons of molten steel/year	0.00722	lb/ton of steel	8.7			No change
Subtotal					34.8	52.0	17.2	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	2.90	lb/MMcf	65.2			No change
COG in stoves	374	MMcf/year	14.21	lb/MMcf	2.7			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	2.90	lb/MMcf	72.4			No change
COG in boilers	2,211	MMcf/year	41.48		45.8			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	9.72	lb/Mgal	0.1			No change
Natural gas in boilers	805	MMcf/year	1.9	lb/MMcf	0.8			Revised to use current AP-42 emission factor
BFG in BFG flare	26,132	MMcf/year	2.9	lb/MMcf	37.9			No change
Natural gas in ladle preheaters	340		1.9		0.3			Revised to use current AP-42 emission factor
Subtotal					225.2	273.0	47.8	
Material Handling Operations at BF and BOF								
Material handling for Coke, Pellets, Limestone	Table F-3 of the 1995 Permit Application tons of charge				17.2			This activity was previously listed only in the contemporaneous changes.
Iron Pellet Screen	2,803,241	material/year	0.00131	lb/ton of material	1.8			USS representation of 85% control to crushed stone EF
BOF Hopper Baghouse	2,413,406	tons of molten steel/year	0.00032	lb/ton of steel	0.4			No change other than regrouping
BOF Bin Floor Baghouse	2,413,406	tons of molten steel/year	0.0016	lb/ton of steel	1.9			No change other than regrouping
Baghouse 1 for Material Handling	2,413,406	tons of molten steel/year	0.00355	lb/ton of steel	4.3			No change other than regrouping
Subtotal					25.6	19.0	-6.6	

R004540

USS Granite City - 1996 Production Increase Project
Revised PM10 PSD Net Emissions Increase Analysis

Contemporaneous Changes		
Remove Blast Furnace Slag Spout Hood	4.9	No change
#2 Caster Production	11.7	No change
Installation of #8 Galvanizing Line	0.0	Removed from analysis because not contemporaneous
Ingot Teeming Shutdown	-22.4	No change
Blooming Mill Shutdown	-3.4	No change
Batch Annealing Shutdown	-0.2	No change
Haul Roads emissions controls	-17.1	Revised to reflect only the road emissions changes
Subtotal	-26.5	
Total	-27.8	

R004541

USS Granite City - 1996 Production Increase Project
Revised NOx PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year	0.00014	lb/ton of hot metal	0.1			3/2012 test assuming no NOx control and 5% fugitive
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.0027	lb/ton of hot metal	2.8			3/2012 test
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.0016	lb/ton of hot metal	1.6			3/2012 test
Subtotal					4.6	24.0	19.4	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.14	lb/ton of steel	170.8			Average of 4/2012, 7/2012, 11/2014 test results
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.0075	lb/ton of steel	9.1			Average from 2019-20 test result
Subtotal					179.8	400.0	220.2	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	5.28	lb/MMcf	118.74			No change
COG in stoves	374	MMcf/year	80	lb/MMcf	14.95			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	5.28	lb/MMcf	131.82			No change
COG in boilers	2,211	MMcf/year	404	lb/MMcf	446.23			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	55	lb/Mgal	0.44			No change
Natural gas in boilers	805	MMcf/year	306	lb/MMcf	123.17			No change
BFG in BFG flare	26,132	MMcf/year	5.28	lb/MMcf	68.99			No change
Natural gas in ladle preheaters	340		306		52.02			Revised to use current AP-42 emission factor
Subtotal					956.3	706.0	-250.3	
Contemporaneous Changes								
Installation of #8 Galvanizing Line							0.0	Removed from analysis because not contemporaneous
Batch Annealing Shutdown							-8.7	Removed from analysis because not contemporaneous
Blooming Mill Shutdown							-217.8	No change
Subtotal							-226.5	
Total							-237.3	

R004542

USS Granite City - 1996 Production Increase Project
Revised VOM PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year	0.00073	lb/ton of hot metal	0.8			3/2012 test assuming no VOM control and 5% fugitive
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.014	lb/ton of hot metal	14.3			3/2012 test
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.0037	lb/ton of hot metal	3.8			3/2012 test
Subtotal					18.8	45.0	26.2	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.019	lb/ton of steel	22.4			Average of 4/2012, 7/2012, 11/2014 test results
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.0035	lb/ton of steel	4.2			Average from 2019-20 test result
BOF Hot Metal Transfer and Desulfurization Baghouse	2,059,557	tons of hot metal/year	0.00019	lb/ton of hot metal	0.2			5/2012 test
BOF Slag Skimming Baghouse	2,059,557	tons of hot metal/year	0.00015	lb/ton of hot metal	0.2			5/2012 test
Subtotal					27.0	45.0	18.0	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	0.24	lb/MMcf	5.40			Updated from Cogen Permit
COG in stoves	374	MMcf/year	0.18	lb/MMcf	0.03			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	0.24	lb/MMcf	5.99			Updated from Cogen Permit
COG in boilers	2,211	MMcf/year	1.22	lb/MMcf	1.34			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	0.28	lb/Mgal	0.00			No change
Natural gas in boilers	805	MMcf/year	5.5	lb/MMcf	2.21			1998 update to AP-42 Section 1.4
BFG in BFG flare	26,132	MMcf/year	0.24	lb/MMcf	3.14			Updated from Cogen Permit
Natural gas in ladle preheaters	340		5.5		0.94			1998 update to AP-42 Section 1.4
Subtotal					19.1	40.0	20.9	
Contemporaneous Changes								
Installation of #8 Galvanizing Line							0.0	Removed from analysis because not contemporaneous
NESHAP Controls Coke By-product							-31.6	No change
Batch Annealing Shutdown							-0.3	No change
Blooming Mill Shutdown							-0.9	No change
Subtotal							-32.8	
Total							32.3	

R004543

Emissions Calculations Included in the 1995 Construction Permit Application

TABLE 3-1
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - CO

Projected Emissions Based On: Blast Furnace @ 8,571NTPD
BOF @ 9,808 NTPD

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	13.7	lb/MMcf	22,774	MMcf	156.00	included in line 17	-	-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	13.7	lb/MMcf	22,203	MMcf	152.09	included in line 17	-	-	-
3	0008	01	Blast Furnace Gas Flare - BFG	13.7	lb/MMcf	26,132	MMcf	179.00	included in line 17	-	-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	13.7	lb/MMcf	37,501	MMcf	256.88	included in line 17	-	-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	40	lb/MMcf	361	MMcf	7.22	included in line 18	-	-	-
6	0044	01	Boiler #11 - BFG	13.7	lb/MMcf	5,323	MMcf	36.46	included in line 17	-	-	-
7	0044	91	Boiler #11 - NG	40	lb/MMcf	226	MMcf	4.52	included in line 18	-	-	-
8	0044	92	Boiler #11 - Fuel Oil	5.0	lb/Mgal	15.00	Mgal	0.04	included in line 18	-	-	-
9	0048	01	Boiler #12 - BFG	13.7	lb/MMcf	7,108	MMcf	48.68	included in line 17	-	-	-
10	0048	91	Boiler #12 - NG	40	lb/MMcf	218	MMcf	4.36	included in line 18	-	-	-
11	0048	92	Boiler #12 - Fuel Oil	5.0	lb/Mgal	1.00	Mgal	0.00	included in line 18	-	-	-
12	0033	01	BOF 2 Vessels	8.993	lb/ton proc.	2,413,406	ton proc.	10,851.88	3,580,000	ton proc.	16,097.47	5,245.59
13	0038	01	BOF Preheaters/Dryers - NG	40	lb/MMcf	283	MMcf	5.66	included in line 18	-	-	-
14	0071 & 0119	01	Continuous Casters #1 & #2 - NG	40	lb/MMcf	57	MMcf	1.14	included in line 18	-	-	-
15			Natural Gas	40	lb/MMcf	1,145	MMcf	inc. above	1,145	MMcf	22.90	-
16			Blast Furnace Gas	13.7	lb/MMcf	121,039	MMcf	inc. above	185,030	MMcf	1,267.46	-
17			Fuel Oil	5.0	lb/Mgal	16	Mgal	inc. above	365	Mgal	0.91	-
	TOTALS:							11,703.94			17,388.74	5,684.80
			Contemporaneous Changes									(11.51)
			Net Change									*5,673.29*

R004545

Projected Emissions Based On: Blast Furnace @ [illegible]1NTPD
BOF @ 9,808 NTPD

TABLE 3-2
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - NOx

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy	
1	0004	01	"A" Blast Furnace Stoves - BFG	5.28	lb/MMcf	22,774	MMcf	60.12	Included in Line 20	-	-	-	
2	0009	01	"B" Blast Furnace Stoves - BFG	5.28	lb/MMcf	22,203	MMcf	58.62	Included in Line 20	-	-	-	
3	0008	01	Blast Furnace Gas Flare - BFG	5.28	lb/MMcf	26,132	MMcf	68.99	Included in Line 20	-	-	-	
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	5.28	lb/MMcf	37,501	MMcf	99.00	Included in Line 20	-	-	-	
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	306	lb/MMcf	361	MMcf	55.23	Included in Line 19	-	-	-	
6	0044	01	Boiler #11 - BFG	5.28	lb/MMcf	5,323	MMcf	14.05	Included in Line 20	-	-	-	
7	0044	91	Boiler #11 - NG	306	lb/MMcf	226	MMcf	34.58	Included in Line 19	-	-	-	
8	0044	92	Boiler #11 - Fuel Oil	55	lb/Mgal	15.00	Mgal	0.41	Included in Line 21	-	-	-	
9	0048	01	Boiler #12 - BFG	5.28	lb/MMcf	7,106	MMcf	18.76	Included in Line 20	-	-	-	
10	0048	91	Boiler #12 - NG	306	lb/MMcf	218	MMcf	33.35	Included in Line 19	-	-	-	
11	0048	92	Boiler #12 - Fuel Oil	55	lb/Mgal	1.00	Mgal	0.03	Included in Line 21	-	-	-	
12	0033	01	BOF 2 Vessels	0.0389	lb/ton proc.	2,413,406	tons proc.	46.94	3,580,000	ton proc.	69.63	X	-
13	0038	01	BOF Preheaters/Dryers - NG	306	lb/MMcf	283	MMcf	43.30	Included in Line 18	-	-	-	
14	0007 & 0012	01	"A" & "B" Blast Furnace - Casthouse	0.01440	lb/ton proc.	2,059,557	tons proc.	14.83	3,165,000	tons proc.	22.79	X	-
15	0005 & 0010	01	"A" & "B" Blast Furnace - Unceptured Roof Emiss.	0.00072	lb/ton proc.	2,059,557	tons proc.	0.74	3,165,000	tons proc.	1.14	-	
16	0070 &0120	01	Caster Mold - Casters #1 & #2	0.05	lb/ton prod.	2,413,406	tons prod.	60.34	3,580,000	ton prod.	89.50	X	-
17	0071 & 0119	01	Continuous Casters #1 & #2 - NG	306	lb/MMcf	57	MMcf	8.72	Included in Line 19	-	-	-	
18			Natural Gas	306	lb/MMcf	1,145	MMcf	inc. above	1,145	MMcf	175.19	-	
19			Blast Furnace Gas	5.28	lb/MMcf	121,039	MMcf	inc. above	185,030	MMcf	488.48	+ 178.54	
20			Fuel Oil	55	lb/Mgal	16	Mgal	inc. above	365	Mgal	10.04	+ 9.55	
	TOTALS:							616.01			656.76	238.75	
			Contemperaneous Changes									(200.54)	
			Net Change									*38.21*	

+38.21
2.4
0.4
19.11
60.21
52.9%
38.15

R004546

Projected Emissions Based On: Blast Furnace @ 8,071NTPD
BOF @ 9,809 NTPD

TABLE 3-3
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - SO2

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy	COMMENTS
1	0004	01	"A" Blast Furnace Stoves - BFG	6.65	lb/MMcf	22,774	MMcf	75.72	included in line 18	-	-	-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	6.65	lb/MMcf	22,203	MMcf	73.82	included in line 18	-	-	-	-
3	0008	01	Blast Furnace Gas Flare - BFG	6.65	lb/MMcf	26,132	MMcf	86.89	included in line 18	-	-	-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	6.65	lb/MMcf	37,501	MMcf	124.69	included in line 18	-	-	-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	0.6	lb/MMcf	361	MMcf	0.11	included in line 18	-	-	-	-
6	0044	01	Boiler #11 - BFG	6.65	lb/MMcf	5,323	MMcf	17.70	included in line 18	-	-	-	-
7	0044	91	Boiler #11 - NG	0.6	lb/MMcf	226	MMcf	0.07	included in line 18	-	-	-	-
8	0044	92	Boiler #11 - Fuel Oil	141.3	lb/Mgal	15.00	Mgal	1.06	included in line 20	-	-	-	-
9	0048	01	Boiler #12 - BFG	6.65	lb/MMcf	7,106	MMcf	23.63	included in line 18	-	-	-	-
10	0048	91	Boiler #12 - NG	0.6	lb/MMcf	218	MMcf	0.07	included in line 18	-	-	-	-
11	0048	92	Boiler #12 - Fuel Oil	141.3	lb/Mgal	1.00	Mgal	0.07	included in line 20	-	-	-	-
12	0038	01	BOF Preheaters/Dryers - NG	0.6	lb/MMcf	283	MMcf	0.08	included in line 18	-	-	-	-
13	0007 & 0012	01	"A & B" Blast Furnace - Casthouse	0.2006	lb/ton proc.	2,059,557	tons proc.	206.57	3,165,000	tons proc.	422.00	215.43	Est. Annual Max.
14	0005 & 0010	01	"A & B" Blast Furnace - Uncap. roof	0.0104	lb/ton proc.	2,059,557	tons proc.	10.71	3,165,000	tons proc.	21.94	11.23	Est. Annual Max.
15	---	--	Iron Spout Baghouse	0.0073	lb/ton proc.	2,059,557	tons proc.	7.52	3,165,000	tons proc.	13.89	6.37	Est. Annual Max.
16	113	1	Blast Furnace Slag Pits	0.0100	lb/ton	2,059,557	tons proc.	10.30	3,165,000	tons proc.	15.83	5.53	
17	0071 & 0119	01	Continuous Casters #1 & #2 - NG	0.6	lb/MMcf	57	MMcf	0.02	included in line 18	-	-	-	
18			Natural Gas	0.6	lb/MMcf	1,145	MMcf	-	1,145	MMcf	0.34	0.00	
19			Blast Furnace Gas	6.65	lb/MMcf	121,039	MMcf	-	185,030	MMcf	615.22	212.77	
20			Fuel Oil	141.3	lb/Mgal	16	Mgal	-	365	Mgal	25.79	24.66	
	TOTALS:							639.03			1,115.01	475.98	
			Contemporaneous Changes									(0.13)	
			Net Change									***475.85***	

R004547

TABLE 3-4
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - PM-10

Projected Emissions Based On: Blast Furnace @ 3,371NTPD
BOF @ 9,808 NTPD

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
3	0008	01	Blast Furnace Gas Flare - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	5.1	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
6	0044	01	Boiler #11 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
7	0044	91	Boiler #11 - NG	5.1	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
8	0044	92	Boiler #11 - Fuel Oil	9.72	lb/Mgal	Included in line 40	Mgal	-	Included in line 40	-			-	-
9	0048	01	Boiler #12 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
10	0048	91	Boiler #12 - NG	5.1	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
11	0048	92	Boiler #12 - Fuel Oil	9.72	lb/Mgal	Included in line 48	Mgal	-	Included in line 48	-			-	-
12	0033	01	BOF 2 Vessels	0.16	lb/ton proc.	2,413,406	tons proc.	193.07	8,760	hours	60	lbs/hr	262.80	69.73
13	0038	01	BOF Preheaters/Dryers - NG	5.1	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
14	0005 & 0010	01	"A" & "B" Blast Furnace - Uncap. Fugitives	0.0155	lb/ton proc.	2,059,557	tons proc.	15.96	3,165,000	tons proc.			24.53	8.57
15	0006 & 0011	01	"A" & "B" Blast Furnace - Charging	0.0024	lb/ton pellets charged	2,803,241	tons proc.	3.36	4,308,581	tons proc.			5.17	1.81
16	0007 & 0012	01	"A" & "B" Blast Furnace - Baghouse Stack	0.0703	lb/ton proc.	2,059,557	tons proc.	72.35	3,165,000	tons proc.			111.19	38.83
17	0034	01	BOF Roof Monitor	0.287	lb/ton proc.	2,413,406	tons proc.	346.20	3,560,000	tons proc.	0.068144		118.40	(227.81)
18	0037	01	Flux Conv. & Xfer Pts., Bin Floor - BOF	0.0016	lb/ton proc.	2,413,406	tons proc.	1.93	3,560,000	tons proc.			2.86	0.93
19	0040	01	Hot Metal Chging Ladle Slag Skimmer	0.0050	lb/ton proc.	2,059,557	tons proc.	5.17	3,165,000	tons proc.			7.94	2.77

R004548

Projected Emissions Based On: Blast Furnace @ 3,071NTPD
BOF @ 9,808 NTPD

TABLE 3-4
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - PM-10

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
20	0070 & 0120	01	Caster Mold - Casters #1 & #2	0.006	lb/ton prod.	2,413,406	tons prod.	7.24	3,580,000	ton prod.			10.74	3.50
21	0071 & 0119	01	Cont. Casters #1 & #2 - Spray Chamber	0.00852	lb/ton proc.	2,413,406	tons prod.	10.28	3,580,000	ton prod.			15.25	4.97
22	0071 & 0119	01	Continuous Casters #1 & #2 - NG	5.1	lb/MMcf	included in line 38	MMcf	-	included in line 38	-			-	-
23	0072 & 0118	01	Slab Cutoff - Casters #1 & #2	0.0071	lb/ton proc.	2,413,406	tons prod.	8.57	3,580,000	ton prod.			12.71	4.14
	73	1	Slab Ripping - Casters #1 & #2	0.00722	lb/ton proc.	2,413,406	tons prod.	8.71	3,580,000	ton prod.			12.92	4.21
25	0103, 0104 & 0121	01	CMF Argon Stirring #1 & #2, Material Handling Tripper	0.00715	lb/ton proc.	2,413,406	tons prod.	8.63	3,580,000	ton prod.			12.80	4.17
26	0105 & 0106	01	Deslagging Station & Material HS	0.00355	lb/ton proc.	2,413,406	tons prod.	4.28	3,580,000	ton prod.			6.35	2.07
27			BOF Hopper Beghouse	0.00032	lb/ton proc.	2,413,406	tons proc.	0.39	3,580,000	tons proc.			0.57	0.18
28	0107 & 0035	01	Desulf. Station (inside BOF shop) & Xfer Pit	0.09721	lb/ton proc.	2,059,557	tons prod.	38.32	3,165,000	ton prod.			58.88	20.57
29	0113	01	Blast Furnace Slag Pits	0.00417	lb/ton proc.	2,059,557	tons slag	4.29	3,165,000	ton prod.			6.60	2.30
30	9003	01	Iron Pellet Screen	0.00279	lb/ton pellets charged	2,803,241	tons proc.	3.91	4,308,581	tons proc.			6.01	2.10
31		01	Iron Spout Baghouse	0.02548	lb/ton proc.	2,059,557	tons proc.	26.24	3,165,000	tons proc.			40.32	14.08
32			Road Fugitive Emissions	Included in Contemporaneous Changes. See Appendix F						-				0.00
33			Material Handling	Included in Contemporaneous Changes. See Appendix F						-				0.00
34			Unpaved Parking Lots					-		-			-	-
35			Paved Parking Lots					-		-			-	-
36			Natural Gas	5.1	lb/MMcf	1,145	MMcf	2.92	1,145	MMcf			2.92	0.00
37			Blast Furnace Gas	2.9	lb/MMcf	121,039	MMcf	175.51	185,030	MMcf			268.29	92.79
38			Fuel Oil	9.72	lb/Mgal	16	Mgal	0.08	365	Mgal			1.77	1.70
	TOTALS:							937.42					989.04	51.62
			Contemporaneous Changes											(37.31)
			Net Change											*14.31*

Note: Actual Emissions = Base Year Throughput * Emission Factor / 2000

Projected Actual Emissions = Projected Throughput * Emission Factor / 2000
except -
BOF Vessels Projected Actual Emissions = 60 lb/hr * 8760 hrs
BOF Roof Monitor Projected Actual Emissions = Projected Emission Factor * Projected Throughput

R004549

Projected Emissions Based On: Blast Furnace @ 1,171NTPD
BOF @ 9,808 NTPD

TABLE 3-5
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - TSP

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
3	0008	01	Blast Furnace Gas Flare - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	5.1	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
6	0044	01	Boiler #11 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
7	0044	91	Boiler #11 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
8	0044	92	Boiler #11 - Fuel Oil	9.72	lb/Mgal	Included in line 40	Mgal	-	Included in line 40	-			-	-
9	0048	01	Boiler #12 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
10	0048	91	Boiler #12 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
11	0048	92	Boiler #12 - Fuel Oil	9.72	lb/Mgal	Included in line 48	Mgal	-	Included in line 48	-			-	-
12	0033	01	BOF 2 Vessels	0.16	lb/ton proc.	2,413,406	tons proc.	193.07	8,760	hours	60	lbs/hr	262.80	69.73
13	0038	01	BOF Preheaters/Dryers - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
14	0005 & 0010	01	"A" & "B" Blast Furnace - Uncap. Fugitives	0.031	lb/ton proc.	2,059,557	tons proc.	31.92	3,165,000	tons proc.			49.06	17.13
15	0006 & 0011	01	"A" & "B" Blast Furnaces - Charging	0.0024	lb/ton pellets charged	2,803,241	tons proc.	3.36	4,308,581	tons proc.			5.17	1.81
16	0007 & 0012	01	"A" & "B" Blast Furnace - Baghouse Stack	0.0703	lb/ton proc.	2,059,557	tons proc.	72.35	3,165,000	tons proc.			111.19	38.83
17	0034	01	BOF Roof Monitor	0.428	lb/ton proc.	2,413,406	tons proc.	516.72	3,580,000	tons proc.	0.0987		176.71	(340.01)
18	0037	01	Flux Conv. & Xfer Pts., Bin Floor - BOF	0.0016	lb/ton proc.	2,413,406	tons proc.	1.93	3,580,000	tons proc.			2.86	0.93
19	0040	01	Hot Metal Chging Ladle Slag Skimmer	0.0050	lb/ton proc.	2,059,557	tons proc.	5.17	3,165,000	tons proc.			7.94	2.77

R004550

Projected Emissions Based On: Blast Furnace @ 6,971NTPD
BOF @ 9,808 NTPD

TABLE 3-5
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - TSP

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
20	0070 & 0120	01	Caster Mold - Casters #1 & #2	0.006	lb/ton prod.	2,413,406	tons prod.	7.24	3,580,000	ton prod.			10.74	3.50
21	0071 & 0119	01	Cont. Casters #1 & #2 - Spray Chamber	0.00852	lb/ton proc.	2,413,406	tons prod.	10.28	3,580,000	ton prod.			16.25	4.97
22	0071 & 0119	01	Continuous Casters #1 & #2 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
23	0072 & 0119	01	Slab Cutoff - Casters #1 & #2	0.0071	lb/ton proc.	2,413,406	tons prod.	8.57	3,580,000	ton prod.			12.71	4.14
	73	1	Slab Ripping - Casters #1 & #2	0.00722	lb/ton proc.	2,413,406	tons prod.	8.71	3,580,000	ton prod.			12.92	4.21
25	0103, 0104 & 0121	01	Argon Stirring #1 & #2, Material Handling Tripper	0.00715	lb/ton proc.	2,413,406	tons prod.	8.63	3,580,000	ton prod.			12.80	4.17
26	0105 & 0106	01	Deslagging Station & Material HS	0.00356	lb/ton proc.	2,413,406	tons prod.	4.28	3,580,000	ton prod.			6.35	2.07
27			BOF Hopper Baghouse	0.00032	lb/ton proc.	2,413,406	tons proc.	0.39	3,580,000	tons proc.			0.57	0.18
28	0107 & 0035	01	Desulf. Station (inside BOF shop) & Xfer Pit	0.03721	lb/ton proc.	2,059,557	tons prod.	38.32	3,165,000	ton prod.			58.88	20.57
29	0113	01	Blast Furnace Slag Pits	0.00417	lb/ton proc.	2,059,557	tons slag	4.29	3,165,000	ton prod.			6.60	2.30
30	9003	01	Iron Pellet Screen	0.00279	lb/ton pellets charged	2,803,241	tons proc.	3.91	4,308,581	tons proc.			6.01	2.10
31		01	Iron Spout Baghouse	0.02548	lb/ton proc.	2,059,557	tons proc.	26.24	3,165,000	tons proc.			40.32	14.08
32			Road Fugitive Emissions	Included in Contemporaneous Changes. See Appendix F						-				0.00
33			Material Handling	Included in Contemporaneous Changes. See Appendix F						-				0.00
34			Unpaved Parking Lots					-		-			-	-
35			Paved Parking Lots					-		-			-	-
36			Natural Gas	5.1	lb/MMcf	1,145	MMcf	2.92	1,145	MMcf			2.92	0.00
37			Blast Furnace Gas	2.9	lb/MMcf	121,039	MMcf	175.51	185,030	MMcf			268.29	92.79
38			Fuel Oil	9.72	lb/Mgal	18	Mgal	0.08	365	Mgal			1.77	1.70
	TOTALS:							1,123.90					1,071.89	(52.01)
			Contemporaneous Changes											(37.16)
			Net Change											*(89.17)*

Note: Actual Emissions = Base Year Throughput * Emission Factor / 2000

Projected Actual Emissions = Projected Throughput * Emission Factor / 2000
except -
BOF Vessels Projected Actual Emissions = 60 lb/hr * 8760 hrs
BOF Roof Monitor Projected Actual Emissions = Projected Emission Factor * Projected Throughput

R004551

TABLE 3-6
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - VOM

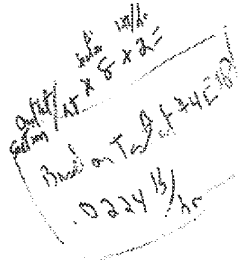
Projected Emissions Based On: Blast Furnace @8,[illegible]1 NTPD
BOF @ 9,808 NTPD

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	0.0	lb/MMcf	22,774	MMcf	0.00	included in line 18	-	-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	0.0	lb/MMcf	22,203	MMcf	0.00	included in line 18	-	-	-
3	0008	01	Blast Furnace Gas Flare - BFG	0.0	lb/MMcf	26,132	MMcf	0.00	included in line 18	-	-	-
4	0041	01	Boiler House 1 (Bire 1-10) - BFG	0.0	lb/MMcf	37,501	MMcf	0.00	included in line 18	-	-	-
5	0041	91	Boiler House 1 (Bire 1-10) - NG	2.8	lb/MMcf	361	MMcf	0.51	included in line 17	-	-	-
6	0044	01	Boiler #11 - BFG	0.0	lb/MMcf	5,323	MMcf	0.00	included in line 18	-	-	-
7	0044	91	Boiler #11 - NG	1.4	lb/MMcf	228	MMcf	0.16	included in line 17	-	-	-
8	0044	92	Boiler #11 - Fuel Oil	0.28	lb/Mgal	15.00	Mgal	0.00	included in line 19	-	-	-
9	0048	01	Boiler #12 - BFG	0.0	lb/MMcf	7,106	MMcf	0.00	included in line 18	-	-	-
10	0048	91	Boiler #12 - NG	1.4	lb/MMcf	218	MMcf	0.15	included in line 17	-	-	-
11	0048	92	Boiler #12 - Fuel Oil	0.28	lb/Mgal	1.00	Mgal	0.00	included in line 19	-	-	-
12	0033	01	BOF Preheaters/Dryers - NG	2.8	lb/MMcf	283	MMcf	0.40	included in line 17	-	-	-
13	0007 & 0012	01	"A & B" Blast Furnace - Casthouse	0.0946	lb/ton proc.	2,059,557	tons proc.	97.40	3,165,000	tons proc.	149.68	-
14	0005 & 0010	01	"A & B" Blast Furnace - Uncap. roof	0.0047	lb/ton proc.	2,059,557	tons proc.	4.83	3,165,000	tons proc.	7.42	-
15	0033	01	2 BOF Vessels	0.0060	lb/ton proc.	2,413,406	tons proc.	7.24	3,580,000	tons proc.	10.74	-
16	0035	01	Transfer Pits	0.0010	lb/ton proc.	2,059,557	tons proc.	1.03	3,165,000	tons proc.	1.58	-
17	0071 & 0119	01	Continuous Casters #1 & #2 - NG	2.8	lb/MMcf	57	MMcf	0.08	included in line 17	-	-	-
18			Natural Gas	2.8	lb/MMcf	-	MMcf	-	1,145	MMcf	1.80	-
19			Blast Furnace Gas	0.0	lb/MMcf	-	MMcf	-	185,030	MMcf	0.00	-
20			Fuel Oil	0.28	lb/Mgal	-	Mgal	-	365	lb/Mgal	0.05	-
	TOTALS:							111.80			171.08	59.28
			Contemporaneous Changes									(31.23)
			Net Change									*28.05*

R004552

Projected Emissions Based On: Blast Furnace @ 8,671NTPD
BOF @ 9,808 NTPD

TABLE 3-7
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - Pb



LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	EMISSION RATE lb/hr	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION TPY	PROJECTED THRUPUT OR PRODUCTION RATIO	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0044	03	Boiler #11 - Fuel Oil	0.01600000	lb/Mgal	0.01600000	15.00	Mgal	0.0001	Included in line 18	-	-	-
2	0048	03	Boiler #12 - Fuel Oil	0.01600000	lb/Mgal	0.01600000	1.00	Mgal	0.0000	Included in line 18	-	-	-
3	0005	01	"A" Blast Furnace - Uncap. Fugitives	0.00039000	lb/hr	0.00039000	8760	hours	0.0017	1.537	tons proc.	0.00262550	-
4	0006	01	"A" Blast Furnace - Charging	0.00055000	lb/hr	0.00055000	8760	hours	0.0024	1.537	tons proc.	0.00370263	-
5	0007	01	"A" Blast Furnace - Baghouse Stack	0.00022000	lb/hr	0.00022000	8760	hours	0.0010	1.537	tons proc.	0.00148105	-
6	0010	01	"B" Blast Furnace - Uncap. Fugitives	0.00036700	lb/hr	0.00036700	8760	hours	0.0016	1.537	tons proc.	0.00247067	-
7	0011	01	"B" Blast Furnace - Charging	0.00053700	lb/hr	0.00053700	8360	hours	0.0024	1.537	tons proc.	0.00361512	-
8	0012	01	"B" Blast Furnace - Baghouse Stack	0.00021400	lb/hr	0.00021400	8360	hours	0.0009	1.537	tons proc.	0.00144086	-
9	0033	01	BOF 2 Vessels Stack	0.19337600	lb/hr	0.19337600	8760	hours	0.8470	1.483	tons prod.	1.25607606	0.2865
10	0034	01	BOF Roof Monitor	0.01280000	lb/hr	0.01280000	8760	hours	0.0585	1.483	tons prod.	0.08379247	-
11	0035	01	Hot Metal Reladling - Xfer Pit	0.00002320	lb/hr	0.00002320	8760	hours	0.0001	1.483	tons prod.	0.00015070	-
12	0037	01	Flux Conv. & Xfer Pts., Bin Floor - BOF	0.00000062	lb/hr	0.00000062	8760	hours	0.0000	1.483	tons prod.	0.00000405	-
13	0040	01	Hot Metal Chging Ladle Slag Skimmer	0.00002250	lb/hr	0.00002250	8760	hours	0.0001	1.483	tons prod.	0.00014815	-
14	0103	01	Argon Stirring #1 & #2	0.00020200	lb/hr	0.00020200	8760	hours	0.0009	1.483	tons prod.	0.00131210	-
15	0105	01	Deslagging Station	0.00240000	lb/hr	0.00240000	8760	hours	0.0105	1.483	tons prod.	0.01568930	-
16	0107	01	Desulf. Station (inside BOF shop)	0.01330000	lb/hr	0.01330000	8760	hours	0.0583	1.483	tons prod.	0.08639088	-
17	0120	01	Caster Mold - Casters	0.00113000	lb/hr	0.00113000	8760	hours	0.0049	1.483	tons prod.	0.00733996	-
18			Boilers -Waste Oil	0.33600000	lb/Mgals		-	-	-	365	Mgals	0.06132000	-
	TOTAL					0.26			0.988			1.527	0.539
			Contemporaneous Changes										0.000
			Net Change										*0.539*

R004553

Contemporaneous Changes from the 1995 Application

APPENDIX E

The following table summarizes emissions changing projects that have been undertaken at Granite City Steel since 1990.

PROJECTS CHANGING EMISSIONS SINCE 1990 (TPY)

Project	Effective Date	TSP/PM_{10}	SO_2	NO_x	CO	VOM
Removal Blast Furnace Slag Sput Hood	January, 1990	+4.90				
# 2 Caster Production	December 1, 1990	+11.70				
Ingot Teeming Shutdown	April 1, 1991	-22.40				
Installation NESHAP Controls Coke By-Product	July, 1991					-31.6
Shutdown Blooming Mill	April 1, 1991	-3.38	-0.34	-217.82	-22.12	-0.92
Shutdown Batch Annealing	December, 1991	-0.18	-0.036	-8.72	-1.19	-0.31
Fugitive Dust Control Program (Roads and Material Handling)	November, 1991 to present	-32.00				
Installation of #8 Galvanizaing Line	Expected 1996	+4.20/+4.05	+.25	+26.0	+11.8	+1.6
Net Change		-37.16/-37.31	-0.126	-200.54	-11.51	-31.23

The following information presents how the emission change was calculated for each project.

REMOVAL OF BLAST FURNACE SLAG SPOUT HOOD - JANUARY, 1990

Based on May 8, 1989 submittal for modification of operating permit for "A" & "B" Blast Furnaces. +4.9 TPY

2 CASTER PRODUCTION - DECEMBER 1, 1990

Summary of Project Emission Changes (tons/yr)[1] (Assuming all steel produced is continuous cast.)

Argon Stirring and Baghouse	4.85
Tundish with Shrouds	--
Powder Addition	7.49
Slab Casting	2.01
Slab Cut-off	9.03
Slab Ripping with Baghouse	2.58
	26.0 tons/yr PM_{10}
Caster #1 Actual	14.3 tons/yr PM_{10}

Caster #2 PM_{10} emissions = 26.0 - 14.3 = 11.7 tons/yr

INGOT TEEMING SHUTDOWN - APRIL 1, 1991

670,000 tons / year X 0.067 lbs / ton = 22.4 tons / year PM_{10} reduction

[1] Reference - March 16, 1988 IEPA "Project Summary for Proposed Issuance of an Air Pollution Control Construction Permit for Continuous Caster".

SHUTDOWN BLOOMING MILL - APRIL 1, 1991

Coke oven gas consumed at Soaking Pits, 1,076,926 MMBtu in 1990.

The coke oven gas which was consumed at the Blooming Mill Soaking Pits (firing rate 408 MMBtu/hr/furnace) is to be used at the Hot Strip Slab Furnaces (1 - 3) (firing rate 321.8 MMBtu/hr/furnace) and #4 slab furnace (firing rate 495 MMBtu/hr).

The emission reductions for the displaced use of natural gas on the slab reheat furnaces is based on the AIRS 1990 emission factor for natural gas sources greater than 100 MMBtu/hr and the "ACT for NO_X Emissions from Iron and Steel Mills".

1990

Coke Oven Gas Soaking Pits - General < 10 MMBtu/hr

44,131 X 0.003 X 1/2000 = 0.066 tpy PM_{10} emission reduction

44,131 X 0.0006 X 1/2000 = 0.013 tpy SO_2 emission reduction

44,131 X 0.10 X 1/2000 = 2.21 tpy NO_X emission reduction

44,131 X 0.0053 X 1/2000 = 0.12 tpy VOC emission reduction

44,131 X 0.02 X 1/2000 = 0.44 tpy CO emission reduction

Natural Gas Blooming Mill < 10 MMBtu/hr

18,083 X 0.003 X 1/2000 = 0.027 tpy PM_{10} emission reduction

18,083 X 0.0006 X 1/2000 = 0.005 tpy SO_2 emission reduction

18,083 X 0.10 X 1/2000 = 0.90 tpy NO_X emission reduction

18,803 X 0.0053 X 1/2000 = 0.05 tpy VOC emission reduction

18,803 X 0.02 X 1/2000 = 0.18 tpy CO emission reduction

Coke Oven Gas Soaking Pits

1,076,926 X 0.005 X 1/2000 = 2.69 tpy PM_{10} emission reduction

1,076,926 X 0.0006 X 1/2000 = 0.32 tpy SO_2 emission reduction

1,076,926 X 0.399 X 1/2000 = 214.71 tpy NO_X emission reduction

1,076,926 X 0.0014 X 1/2000 = 0.75 tpy VOC emission reduction

1,076,926 X 0.04 X 1/2000 = 21.5 tpy CO emission reduction

EMISSION REDUCTION SUMMARY for SHUTDOWN of BLOOMING MILL (tons/year)

	PM_{10}	SO_2	NO_X	CO	VOC
Soaking Pit - General	0.66	0.013	2.21	0.44	0.12
Blooming Mill	0.027	0.005	0.90	0.18	0.05
Soaking Pits	2.69	0.32	214.71	21.5	0.75
Total	3.377	0.338	217.82	22.12	0.92

SHUTDOWN BATCH ANNEALING - DECEMBER, 1991

1990 Natural Gas Usage 118,612 MMBtu (< 10 MMBtu/hr)

118,612 X 0.003 X 1/2000 = 0.18 tpy PM_{10} emission reduction

118,612 X 0.0006 X 1/2000 = 0.036 tpy SO_2 emission reduction

118,612 X 0.147[2] X 1/2000 = 8.72 tpy NO_X emission reduction

118,612 X 0.0053 X 1/2000 = 0.31 tpy VOC emission reduction

118,612 X 0.02 X 1/2000 = 1.19 tpy CO emission reduction

[2] Based on the "ACT for NO_X Emissions from Iron and Steel Mills".

NO. 8 GALVANIZING LINE

Furnace

54.6 MMBtu/hr - natural gas fired

Pollutant	*Emission Factor/Source (lb/MMBtu)*	*Heat Input (MMBtu/hr)*	*Annual Emissions (tpy)*
NO_X	0.0378/Vendor Guarantee	54.6	9.04
TSP	0.003/AP-42	54.6	0.72
PM_{10}	0.003/AP-42	54.6	0.72
VOM	0.0028/AP-42	54.6	0.67
CO	0.035/AP-42	54.6	8.37
SO_2	0.0006/AP-42	54.6	0.14

Fume Scrubber

10,000 cfm

Pollutant	*Emission Factor (lb/hr)/Source*	*Annual Emissions (tpy)*
TSP	0.24/Vendor Guarantee	1.05
PM_{10}	0.24/ Vendor Guarantee	1.05

5 Space Heaters

3,440,000 Btu/hr per heater - natural gas fired
1,019 Btu/ft^3 (1993 emission inventory)
5 * 3,440,000 Btu/hr / (1,019 Btu/ft^3) = 16,879.3 ft^3/hr total natural gas consumption, 5 heaters

Pollutant	*Emission Factor(lb/MMft^3) AIRS-1-05-001-6*	*Heat Input (MMBtu/hr)*	*Annual Emissions (tpy)*
NO_X	100.0	16,879.3	7.39
TSP	3.0	16,879.3	0.22
PM_{10}	3.0	16,879.3	0.22
VOM	5.3	16,879.3	0.39
CO	20.0	16,879.3	1.48
SO_2	0.6	16,879.3	0.04

11 Galvanize Line Related Heaters

Heaters associated with the following galvanizing processes are to be installed as part of the No. 8 Galvanize Line Project:

Equipment	*Maximum Natural Gas Use (CFH)*
Entry Strip Dryer	2,078
Quench Strip Dryer	1,419
Chem. Treat Strip Dryer	1,370
Pre-clean Recirc. Tank	2,944
Electrolytic Recirc. Tank #1	2,748
Electrolytic Recirc. Tank #2	2,500
Hot Water Rinse Tank	883
Hot Water Make-up Tank	6,869
Chimical Treat Recirc. Tank	491
Chemical Treat Mix Tank	491
Roll Rig Preheaters	102
Total	21,895

Pollutant	*Emission Factor($lb/MMft^3$) AIRS-1-05-001-6*	*Heat Input (MMBtu/hr)*	*Annual Emissions (tpy)*
NO_X	100.0	21,895	9.60
TSP	3.0	21,895	0.29
PM_{10}	3.0	21,895	0.29
VOM	5.3	21,895	0.51
CO	20.0	21,895	1.92
SO_2	0.6	21,895	0.06

Kettle Melting

32,000 tons product per month
0.1 tons Zn per ton product

32,000 tons product/month * 0.1 tons Zn/ton product * 0.1 lbs TSP/ton Zn * 12 months / 2000 lbs /ton = 1.92 tons TSP
1.92 tons TSP * 0.92 = 1.77 tons PM_{10}

Pollutant	*Emission Factor (lb/ton Zn)/Source*	*Annual Emissions (tpy)*
TSP	0.1/AP-42	1.92
PM_{10}	0.092/AP-42	1.77

TOTAL EMISSIONS ASSOCIATED WITH NO. 8 GALVANIZE LINE PROJECT

Pollutant	*Annual Emissions (tpy)*
NO_X	26.03
TSP	4.20
PM_{10}	4.05
VOM	1.56
CO	11.77
SO_2	0.25

INSTALLATION OF NESHAP CONTROLS AT COKE BY-PRODUCT PLANT

VOC Emissions Reduction at Coke By-Product Plant after Installation of NESHAPS Controls

It was reported, in Attachment 2 of the October 8, 1991 submittal of additional information in application for modification of Operating Permits for the Granite City Division Emission Reduction Plant Production Increase Project, that the installation of benzene emission controls (NESHAPS) at the Coke By-Product Recovery Plant would provide a reduction of 31.6 TPY VOC other than benzene. The following is a demonstration of the derivation of that VOC emission reduction.

All calculations are based on 1990 coke production of 577,473 tons.

Emission factors are taken from the publication EPA-450/3-83-016a, "Benzene Emissions from Coke By-Product Recovery Plants - Background Information for Proposed Standards." The NESHAPS emission factors contained in this publication are for benzene only. The emissions of other light oil (L.O.) constituents were calculated by taking the ratio of the mole fraction of each L.O. constituent (liquid) times the vapor pressure of that constituent to the mole fraction of benzene (liquid) times the vapor pressure of benzene, then multiplying that ration by the calculated benzene emissions. It is assumed that all emissions are vapors and that the vapors are in equilibrium with the liquid light oil.

Sample calculation:

For the direct water cooling tower, benzene emissions are calculated as follows:

$$(577{,}473 \text{ tons coke}) \times \frac{2000 \text{ lb.}}{\text{ton}} \times \frac{454 \text{g}}{\text{lb.}} \times \frac{1 \text{ Mg}}{10^6 \text{g}} = 524{,}346 \text{ Mg coke}$$

$$\frac{524{,}346 \text{ Mg coke}}{\text{yr.}} \times \frac{270 \text{g}}{\text{Mg}} \times \frac{1 \text{ lb.}}{454 \text{g}} = 311{,}836 \text{ lb./year}$$

where 270g/Mg = uncontrolled benzene emission factor from Table 3 - 7, attached.

From the Light Oil Constituents table, attached,

Benzene: $y(P^*) = .71(96) = 68.16$

where .71 = benzene mole fraction
and 96 = benzene vapor pressure

Similarly,

Toluene: $y(P^*) = .159(30) = 4.77$

Hence, the toluene emissions, with no controls, from the direct water cooling tower are

$$\frac{4.77}{68.16} \text{ (311,836 lb/yr.)} = 21{,}823 \text{ lb. toluene/year}$$

Toluene emissions after installation of NESHAPS controls with 100% efficiency are

21,823 lb. toluene (100 - 100) = 0 lb. toluene/yr.

Emission of benzene, toluene, xylene, ethylbenzene and styrene are calculated, as above, for the various emission sources at the By-Product Plant and presented in the table Emissions of Light Oil Constituents after Installation of NESHAPS Controls at the Coke Oven By-Products Plant, attached.

The non-benzene emissions controlled by the NESHAPS project are then calculated, for each light oil constituent considered, by subtracting the total emissions after controls were applied at all sources from the total emissions prior to application of controls at all sources. These calculations are presented in the table entitled Non-Benzene Emissions Controlled by NESHAPS Project, attached.

Non-Benzene Emissions Controlled by NESHAPS Project

	Total Uncontrolled Emissions		Total Uncontrolled Emissions after NESHAPS Controls Installed					
Toluene	59,584	-	997	=	58,587 lbs.	x $\frac{1T}{2000}$	=	29.3 tons/yr.
Xylene	2,871	-	48	=	2,823 lbs.	x $\frac{1T}{2000}$	=	1.4 tons/yr.
Ethylbenzene	959	-	10	=	949 lbs.	x $\frac{1T}{2000}$	=	0.5 tons/yr.
Styrene	868	-	9	=	859 lbs.	x $\frac{1T}{2000}$	=	0.4 tons/yr.
								31.6 tons/yr.

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Emissions of Light Oil Constituents after Installation of NESHAPS Controls at the By-Product Plant

By-Product Source	Uncontrolled Benzene Factor (g Mg)	NESHAPS Control	NESHAPS Control Efficiency %	Benzene (lb./yr.) A*	Benzene (lb./yr.) B**	Toluene (lb./yr.) A	Toluene (lb./yr.) B	Xylene (lb./yr.) A	Xylene (lb./yr.) B	Ethylbenzene (lb./yr.) A	Ethylbenzene (lb./yr.) B	Styrene (lb./yr.) A	Styrene (lb./yr.) B
Direct Water Cooling Tower	270	Tar Spray Final Cooler	100	311,836	0	21,823	0	1,050	0	351	0	317	0
Light Oil Condenser Vent	89	Gas Blanket	98	102,790	2,056	7,193	144	346	7	116	2	105	2
Napthalene Separator	87	Tar Spray	100	100,488	0	7,032	0	339	0	113	0	102	0
Napthalene Processing	20	Tar Spray	100	23,099	0	1,617	0	78	0	26	0	23	0
Tar-Intercepting Sump	95	Gas Blanket	98	109,720	2,194	7,678	154	370	7	124	3	112	2
Tar Dewatering	21	Steam Blanket	98	24,254	485	1,697	34	82	2	27	1	25	1
Tar Decanter	77	Steam Blanket	98	88,931	1,779	6,224	125	300	6	100	2	90	2
Tar Storage	12	Steam Blanket	98	13,859	277	970	19	47	1	16	0	14	0
Light Oil Sump	15	Gas Blanket	98	17,324	347	1,212	24	58	1	20	0	18	0
Light Oil Storage	5.8	Gas Blanket	98	6,699	134	469	9	23	1	8	0	7	0
BTX Storage (TLO)	5.8	Gas Blanket	98	6,699	134	469	9	23	1	8	0	7	0
Leaks	14	Manual Detection	88	16,169	1,940	1,132	136	55	7	18	2	16	2
Flushing Liquor Circulation Tank	9	Steam Blanket	98	10,395	208	727	15	35	1	11	0	11	0
Excess Ammonia Liquor Tank	9	Steam Blanket	98	10,395	208	727	15	35	1	11	0	11	0
Wash Oil Decanter	3.8	Uncontrolled	0	4,389	4,389	307	307	15	15	5	0	5	0
Wash Oil Circulating Tank	3.8	Gas Blanket	98	4,389	88	307	6	15	0	5	0	5	0
				851,428	14,239	59,584	997	2,871	48	959	10	868	0

*Uncontrolled emissions

**Emissions after NESHAPS controls installed

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LIGHT OIL CONSTITUENTS

Chemical	Weight fraction (X)	MW	X/MW	Mole fraction (v)	P° at 25°C
enzene	.5925	78.11	.0076	.710	96 mm Hg
oluene	.1598	92.13	.0017	.159	30
ylene (mixed)	.0336	106.16	.0003	.028	8.2
ylbenzene	.0100	106.16	.00009	.008	9.6
rene	.0136	104.14	.0001	.009	7.7
hthalene	.005	128.16	.00004	.004	<1
bon disulfide	.003	76.14	.00004	.004	366
marin	.0367	118.13	.00031	.029	100
lohexane	.0009	84.16	.00001	.001	98
lohexene	.0276	82.14	.00034	.032	100
lopentadiene	.0064	66.10	.00009	.008	600
lene	.0029	70.13	.00004	.004	654
tane	.0014	72.15	.00002	.002	533
ophene	.0024	84.13	.00003	.003	79
,5-trimethylbenzene	.0028	120.20	.00002	.002	7.0
,3-trimethylbenzene	.0130	120.20	.0001	.002	6.8

$\Sigma \frac{X}{MW} = .01071$

* Benzene, toluene, and xylene weight fractions were the average of two analysis OK of light oil samples: Environmetrics on March 1, 1991, and by Doug Stracke of Granite City Steel on March 24, 1985.

Average molecules weight of light oil = ΣyM = 84.47
Average vapor pressure of light oil = ΣyP = 89.67

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Benzene Emissions from Coke By-Product Recovery Plants - Background Information for Proposed Standards

Draft EIS

NESHAP

TABLE 3-7. UNCONTROLLED BENZENE EMISSION FACTORS FOR COKE BY-PRODUCT PLANTS

Source	Emission factor (g benzene/Mg coke)	Industry emissions (Mg/yr)[a]
Cooling tower		
Direct-water	270	6,340
Tar-bottom	70	1,090
Light-oil condenser vent	89	4,080
Naphthalene separation	87	2,040
Naphthalene processing	20	470
Tar-intercepting sump	95	5,360
Tar dewatering	21	1,090
Tar decanter	77	4,350
Tar storage	12	680
Light-oil sump	15	780
Light-oil storage	5.8	300
BTX storage	5.8	80
Benzene storage	5.8	80
Flushing-liquor circulation tank	9	510
Excess-ammonia liquor tank	9	510
Wash-oil decanter	3.8	180
Wash-oil circulation tank	3.8	180
Pump seals	a	600
Valves	a	400
Pressure-relief devices	a	270
Exhausters	a	30
Sample connections	a	50
Open-ended lines	a	20
Total (rounded)		29,000

[a] Emissions were estimated on the basis of number of potentially leaking units. Emission factors are listed in Table 3-6.

APPENDIX F

FUGITIVE PARTICULATE EMISSIONS

EMISSION CALCULATIONS

Fugitive particulate emissions from paved and unpaved roads were calculated based on information provided in "Granite City Area PM-10 Emission Inventory", MRI Final Report, 1988, and the 1991 PM_{10} SIP developed by the Illinois Environmental Protection Agency.

Based on information in these sources, fugitive particulate inventories were developed for three scenarios:

- Initial Uncontrolled Emissions - These are uncontrolled emission estimates taken from the 1988 MRI report.
- Projected Initial Uncontrolled Emissions - These emission estimates reflect uncontrolled emissions reported in the 1988 MRI document scaled up by a factor related to the requested production increase. That factor is derived by dividing the requested production level by the base period production level. The factor applied is dependent on the potential increase in activity on each specific road segment. A factor of one was used for those areas where activity is not a function of production level. A factor of 1.1 was used in those areas where some increase in activity may occur, but that increase is expected to be minor.
- Projected Controlled Emissions - These estimates start with the Projected Initial Uncontrolled Emissions and are then reduced to reflect the fugitive emission control program that will be in effect with the production increase.

EMISSION CONTROL PROGRAM

Table F-1 presents intitial uncontrolled, projected uncontrolled, and projected controlled emissions.

Projected controlled emissions reflect an extensive fugitive dust control program. As a part of this application, Granite City Steel is committing to a fugitive emission control program that adds to the commitments that were implemented earlier. The resulting control program is outlined below in **Table F-2.**

MATERIALS HANDLING

Uncontrolled and controlled emissions from materials handling activities that will be affected by the production increase were estimated using the same sources previously cited. These estimates are presented in **Table F-3**.

SUMMARY

Fugitive emissions ard credits are summarized on **Table F-4**.

TABLE F-1

Granite City Division of National Steel Company
Projected PM-10 Emissions - Roads

Area	Segment ***	Initial Uncontrolled Emissions * (TPY)	Production Increase Factor	Projected Initial Uncontrolled Emissions **	Control Efficiency for Projected Emissions (%) *	Projected Controlled Emissions ***
South Plant	A ****	26.09	1.00	26.09	95.00%	1.30
	B	9.91	1.00	9.91	98.00%	0.20
	C	7.46	1.00	7.46	98.00%	0.15
Steelworks	D****	45.72	1.48	67.80	98.00%	1.36
	K ****	6.23	1.48	9.24	98.00%	0.18
	M ****	7.39	1.48	10.96	98.00%	0.22
	E	8.79	1.00	8.79	98.00%	0.18
	F ****	148.15	1.48	219.71	98.84%	2.55
	G ****	3.96	1.48	5.87	96.24%	0.22
	H [2]	11.24	1.00	11.24	97.90%	0.24
	J	8.10	1.00	8.10	98.00%	0.16
	L	161.37	1.48	239.31	98.00%	4.79
	R ****	2.57	1.48	3.81	98.00%	0.08
BOF	O ****	37.61	1.48	55.78	98.00%	1.12
	N	27.75	1.48	41.15	98.00%	0.82
	P [2]	28.44	1.48	42.18	99.30%	0.30
Furnace	V [2]	66.65	1.10	72.22	99.50%	0.36
	W ****	6.59	1.10	7.25	96.54%	0.25
	X ****	238.15	1.54	366.04	97.52%	9.08
	Y	11.06	1.00	11.06	98.00%	0.22
	Z [1]	43.70	1.54	67.17	99.67%	0.22
North Plant	S ****	17.84	1.00	17.84	95.00%	0.89
	T ****	21.09	1.00	21.09	95.00%	1.05
Area	D-D [2]	41.87	1.54	64.35	98.98%	0.66
	E-E [2]	1.69	1.54	2.60	97.87%	0.06
	F-F	1.53	1.54	2.35	98.00%	0.05
	CS[1] ****	13.57	1.00	13.57	98.00%	0.27
	CS[2]	8.49	1.00	8.49	98.00%	0.17
	G-G	5.81	1.00	5.81	95.00%	0.29
	Total:	1,017.82		1,427.23		27.42

* Based on IEPA PM10 SIP
** Base case emissions times production increase factor
*** Unpaved roads paved as per proposed schedule.
**** Paved Road.
[1] Road 72% paved. The remaining 28% will be paved prior to the production increase.
[2] Road to be paved prior to production increase.

TABLE F-2
GRANITE CITY DIVISION of NATIONAL STEEL
FUGITIVE PARTICULATE EMISSION CONTROL PROGRAM for REQUESTED PRODUCTION INCREASE

AREA	SEGMENT	SURFACE	CONTROL
South Plant	A	Paved	Sweep or Flush once per month
	B	Unpaved	Spray three times per month
	C	Unpaved	Spray three times per month
Steelworks	D	Paved	Sweep or flush daily
	K	Paved	Sweep or flush daily
	M	Paved	Sweep or flush daily
	E	Unpaved	Spray three times per month
	F	Paved	Sweep or flush daily
	G	Paved	Sweep or flush daily
	H *	Paved	Sweep or flush once per month
	J	Paved	Sweep or flush daily
	L	Unpaved	Spray four times per month
	R	Paved	Sweep or flush daily
BOF	O	Paved	Sweep or flush daily
	N	Unpaved	Spray three times per month
	P *	Paved	Sweep or flush five days per week
Blast Furnace	V *	Paved	Sweep or flush five days per week
	W	Paved	Sweep or flush five days per week
	X	Paved	Sweep or flush five days per week
	Y	Unpaved	Spray three times per month
	Z *	Paved	Sweep or flush five days per week
North Plant	S	Paved	Sweep or flush every other day
	T	Paved	Sweep or flush every other day
Area	D-D *	Paved	Sweep or flush five days per week
	E-E *	Paved	Sweep or flush five days per week
	F-F	Unpaved	Spray three times per month
	CS(1)	Paved	Sweep or flush five days per week
	CS(2)	Unpaved	Spray three times per month
	G-G	Unpaved	Spray quarterly

* Sprayed four times per month as of production increase; paved by July 31, 1996.

TABLE F-3

Granite City Division of Nation Steel

Base Case PM10 Emissions and Contemporaneous Emissions Reductions - Materials Handling

Material			Control * Efficiency		Production Increase			Production Increase Related
	TPY (1)	TPY		TPY		TPY	TPY	TPY
Coke	7.45	7.45	90%	0.64	1.54	0.98	(6.47)	0.34
Coke Breeze	0.01	0.01	90%	0.00	1.54	0.00	(0.01)	0.00
Pellets	7.84	7.84	90%	0.67	1.54	1.03	(6.81)	0.36
Limestone	1.88	1.88	90%	0.16	1.54	0.25	(1.63)	0.09
	17.18	17.18		1.47		2.26	(14.92)	0.79

*** Based on IEPA PM10 SIP**

**** Reductions based Contemporaneous Controls**

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TABLE F-4
FUGITIVE EMISSION SUMMARY
Granite City Division of National Steel

IEPA Fugitive PM10 SIP Control Requirement for GCS			61.68	tons / year
PM10 Emissions from Roads	27.42	tons / year		
PM10 Emissions from Materials Handling	2.26	tons / year		
Total Fugitive PM10 Emissions After Production Increase			29.68	tons / year
Excess Fugitive PM10 Reduction (Credit)			32.00	tons / year

R004574

Appendix C – Air Quality Modeling Report

CARBON MONOXIDE AIR DISPERSION MODELING FOR A PREVENTION OF SIGNIFICANT DETERIORATION AND CONSTRUCTION PERMIT REVISION FOR UNITED STATES STEEL GRANITE CITY WORKS



Prepared for:
United States Steel Corporation
Granite City Works
20th and State Streets
Granite City, IL 62040

Prepared by:
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304A West Millbrook Road
Raleigh, North Carolina 27609

October 2022

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the United States Steel Corporation, Granite City Works ("US Steel") iron and steel making facility in Granite City, Illinois. The analysis has been conducted by RTP Environmental Associates, Inc. ("RTP Environmental") on behalf of US Steel.

The analysis evaluated the emissions of the criteria pollutant carbon monoxide ("CO") as regulated under the applicable provisions of the Prevention of Significant Deterioration ("PSD") regulations of 40 CFR § 52.21, incorporated by reference in the federally approved Illinois State Implementation Plan at 40 CFR § 52.738(b).[1] The criteria pollutant analysis was conducted to ensure that the proposed revisions to the CO emission limitations in the Prevention of Significant Deterioration ("PSD") and Construction Permit (Permit Number 95010001) ("1996 Construction Permit") do not cause or contribute to violation of a National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR § 52.21(l), the analysis conforms with the modeling procedures outlined in the Guideline on Air Quality Models[1] promulgated by United States Environmental Protection Agency ("USEPA") (the "Guideline" or "Appendix W"). It also conforms to the Illinois Environmental Protection Agency's (IEPA) Prevention of Significant Deterioration Modeling Guidance[2], the modeling protocol submitted to the IEPA on February 3, 2020, and associated USEPA modeling policy and guidance.

[1] All citations to the PSD regulations herein are to the currently applicable provisions of 40 CFR § 52.21. The analysis also is designed to satisfy the parallel requirements of the currently pending Illinois PSD rule, 35 Ill. Adm. Code Part 204.

2.0 PROJECT DESCRIPTION

The 1996 Construction Permit authorized National Steel to increase iron and steel production limitations for the blast furnaces and basic oxygen furnace ("BOF") shop at the existing integrated iron and steel manufacturing facility in Granite City, in Madison County, Illinois. US Steel purchased the assets of National Steel in 2003, including Granite City Works. US Steel is proposing revisions to the 1996 Construction Permit that involve increases in the CO emission limitations that were established per the PSD requirements. Therefore, the proposed increases in the CO rates were evaluated for PSD requirements including compliance with the NAAQS for CO. No physical changes are proposed in conjunction with the requested revisions to the 1996 Construction Permit.

3.0 FACILITY AND SITE DESCRIPTION

The US Steel Granite City Works produces high-quality hot-rolled, cold-rolled and coated sheet steel products to customers in the construction, container, piping and tubing, service center, and automotive industries. Granite City Works has an annual raw steelmaking capability of 3.58 million net tons.

The facility occupies approximately 400 acres and is located approximately 12 miles east of Lambert, St. Louis International Airport. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 749,000m East and 4,287,000m North (NAD83, Zone 15). Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

The US Steel facility is classified under the regulations governing PSD and Title V as a major source. The area of Madison County where US Steel facility is located is classified as attainment or unclassifiable for all regulated pollutants except ozone. St. Louis is classified as marginal nonattainment for the 2015 8-hour ozone standard.

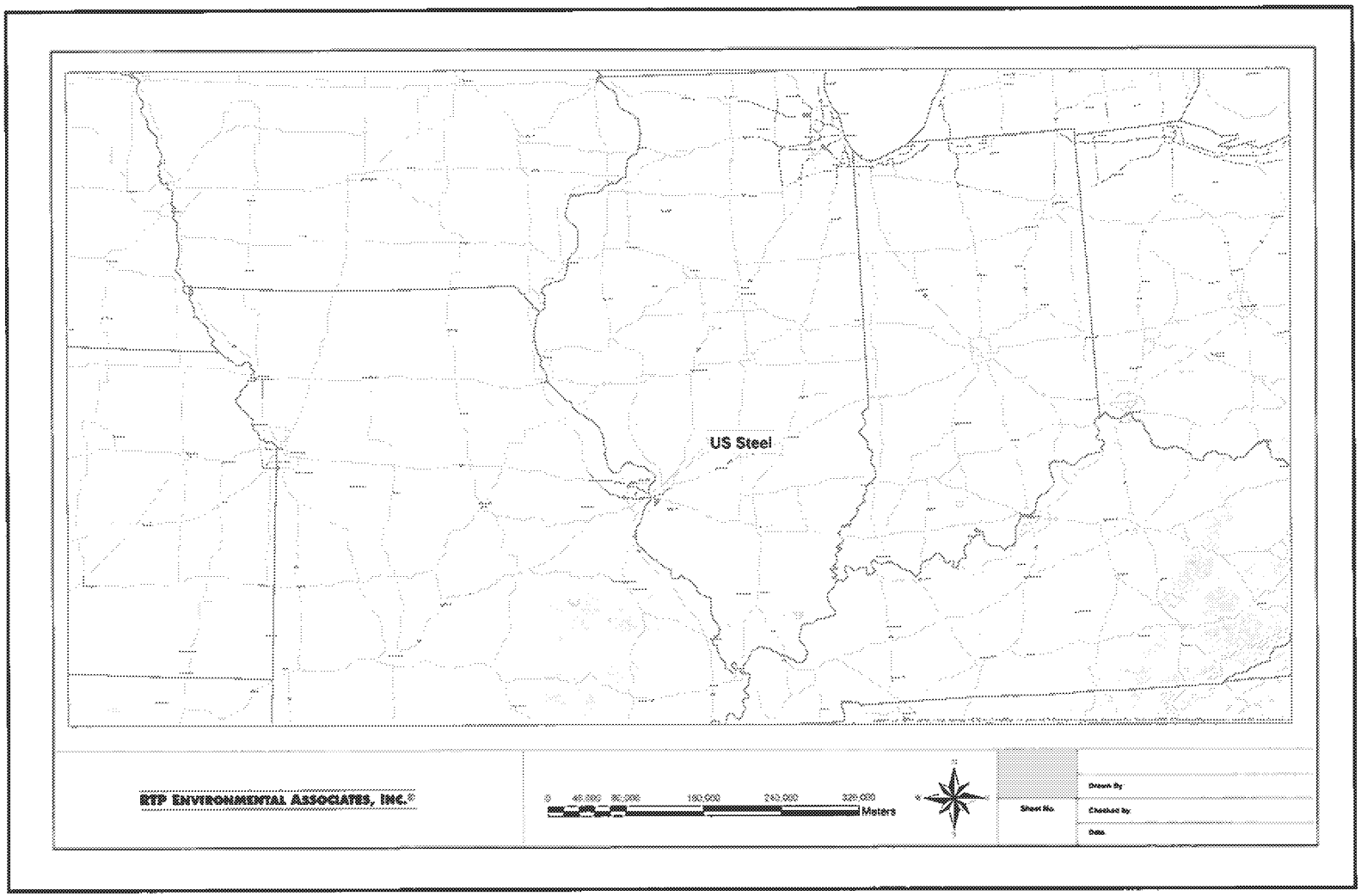


Figure 1. General Location of the US Steel Granite City Works

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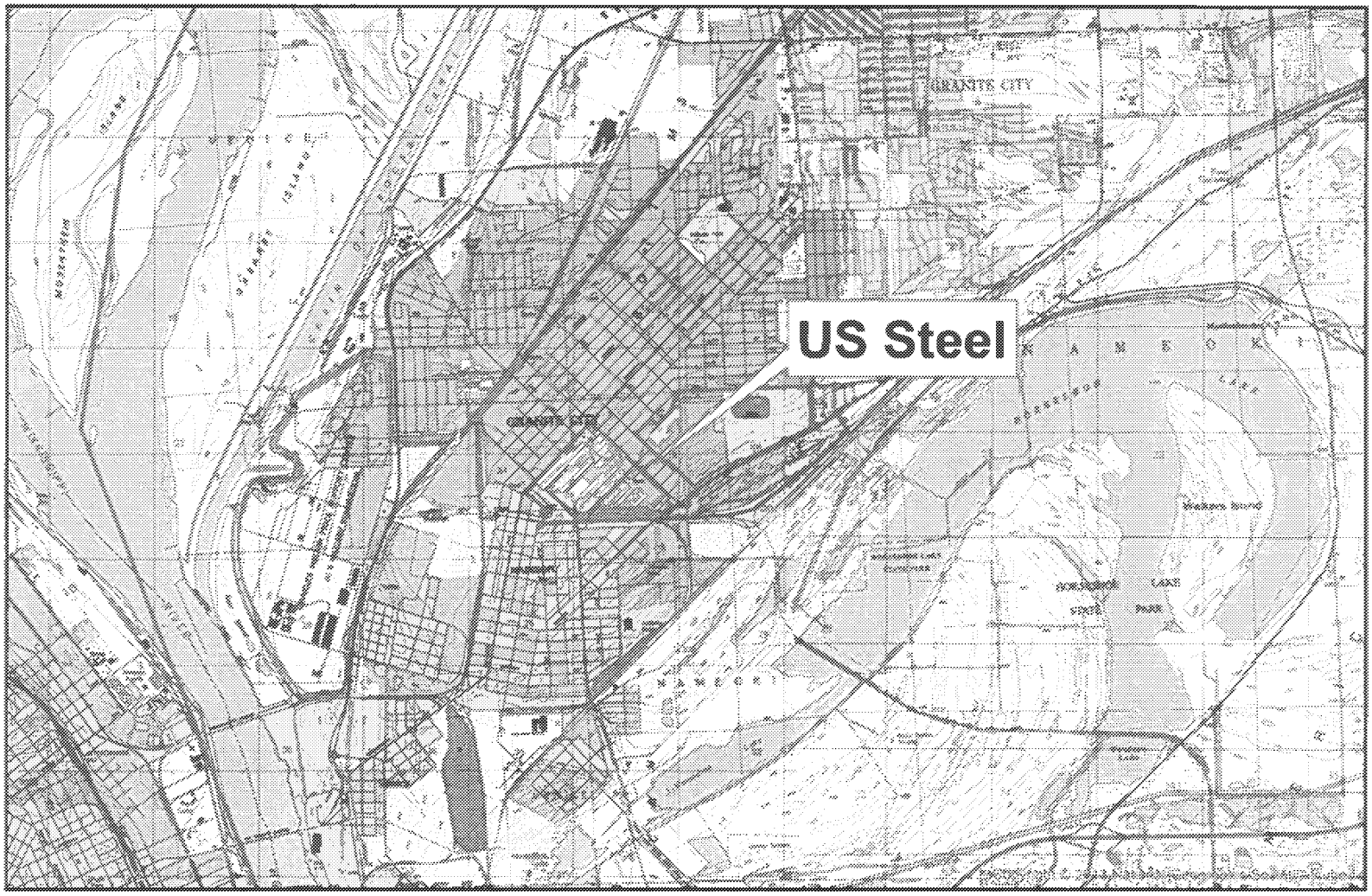


Figure 2. Specific Location of US Steel Granite City Works

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4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 22112) was used to conduct the dispersion modeling analysis. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the required default model for calculating ambient concentrations near the US Steel facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the USEPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W was not warranted.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. These coefficients were used by the Illinois Environmental

Protection Agency ("IEPA") in its evaluation of the facility as part of the 1-hr sulfur dioxide ("SO2") Data Requirements Rule ("DRR").

4.3 Source Data

The modeling input data and modeled CO emission rates can be found in Appendix A of this report.

Source Characterization

The majority of modeled source input parameters were obtained from the IEPA's model conducted for the Data Requirements Rule ("DRR").

Point Sources

Most emission sources at the site vent to stacks with a well defined opening. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well defined opening. These sources were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were provided by the IEPA and were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

Flares

The facility uses blast furnace gas flares to combust excess process gas. Emissions that occur only during periods of malfunction are not required to be modeled per 40 CFR Part 51 Appendix W. Non-malfunction emissions were modeled using the procedures outlined in the AERSCREEN Manual[3]. The effective stack height (H, in meters) was computed by the IEPA as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare stack in caloriesper second:

$$H_{equivalent} = H_{actual} + 4.56x10^{-3} \times Q^{0.478}$$

The effective flare stack diameter (d, in meters) was computed as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88x10^{-4} \times (Q \times 0.45)^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec is assumed.

All source locations were based upon a NAD83, UTM Zone 15 projection.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for any stacks n excess of 65m. Procedures used are in accordance with those described in the USEPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[4]. GEP formula stack height, as defined in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from a facility plot plan. The structure locations and heights were obtained from the IEPA and were input to the USEPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The structures included in the GEP analysis are shown as the green blocks in Figure 3. All stacks and structures that are located near a stack were included in the BPIP runs.

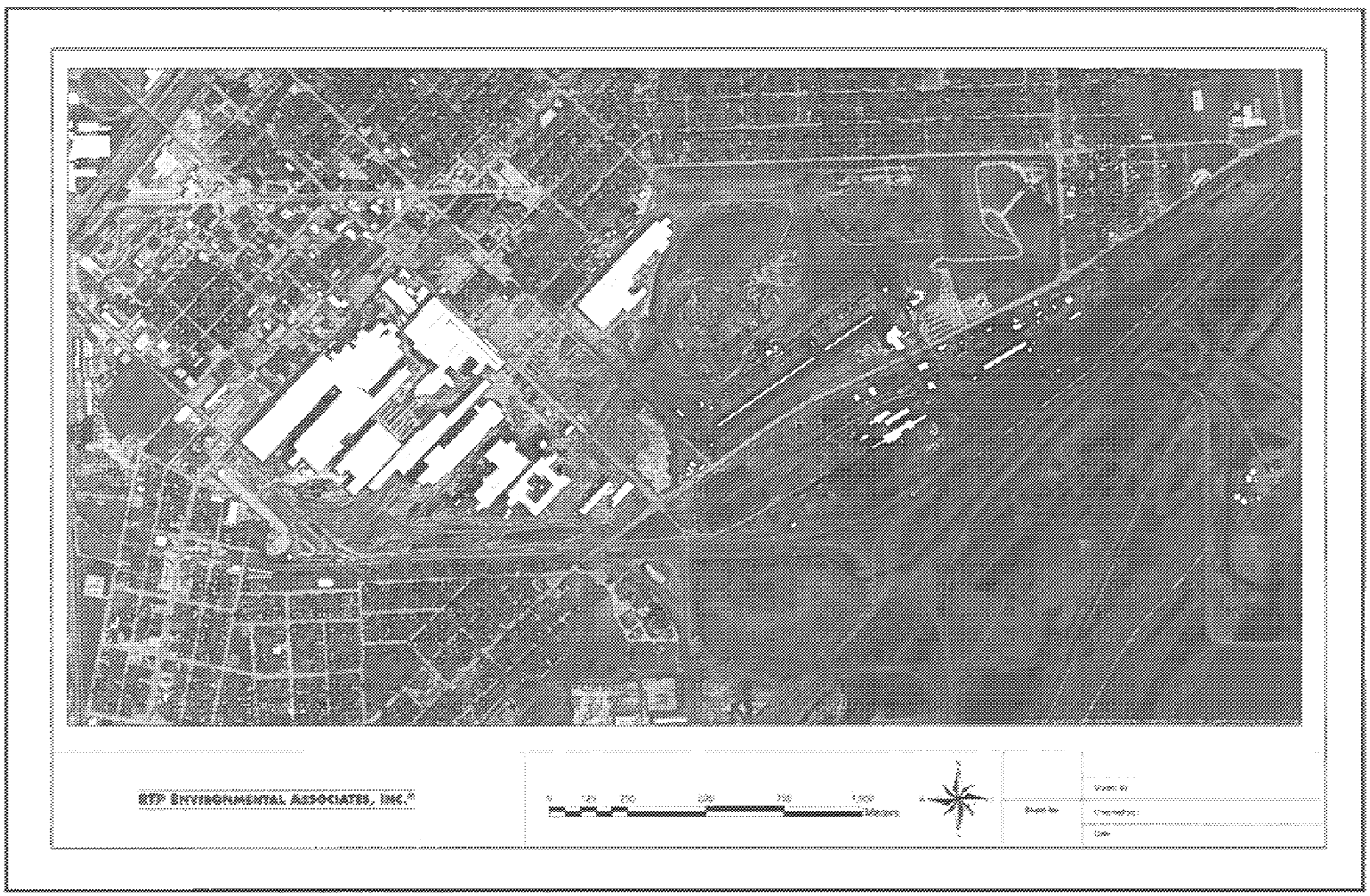


Figure 3. Structures Included in the US Steel GEP Analysis

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4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 40 CFR § 52.21(m), as discussed in Section 5.0herein.

Pursuant to 40 CFR § 52.21(i)(5), requirements for ambient monitoring data may be waived by the permitting authority if projected increases in ambient concentrations due to the project are less than the Significant Monitoring Concentrations. However, in light of the decision of the D.C. Circuit Court of Appeals *Sierra Club v. EPA*,[5] US Steel has elected not to request such a waiver at this time.

The USEPA Monitoring Guidelines[6], other USEPA interpretive guidance, and USEPA administrative decisions clarify that representative, existing air quality monitoring data may be used to fulfill the PSD pre-construction monitoring requirements and establish background concentrations needed for assessing NAAQS compliance, in lieu of monitoring data. USEPA's Monitoring Guidelines suggest specific criteria to determine representativeness of off-site data: *quality of the data, currentness of the data, and monitor location.*

There are many existing ambient CO monitors within 100 miles in the facility (Figure 4). Existing monitoring data have been evaluated in relation to the criteria provided in USEPA's Ambient Monitoring Guidelines as being representative of the US Steel site.

We have used recently available, quality assured data (2016-2018) from the AQS monitor in East St. Louis, IL (AQS Site # 17-163-0010). 2018 is the latest year of complete, available data. The 4th quarter of 2019 is incomplete and data are not



Figure 4. Ambient Air Quality Monitors in the Vicinity of the US Steel Facility

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available for 2020-2021. This monitor best represents background concentrations near the facility as it is the closest monitor with current CO data and is in the vicinity of the site and therefore representative of conditions as the site. The background data are presented in Table 1.

Table 1. Proposed Background Concentrations 2016-2018

Pollutant	Averaging Time	Design Value (ppb)[µg/m^3]	Basis	AQS Site No.
CO	1-hour	(2,200) [2,515]	Maximum	17-163-0010 St. Louis
	8-hour	(1,440) [1,646]		

The existing monitoring data satisfy the criteria provided in USEPA's Ambient Monitoring Guidelines[7] as being representative of the site.

Monitor Location

Of the monitors available, the East St. Louis monitor represents background concentrations as it is the closest monitor with data for the pollutants of concern that is not also significantly influenced by the localized source impacts.

Data Quality

The monitor data were collected and quality assured by the IEPA.

Currentness of Data

The data were collected during 2016-2018, which represents the recently available, quality assured data available for use in assessing compliance.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 14,100 receptors were used in the AERMOD significant impacts analysis. The receptor grid consisted of three cartesian grids and receptors located at 50m intervals along the facility fence line.

The first cartesian grid extended to approximately 3.0km from the facility in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region were 250m. A third grid extended to 15km with a spacing of 500m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 2.

Table 2. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Facility (m)
100	3,000
250	5,000
500	15,000

The US Steel facility is located in southern Illinois. Terrain within 10km of the site is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS one arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 15 projection. The near-field receptor grid is presented in Figure 5.

4.6 Meteorological Data

The 2016-2020, 5-year sequential hourly surface meteorological data from the National Weather Service (NWS) at St. Louis Lambert Field (WBAN No. 13994) and upper air data from the NWS station in Lincoln, IL (WBAN No. 04833) were used in the analysis. These data were processed into a "model-ready" format using AERMET version 21112.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption.

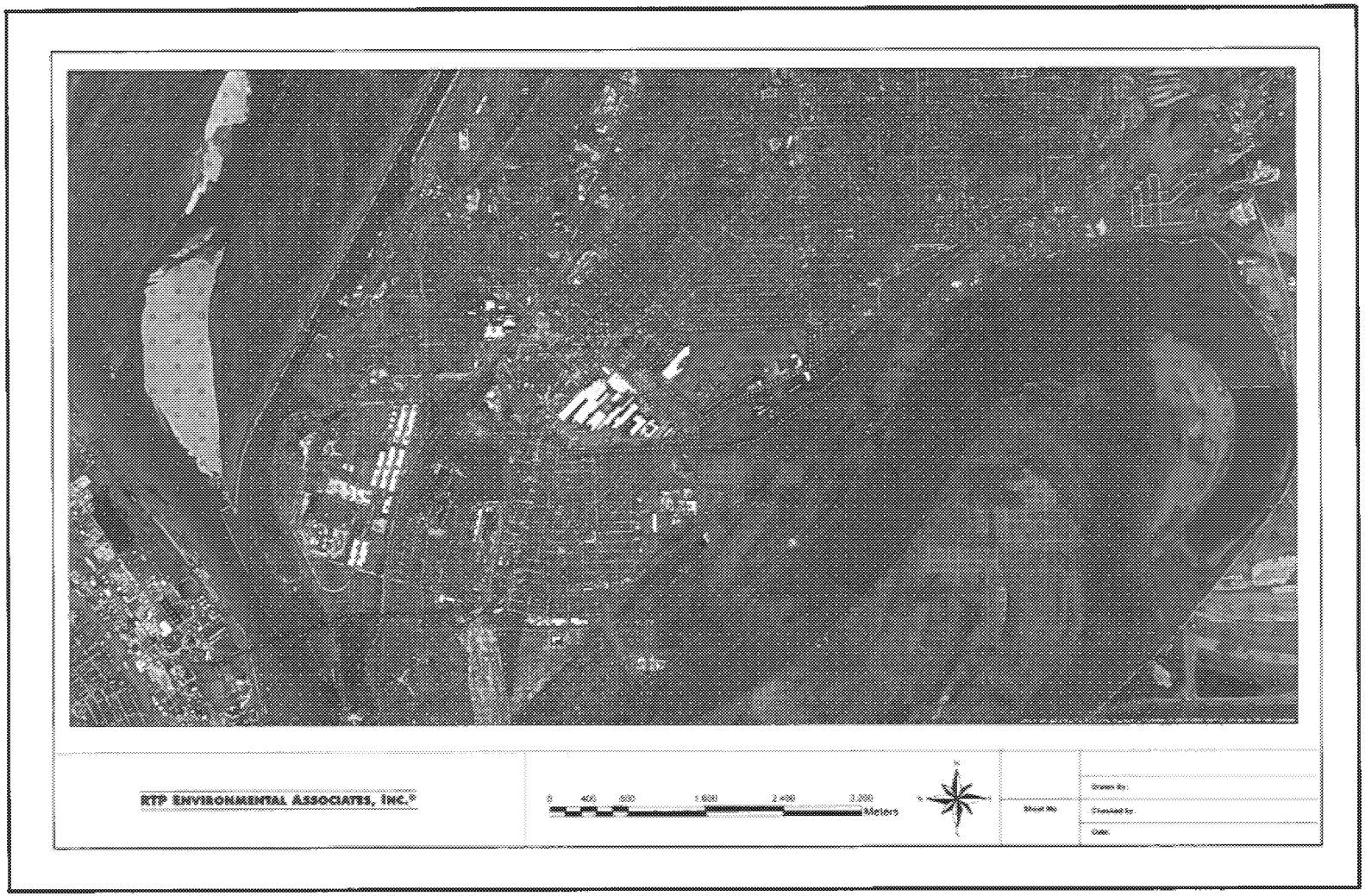


Figure 5. US Steel Facility Near-field Receptor Grid

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The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. Estimates of the surface characteristics were made by the IEPA using USEPA's AERSURFACE program (Version 13016) and provided to RTP Environmental. A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. RTP employed the "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed.

The use of NWS meteorological data for dispersion modeling can often lead to a high incidence of calms and variable wind conditions if the data are collected by Automated Surface Observing Stations ("ASOS"), as are in use at most NWS stations since the mid-1990's. A calm wind is defined as a wind speed less than 3 knots and is assigned a value of 0 knots. In addition, variable wind observations may include wind speeds up to 6 knots, but the wind direction is reported as missing, if the wind direction varies more than 60 degrees during the 2-minute averaging period for the observation. The AERMOD model currently cannot simulate dispersion under calm or missing wind conditions. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations were used to calculate hourly average wind speed and directions, which were used to supplement the standard archive of hourly observed winds processed in AERMET. The USEPA AERMINUTE program (Version 15272) was used for these calculations. A wind rose of the 5-year meteorological dataset is provided in Figure 6.

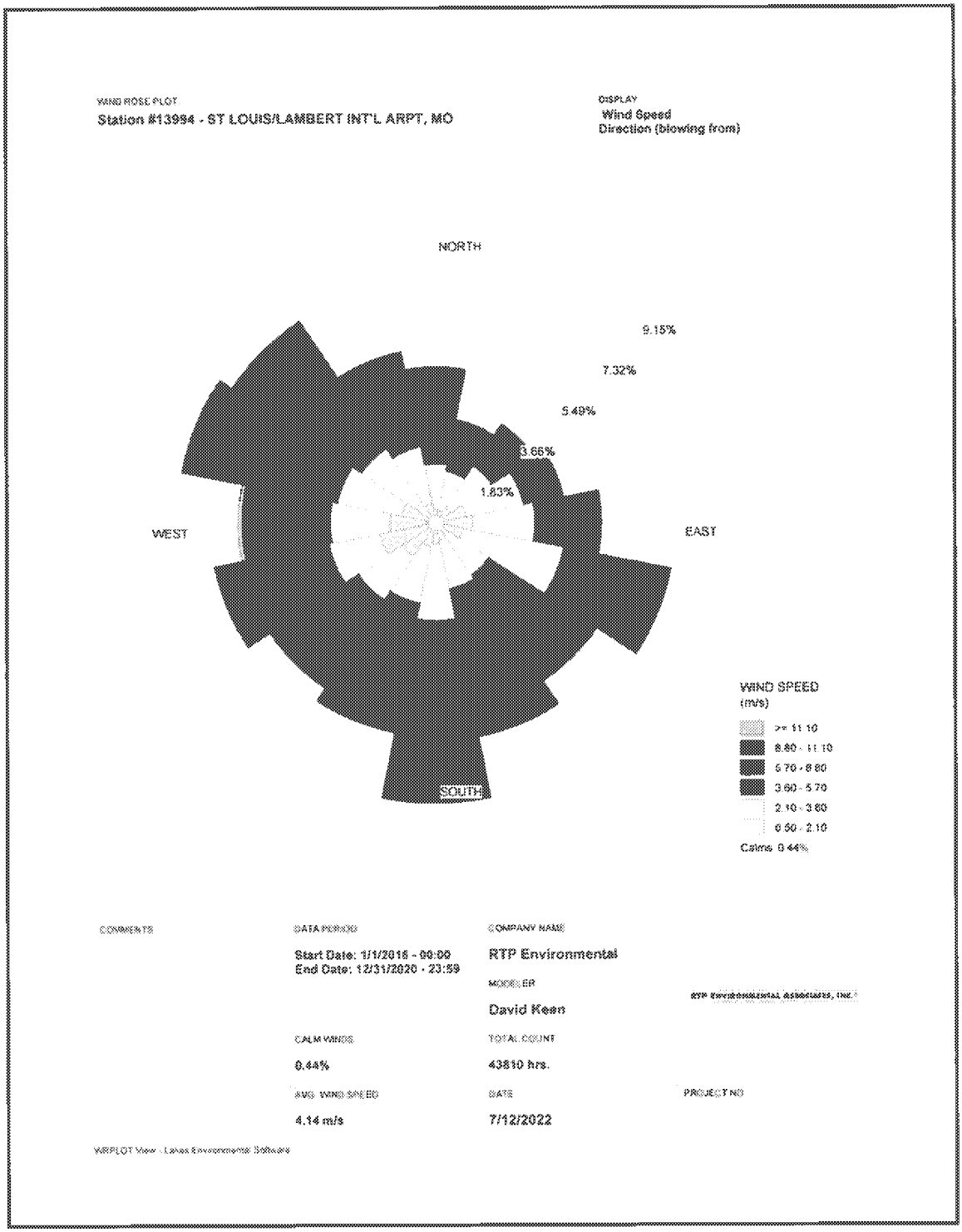


Figure 6. Lambert Field Windrose 2014-2018.

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

USS Steel is proposing changes to the CO emission limitations in the 1996 Construction Permit that were established per the PSD requirements. Therefore, as requested by Illinois EPA, dispersion modeling of CO emissions have been evaluated and compared to the NAAQS.

5.2 Significant Impact Analysis

The air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase NAAQS analysis. In the significant impact analysis, the calculated maximum impacts due to the project were determined for CO.[b] These impacts determined the net change in air quality resulting from the proposed revision to modification permitted under the 1996 Construction Permit. Five years of meteorological data were used in the significant impact analysis. Maximum modeled CO concentrations were compared to the significance levels. The PSD Class II Significant Impact Levels for CO are listed in Table 3.

Table 3. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels ($\mu g/m^3$)
CO	1-hour	2,000
	8-hour	500

[b] For some of the affected emissions units, in place of project related emissions increases, we conservatively used the potential to emit of CO.

5.3 NAAQS Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the CO NAAQS was conducted. In the NAAQS analysis, impacts from the US Steel facility were added to concentrations calculated from other nearby sources, plus a regional background concentration. The resultant total concentrations were compared to the NAAQS to assess compliance. The receptors modeled in the NAAQS analyses were limited to those showing a significant CO impact. Five years of meteorological data were again used in this analysis.

Nearby Source Inventory

Off-site sources were included in the NAAQS analysis. A 50km radius was used to define the screening area. A list of sources that are located within the screening area has been obtained from the IEPA as well as the Missouri Department of Natural Resources ("MDNR"). Section 8.3.3.b of Appendix W to 40 CFR Part 51 states that the number of nearby sources to be explicitly modeled is expected to be few, except in unusual situations. Appendix W further states that the sources to be included will usually be located within the first 10 to 20km from the source under consideration. In addition, it states that identification of nearby sources calls for the exercise of professional judgment by the appropriate reviewing authority. Further, USEPA's Guidance for PM2.5 Permit Modeling reiterates the Appendix W emphasis on a 10km screening radius for determining which nearby sources to include in the cumulative modeling analysis.

We conservatively included all sources provided by the IEPA and MDNR that are located within 50km of the US Steel facility. Total facility, potential emissions (i.e., all sources at a facility) were used in the NAAQS evaluation.

NAAQS Compliance Assessment

Ambient background concentrations (as discussed in more detail in Section 4.4) were then added to assess NAAQS compliance. The modeled and monitored values shown in Table 4 were used for this assessment.

Table 4. Monitored and Modeled Values Used to Assess NAAQS Compliance

Pollutant	Averaging Time	Monitored Value	Modeled Value
CO	1-hour & 8-hour	Maximum over 3 years	Highest, second high over 5 years

The NAAQS are shown in Table 5.

Table 5. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards ($\mu g/m^3$)	
		Primary	Secondary
CO	1-hour	40,000	--
	8-hour	10,000	--

6.0 RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are included on the enclosed CD.

6.1 Significant Impact Analysis Results

The project results in CO impacts in excess of the 8-hour Significant Impact Level shown in Table 3. The significant impact analysis results are presented in Table 6. Based upon the results of the significant impacts analysis, a cumulative, NAAQS analysis was conducted.

6.2 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the CO NAAQS. The project resulted in insignificant 1-hr CO impacts, as a result the 1-hr average was not included in the NAAQS assessment. All sources located within 50km of the US Steel facility were modeled in conjunction with the US Steel facility in assessing compliance. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the CO short term standards was based upon the maximum of the highest-second-highest values from the five-year meteorological dataset.

The results of the NAAQS analysis are presented in Table 7. As can be seen, the model demonstrates compliance.

Table 6. Significant Impact Analysis Results

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
CO	1-hr	1,157	2,000	N/A	NA
	8-hr	692	500	575	2.2

N/A – Not applicable, impacts calculated to be insignificant.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Comment
CO	8-hour	2,045	1,646	3,691	10,000	Compliant

R004598

ATTACHMENT A
MODELING INPUT DATA

US Steel Granite City Point Source Model Input (NAD83, Zone 15)
Last Update (10-5-22)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
132833	DEFAULT	Blast Furnace A Stoves	749816.02	4286809.08	416.83	217.0	500.0	49.66	7.0	1604.52	1604.52
132838	DEFAULT	Blast Furnace B Stoves	749665.50	4286719.93	417.16	229.0	500.0	51.05	9.8	1837.76	1837.76
132837	DEFAULT	Blast Furnace Gas Flare #1	749777.33	4286841.02	418.21	221.8	1831.7	65.62	15.4	6280.99	6280.99
240479	DEFAULT	Blast Furnace Gas Flare #2	749865.93	4286920.23	416.24	221.8	1831.7	65.62	15.4	6280.99	0.00
132836	DEFAULT	Casthouse Baghouse	749616.61	4286732.18	417.75	63.0	150.0	63.88	11.0	63.77	21.68
132927	DEFAULT	Blast Furnace A and B Iron Spout Baghouse	749831.35	4286818.73	415.98	43.0	123.0	43.04	7.8	6.43	2.19
239459	DEFAULT	Cogeneration Boiler BFG-fired some NG-firing	749776.38	4287073.85	415.19	137.0	400.1	62.11	6.0	203.08	0.00
132867	DEFAULT	Boiler 11	749865.15	4286883.84	416.24	149.9	335.0	29.82	8.0	90.48	90.48
132872	DEFAULT	Boiler 12	749881.40	4286887.85	416.50	150.0	335.0	26.74	8.0	90.48	90.48
BOF	DEFAULT	BOF ESP	748415.00	4286681.00	416.57	125.0	400.0	50.00	15.0	4121.79	1274.01
BOF2ND	DEFAULT	BOF Secondary Baghouse	748625.57	4286763.99	413.00	160.0	275.0	38.56	17.0	19.69	19.69
132842	DEFAULT	Slab Reheat Furnace #1	747729.70	4286762.02	417.52	56.8	650.1	44.88	8.0	26.52	0.00
172532	DEFAULT	Slab Reheat Furnace #2	747715.25	4286747.05	416.47	56.8	650.1	44.88	8.0	26.52	0.00
172512	DEFAULT	Slab Reheat Furnace #3	747700.79	4286730.53	415.88	56.8	650.1	44.88	8.0	26.52	0.00
172514	DEFAULT	Slab Reheat Furnace #4	747700.27	4286714.00	416.08	146.0	736.1	26.94	13.7	40.76	0.00
132849	DEFAULT	Galvanizing line #8 - fume scrubber	748883.00	4287195.00	416.57	80.0	80.0	41.66	3.0	0.00	0.00
229397	DEFAULT	Galvanizing line #8 - space heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229398	DEFAULT	Galvanizing line #8 - drying oven and storage area heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229399	DEFAULT	Galvanizing line #8 - miscellaneous heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229601	DEFAULT	Emergency Generator (3500 HP)	749641.00	4286863.00	416.17	37.0	442.0	32.80	1.9	0.00	0.00
GTEWY1	DEFAULT	Gateway Energy & Coke Co., LLC - Coking (New Main Stack)	749279.00	4286984.00	415.78	199.9	293.1	48.249	13.0	2.62E+01	0.00
GTEWY2	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 2 of 6	749549.00	4287055.00	418.18	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY3	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 3 of 6	749433.00	4286972.00	418.93	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY4	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 4 of 6	749357.00	4286918.00	418.64	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY5	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 5 of 6	749278.00	4286861.00	418.44	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY6	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 6 of 6	749202.00	4286808.00	418.60	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY7	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 1 of 6	749624.00	4287108.00	418.50	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY8	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 1	749199.00	4286809.00	418.60	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY9	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 1 of 6	749620.00	4287113.00	418.11	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY10	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 2	749274.00	4286862.00	418.31	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY11	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 3	749353.00	4286919.00	418.67	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY12	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 4	749429.00	4286973.00	419.00	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY13	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 5	749545.00	4287055.00	418.27	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY14	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 6	749620.00	4287109.00	418.34	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY15	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 2 of 6	749545.00	4287060.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY16	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 3 of 6	749429.00	4286977.00	418.93	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY17	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 4 of 6	749352.00	4286923.00	418.57	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY18	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 5 of 6	749274.00	4286866.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY19	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 6 of 6	749199.00	4286813.00	418.77	20.0	400.0	69.602	5.0	1.32E+00	0.00

US Steel Granite City Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
26070	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748457.20	4286596.40	413.88	169.0	21.6	78.6	1.373	1.373
26080	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748466.60	4286606.00	413.98	169.0	21.6	78.6	1.373	1.373
26090	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748475.40	4286616.10	413.88	169.0	21.6	78.6	1.373	1.373
26100	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748483.60	4286624.10	413.85	169.0	21.6	78.6	1.029	1.029
26110	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748495.20	4286635.90	414.01	169.0	21.6	78.6	1.029	0.000
26120	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748504.10	4286646.00	414.37	169.0	21.6	78.6	1.029	0.000
26130	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748513.90	4286656.70	414.63	169.0	21.6	78.6	1.029	0.000
26570	Galv Line 8	748368.26	4287046.91	420.41	101.7	12.3	48.5	0.254	0.000
26580	Galv Line 8	748374.01	4287041.49	420.11	101.7	12.3	48.5	0.254	0.000
26590	Galv Line 8	748379.56	4287036.28	419.82	101.7	12.3	48.5	0.254	0.000
26600	Galv Line 8	748420.52	4286997.79	419.55	38.0	15.1	38.0	0.254	0.000
26610	Galv Line 8	748428.00	4286990.81	419.95	38.0	15.1	38.0	0.254	0.000
26620	Galv Line 8	748436.60	4286982.91	419.85	38.0	15.1	38.0	0.254	0.000
26630	Galv Line 8	748444.54	4286975.49	419.62	38.0	15.1	38.0	0.254	0.000
26640	Galv Line 8	748451.78	4286968.87	418.50	38.0	15.1	38.0	0.254	0.000
26650	Galv Line 8	748324.79	4287118.60	421.65	38.0	15.6	17.7	0.254	0.000
26660	Galv Line 8	748331.95	4287112.00	421.52	38.0	15.6	17.7	0.254	0.000
26670	Galv Line 8	748340.34	4287104.30	421.39	38.0	15.6	17.7	0.254	0.000
26680	Galv Line 8	748347.69	4287097.51	421.29	38.0	15.6	17.7	0.254	0.000
26690	Galv Line 8	748354.48	4287091.31	421.16	38.0	15.6	17.7	0.254	0.000
26700	Galv Line 8	748362.29	4287084.18	420.87	38.0	15.6	17.7	0.254	0.000
26710	Galv Line 8	748370.46	4287076.71	420.51	38.0	15.6	17.7	0.254	0.000
26720	Galv Line 8	748378.04	4287069.70	420.14	38.0	15.6	17.7	0.254	0.000
26730	Galv Line 8	748385.51	4287062.91	419.52	38.0	15.6	17.7	0.254	0.000
0126A_1	Slag Pit Volume 1	749691.91	4286762.44	418.70	53.0	29.0	17.7	0.000	0.000
0126A_2	Slag Pit Volume 2	749708.01	4286772.50	421.33	53.0	29.0	17.7	0.000	0.000
0126A_3	Slag Pit Volume 3	749724.24	4286782.31	420.44	53.0	29.0	17.7	0.000	0.000
0126A_4	Slag Pit Volume 4	749740.84	4286791.62	419.00	53.0	29.0	17.7	0.000	0.000
0126A_5	Slag Pit Volume 5	749757.20	4286801.31	418.86	53.0	29.0	17.7	0.000	0.000

R004601

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL131772	DEFAULT	Star Memorial Pet Crematory - Crematory	749244.00	4324486.00	641.44	16.0	800.0	27.585	1.0	2.70E+00	0.00E+00	0.00E+00
IL131841	DEFAULT	Alton Steel Inc. - Electric arc furnaces	747753.00	4307832.00	433.07	100.0	250.1	31.029	24.2	2.25E+02	7.07E+01	7.07E+01
IL131845	DEFAULT	Alton Steel Inc. - 14 inch rolling mill reheat furnace	747645.00	4307692.00	432.84	106.0	200.0	2.394	16.0	2.40E+01	0.00E+00	0.00E+00
IL131948	DEFAULT	Alton Memorial Hospital - 3 Boilers	746364.00	4309470.00	521.36	89.0	389.9	24.108	3.0	0.00E+00	1.28E+01	1.28E+01
IL132052	DEFAULT	Olin Winchester, LLC - Package Boiler (B-4)	750887.00	4308614.00	435.63	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132062	DEFAULT	Olin Winchester, LLC - Package Boiler (B-3)	750891.00	4308619.00	435.89	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132063	DEFAULT	Olin Winchester, LLC - Package Boiler (B-2)	750892.00	4308613.00	435.53	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132064	DEFAULT	Olin Winchester, LLC - Package Boiler (B-1)	750888.00	4308609.00	435.30	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-5)	750883.00	4308610.00	435.27	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132148	DEFAULT	Amsted Rail Co , Inc. - Electric Arc Furnace #1 (EF-1)	747122.00	4287625.00	425.28	55.0	250.1	54.087	6.2	3.84E+01	4.07E+00	4.07E+00
IL132149	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #2 (EF-2)	747147.00	4287625.00	425.20	44.0	250.1	42.443	7.0	3.84E+01	4.07E+00	4.07E+00
IL132193	DEFAULT	Velocity Services, LLC. - North American Boiler	748928.00	4286192.00	416.21	27.0	450.1	24.305	2.3	2.36E+00	0.00E+00	0.00E+00
IL132194	DEFAULT	Velocity Services, LLC. - Cleaver Brooks boiler	748928.00	4286192.00	416.21	29.0	440.0	39.580	2.0	2.36E+00	0.00E+00	0.00E+00
IL132225	DEFAULT	Gateway Regional Medical Center - Boiler #3	748587.00	4287448.00	426.05	48.0	600.0	41.131	4.5	1.53E+00	1.28E+01	1.28E+01
IL132226	DEFAULT	Gateway Regional Medical Center - Boilers #1 and 2	748592.00	4287452.00	425.95	48.0	600.0	38.966	4.5	3.07E+00	2.57E+01	2.57E+01
IL132247	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #1	747505.00	4287550.00	424.84	75.0	375.0	30.078	2.5	1.30E-01	0.00E+00	0.00E+00
IL132248	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #2	747505.00	4287550.00	424.64	25.0	375.0	65.010	2.5	2.40E-01	1.19E+00	1.19E+00
IL132324	DEFAULT	Precoat Metals - Afterburner AB1 and AB2	749469.00	4282538.00	424.97	34.0	1000.0	64.518	4.0	3.23E+00	0.00E+00	0.00E+00
IL132424	DEFAULT	Highland Electric Light Plant - Engine #C-6	788128.93	4293320.17	534.65	28.0	612.1	84.854	2.0	2.07E+01	0.00E+00	0.00E+00
IL132425	DEFAULT	Highland Electric Light Plant - Engine #C-7	788128.93	4293320.17	534.85	57.0	734.1	6.265	11.4	2.51E+01	0.00E+00	0.00E+00
IL132496	DEFAULT	ConocoPhillips Co. - Catalytic reformer #1 (STK12-4)	754869.00	4302625.00	442.55	349.9	600.0	56.810	15.0	6.28E+01	9.53E+01	9.53E+01
IL132510	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-F301 (STK5-2)	754327.00	4303077.00	444.69	185.0	319.0	21.878	8.0	1.21E+01	0.00E+00	0.00E+00
IL132511	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-F302 (STK5-1)	754326.00	4303100.00	444.49	150.0	150.0	11.677	8.5	1.57E+01	5.29E+00	5.29E+00
IL132512	DEFAULT	ConocoPhillips Co. - Steam methane reformer: SMR Heater (HTR-SMR - STK12-8)	754873.00	4302750.00	443.04	199.9	749.9	36.638	12.0	4.75E+01	6.82E+01	6.82E+01
IL132516	DEFAULT	ConocoPhillips Co. - Rectified absorption unit: Reboiler heater (HTR-RAU-DEBUT - STK5-5)	754470.00	4302948.00	444.98	75.0	850.0	34.440	5.0	7.14E+00	0.00E+00	0.00E+00
IL132517	DEFAULT	ConocoPhillips Co. - Rectified absorption system to RFG	754240.00	4303144.00	443.47	150.0	710.0	26.338	8.0	0.00E+00	1.20E+02	1.20E+02
IL132519	DEFAULT	ConocoPhillips Co. - Cracked absorption unit (HTR-CAU-ROSYILL - STK5-4)	754468.00	4302963.00	445.41	85.0	800.0	22.173	7.2	6.72E+00	0.00E+00	0.00E+00
IL132526	DEFAULT	ConocoPhillips Co. - CCU-1 Startup heater B-1	754240.00	4303144.00	443.47	212.0	500.1	86.953	4.5	0.00E+00	3.55E+01	3.55E+01
IL132535	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #2 (STK6-3)	754848.00	4302895.00	443.27	199.9	175.0	49.954	11.0	4.72E+01	2.17E+03	2.17E+03
IL132551	DEFAULT	ConocoPhillips Co. - Alkylation unit: HTR-ALKY-HM2 (STK6-6)	754930.00	4303043.00	442.59	150.9	475.1	12.398	5.7	4.33E+00	0.00E+00	0.00E+00
IL132556	DEFAULT	ConocoPhillips Co. - Utility boiler #15 (STK12-15)	754859.00	4302776.00	443.44	132.0	425.0	48.165	7.0	2.65E+01	1.62E+01	1.62E+01
IL132557	DEFAULT	ConocoPhillips Co. - Utility boiler #16 (STK12-16)	754875.00	4302778.00	443.21	132.0	425.0	48.165	7.0	2.78E+01	1.41E+01	1.41E+01
IL132558	DEFAULT	ConocoPhillips Co. - Utility boiler 17 (STK12-17)	754902.00	4302784.00	442.91	150.0	317.0	52.218	10.0	3.60E+01	1.82E+01	1.82E+01
IL132559	DEFAULT	ConocoPhillips Co. - Utility boiler 18 (STK6-9)	754919.00	4302809.00	442.92	100.0	325.0	14.465	6.2	3.00E+01	6.61E+00	6.61E+00
IL132561	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #1: Charge heater (HTR-HDU-1 - STK13-1)	755217.00	4302588.00	442.16	150.0	790.1	32.144	5.0	5.60E+00	0.00E+00	0.00E+00
IL132564	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #2: Charge heater (HTR-HDU-2 - STK12-14)	755022.00	4302530.00	442.95	150.0	900.1	31.422	5.8	4.90E+00	0.00E+00	0.00E+00
IL132565	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Stabilizer reboiler (HTR-CR3-H2 - STK12-9)	755014.00	4302580.00	442.62	150.0	950.1	7.019	7.8	4.79E+00	0.00E+00	0.00E+00
IL132567	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: Charge heater (HTR-CR3 -H4)	755019.00	4302571.00	442.65	150.0	800.0	28.786	7.8	1.75E+01	8.04E+00	8.04E+00
IL132568	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: First interreactor heater (HTR-CR3-H5)	755019.00	4302548.00	442.78	150.0	749.9	26.929	7.8	2.11E+01	6.93E+00	6.93E+00
IL132569	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Second interreactor heater (HTR-CR3-H6 - STK12-13)	755019.00	4302559.00	442.72	150.0	749.9	14.006	7.8	5.55E+00	0.00E+00	0.00E+00
IL132594	DEFAULT	ConocoPhillips Co. - Sulfuric acid tank	755114.00	4302829.00	441.95	40.0	186.0	26.273	2.0	1.78E+00	2.35E+00	2.35E+00
IL132598	DEFAULT	ConocoPhillips Co. - CCU-2 Startup heater B-1	754240.00	4303144.00	443.47	16.0	509.1	32.964	3.2	4.40E-01	0.00E+00	0.00E+00
IL132599	DEFAULT	Airgas USA, LLC - Liquified carbon dioxide plant	756314.00	4302509.00	435.99	30.0	70.1	79.573	0.2	4.10E-01	0.00E+00	0.00E+00
IL132701	DEFAULT	Kinder Morgan Liquids Terminals, LLC - New Truck loading rack	752898.00	4303578.00	435.63	20.0	70.1	0.262	2.2	4.87E+00	0.00E+00	0.00E+00
IL132739	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 1 of 2)	750915.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL132777	DEFAULT	Elias Kallal & Schaaf Funeral Home & Crematory - Crematorium	742098.00	4312210.00	627.20	30.0	1400.1	18.368	1.7	3.00E+00	0.00E+00	0.00E+00
IL132781	DEFAULT	Chost Bros Products, LLC - Baghouse	754160.00	4283243.00	419.46	32.0	240.0	83.706	3.9	5.56E+01	2.48E+01	2.48E+01
IL132928	DEFAULT	Enable Mississippi River Transmission, LLC - Engine SN-02	782556.00	4285336.00	492.29	30.0	1000.0	9.414	2.6	1.36E+01	0.00E+00	0.00E+00
IL133625	DEFAULT	Waterloo City Light Plant - Engine #1	748326.00	4246769.00	640.45	29.0	749.9	13.579	2.3	4.00E+01	1.35E+00	1.35E+00
IL133627	DEFAULT	Waterloo City Light Plant - Engine #9	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL133628	DEFAULT	Waterloo City Light Plant - Engine #10	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL135983	DEFAULT	Lakeview Memorial Gardens - Crematory	762896.00	4273894.00	578.59	16.0	895.0	26.666	2.6	8.40E+00	0.00E+00	0.00E+00
IL136012	DEFAULT	Breckenridge of IL - Natural gas combustion	756461.00	4277782.00	428.82	38.0	341.0	25.781	2.7	3.94E+00	0.00E+00	0.00E+00
IL136014	DEFAULT	Touchette Regional Hospital - 2 Boilers	751890.00	4273014.00	415.94	39.0	800.0	6.560	3.7	2.26E+00	0.00E+00	0.00E+00
IL136018	DEFAULT	Upchurch Ready Mix Concrete Company - Boiler	749859.00	4276616.00	418.44	30.0	376.1	29.684	3.7	0.00E+00	3.00E-01	3.00E-01

R004602

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL136098	DEFAULT	Safety Kleen Systems, Inc. - Pipe still (heat exchanger)	749786.00	4276425.00	420.28	15.0	170.0	0.295	1.0	0.00E+00	1.38E+00	1.38E+00
IL136125	DEFAULT	Milam Recycling and Disposal Facility - Open flare	750434.00	4282812.00	420.54	42.0	1800.1	10.070	1.0	1.83E+01	6.00E+00	6.00E+00
IL136129	DEFAULT	Village of Freeburg - Engine #6	769352.00	4257578.00	509.42	24.0	749.9	24.239	1.8	3.93E+00	0.00E+00	0.00E+00
IL136130	DEFAULT	Village of Freeburg - Engine #4	769352.00	4257578.00	509.42	25.0	550.0	87.871	1.3	9.60E+00	0.00E+00	0.00E+00
IL136131	DEFAULT	Village of Freeburg - Engine #7	769352.00	4257578.00	509.42	22.0	900.1	18.926	2.7	4.50E+01	4.43E+00	4.43E+00
IL136169	DEFAULT	Darling Ingredients, Inc. - Continuous rendering process	747472.00	4281438.00	414.93	44.0	74.9	84.854	4.0	6.67E+00	1.43E+00	1.43E+00
IL136187	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	772959.00	4275690.00	514.30	33.0	325.0	47.134	4.5	6.49E+01	2.90E+01	2.90E+01
IL136486	DEFAULT	Cerro Flow Products, LLC. - Piercing Mill Furnace #2	746228.00	4275272.00	407.32	25.0	299.9	38.901	2.0	8.65E-01	0.00E+00	0.00E+00
IL136547	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	747162.00	4269805.00	448.72	36.0	315.1	86.592	3.5	1.34E+01	5.91E+00	5.91E+00
IL142809	DEFAULT	Magnesium Elektron North America - Combustion units	746452.00	4285724.00	415.49	80.0	450.1	30.537	2.0	1.02E+01	4.44E+00	4.44E+00
IL143317	DEFAULT	Waterloo City Light Plant - Engine #11	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL143319	DEFAULT	Waterloo City Light Plant - Engine #7	748326.00	4246769.00	640.45	33.0	749.9	84.854	2.0	3.41E+01	0.00E+00	0.00E+00
IL143320	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246769.00	640.45	27.0	880.1	84.230	2.3	1.87E+01	1.36E+00	1.36E+00
IL145809	DEFAULT	ConocoPhillips Co. - Crude heaters (STK5-3)	754415.00	4303016.00	445.93	311.9	530.0	87.970	14.0	7.81E+01	1.98E+01	1.98E+01
IL145820	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #1 (STK3-1)	752928.00	4303077.00	428.41	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145826	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-1	754240.00	4303144.00	443.47	15.0	117.1	20.369	1.5	7.10E-01	1.74E+00	1.74E+00
IL145838	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #2 (STK3-2)	752929.00	4303071.00	428.38	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145850	DEFAULT	ConocoPhillips Co. - Flare for major effluent treatment project	754240.00	4303144.00	443.47	30.0	78.0	14.006	9.2	4.51E+00	0.00E+00	0.00E+00
IL147845	DEFAULT	Mayco Mfg, LLC - Britt kettles combustion stack	747189.00	4286970.00	421.78	34.0	250.1	2.362	1.1	2.00E-01	0.00E+00	0.00E+00
IL147846	DEFAULT	Mayco Mfg, LLC - Mixed metals A-II dross baghouse discharge stack	747189.00	4286970.00	421.78	30.0	95.1	52.611	5.0	5.77E-01	0.00E+00	0.00E+00
IL148354	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #1 (STK6-2)	754864.00	4302895.00	442.88	199.9	175.0	49.954	11.0	2.32E+01	3.84E+01	3.84E+01
IL149873	DEFAULT	City of Alton - Incinerator	749456.00	4310990.00	446.93	25.0	1400.1	53.038	1.0	1.40E+00	0.00E+00	0.00E+00
IL149908	DEFAULT	Charles E. Mahoney - Drum mix asphalt plant	749517.00	4309892.00	443.14	25.0	295.1	66.269	4.0	5.74E+01	2.56E+01	2.56E+01
IL154190	DEFAULT	Milam Recycling and Disposal Facility - Engine #1	750544.00	4282853.00	411.88	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154191	DEFAULT	Milam Recycling and Disposal Facility - Engine #2	750538.00	4282852.00	412.01	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154192	DEFAULT	Milam Recycling and Disposal Facility - Engine #3	750548.00	4282855.00	411.81	26.0	820.0	86.231	0.8	7.14E+00	1.84E+00	1.84E+00
IL155302	DEFAULT	Alton Steel Inc. - Ladle Furnace	747753.00	4307832.00	433.07	74.0	275.1	87.215	3.0	2.24E+01	1.12E+01	1.12E+01
IL155304	DEFAULT	Precoat Metals - Boiler #1	749489.00	4292538.00	424.97	24.0	700.1	20.730	1.8	8.80E-01	0.00E+00	0.00E+00
IL155305	DEFAULT	Granite City Pickling & Warehousing - Boiler	746973.00	4286890.00	422.41	50.0	331.1	15.449	2.7	7.06E-01	0.00E+00	0.00E+00
IL155307	DEFAULT	Kraft Heinz Co. - Boiler 8	748105.00	4289580.00	423.56	80.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL155437	DEFAULT	Southwestern Illinois Correctional Center - 2 Boilers	753202.00	4278290.00	421.46	32.0	450.1	15.285	1.5	7.06E-01	0.00E+00	0.00E+00
IL155441	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	772959.00	4275690.00	514.30	33.0	341.0	18.368	3.2	0.00E+00	2.80E+00	2.80E+00
IL156624	DEFAULT	US Air Force/Scott Air Force Base - Boilers and Heaters	774337.00	4270862.00	440.82	30.0	331.1	23.288	2.2	4.81E+00	0.00E+00	0.00E+00
IL158970	DEFAULT	Olin Winchester, LLC - Package Boiler (B-6)	750906.00	4308625.00	436.06	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL159940	DEFAULT	Afton Chemical Corp. - 258 Sulfonation Stack	746513.00	4276305.00	407.05	158.0	70.1	41.820	1.0	0.00E+00	5.59E+00	5.59E+00
IL159942	DEFAULT	Afton Chemical Corp. - Unit 266: Flare 36-0011/36-0610	746653.00	4276356.00	410.10	100.0	700.1	59.388	0.7	8.55E+00	4.90E+01	4.90E+01
IL159965	DEFAULT	Afton Chemical Corp. - Flare 36-0219	746513.00	4276305.00	407.05	146.0	1000.0	42.837	0.4	3.84E+00	2.74E+01	2.74E+01
IL160741	DEFAULT	Brady McCasland, Inc. - Compaction plant	748518.00	4276987.00	413.75	17.0	1521.1	65.469	1.8	5.20E-01	0.00E+00	0.00E+00
IL160742	DEFAULT	Darling Ingredients, Inc. - Kewanee boiler	747472.00	4281438.00	414.93	35.0	450.1	54.448	2.6	1.96E+00	1.51E+01	1.51E+01
IL160799	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-2	754240.00	4303144.00	443.47	48.0	117.1	20.369	1.5	0.00E+00	1.74E+00	1.74E+00
IL160898	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0110	746653.00	4276489.00	408.22	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL165120	DEFAULT	BFI Waste Systems of North America, Inc. - Flare	758882.00	4264336.00	574.97	35.0	1600.1	23.485	0.8	6.80E+00	0.00E+00	0.00E+00
IL166479	DEFAULT	Union Electric Co. - Turbine CT01A	745573.00	4283620.00	420.60	30.0	850.0	18.860	11.4	7.73E+01	2.73E+01	2.73E+01
IL166491	DEFAULT	Enable Mississippi River Transmission, LLC - Turbine SN-03	782556.00	4285336.00	492.29	30.0	749.9	86.854	2.9	9.56E+00	0.00E+00	0.00E+00
IL167781	DEFAULT	Amsted Rail Co., Inc. - Pouring and casting (PA/CST-1)	747025.00	4287611.00	424.80	101.0	251.0	34.768	9.7	0.00E+00	6.70E-01	6.70E-01
IL167787	DEFAULT	Amsted Rail Co., Inc. - Ladle Preheater (LDP-1)	747039.00	4287611.00	424.93	82.0	505.0	31.488	6.1	6.50E+00	2.20E-01	2.20E-01
IL167858	DEFAULT	ConocoPhillips Co. - Scot unit	754240.00	4303144.00	443.47	16.0	115.1	15.580	9.0	0.00E+00	1.72E+02	1.72E+02
IL169228	DEFAULT	Messer, LLC - 2 Boilers	752309.00	4301220.00	434.42	15.0	800.0	0.525	1.4	2.52E+00	0.00E+00	0.00E+00
IL172707	DEFAULT	St. Anthony's Hospital - Boiler #4	745097.00	4310364.00	584.58	64.0	400.0	58.614	2.3	0.00E+00	6.02E+00	6.02E+00
IL179611	DEFAULT	Highland Electric Light Plant - Engine IC-1	788126.93	4293320.17	534.65	12.0	656.0	86.920	1.2	1.44E+01	0.00E+00	0.00E+00
IL179671	DEFAULT	Village of Freeburg - Engine #1	769352.00	4257578.00	509.42	30.0	900.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179672	DEFAULT	Village of Freeburg - Engine #2	769352.00	4257578.00	509.42	30.0	900.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179673	DEFAULT	Village of Freeburg - Engine #3a	769352.00	4257578.00	509.42	25.0	900.1	55.170	1.0	5.92E+00	0.00E+00	0.00E+00
IL181173	DEFAULT	ConocoPhillips Co. - Loading rack	752292.00	4299987.00	429.92	40.0	1800.1	87.510	2.0	1.53E+00	0.00E+00	0.00E+00
IL183733	DEFAULT	Veolia ES Technical Solutions, LLC - Hazardous waste incinerator #4 (rotary kiln)	745532.00	4275942.00	414.76	57.0	650.9	32.570	2.8	9.17E+00	1.16E+01	1.16E+01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL189069	DEFAULT	US Air Force/Scott Air Force Base - Diesel generators	774337.00	4270862.00	440.32	37.0	402.0	29.389	1.3	5.83E+01	0.00E+00	0.00E+00
IL190090	DEFAULT	Contract Services, LLC - 3 Boilers	746767.00	4275755.00	417.81	40.0	310.0	50.381	4.2	8.53E+00	5.14E+00	5.14E+00
IL192953	DEFAULT	Midwest Metal Coatings, LLC - Chemical coater/infrared oven (CC/ IRO)	748281.00	4290395.00	423.88	34.0	110.0	18.926	3.0	2.80E-01	0.00E+00	0.00E+00
IL192964	DEFAULT	Midwest Metal Coatings, LLC - Afterburner	748281.00	4290395.00	423.88	34.0	900.1	23.780	5.0	3.28E-01	0.00E+00	0.00E+00
IL192967	DEFAULT	Midwest Metal Coatings, LLC - Boiler (B1)	748281.00	4290395.00	423.88	34.0	400.0	67.338	1.5	2.12E+00	0.00E+00	0.00E+00
IL198552	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	778702.00	4276348.00	439.34	35.0	297.1	62.254	3.8	2.95E+01	1.32E+01	1.32E+01
IL201652	DEFAULT	Empire Comfort Systems - Stack	763529.00	4266192.00	477.26	25.0	800.0	14.334	1.0	2.69E+00	0.00E+00	0.00E+00
IL204833	DEFAULT	Milam Recycling and Disposal Facility - 3 Passive solar flares	750590.00	4282537.00	594.06	20.0	1800.1	57.138	0.7	4.23E+00	4.38E+00	4.38E+00
IL207740	DEFAULT	Chemtrade Solutions, LLC - Scrubber C007	753339.00	4281367.00	422.21	30.0	70.1	0.394	0.3	0.00E+00	2.00E-01	2.00E-01
IL208343	DEFAULT	Center Point Terminal Co. - Asphalt and polymer modified blend tank (T-9)	746361.00	4289240.00	416.44	33.0	185.1	0.961	1.5	1.00E-01	0.00E+00	0.00E+00
IL209238	DEFAULT	Concrete Supply, LLC - Natural gas combustion	757768.00	4302270.00	444.69	20.0	341.0	25.781	2.7	9.69E-01	0.00E+00	0.00E+00
IL209433	DEFAULT	Alton Water Treatment Facility - Stack	742583.00	4309460.00	488.98	22.0	400.0	85.083	0.7	0.00E+00	5.50E-01	5.50E-01
IL211274	DEFAULT	Kraustar-Illinois, LLC - Natural gas combustion	764550.00	4296982.00	575.95	20.0	341.0	25.781	2.7	7.68E-01	0.00E+00	0.00E+00
IL211772	DEFAULT	Center Point Terminal Co. - Incinerator/waste heat boiler	746361.00	4289240.00	416.44	18.0	650.0	7.970	2.0	1.83E-01	1.05E+00	1.05E+00
IL212692	DEFAULT	Chain of Rocks Recycling & Disposal - Open flare	748948.00	4293274.00	431.59	20.0	1400.1	47.265	0.7	6.92E+00	1.06E+00	1.06E+00
IL212881	DEFAULT	Koch Fertilizer, LLC - Ammonia heater	750008.00	4305316.00	428.15	25.0	250.1	42.443	1.0	2.43E+00	5.30E-01	5.30E-01
IL213573	DEFAULT	Illinois Department of Transportation - B and K model 367-1 incinerator	732106.00	4332182.00	623.79	15.0	736.1	30.865	2.8	2.88E+00	0.00E+00	0.00E+00
IL213834	DEFAULT	Darling Ingredients, Inc. - Johnson boiler	747472.00	4281438.00	414.93	33.0	450.1	46.937	2.8	1.96E+00	1.51E+01	1.51E+01
IL213854	DEFAULT	Solvay Fluorides, LLC - Boiler	750245.00	4276115.00	419.72	30.0	361.0	7.914	2.8	1.44E+00	0.00E+00	0.00E+00
IL215315	DEFAULT	Madison County Sand, LLC - Drum mix asphalt plant	758921.00	4289026.00	422.01	32.0	245.0	64.452	4.1	1.48E+01	5.00E-01	5.00E-01
IL217756	DEFAULT	Phillips 66 Pipeline, LLC - Truck loading racks	744935.00	4274152.00	407.25	20.0	70.1	10.594	2.0	1.10E+01	0.00E+00	0.00E+00
IL218530	DEFAULT	ConocoPhillips Co. - North property ground flare (FLR1-2)	754486.00	4303322.00	445.08	195.0	1800.1	2.394	3.0	1.41E+01	0.00E+00	0.00E+00
IL218537	DEFAULT	Custom Steel Processing - Scrubber	746335.00	4286043.00	416.99	55.0	70.1	49.036	4.2	0.00E+00	1.00E-01	1.00E-01
IL218539	DEFAULT	Custom Steel Processing - Sulfuric acid storage tank	746335.00	4286043.00	416.99	35.0	127.0	0.000	2.4	0.00E+00	1.00E-01	1.00E-01
IL218569	DEFAULT	Contract Services, LLC - Boiler #4	746767.00	4275755.00	417.81	40.0	310.0	49.036	3.7	1.30E+01	1.64E+00	1.64E+00
IL218687	DEFAULT	ConocoPhillips Co. - Gas plant sour water stripper	754240.00	4303144.00	443.47	15.0	128.9	13.382	2.9	1.06E+00	0.00E+00	0.00E+00
IL218995	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silos and truck loadout	772959.00	4275690.00	514.30	32.0	86.1	84.854	1.5	1.26E+00	0.00E+00	0.00E+00
IL219420	DEFAULT	Crown Textile Services - Boiler	744287.00	4259382.00	466.40	24.0	450.1	35.227	1.7	1.03E+00	0.00E+00	0.00E+00
IL220268	DEFAULT	American Colloid Co. - Sand drying	746862.00	4287239.00	419.91	72.0	491.1	28.766	3.3	1.29E+00	0.00E+00	0.00E+00
IL220267	DEFAULT	American Colloid Co. - Space Heaters	746867.00	4287239.00	419.91	35.0	198.1	21.484	1.4	2.30E-01	0.00E+00	0.00E+00
IL220618	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	757560.00	4299901.00	441.63	32.0	280.0	66.322	4.3	7.61E+01	3.40E+01	3.40E+01
IL220849	DEFAULT	ConocoPhillips Co. - Alkylation unit flare (FLR8-1)	755035.00	4303081.00	442.55	199.9	1800.1	2.034	2.5	1.85E-01	0.00E+00	0.00E+00
IL222033	DEFAULT	Waterloo City Light Plant - Dual fuel-fired Turbine GT1	748326.00	4246769.00	640.45	39.0	612.1	41.590	4.8	1.77E+01	0.00E+00	0.00E+00
IL222134	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silo loading	757560.00	4299901.00	441.63	26.0	123.0	4.986	1.7	7.00E-01	0.00E+00	0.00E+00
IL222135	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	757560.00	4299901.00	441.63	35.0	361.0	26.996	3.7	0.00E+00	2.80E+00	2.80E+00
IL222988	DEFAULT	Apex Oil Co., Inc. - Thermal oxidizers	752471.00	4302667.00	431.07	18.0	820.0	43.985	2.3	2.98E+00	0.00E+00	0.00E+00
IL223796	DEFAULT	Union Electric Co. - Turbine CT03	745735.00	4282930.00	420.96	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223797	DEFAULT	Union Electric Co. - Turbine CT04	745778.00	4282947.00	421.16	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223798	DEFAULT	Union Electric Co. - Turbine CT05	745538.00	4283620.00	420.90	38.0	603.1	74.948	3.4	6.90E+01	9.00E-01	9.00E-01
IL224167	DEFAULT	Interurban ILAWC - Emergency generator	757265.00	4276109.00	482.38	28.0	880.1	51.463	1.3	1.10E+01	4.60E+00	0.00E+00
IL224416	DEFAULT	Belleville Landfill, Inc. - Flare	760402.00	4264040.00	571.88	35.0	1600.1	8.659	0.8	1.22E+01	0.00E+00	0.00E+00
IL224592	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	755685.00	4299873.00	431.10	32.0	251.0	53.628	4.1	3.09E+01	1.38E+01	1.38E+01
IL224594	DEFAULT	Christ Bros Products, LLC - Asphalt tank heaters and boilers	755701.00	4299843.00	427.46	10.0	416.0	42.443	1.0	1.18E+00	2.80E+00	2.80E+00
IL224836	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-01	750039.00	4285426.00	410.47	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224839	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-02	750044.00	4285416.00	410.24	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224840	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-03	750049.00	4285406.00	410.37	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224841	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-04	750054.00	4285397.00	410.30	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224901	DEFAULT	Premcor Refining Group, Inc. - Thermal oxidizer	752775.00	4302414.00	429.95	28.0	342.1	49.462	0.8	7.40E-01	0.00E+00	0.00E+00
IL225166	DEFAULT	Metro Crematory - Crematory	754126.00	4290785.00	417.29	18.0	736.1	84.854	1.0	1.50E+00	0.00E+00	0.00E+00
IL225832	DEFAULT	ConocoPhillips Co. - Startup/malfunction/breakdown	754240.00	4303144.00	443.47	103.0	623.9	71.681	4.6	7.86E+01	1.91E+02	1.91E+02
IL225843	DEFAULT	City of O'Fallon - 400 kW (591 HP) Diesel generator	774612.00	4277280.00	434.42	13.0	900.1	86.592	0.7	3.37E+00	0.00E+00	0.00E+00
IL225844	DEFAULT	City of O'Fallon - 900 kW (1 322 HP) Diesel generator	774612.00	4277280.00	434.42	17.0	900.1	86.592	0.7	7.55E+00	0.00E+00	0.00E+00
IL225960	DEFAULT	Waterloo City Light Plant - Engine #4	748326.00	4246769.00	640.45	37.0	680.1	87.904	2.5	3.32E+01	0.00E+00	0.00E+00
IL226013	DEFAULT	Milam Recycling and Disposal Facility - 325 HP Tub grinder	750550.00	4282537.00	594.06	7.0	627.0	74.030	0.3	2.20E+00	8.00E-01	8.00E-01
IL226014	DEFAULT	Milam Recycling and Disposal Facility - Enclosed flare	750476.00	4282825.00	419.62	55.0	1400.1	0.656	12.0	2.40E+01	6.08E+00	6.08E+00

R004604

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL226015	DEFAULT	Milam Recycling and Disposal Facility - 750 HP Tub grinder	750590.00	4282537.00	594.06	8.0	627.0	70.881	0.7	5.10E+00	1.90E+00	1.90E+00
IL226184	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - 1F Mix muller (MM-3) Low profile turbine (LF-1) and induction form sta	750075.00	4306259.00	452.32	41.0	209.9	36.080	2.1	2.00E+00	0.00E+00	0.00E+00
IL226204	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #4 (SA-4)	750150.00	4308388.00	431.10	90.0	350.0	41.426	1.6	9.83E+01	0.00E+00	0.00E+00
IL226256	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip Anneal #3 (SA-3)	750439.00	4308328.00	433.83	100.0	350.0	62.746	1.3	9.83E+01	0.00E+00	0.00E+00
IL226257	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - #7 Strip Anneal (SA-7)	750222.00	4308335.00	433.20	89.0	850.0	38.671	1.5	1.18E+02	0.00E+00	0.00E+00
IL226352	DEFAULT	Olin Winchester, LLC - Hammermill 1 2 and 3 (HM-1 HM-2 and HM-3)	750495.00	4308287.00	434.42	21.0	180.1	19.647	1.8	8.03E+00	0.00E+00	0.00E+00
IL226612	DEFAULT	Solutia Inc. - Santoflex process: Thermal oxidizer 2770934	746325.00	4275822.00	405.12	112.0	865.0	16.794	12.6	1.50E+01	0.00E+00	0.00E+00
IL226783	DEFAULT	Schildknecht Funeral Home, Inc. - Crematory	760933.00	4275796.00	549.57	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL227030	DEFAULT	ConocoPhillips Co. - #4 Crude unit heater H-24 (STK9-5)	753051.00	4302413.00	428.81	179.9	550.0	26.207	8.5	2.27E+01	0.00E+00	0.00E+00
IL227032	DEFAULT	ConocoPhillips Co. - Hydrogen plant #1 flare (FLR12-2)	755194.00	4302793.00	443.67	130.0	1800.1	7.970	1.7	1.62E+01	0.00E+00	0.00E+00
IL227034	DEFAULT	ConocoPhillips Co. - Sulfur operation	754240.00	4303144.00	443.47	158.0	590.1	37.753	3.4	0.00E+00	3.00E+01	3.00E+01
IL227035	DEFAULT	ConocoPhillips Co. - Process heater HP-1 (STK12-6)	755194.00	4302793.00	443.67	127.0	360.1	27.093	7.5	6.97E+00	0.00E+00	0.00E+00
IL227038	DEFAULT	ConocoPhillips Co. - SZU Charge heater H-3	755219.00	4302667.00	442.29	150.0	567.1	25.518	5.0	5.75E+00	0.00E+00	0.00E+00
IL227333	DEFAULT	Waterloo City Light Plant - Engine SGS	750835.00	4249410.00	629.97	8.0	924.0	61.172	0.7	1.40E+00	0.00E+00	0.00E+00
IL227400	DEFAULT	Collinsville Wastewater Treatment Plant - Emergency diesel generator (2922 HP/2180 kW)	758289.00	4283982.00	419.36	36.0	692.0	67.371	2.0	1.72E+01	1.20E+00	0.00E+00
IL227432	DEFAULT	Totall Metal Recycling, Inc. - Safety certification unit	748030.00	4289120.00	422.74	6.0	587.0	8.069	1.2	1.00E-01	0.00E+00	0.00E+00
IL227590	DEFAULT	Illinois Electric Works - 3 Burn off ovens	747872.00	4288124.00	423.20	46.0	250.1	41.230	2.4	1.17E+00	6.90E-02	6.90E-02
IL227679	DEFAULT	Union Electric Co. - Diesel generator	745516.00	4283326.00	430.38	26.0	490.0	60.811	1.4	1.30E+00	1.60E-01	1.60E-01
IL228119	DEFAULT	St. Clair Crematory - Human crematory	773291.00	4275644.00	507.28	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL228280	DEFAULT	Center Ethanol Co. - West boiler	745855.00	4275662.00	412.66	75.0	428.1	43.460	3.0	3.23E+00	0.00E+00	0.00E+00
IL228262	DEFAULT	Center Ethanol Co. - East boiler	745888.00	4275662.00	412.66	75.0	428.1	45.428	3.0	3.23E+00	0.00E+00	0.00E+00
IL228263	DEFAULT	Center Ethanol Co. - RTO	745888.00	4275662.00	412.66	50.0	310.0	70.684	5.5	6.85E+00	0.00E+00	0.00E+00
IL228294	DEFAULT	ConocoPhillips Co. - Distilling west refinery flare (FLR10-1)	753647.00	4302546.00	430.31	197.0	1800.1	6.526	3.0	2.51E+01	0.00E+00	0.00E+00
IL228295	DEFAULT	ConocoPhillips Co. - SZU Regenerator vent	755209.00	4302720.00	442.32	44.0	135.1	32.341	2.0	1.78E+00	2.35E+00	2.35E+00
IL229021	DEFAULT	Christ Bros Products, LLC - 8 Heaters and boilers	754160.00	4283243.00	419.46	37.0	400.0	20.664	1.8	1.18E+00	2.80E+00	2.80E+00
IL229022	DEFAULT	Christ Bros Products, LLC - Silo filling	754160.00	4283243.00	419.46	25.0	74.0	0.262	0.4	5.10E-01	0.00E+00	0.00E+00
IL229023	DEFAULT	Christ Bros Products, LLC - Truck loading	754160.00	4283243.00	419.46	29.0	135.1	48.052	2.0	5.80E-01	0.00E+00	0.00E+00
IL230300	DEFAULT	Alton Chemical Corp. - Flare 36-0090	746478.00	4276293.00	407.28	45.0	1600.1	0.656	8.0	2.20E+00	0.00E+00	0.00E+00
IL230350	DEFAULT	Village of Freeburg - Engine #10	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL230355	DEFAULT	Asphalt Sales & Products Inc. - Truck loadout	757560.00	4299901.00	441.63	28.0	135.1	43.198	1.9	7.90E-01	0.00E+00	0.00E+00
IL231259	DEFAULT	Village of Freeburg - Engine #11	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231260	DEFAULT	Village of Freeburg - Engine #12	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231291	DEFAULT	Kurrus Funeral Home - 2 Crematories	759066.00	4271234.00	547.11	18.0	787.0	13.186	1.1	2.70E+00	0.00E+00	0.00E+00
IL232739	DEFAULT	ConocoPhillips Co. - Benzene extraction unit #3 (STK6-4)	754923.00	4302930.00	442.59	185.0	470.0	16.138	9.7	1.22E+01	0.00E+00	0.00E+00
IL232785	DEFAULT	Roxana Landfill, Inc. - Enclosed flare	759153.00	4301368.00	619.62	35.0	1600.1	20.008	12.0	2.31E+01	1.78E+00	1.78E+00
IL233294	DEFAULT	Gateway Terminals, LLC. - Marine vapor combustion unit (MVCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	1.69E+01	0.00E+00	0.00E+00
IL233295	DEFAULT	Gateway Terminals, LLC. - Truck/Rail vapor destruction unit (TRCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	8.39E+00	0.00E+00	0.00E+00
IL235261	DEFAULT	Gulfstream Aerospace Services Corp. - Make-up air unit 19-3	747629.00	4273860.00	410.10	42.0	577.0	29.356	2.5	1.63E+00	0.00E+00	0.00E+00
IL235959	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #5 (SA-5)	750151.00	4308379.00	430.91	90.0	450.1	54.087	1.4	1.07E+02	0.00E+00	0.00E+00
IL235940	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #6 (SA-6)	750207.00	4308290.00	431.82	110.0	580.0	62.779	1.3	1.07E+02	0.00E+00	0.00E+00
IL236260	DEFAULT	Bunge-SF Grain, LLC. - Grain Dryer	746158.00	4281045.00	417.55	96.0	105.0	87.984	5.2	5.08E+00	1.71E+01	1.71E+01
IL236359	DEFAULT	City of Belleville - 2 Emergency generators (1500 kW each)	763544.00	4265595.00	474.70	28.0	627.0	73.767	1.2	2.57E+01	1.84E+00	0.00E+00
IL236927	DEFAULT	Kraft Heinz Co. - Boiler C	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236928	DEFAULT	Kraft Heinz Co - Boiler D	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236929	DEFAULT	Kraft Heinz Co. - Boiler E	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236930	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 2 of 2)	750920.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL237099	DEFAULT	Union Electric Co. - Turbine CTD2B	745573.00	4283613.00	415.89	30.0	850.0	18.860	11.4	7.74E+01	2.73E+01	2.73E+01
IL237182	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	812.1	84.854	2.0	1.32E+01	0.00E+00	0.00E+00
IL237183	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	37.0	734.1	61.762	11.4	2.57E+01	0.00E+00	0.00E+00
IL237340	DEFAULT	Charles E. Mahoney - Asphalt silo filling	749517.00	4309892.00	443.14	25.0	74.0	0.262	0.4	5.30E-01	0.00E+00	0.00E+00
IL237341	DEFAULT	Charles E. Mahoney - Truck loadout	749517.00	4309892.00	443.14	27.0	136.0	42.050	1.9	6.00E-01	0.00E+00	0.00E+00
IL237342	DEFAULT	Charles E. Mahoney - Asphalt heaters and boilers	749517.00	4309892.00	443.14	10.0	350.0	69.995	1.0	1.18E+00	2.80E+00	2.80E+00
IL237659	DEFAULT	Green Plains Madison, LLC - Boiler #1	745256.00	4285477.00	414.14	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL237660	DEFAULT	Green Plains Madison, LLC - Fire Pump back-up Engine (480 HP)	745191.00	4285409.00	413.85	13.0	627.0	86.231	0.8	4.80E-01	9.40E-01	0.00E+00
IL237661	DEFAULT	Green Plains Madison, LLC - Electrical system backup Engine (1495 HP)	745144.00	4285537.00	415.88	28.0	627.0	73.767	1.2	3.54E+00	1.21E+01	0.00E+00

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL237679	DEFAULT	Green Plains Madison, LLC - Indirect dryer #1	748191.00	4285468.00	415.32	71.0	387.1	12.136	4.6	7.97E+00	4.10E-01	4.10E-01
IL237866	DEFAULT	Amsted Rail Co., Inc. - Curing oven	748913.00	4287625.00	419.23	39.0	258.0	27.979	1.9	2.52E-01	0.00E+00	0.00E+00
IL237899	DEFAULT	Center Ethanol Co. - Emergency generator	745888.00	4275662.00	412.66	28.0	627.0	73.767	1.2	3.80E+00	0.00E+00	0.00E+00
IL237903	DEFAULT	Center Ethanol Co. - Ethanol loadout Rack	745888.00	4275667.00	412.66	19.0	99.1	7.806	0.7	8.88E-01	0.00E+00	0.00E+00
IL238199	DEFAULT	Solutia Inc. - An in-situ soil vapor extraction system	746825.00	4279822.00	405.12	15.0	70.1	78.406	0.2	4.00E-01	0.00E+00	0.00E+00
IL238838	DEFAULT	Waterloo City Light Plant - Turbine Generator (GT2)	748326.00	4246769.00	640.45	39.0	965.9	87.937	4.8	1.78E+01	0.00E+00	0.00E+00
IL238942	DEFAULT	ConocoPhillips Co. - Bernal Boiler #2	754240.00	4303144.00	443.47	20.0	550.0	46.412	4.0	1.65E+00	0.00E+00	0.00E+00
IL239896	DEFAULT	Amsted Rail Co., Inc. - Sand dryer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	1.14E+00	0.00E+00	0.00E+00
IL239896	DEFAULT	Amsted Rail Co., Inc. - Thermal sand reclaimer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	8.70E-01	0.00E+00	0.00E+00
IL239899	DEFAULT	Shell Oil Products US - RTO	753758.00	4303650.00	442.59	19.0	200.0	33.948	2.5	0.00E+00	8.47E-01	8.47E-01
IL240083	DEFAULT	Westwood Lands, Inc. - Process heater OPH-1	748864.00	4285684.00	417.99	39.0	284.1	23.157	2.0	8.30E-01	0.00E+00	0.00E+00
IL240359	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0210	748660.00	4276488.00	405.74	45.0	350.0	17.318	2.0	4.85E+00	0.00E+00	0.00E+00
IL240360	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0310	748874.00	4276493.00	407.25	45.0	350.0	17.318	2.0	4.91E+00	0.00E+00	0.00E+00
IL241300	DEFAULT	ConocoPhillips Co - VOC Flare (West - FLR4-1)	753428.00	4303079.00	428.81	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241301	DEFAULT	ConocoPhillips Co. - VOC Flare (East - FLR4-2)	753641.00	4303073.00	428.77	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241302	DEFAULT	ConocoPhillips Co. - Coker north flare (FLR1-3)	754947.00	4303664.00	444.23	139.0	911.0	26.595	9.4	0.00E+00	3.08E+01	3.08E+01
IL241303	DEFAULT	ConocoPhillips Co. - VP-6 Heater (H-350H3 - STK1-1)	754937.00	4303459.00	444.98	150.0	650.0	26.765	12.0	0.00E+00	1.35E+01	1.35E+01
IL241304	DEFAULT	ConocoPhillips Co. - Coker north heater (H-355H2 - STK1-2)	754953.00	4303305.00	444.86	150.0	506.1	22.304	10.0	0.00E+00	7.37E+00	7.37E+00
IL241305	DEFAULT	ConocoPhillips Co - Coker north heater (H-355 H1 - STK1-3)	754986.00	4303306.00	444.82	150.0	500.1	22.304	10.0	0.00E+00	7.38E+00	7.38E+00
IL241312	DEFAULT	ConocoPhillips Co. - Heater HP-2 (STK7-1)	755283.00	4302820.00	443.86	118.0	490.0	48.002	10.8	0.00E+00	2.87E+01	2.87E+01
IL241405	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #1	756504.00	4296421.00	425.00	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL241449	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #2	756494.00	4296733.00	424.74	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL242126	DEFAULT	Center Point Terminals Co. - Tank Heater	746359.00	4289027.00	411.84	49.0	931.1	32.144	2.5	1.93E+00	0.00E+00	0.00E+00
IL245579	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #3	756198.00	4295809.00	424.97	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245580	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #4	756182.00	4295721.00	424.77	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245839	DEFAULT	Milam Recycling and Disposal Facility - Landfill gas conversion plant	750666.00	4282895.00	413.89	55.0	78.1	0.000	4.5	3.80E+00	9.00E-01	9.00E-01
IL246759	DEFAULT	Brookey Township WWTP - 2000 kW Emergency generator	756253.00	4288975.00	518.86	28.0	627.0	73.767	1.2	3.80E+01	0.00E+00	0.00E+00
IL246761	DEFAULT	Omega Partners Hartford, LLC - Truck Rail Marine racks loadout and VCUs	752282.00	4300866.00	480.74	33.0	88.8	0.328	0.3	6.60E+00	0.00E+00	0.00E+00
IL246762	DEFAULT	Omega Partners Hartford, LLC - Boiler 1 and 2	752273.00	4300898.00	480.18	58.0	436.0	27.650	3.4	3.93E+00	0.00E+00	0.00E+00
IL248080	DEFAULT	Kraft Heinz Co. - Boiler F	748105.00	4289580.00	423.56	26.0	388.0	34.407	2.0	1.44E+00	0.00E+00	0.00E+00
IL248262	DEFAULT	Olin Winchester, LLC - New Rotary retort process (RDE-2)	750495.00	4303287.00	434.42	16.0	119.9	26.634	1.7	9.62E+00	0.00E+00	0.00E+00
IL248798	DEFAULT	Gateway Terminals, LLC. - 800 HP Boiler	744607.00	4275093.00	472.70	26.0	448.0	39.557	2.2	2.11E+00	0.00E+00	0.00E+00
IL249480	DEFAULT	Highland Electric Light Plant - Engine IC-2	788176.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.44E+01	0.00E+00	0.00E+00
IL249481	DEFAULT	Highland Electric Light Plant - Engine IC-3	788176.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.25E+01	0.00E+00	0.00E+00
IL249482	DEFAULT	Highland Electric Light Plant - Engine IC-9	788176.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249483	DEFAULT	Highland Electric Light Plant - Engine IC-10	788176.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249488	DEFAULT	Roxana Landfill, Inc. - Zink ultra-Low emissions (Zulk) Flare	758153.00	4301368.00	619.62	60.0	1600.1	48.836	13.0	1.25E+01	1.55E+01	1.55E+01
IL250343	DEFAULT	Mayco Mfg. LLC - Natural gas combustion	747198.00	4268970.00	421.78	39.0	284.1	23.157	2.0	1.74E+00	0.00E+00	0.00E+00
IL250892	DEFAULT	ConocoPhillips Co. - Lift station pump (21028)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.90E-01	4.90E-01
IL250893	DEFAULT	ConocoPhillips Co - Lift station pump (21029)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.60E-01	4.60E-01
IL250894	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #1	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250895	DEFAULT	ConocoPhillips Co - Non-emergency air compressor #2	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250896	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #3	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL250897	DEFAULT	ConocoPhillips Co - Non-emergency air compressor #4	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250898	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #5	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250899	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #6	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL251099	DEFAULT	Amsted Rail Co., Inc. - Annealing Furnace 18	747071.00	4287670.00	426.02	39.0	284.1	23.157	2.0	1.12E+00	1.90E-01	1.90E-01
IL251286	DEFAULT	Premcor Refining Group, Inc. - Vapor Combustion Unit	752775.00	4302434.00	423.95	53.0	269.0	24.830	2.9	1.00E+01	0.00E+00	0.00E+00
IL251755	DEFAULT	ConocoPhillips Co - Diesel engine (606 HP)	754240.00	4303144.00	443.47	13.0	89.3	0.328	0.3	3.50E+00	0.00E+00	0.00E+00
IL251754	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #1	746944.00	4295274.00	431.79	30.0	841.0	4.756	0.5	4.96E-01	0.00E+00	0.00E+00
IL253107	DEFAULT	Altivia USA, Inc. - Natural gas combustion	749698.00	4276478.00	426.57	58.0	488.0	27.650	3.4	3.26E+00	0.00E+00	0.00E+00
IL253166	DEFAULT	Cerro Flow Products, LLC. - Generators	746228.00	4275272.00	407.32	26.0	490.0	60.811	1.4	9.23E-01	2.92E-01	2.92E-01
IL253167	DEFAULT	City of Belleville - Emergency diesel generator (1500 kW)	762460.00	4266351.00	468.78	26.0	490.0	60.811	1.4	1.16E+01	0.00E+00	0.00E+00
IL253200	DEFAULT	Phillips 66 Pipeline, LLC - Engines (insignificant activities)	744955.00	4274152.00	407.25	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253361	DEFAULT	Amsted Rail Co., Inc. - Sand regeneration process (combustion)	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	2.60E-01	2.80E-01	2.80E-01

R004606

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL253367	DEFAULT	Green Plains Madison, LLC - Boiler #2	745258.00	4285486.00	414.27	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253368	DEFAULT	Green Plains Madison, LLC - Boiler #3	745260.00	4285491.00	414.24	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253369	DEFAULT	Green Plains Madison, LLC - Boiler #4	745262.00	4285500.00	414.21	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253370	DEFAULT	Green Plains Madison, LLC - Indirect dryer #2	745164.00	4285480.00	414.80	81.0	387.1	8.450	5.5	7.97E+00	4.10E-01	4.10E-01
IL253386	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Engines (insignificant activities)	750423.00	4288352.00	434.28	26.0	490.0	60.811	1.4	9.25E-01	0.00E+00	0.00E+00
IL253738	DEFAULT	Milam Recycling and Disposal Facility - 3000 scfm Utility flare	750559.00	4282587.00	594.06	36.0	852.0	18.565	4.6	1.83E+01	7.32E+00	7.32E+00
IL253769	DEFAULT	Veolia ES Technical Solutions, LLC - 2 Emergency generators	745532.00	4275942.00	414.76	26.0	490.0	60.811	1.4	7.41E-01	0.00E+00	0.00E+00
IL254175	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #2	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254176	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #3	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254177	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #4	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254178	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #5	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254179	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #6	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254699	DEFAULT	HSHS St. Elizabeth's Hospital - 2 Emergency generators	767237.00	4275111.00	541.01	28.0	827.0	73.767	1.2	1.93E+01	0.00E+00	0.00E+00
IL255341	DEFAULT	Roxana Landfill, Inc. - New open flare	759153.00	4301368.00	619.62	45.0	1800.1	81.434	1.3	9.77E+01	8.17E+00	8.17E+00
IL255527	DEFAULT	Magnesium Elektron North America - Natural gas combustion	746452.00	4285724.00	415.49	39.0	284.1	23.157	2.0	4.20E-01	0.00E+00	0.00E+00
IL255741	DEFAULT	ConocoPhillips Co. - Utility Boiler #19 (BLR-19)	754755.00	4302798.00	442.16	132.0	304.1	46.281	7.0	0.00E+00	1.54E+01	1.54E+01
IL255816	DEFAULT	Mayco Mfg, LLC - Expansion: Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.84E+00	0.00E+00	0.00E+00
IL255953	DEFAULT	Moore Recycling Concrete & Asphalt, LLC. - Drum mix asphalt plant	762178.00	4246660.00	465.19	35.0	251.0	56.908	4.0	1.32E+01	0.00E+00	0.00E+00
IL256624	DEFAULT	PBT Acquisition, LLC - ASR Dryer	748704.00	4280830.00	418.77	32.0	305.0	19.485	1.5	2.53E+00	0.00E+00	0.00E+00
IL257835	DEFAULT	Marathon Ashland Pipe Line, LLC - Marine vapor combustion unit	751239.00	4302563.00	402.85	51.0	810.1	27.749	7.4	2.71E+01	0.00E+00	0.00E+00
SJEFF1	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	410.0	370.0	54.081	19.0		1.44E+02	1.44E+02
SJEFF2	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	325.0	210.0	59.173	6.6		2.04E-02	2.04E-02
SJEFF3	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	10.0	1100.0	23.333	0.5		1.32E-01	0.00E+00
SJEFF15	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	52.0	260.0	10.666	2.0		5.09E-03	5.09E-03
SJEFF16	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	2.29E-01
SJEFF17	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.40E-03	2.40E-03
SJEFF18	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	0.00E+00
SJEFF19	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.80E-03	1.80E-03
SJEFF20	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.20E-03	1.20E-03
SJEFF21	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		5.40E-04	5.40E-04
SJEFF22	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.80E-04	4.80E-04
SJEFF23	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.20E-04	4.20E-04
SJEFF24	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		3.00E-04	3.00E-04
SJEFF25	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	15.0	1049.0	149.734	0.2		4.80E-04	0.00E+00
SJEFF26	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	20.7		1.73E+03	1.73E+03
SJEFF27	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	170.0	82.001	29.0		2.50E+03	2.50E+03
SJEFF28	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	30.0	985.0	105.688	1.3		8.52E-06	0.00E+00
SJEFF29	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	240.0	600.0	32.999	7.0		3.54E-03	3.54E-03
SJEFF59	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF60	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF61	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	4.20E-02	3.00E-04	3.00E-04
SJEFF62	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.000	1.7	1.11E-02	7.98E-05	7.98E-05
SJEFF63	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	27.0	1800.0	10.046	1.5	2.86E-02	1.63E-01	1.63E-01
SJEFF65	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.45E-02	4.34E-04	4.34E-04
SJEFF66	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.40E-02	4.20E-04	4.20E-04
SJEFF67	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	8.35E-02	5.97E-04	5.97E-04
SJEFF68	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	3.54E-01	2.53E-03	2.53E-03
SJEFF69	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	-459.7	0.003	2.0	2.51E-01	1.79E-03	1.79E-03
SJEFF70	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF71	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF72	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	3.32E-01	1.02E-01	0.00E+00
SJEFF73	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF74	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF82	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	7.38E-02	3.77E+00	3.77E+00
SJEFF83	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	1.96E-01	6.37E+00	6.37E+00

R004607

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SJEFF86	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	20.0	0.0	0.000	0.5	1.26E-01	9.00E-04	9.00E-04
SJEFF92	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	10.0	1100.0	23.333	0.5		2.17E+00	0.00E+00
SJEFF99	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	2.5	170.0	46.499	2.0	5.60E-01	4.25E-02	4.25E-02
SJEFF100	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	2.5	170.0	46.499	2.0	1.60E-01	1.14E-03	1.14E-03
SJEFF125	DEFAULT	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	20.0	250.0	49.249	5.0		5.88E-02	5.88E-02
SJEFF128	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.33E-01	2.33E-01
SJEFF129	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.92E-02	1.92E-02
SJEFF130	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		9.62E-03	9.62E-03
SJEFF131	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		3.50E-01	3.50E-01
SJEFF132	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.95E-01	2.95E-01
SJEFF133	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1347.0	16.316	1.0		1.54E-02	1.54E-02
SJEFF134	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		6.01E-03	6.01E-03
SJEFF135	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.44E-02	1.44E-02
SJEFF136	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1600.0	18.734	2.0		7.50E-02	7.50E-02
SJEFF137	DEFAULT	JEFFERSON COUNTY CREMATION SERVICES LC PEVELY	728536.07	4239554.88	583.23	10.0	1100.0	23.333	0.5		9.39E-02	9.39E-02
SJEFF138	DEFAULT	SIMPSON CONSTRUCTION MATERIALS PAULINA HILLS SITE	726459.86	4259186.04	426.64	12.0	885.0	42.441	0.5		1.29E-01	1.29E-01
SJEFF144	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	32.0	247.0	0.853	3.7	3.03E+00	1.21E+00	1.21E+00
SJEFF145	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	5.35E-02	3.07E-01	3.07E-01
SJEFF146	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	3.61E-03	9.62E-08	9.62E-08
SSTC1	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	138.7	46.759	23.6		2.32E+02	2.32E+02
SSTC2	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	136.8	46.844	23.6		2.89E+02	2.89E+02
SSTC3	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	212.0	325.0	50.000	8.5		8.90E-04	8.90E-04
SSTC4	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	25.0	1100.0	23.333	1.0		1.42E+00	0.00E+00
SSTC9	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC10	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC11	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC12	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC13	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC14	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC15	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	40.515	0.4		3.58E-01	0.00E+00
SSTC16	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC17	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.06E+00	0.00E+00
SSTC18	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	56.732	0.4		3.68E-01	2.38E-04
SSTC28	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	688428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC29	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	688428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		7.21E+02	7.21E+02
SSTC30	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	688428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC31	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	688428.03	4299089.70	622.57	53.0	520.0	58.999	1.8		1.33E-01	1.33E-01
SSTC45	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.31E+00	2.31E+00
SSTC46	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.66E-02	2.66E-02
SSTC47	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	10.0	1100.0	23.333	0.5		1.52E+00	0.00E+00
SSTC48	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		1.50E-03	1.50E-03
SSTC57	DEFAULT	BLASTCO INC	690213.84	4297755.23	543.44	20.0	0.0	0.000	0.5		3.96E-04	3.96E-04
SSTC63	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	85.0	18.499	1.5		4.20E-03	4.20E-03
SSTC64	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	17.0	450.0	27.681	1.3		4.09E-03	4.09E-03
SSTC65	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	20.0	0.0	0.000	0.5		4.10E-03	4.10E-03
SSTC66	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		1.56E-03	1.56E-03
SSTC67	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		8.40E-04	8.40E-04
SSTC68	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	450.0	39.416	1.5		1.44E-03	1.44E-03
SSTC69	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	400.0	29.708	1.0		1.74E-03	1.74E-03
SSTC70	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	450.0	24.803	1.2		4.68E-03	4.68E-03
SSTC71	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	475.0	1.667	0.5		0.00E+00	0.00E+00
SSTC72	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	450.0	27.560	2.3		0.00E+00	0.00E+00
SSTC73	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	10.0	1100.0	23.333	0.5		3.07E+00	0.00E+00
SSTC87	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	2.10E-02	6.31E-04	6.31E-04
SSTC88	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	3.14E-02	1.73E-04	1.73E-04

R004608

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTC89	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4288189.47	585.40	20.0	0.0	0.000	0.5	1.20E+00	3.65E-01	3.65E-01
SSTC98	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC99	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC100	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC101	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC102	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC103	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC104	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC105	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC106	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC107	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTL1	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.28E-02	2.28E-02
SSTL2	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.20E-02	2.20E-02
SSTL3	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	345.0	135.400	14.0		2.97E+02	2.97E+02
SSTL4	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	374.0	123.284	16.0		4.69E+02	4.69E+02
SSTL5	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	40.0	642.0	88.100	1.0		5.46E-03	5.46E-03
SSTL6	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL7	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.96E+00	1.96E+00
SSTL8	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL9	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		2.01E-02	2.01E-02
SSTL10	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL11	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.10E-02	1.10E-02
SSTL24	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	9.84E-01	1.42E+00	1.42E+00
SSTL15	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	1.06E-02	7.55E-05	7.55E-05
SSTL16	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	10.0	1100.0	23.333	0.5	5.03E+00	1.53E+00	0.00E+00
SSTL17	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	2.91E+00	4.15E+00	4.15E+00
SSTL18	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	9.59E-02	6.85E-04	6.85E-04
SSTL19	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.95E-05	2.95E-05
SSTL20	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.24E-02	2.24E-02
SSTL21	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		1.06E+00	0.00E+00
SSTL22	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		5.74E-04	0.00E+00
SSTL23	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.57E+01	2.57E+01
SSTL24	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		6.69E-03	6.69E-03
SSTL25	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.66E-02	2.66E-02
SSTL26	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	110.0	70.0	0.003	2.7		1.39E-02	1.39E-02
SSTL27	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.11E+01	1.11E+01
SSTL28	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.95E-02	1.95E-02
SSTL29	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		3.08E-05	3.08E-05
SSTL30	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	800.0	32.667	4.8		2.36E-02	2.36E-02
SSTL31	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		8.34E-01	0.00E+00
SSTL32	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-03	0.00E+00
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		3.77E+00	0.00E+00
SSTL37	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	0.00E+00	0.00E+00	0.00E+00
SSTL38	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	2.24E+00	1.60E-02	1.60E-02
SSTL39	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	0.00E+00	0.00E+00	0.00E+00
SSTL40	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	6.04E-01	4.31E-03	4.31E-03
SSTL41	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.39E+01	2.34E-03	0.00E+00
SSTL42	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	2.12E+01	5.78E-02	0.00E+00
SSTL43	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.59E+01	4.87E+00	0.00E+00
SSTL44	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.13E-02	2.37E+01	2.37E+01
SSTL45	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.02E-02	4.11E+01	4.11E+01
SSTL46	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	1.05E-01	1.48E+01	1.48E+01
SSTL47	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	2.86E-01	2.62E+01	2.62E+01
SSTL48	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7		2.04E-03	2.04E-03
SSTL66	DEFAULT	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	20.0	250.5	31.309	5.1		3.27E-01	3.27E-01

R004609

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL70	DEFAULT	FRED WEBER, INC. ANTIRE	711291.07	4264547.49	448.49	30.0	250.0	58.950	4.0		1.27E+00	1.27E+00
SSTL76	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	5.58E+00	8.24E+00	8.24E+00
SSTL77	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	1.38E+00	9.87E-03	9.87E-03
SSTL78	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	3.02E+00	4.47E+00	4.47E+00
SSTL79	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	1.06E+00	7.57E-03	7.57E-03
SSTL80	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	2.95E+00	4.36E+00	4.36E+00
SSTL81	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	7.02E-01	5.01E-03	5.01E-03
SSTL82	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	1.0	100.0	12.733	0.1	1.66E+00	1.19E-02	1.19E-02
SSTL83	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	15.0	855.0	19.800	0.7	2.52E+01	4.49E-02	0.00E+00
SSTL84	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	7.0	960.0	118.182	0.8	2.50E+01	7.69E+00	0.00E+00
SSTL85	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	30.0	865.0	31.234	5.0	2.03E-01	1.04E-02	1.04E-02
SSTL86	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	17.0	72.0	29.882	2.8		5.58E-03	5.58E-03
SSTL88	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	28.0	1400.0	25.466	1.0		1.01E+00	1.01E+00
SSTL89	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.3	1400.0	21.568	12.0		7.77E-01	7.77E-01
SSTL90	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.0	1400.0	21.568	12.0		6.35E-01	6.35E-01
SSTL92	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		1.86E-02	1.86E-02
SSTL93	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		6.98E-02	6.98E-02
SSTL94	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		1.70E+01	1.70E+01
SSTL95	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		5.43E+01	5.43E+01
SSTL96	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	35.0	1200.0	53.051	1.0		1.22E-01	1.22E-01
SSTL97	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.08E-03	1.08E-03
SSTL98	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.07E-03	1.07E-03
SSTL100	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		9.06E+00	9.06E+00
SSTL101	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		7.14E-03	7.14E-03
SSTL102	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	130.0	1009.0	53.156	1.0		2.56E+00	0.00E+00
SSTL106	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		6.63E-02	6.63E-02
SSTL107	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.15E-02	1.15E-02
SSTL108	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	12.0	900.0	38.100	1.2		8.33E+00	0.00E+00
SSTL109	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.37E-03	1.37E-03
SSTL111	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	3.02E+00	4.35E+00	4.35E+00
SSTL112	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.17E-01	2.98E-03	2.98E-03
SSTL113	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.40E-03	6.49E-03	6.49E-03
SSTL114	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	6.81E-01	4.86E-03	4.86E-03
SSTL115	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	10.0	1100.0	23.333	0.5	1.62E+02	3.11E+01	0.00E+00
SSTL116	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	1.45E-01	6.26E-03	6.26E-03
SSTL117	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	9.17E-01	6.55E-03	6.55E-03
SSTL118	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	15.0	-459.7	0.003	1.0	3.28E+01	3.00E-01	0.00E+00
SSTL120	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	15.0	65.0	7.165	2.2		3.20E-03	3.20E-03
SSTL121	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	16.0	75.0	26.940	1.1		8.96E-03	8.96E-03
SSTL122	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	28.0	600.0	14.167	2.5		4.83E-01	4.83E-01
SSTL123	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	30.0	365.0	12.001	1.2		4.48E-01	4.48E-01
SSTL124	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	360.0	25.499	0.7		1.63E-01	1.63E-01
SSTL126	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	20.0	0.0	0.000	0.5		1.23E-02	1.23E-02
SSTL127	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		3.60E-03	3.60E-03
SSTL128	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		1.79E+01	1.79E+01
SSTL129	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		2.26E-03	2.26E-03
SSTL130	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		1.44E+01	1.44E+01
SSTL131	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	54.0	1800.0	17.218	2.3		1.21E-03	1.21E-03
SSTL132	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL133	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL141	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		3.40E+00	3.40E+00
SSTL142	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		8.76E-04	8.76E-04
SSTL143	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	30.0	450.0	0.003	1.5		5.59E-04	5.59E-04
SSTL144	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	10.0	1100.0	23.333	0.5		4.66E-02	0.00E+00
SSTL147	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	9.18E-01	8.00E-01	8.00E-01

R004610

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTL148	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	1.58E+00	5.47E-03	5.47E-03
SSTL149	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	4.42E-01	2.28E-01	2.28E-01
SSTL150	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	9.14E-02	4.81E-03	4.81E-03
SSTL151	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	16.0	77.0	4.774	2.0	2.46E+00	4.74E-01	4.74E-01
SSTL152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	42.0	300.0	88.494	4.2	2.49E+01	5.49E+00	5.49E+00
SSTL153	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	3.84E-03	1.20E-04	1.20E-04
SSTL154	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	4.60E-02	1.44E-03	1.44E-03
SSTL162	DEFAULT	MACLAN INDUSTRIES	742056.49	4281486.76	495.44	14.0	190.0	0.003	0.2		2.29E-01	2.29E-01
SSTL165	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	22.0	871.0	24.016	0.8		1.02E-01	1.02E-01
SSTL166	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	10.0	871.0	24.016	0.8		2.38E-01	2.38E-01
SSTL169	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	1.79E-01	1.28E-03	1.28E-03
SSTL170	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	25.0	-459.7	0.003	0.8	2.33E+01	3.69E-03	3.69E-03
SSTL171	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	18.0	-459.7	0.003	4.0	1.61E+00	6.69E-02	6.69E-02
SSTL172	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	15.0	-459.7	0.003	2.0	1.20E-02	8.60E-05	8.60E-05
SSTL173	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	16.0	-459.7	0.003	0.5	9.34E-01	2.85E-01	2.85E-01
SSTL174	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL175	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL196	DEFAULT	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	7.7	25.0	11.788	0.9	3.92E+00	1.28E-01	1.28E-01
SSTL199	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		1.59E-01	1.59E-01
SSTL200	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		7.25E-01	7.25E-01
SSTL209	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0		9.51E+00	9.51E+00
SSTL214	DEFAULT	THE HARPER COMPANY	731184.93	4292013.86	588.35	10.0	1100.0	23.333	0.5		2.75E-01	0.00E+00
SCITY1	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	21.217	10.0		2.38E-02	2.38E-02
SCITY2	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	100.0	350.0	47.149	3.0		5.80E-02	5.80E-02
SCITY3	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.87E+01	1.87E+01
SCITY4	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.78E-02	1.78E-02
SCITY5	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.53E+01	2.53E+01
SCITY6	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.15E-02	2.15E-02
SCITY7	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	135.0	950.0	19.367	1.5		1.75E+01	1.75E+01
SCITY8	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	20.0	50.0	70.000	1.0		1.69E+00	1.69E+00
SCITY9	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	1.33E+00	9.51E-03	9.51E-03
SCITY10	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	2.13E+00	1.52E-02	1.52E-02
SCITY11	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	2.53E+00	1.81E-02	1.81E-02
SCITY12	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	3.20E-01	2.29E-03	2.29E-03
SCITY13	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	12.0	200.0	0.885	1.0	3.77E+00	1.15E+00	0.00E+00
SCITY14	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.55E-02	1.07E-03	1.07E-03
SCITY15	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.07E-02	9.22E-04	9.22E-04
SCITY16	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	69.751	1.7	3.07E-02	9.22E-04	9.22E-04
SCITY17	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	16.0	77.0	24.600	0.2		1.41E-03	1.41E-03
SCITY18	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	3.0	800.0	0.335	0.5	1.63E-01	4.98E-02	0.00E+00
SCITY22	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	0.0	0.000	0.5	5.72E-03	1.72E-04	1.72E-04
SCITY23	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	6.00E-02	1.83E-02	0.00E+00
SCITY24	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.8	2.11E+00	6.44E-01	0.00E+00
SCITY25	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	8.12E-03	4.79E-03	0.00E+00
SCITY26	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	1.73E-02	5.29E-03	0.00E+00
SCITY27	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	42.0	77.0	3.734	0.2	4.35E-02	1.33E-02	0.00E+00
SCITY28	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	200.0	0.335	1.0	1.98E-01	6.04E-02	0.00E+00
SCITY29	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.07E-01	3.27E-02	0.00E+00
SCITY30	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.09E-04	3.32E-05	0.00E+00
SCITY31	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	12.0	212.0	1.296	1.0	5.28E-01	1.61E-01	0.00E+00
SCITY32	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	90.0	77.0	33.215	2.2	1.09E-04	3.32E-05	0.00E+00
SCITY33	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	3.65E-02	1.12E-02	0.00E+00
SCITY34	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.98E-01	6.04E-02	0.00E+00
SCITY48	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.58E-01	2.58E-01
SCITY49	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.42E-02	2.42E-02

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITYS0	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.20E+00	1.20E+00
SCITYS1	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.53E-01	1.53E-01
SCITYS2	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITYS3	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		6.91E-03	6.91E-03
SCITYS4	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITYS5	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		7.87E-03	7.87E-03
SCITYS6	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	30.0	975.0	237.684	0.8		3.10E-02	0.00E+00
SCITYS7	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		2.59E+01	2.59E+01
SCITYS8	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		5.09E+00	5.09E+00
SCITYS9	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		3.48E-02	3.48E-02
SCITY60	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	3.97E-01	3.97E-01
SCITY61	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	5.32E-02	5.32E-02
SCITY62	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY63	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	2.36E-02	2.36E-02
SCITY64	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.20E+00	2.29E-02	2.29E-02
SCITY66	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	20.0	0.0	0.000	0.5	4.42E+01	1.33E+00	1.33E+00
SCITY67	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	83.035	3.0	4.19E+00	4.64E+00	4.64E+00
SCITY68	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	83.035	3.0	8.11E-01	5.15E-03	5.15E-03
SCITY69	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.04E+00	4.48E+00	4.48E+00
SCITY70	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	1.14E+00	8.17E-03	8.17E-03
SCITY71	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	28.333	0.5	2.98E-03	4.70E-07	0.00E+00
SCITY72	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	28.333	0.5	7.05E+00	2.15E+00	0.00E+00
SCITY83	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		1.14E-04	1.14E-04
SCITY84	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		4.07E-03	4.07E-03
SCITY85	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.40E-03	8.40E-03
SCITY86	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY87	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY88	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY89	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY90	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	10.0	1100.0	28.333	0.5		2.87E+00	0.00E+00
SCITY110	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	32.0	120.0	15.458	2.0		2.08E-02	2.08E-02
SCITY111	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	461.0	200.0	9.432	3.0		5.70E-03	5.70E-03
SCITY112	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	460.0	15.922	4.0		6.81E+01	6.81E+01
SCITY113	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	600.0	15.922	4.0		3.75E-02	3.75E-02
SCITY114	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	45.0	122.0	551.818	2.0		1.14E-02	1.14E-02
SCITY115	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	80.0	171.0	69.682	2.0		5.14E-03	5.14E-03
SCITY116	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	78.0	176.0	88.484	1.2		1.43E-03	1.43E-03
SCITY117	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	70.0	1100.0	23.938	0.5		1.91E-03	1.91E-03
SCITY121	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		9.43E+01	9.43E+01
SCITY122	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		5.31E-02	5.31E-02
SCITY123	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		6.41E+00	6.41E+00
SCITY124	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		7.35E-03	7.35E-03
SCITY125	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		1.86E-02	1.86E-02
SCITY126	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		3.89E-04	3.89E-04
SCITY127	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	30.0	140.0	0.125	2.0		1.44E-03	1.44E-03
SCITY128	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	15.4	752.2	82.451	1.0		7.88E-03	0.00E+00
SCITY129	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY132	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	6.916	3.3		1.77E-02	1.77E-02
SCITY133	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	36.901	7.0		3.72E-03	3.72E-03
SCITY135	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1800.0	8.301	3.7		8.58E-03	8.58E-03
SCITY137	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	42.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY140	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY141	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	200.0	39.648	2.8		5.16E-03	5.16E-03

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY143	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY144	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY145	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY146	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY147	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	25.0	900.0	14.865	2.0		1.14E-02	1.14E-02
SCITY148	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	20.0	0.0	0.000	0.5		3.30E-03	3.30E-03
SCITY149	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	37.0	600.0	38.983	1.2		1.98E-03	1.98E-03
SCITY156	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY157	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.20E-02	1.20E-02
SCITY158	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY159	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	14.0	490.0	60.200	0.5		7.80E-01	0.00E+00
SCITY160	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	12.6	260.0	205.400	0.5		7.80E-01	0.00E+00
SCITY162	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	2.69E+00	1.16E-01	1.16E-01
SCITY163	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	6.20E+00	4.46E-02	4.46E-02
SCITY164	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.20E+00	9.30E-03	0.00E+00
SCITY165	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.18E+00	9.20E-03	0.00E+00
SCITY166	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.77E+00	8.30E-03	0.00E+00
SCITY167	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.12E+00	9.10E-03	0.00E+00
SCITY168	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.01E+00	1.29E+00	0.00E+00
SCITY169	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.15E+00	1.80E-02	0.00E+00
SCITY170	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.90E+00	1.08E-01	0.00E+00
SCITY171	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.52E+00	1.88E-02	0.00E+00
SCITY172	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	4.71E+00	2.04E-01	2.04E-01
SCITY173	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	1.09E+01	7.76E-02	7.76E-02
SCITY174	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	2.50E+00	1.08E-01	1.08E-01
SCITY175	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	6.01E+00	4.29E-02	4.29E-02
SCITY176	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	6.24E+00	1.38E-02	0.00E+00
SCITY177	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	5.17E+00	1.14E-02	0.00E+00
SCITY178	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	9.14E+00	2.02E-02	0.00E+00
SCITY179	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.31E+00	9.84E-01	0.00E+00
SCITY180	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.96E+00	8.40E-03	0.00E+00
SCITY181	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	3.53E-03	3.53E-03
SCITY183	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	2.41E-03	2.41E-03
SCITY185	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.24E-02	5.89E-04	5.89E-04
SCITY187	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.36E-01	1.69E-03	1.69E-03
SCITY189	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	1.37E+00	4.86E-01	0.00E+00
SCITY190	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.35E-02	2.31E-03	2.31E-03
SCITY191	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	9.00E-01	3.57E-03	3.57E-03
SCITY192	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.69E+01	6.78E-02	0.00E+00
SCITY193	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.48E+00	1.56E-02	0.00E+00
SCITY194	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.09E+01	4.41E-02	0.00E+00
SCITY227	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0		2.54E-03	2.54E-03
SCITY228	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0		1.20E+00	1.20E+00
SCITY229	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	25.0	0.0	0.000	1.0		2.19E-04	2.19E-04
SCITY242	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	250.0	71.667	1.7		2.39E-03	2.39E-03
SCITY243	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	400.0	19.833	1.5		4.87E-03	4.87E-03
SCITY244	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		1.37E-04	1.37E-04
SCITY245	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	55.0	750.0	11.168	4.2		8.18E-03	8.16E-03
SCITY246	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	43.0	500.0	7.467	2.5		7.33E-05	7.33E-05
SCITY247	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		3.46E-04	3.46E-04
SCITY248	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	36.0	375.0	1.716	2.0		2.48E-03	2.48E-03
SCITY266	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	24.0	1139.0	15.915	1.7		1.19E-02	1.19E-02
SCITY267	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	28.0	1800.0	15.584	2.0		6.76E-01	6.76E-01
SCITY275	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		2.33E+01	2.33E+01
SCITY276	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		4.99E-03	4.99E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY277	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	28.0	800.0	0.003	0.5	7.11E-01	1.25E-05	0.00E+00
SCITY278	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	20.5	250.0	0.003	1.3	3.05E-01	1.28E-04	1.28E-04
SCITY279	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	20.5	250.0	0.003	1.3	6.87E-01	4.91E-03	4.91E-03
SCITY280	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	20.5	250.0	0.003	1.3	3.05E-02	1.28E-05	1.28E-05
SCITY281	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	20.5	250.0	0.003	1.3	6.88E-01	4.93E-03	4.93E-03
SCITY282	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	22.0	250.0	0.003	1.0	1.22E-01	5.27E-03	5.27E-03
SCITY283	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	22.0	250.0	0.003	1.0	2.73E-01	1.95E-03	1.95E-03
SCITY284	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	22.5	250.0	0.003	2.0	6.10E-01	2.56E-04	2.56E-04
SCITY285	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	22.5	250.0	0.003	2.0	1.38E+00	9.84E-03	9.84E-03
SCITY286	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	20.5	800.0	0.003	1.5	8.65E-01	1.53E-05	0.00E+00
SCITY287	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	20.5	800.0	0.003	1.5	7.84E+00	1.28E-04	0.00E+00
SCITY288	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275182.40	439.30	20.5	800.0	0.003	1.5	7.84E+00	1.28E-04	0.00E+00
SCITY289	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	78.0	400.0	50.535	2.0		2.26E-03	2.26E-03
SCITY290	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	78.0	400.0	50.535	2.0		2.91E+01	2.91E+01
SCITY291	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	78.0	400.0	50.535	2.0		1.65E-03	1.65E-03
SCITY292	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	81.0	1590.0	19.255	1.5		1.28E+01	1.28E+01
SCITY293	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	81.0	1590.0	19.255	1.5		3.47E+00	3.47E+00
SCITY295	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY296	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.81E+00	1.29E-01	1.29E-01
SCITY297	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	8.93E-01	2.57E+01	2.57E+01
SCITY298	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	6.82E+00	4.73E-02	4.73E-02
SCITY299	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.89E+00	5.45E+01	5.45E+01
SCITY300	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	7.92E+00	5.66E-02	5.66E-02
SCITY301	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY302	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.04E+00	7.40E-03	7.40E-03
SCITY303	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	9.62E+00	5.15E+00	0.00E+00
SCITY304	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	5.11E+00	6.68E+00	0.00E+00
SCITY315	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	6.50E+00	1.39E+00	0.00E+00
SCITY316	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	2.40E-02	2.22E-03	2.22E-03
SCITY317	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	2.40E-02	2.22E-03	2.22E-03
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	9.62E-01	3.00E-01	3.00E-01
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	2.00E-02	8.00E-04	8.00E-04
SCITY320	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	1.76E-02	3.70E-04	3.70E-04
SCITY321	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	8.99E-01	3.88E-02	3.88E-02
SCITY322	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	4.60E-01	8.28E-03	8.28E-03
SCITY323	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	1.40E-02	3.08E-05	0.00E+00
SCITY324	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	7.00E-03	1.54E-05	0.00E+00
SCITY325	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	5.78E-03	5.22E-05	0.00E+00
SCITY326	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.71E-02	3.76E-03	3.76E-03
SCITY327	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.30E-01	5.03E-03	5.03E-03
SCITY328	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	7.46E-01	3.22E-02	3.22E-02
SCITY329	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	9.04E-01	6.46E-03	6.46E-03
SCITY330	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	1007.0	51.650	0.7	4.88E-01	1.08E-03	0.00E+00
SCITY331	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	4.06E+00	1.24E+00	0.00E+00
SCITY332	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	2.03E-01	1.44E-03	1.44E-03
SCITY333	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	6.6	1257.0	35.000	0.3	8.24E+00	2.93E+00	0.00E+00
SCITY334	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	6.0	1076.0	151.667	0.3	7.56E+00	7.82E-01	0.00E+00
SCITY335	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	9.9	819.0	37.879	0.8	6.13E-01	1.35E-03	0.00E+00
SCITY344	DEFAULT	PAVLO PRODUCTS COMPANY	736597.70	4278776.67	501.12	32.0	200.0	1.933	1.2		5.04E-03	5.04E-03
SCITY353	DEFAULT	CHRISTY REFRACTORIES CO L.L.C	738223.37	4278219.85	483.66	1.0	325.0	0.003	1.0		9.60E-02	9.60E-02
SCITY355	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	631.0	79.216	2.0		9.54E-01	9.54E-01
SCITY356	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	455.0	79.216	2.0		9.54E-01	9.54E-01
SCITY357	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	428.0	79.216	2.0		9.54E-01	9.54E-01
SCITY358	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	885.0	28.035	0.7		3.05E-01	3.05E-01
SCITY359	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01

R004614

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY360	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY361	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		1.09E-03	1.09E-03
SCITY362	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		4.92E-03	4.92E-03
SCITY363	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY364	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY365	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		1.19E+00	1.19E+00
SCITY366	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		5.13E+00	5.13E+00
SCITY367	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY368	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY380	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	25.0	450.0	20.000	2.5		2.46E-03	2.46E-03
SCITY381	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	12.0	150.0	8.333	1.0		1.63E-01	1.63E-01
SCITY394	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5		2.06E+00	0.00E+00
SCITY395	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		9.53E-03	9.53E-03
SCITY396	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		1.71E-03	1.71E-03
SCITY401	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		9.30E-05	9.30E-05
SCITY402	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		4.97E-03	4.97E-03
SCITY403	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		5.07E-05	5.07E-05
SCITY404	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		2.48E-03	2.48E-03
SCITY405	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	10.0	1100.0	23.333	0.5		1.83E-02	0.00E+00
SCITY406	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.55E+00	2.55E+00
SCITY407	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.87E-02	2.87E-02
CJEFF34	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	36.6	77.0	20.600	1.8	2.68E-02		
CJEFF35	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	350.0	40.000	2.0	2.90E-01		
CJEFF36	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	2.07E-01		
CJEFF37	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	20.0	0.0	0.000	0.5	9.13E-03		
CJEFF43	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	56.0	370.0	33.333	2.5	1.01E-01		
CJEFF44	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	8.06E-01		
CJEFF45	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	112.999	2.5	9.97E-02		
CJEFF46	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	20.600	2.5	2.58E-01		
CSTLC55	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.68E-02		
CSTLC56	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.27E+00		
CSTLC57	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	1.66E-02		
CSTLC58	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	3.85E-01		
CSTLC59	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	20.0	250.0	2.083	1.0	7.72E-02		
CSTLC60	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	8.5	1200.0	254.649	0.2	3.28E+00		
CSTLC61	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	8.5	1200.0	254.649	0.2	1.29E-01		
CSTLC62	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	8.5	1200.0	254.649	0.2	9.99E-05		
CSTLC63	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	19.0	425.0	7.047	1.7	6.01E-01		
CSTLC64	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	24.0	270.0	105.951	2.0	8.24E+00		
CSTLC152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.29	4268469.87	430.05	43.0	-459.7	8.225	1.0	1.38E-01		
CSTLC155	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	37.0	250.0	51.250	4.2	2.57E+01		
CSTLC156	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	12.0	355.0	0.804	1.3	4.03E-01		
CSTLC157	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	31.0	230.0	80.499	4.2	3.93E+01		
CSTLC158	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	20.0	300.0	16.667	1.1	2.29E-01		
CSTLC207	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	738394.88	4300010.04	461.78	15.0	896.0	0.000	14.0	1.61E+02		
CCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279905.98	511.94	100.0	350.0	29.984	1.3	3.08E-02		
CCITY203	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0	3.56E-01		
CCITY204	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0	1.68E+02		
CCITY344	DEFAULT	GP RECYCLING, LLC	743830.86	4284034.28	422.18	20.0	0.0	0.000	0.5	1.72E-02		
CCITY368	DEFAULT	GP RECYCLING, LLC	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5	6.73E+00		
CCITY369	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	1.33E+00		
CCITY370	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	5.69E-02		

R004615

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF84	MERCY HOSPITAL JEFFERSON	728139.03	4230846.83	429.75	16.4	3.8	15.3	1.29E-02	9.13E-05	9.13E-05
SJEFF84	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	4.68E-03	4.68E-03
SJEFF85	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	7.06E-03	7.06E-03
SJEFF87	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	16.4	3.8	15.3	2.29E-01	1.44E-02	1.44E-02
SJEFF88	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	3.91E-03	3.91E-03
SJEFF89	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.47E-03	1.47E-03
SJEFF90	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		2.29E-01	2.29E-01
SJEFF91	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		6.88E-03	6.88E-03
SJEFF92	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.38E-03	1.38E-03
SJEFF101	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	4.81E-01	2.40E-02	2.40E-02
SJEFF102	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	6.41E-01	1.42E-02	1.42E-02
SJEFF103	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	5.24E-01	6.09E-03	6.09E-03
SJEFF104	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	1.53E-01	3.75E-03	3.75E-03
SJEFF105	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.08E-03	1.08E-03
SJEFF106	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.14E-03	1.14E-03
SJEFF107	AERO METAL FINISHING	710699.61	4263747.23	613.55	8.2	2.3	7.6		2.43E-01	2.43E-01
SJEFF126	FRED WEBER, INC. ANTONIA	720162.79	4248872.71	670.57	8.2	2.3	7.6		3.08E+00	3.08E+00
SSTC56	BLASTCO INC	690219.84	4257755.23	543.44	8.2	2.3	7.6		1.47E-01	1.47E-01
SSTL67	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		5.88E-04	5.88E-04
SSTL68	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		1.02E+00	1.02E+00
SSTL175	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	8.2	2.3	7.6		7.18E-03	7.18E-03
SSTL197	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	8.2	2.3	7.6		1.80E-01	1.80E-01
SCITY19	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	6.24E-02	2.47E-02	2.47E-02
SCITY20	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	4.44E-03	7.73E-01	7.73E-01
SCITY21	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	2.59E+00	7.94E-01	7.94E-01
SCITY44	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.50	425.39	15.0	0.2	14.0		6.22E-04	6.22E-04
SCITY45	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		2.76E-02	2.76E-02
SCITY118	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4279043.36	414.11	8.2	2.3	7.6		7.50E-05	7.50E-05
SCITY119	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4279043.36	414.11	8.2	2.3	7.6		4.00E-01	4.00E-01
SCITY120	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4279043.36	414.11	8.2	2.3	7.6		2.61E-01	2.61E-01
SCITY130	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY131	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY134	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY135	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY138	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY139	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY182	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	9.38E-02	2.40E-04	2.40E-04
SCITY184	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	6.59E-02	4.71E-04	4.71E-04
SCITY186	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY188	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	4.95E-02	3.53E-04	3.53E-04
SCITY189	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	8.2	2.3	7.6	8.40E-02	6.00E-04	6.00E-04
SCITY241	PQ CORPORATION -THE	729053.43	4285317.19	495.80	8.2	2.3	7.6		2.66E-02	2.66E-02
SCITY340	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		3.60E-04	3.60E-04
SCITY341	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.13E-03	1.13E-03
SCITY342	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-03	1.20E-03
SCITY343	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-02	1.20E-02
CJEFF38	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.49E-01		
CJEFF36	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.71E-03		
CJEFF39	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.22E-03		

R004616

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr)		
								CO	SOx	SO2 (1-hour)
CJEFF40	METAL CONTAINER CORPORATION ARNOLD	730600.10	4257280.94	441.70	16.4	3.8	15.3	2.01E-01		
CJEFF41	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.10E-03		
CJEFF42	METAL CONTAINER CORPORATION ARNOLD	730900.10	4257280.94	441.70	16.4	3.8	15.3	8.18E-04		
CJEFF47	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.55E-02		
CJEFF48	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.56E-06		
CJEFF49	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.09E-04		
CJEFF50	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.48E-04		
CJEFF51	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	5.28E-02		
CJEFF52	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.46E-03		
CJEFF53	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.53E-01		
CJEFF54	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.56E-02		
CJEFF55	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.16E-01		
CJEFF56	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.45E-03		
CJEFF57	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.42E-01		
CJEFF58	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.74E-03		
CJEFF59	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.92E-01		
CJEFF60	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.35E-02		
CSTLC92	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	9.2	2.3	7.6	2.25E-01		
CSTLC151	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	13.5	1.4	0.7	1.58E-01		
CSTLC195	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	13.5	1.4	0.7	5.97E-01		
CCITY343	GP RECYCLING, LLC	743830.86	4284034.28	422.18	8.2	2.3	7.6	5.57E-02		

R004617

ATTACHMENT B
MODEL SUMMARY OUTPUT

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	1157.328	746400	4286400	128.82	132.25		0	19020109	STL_LCN15	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	1094.348	750800	4288100	127.44	127.44		0	16121910	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	1036.463	745200	4287400	129.9	134.11		0	18112209	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	997.1573	746700	4287100	126.89	126.89		0	20010616	STL_LCN2C	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	982.6781	748434.9	4287033	127.16	127.16		0	17051502	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	691.6775	748481.6	4286378	126.67	126.67		0	19081908	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	669.2078	748481.6	4286378	126.67	126.67		0	18111224	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	651.9973	750472	4287091	125.7	125.7		0	17090416	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	645.9934	748434.9	4287033	127.16	127.16		0	16110108	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	618.4866	748434.9	4287033	127.16	127.16		0	20041108	STL_LCN2C	13	1	14098

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1157.3	2,000	58%
CO	8-HR	ALL	1ST	691.7	500	138%

10-5-22 US Steel CO NAAQS Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City NAAQS_2016_CO.SUM	CO	8-HR	ALL	2ND	1856.677	748434.9	4287033	127.16	127.16		0	16032208	STL_LCN16	584	1	205
AERMOD 22112	Granite City NAAQS_2017_CO.SUM	CO	8-HR	ALL	2ND	1941.224	748434.9	4287033	127.16	127.16		0	17121824	STL_LCN17	584	1	205
AERMOD 22112	Granite City NAAQS_2018_CO.SUM	CO	8-HR	ALL	2ND	1726.885	748470.1	4287000	126.94	126.94		0	18082424	STL_LCN18	584	1	205
AERMOD 22112	Granite City NAAQS_2019_CO.SUM	CO	8-HR	ALL	2ND	2045.17	748434.9	4287033	127.16	127.16		0	19110908	STL_LCN19	584	1	205
AERMOD 22112	Granite City NAAQS_2020_CO.SUM	CO	8-HR	ALL	2ND	1966.717	748434.9	4287033	127.16	127.16		0	20092408	STL_LCN2C	584	1	205

10-5-22 US Steel CO NAAQS Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	% Standard
CO	8-HR	ALL	2ND	2045.2	1646	3691.2	10,000	37%

Background data from East St. Louis monitor (AQS No. 85-163-029), high second high value from 2016-2018.

R004619

REFERENCES

1. Guidelines on Air Quality Models, (Revised). Appendix W of 40 CFR Part 51, 82 FR 5182, January 17, 2017.

2 . Prevention of Significant Deterioration, The Art and Science of PSD Air Quality Analysis, The Modeling Perspective, Illinois Environmental Protection Agency, Modeling Unit, February 27, 2014..

3. AERSCREEN User's Guide. EPA-454/B-15-005, July 2015.

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. *Sierra Club v. EPA*, No. 10-1413, 2013 WL 216018 (Jan. 22, 2013).

6. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

7. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

Appendix D – Copies of Construction Permits

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST. P.O. BOX 19506. SPRINGFIELD, ILLINOIS 62794-9506 · (217) 782-2113

PAT QUINN, GOVERNOR JOHN J. KIM, INTERIM DIRECTOR

217/785-1705

CONSTRUCTION PERMIT/PSD APPROVAL
REVISED

PERMITTEE

U.S. Steel Granite City
Attn: Bryan Kresak, Environmental Director
Route 203 and 20th Street
Granite City, Illinois 62040

Application/Permit No.: 95010001 I.D. No.: 119813AAI
Applicant's Designation: Date Orig. Issued: January 25, 1996
Subject: Production Increase
Date Revision Request: May 30, 2012
Date Revision Issued: December 17, 2012 (See Finding 1(c))
Location: Southeastern Granite City

Permit is hereby granted to the above-designated Permittee for an increase in the allowable production rate of iron (from 2,372,500 to 3,165,000 net tons per year) and steel (from 2,774,000 to 3,580,000 net tons per year) as described in the above-referenced application. This permit is subject to standard conditions attached hereto and the following special conditions:

FINDINGS

1a. Various changes have been made to the provisions of this permit for the Basic Oxygen Furnaces (BOF's), at the request of the Permittee, so that the permit will accommodate an emission reduction project that is planned for particulate emissions from the BOFs. In particular, the revised permit does not include requirements for the operation of these BOF's and the existing electrostatic precipitator (ESP) control system that would be inconsistent with the use of a separate control system with a baghouse for secondary emissions of the BOFs, as is now planned (see Construction Permit Application 11050006).

b. Prior to issuance of this revised permit, a draft of the revised permit underwent a public comment period, including a public hearing.

c. This revised permit will become effective 33 days after the date of issuance unless a petition for review is filed, in accordance with 40 CFR Part 124, with the USEPA's Environmental Appeals Board (Board), in which case, this revised permit will only take effect when and if the Board declines the petition for review or the Board issues a decision on the merits of the appeal that does not include a remand of the proceeding.

BLAST FURNACE OPERATIONS

2a. Total combined production of hot metal (a.k.a., iron) from blast furnaces A and B shall not exceed 9,849 net tons per day, averaged over any calendar month, and;

b. Total combined production of hot metal from blast furnaces A and B shall not exceed 3,165,000 net tons per year.

3a. Particulate emissions from the blast furnace casthouse baghouse and iron spout baghouse shall not exceed 0.010 gr/dscf, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

b. The opacity of emissions from the blast furnace casthouse baghouse and the iron spout baghouse shall not exceed 10% on a 6 minute rolling average basis, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

4a. Emissions of particulate matter from any opening in the blast furnace casthouse shall not exceed 20% opacity on a 6-minute rolling average basis beginning from initiation of the opening of the tap hole up to the point where iron and slag stops flowing in the troughs, pursuant to 35 Ill. Adm. Code 212.445(a)(2).

5. Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.

BASIC OXYGEN FURNACE SHOP

6a. Total combined production of liquid steel from the Basic Oxygen Furnaces (BOF's) shall not exceed 11,000 net tons per day, averaged over any calendar month; and

b. Total combined production of liquid steel from the BOF's shall not exceed 3,580,000 net tons per year.

7. The emissions of PM-10 from the BOF stack for the total of all BOF processes (i.e., operations from the beginning of the charging process through the end of the tapping process) shall not exceed 60.0 lbs/hour and 0.225 lbs per ton of steel in process, pursuant to 35 Ill. Adm. Code 212.458(b)(23).

8. Opacity of emissions from any opening in the BOF shop (e.g., roof monitor) shall not exceed 20% on a 3 minute rolling average basis, pursuant to 35 IAC 212.446(c).

9. The Permittee shall operate and maintain the BOF's and associated capture and control systems in accordance with applicable requirements of the National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing Facilities, 40 CFR 63 Subpart FFFFF, including requirements for operational monitoring, performance testing for opacity and emissions of particulate matter,* operation of capture and control systems within established limits for operating parameters, implementation of specified operation and maintenance practices, recordkeeping and reporting.

* As related to testing of emissions, if the Permittee is not willing to consider all particulate matter measured by testing to be PM_{10}, as provided for by 35 IAC 212.108(a)(3), performance tests for emissions

of particulate matter shall also include measurements for emissions of PM_{10} in accordance with 35 IAC 212.108(a)(1) or (2).

Note: This condition requires the Permittee to comply with the operating and maintenance requirements of 40 CFR 63 Subpart FFFFF as the means to verify ongoing compliance with the requirements of Conditions 7 and 8 and to address implementation of good air pollution control practice for the BOF's.

(Former Condition 10 has been removed in this revised permit.)

11a. Flame suppression shall be used and maintained during the entire tapping process.

b. The above requirement for flame suppression and the various requirements for the BOF's in Condition 12 and 13 shall end after the Permittee begins operation of a capture and control system for secondary emissions from the BOF's that makes these requirements infeasible or unnecessary, as explicitly recognized by Construction Permit 11050006 or other construction permit issued by the Illinois EPA for a capture and control system for secondary emissions.

12a. Except for purposes of emissions testing as related to the set points for the capture system for the BOF's, this capture system shall be operated at the following minimum set points for gas flow rate in the ESP stack until and unless the Illinois EPA approves lower minimum set point(s) based on a demonstration that a better level of particulate matter capture efficiency would now be achieved by the charging hoods and primary hoods.

b. Set points requirements while only a single BOF vessel is in operation:

i. Minimum set point during charging process: 550,000 cfm.

ii. Minimum set point during refining process: 650,000 cfm.

iii. Minimum set point during tapping process: 200,000 cfm (until one minute after completing alloy addition).

c. i. During dual operation of BOF vessels (a.k.a., overlapping BOF operation), the minimum set point shall be 700,000 cfm.

ii. In addition, overlapping operation of the BOF vessels is subject to the following requirements. These requirements shall be part of the Standard Operating Procedure for the BOFs.

A. The hot metal charge of the second vessel shall be initiated and completed during the time between completion of the blow and start of tap on the first vessel while sufficient draft at the ESP capture system is established and maintained for both vessels.

B. The charge and/or blow on one vessel shall not begin until sufficient draft has been established at the associated ESP capture system (a.k.a., doghouse) and the alloy addition at the vessel tapping has been completed for a least 1 minute.

C. Sufficient draft at the ESP capture system of the vessel being tapped shall be maintained for at least 1 minute after alloy addition has been completed. After such period, the capture system draft may be transferred over to the other.

D. Only overlapping of the hot metal charge of the second vessel after the end of blow and prior to onset of tap of the first vessel and overlapping of tapping of the first vessel, after alloy addition, and the hot metal charge and/or blow on the second vessel are allowed.

13a. i. The Permittee shall operate, maintain and calibrate a continuous operational monitor to ESP stack gas flow rate.

ii. The Permittee shall record for each steel production cycle the various stack gas flow rates for each process (i.e., for each charge, each refine, each tap) of each steel production cycle. That is, the Permittee shall be able to distinguish the measured flow rate of stack gas during each production cycle.

b. i. The Permittee shall operate and maintain a continuous operational monitor for waste gas suction, i.e., the static pressure in the main downcomer duct of the ESP.

ii. The Permittee shall record the waste gas suction for each process (i.e., for each charge, each refine, each tap) of each steel production cycle.

c. These monitoring systems shall be calibrated on at least a quarterly basis.

d. These monitoring systems shall be operated at all times that a BOF is in operation and shall be used as mechanisms to ensure sufficient draft is maintained in the emissions capture hoods and transport ducts.

(Former Conditions 14 through 17 have been removed in this revised permit.)

18. Emissions from the BOF Shop shall not exceed the limits in attached Tables 2 and 5.

(The note that previously accompanied Condition 18 has been removed in this revised permit.)

CONTINUOUS CASTING OPERATIONS

19. The continuous casting operations shall comply with 35 Ill. Adm. Code 212.450 and 212.458(b)(8).

20. Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5.

FUEL COMBUSTION

21. Total fuel usage for blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares shall not exceed the following limits:

    a. Natural Gas usage: 225 million ft^3 per month and 1,346 million ft^3 per year;

    b. Blast Furnace Gas (BFG) usage: 30,800 million ft^3 per month and 185,030 million ft^3 per year;

    c. Fuel Oil usage: 60 thousand gallons per month and 365 thousand gallons per year.

22. Emissions from the fuel combustion units listed above shall not exceed the limits in Tables 4 and 5.

ON-SITE FUGITIVE DUST CONTROL

(Refer to Attachment B for a table which summarizes the required on-site fugitive dust roadway control measures and maps indicating the referred to road segments)

23. The Permittee shall immediately initiate and maintain the on-site fugitive dust control measures specified in this permit so as eliminate dust spillage on in-plant and out-of-plant roadways.

24a. The Permittee shall sweep or flush at least every day the paved access area below the BOF ESP where ESP dust collection bags are used, stored and transported.

  b. The Permittee shall implement a housekeeping program for the non-roadway areas below and around the BOF ESP. This program shall, at a minimum, contain the following:

    i. The ground and other accessible areas where dust may gather shall be swept or cleaned at least every day;

    ii. Cleaning shall be performed in such a manner as to minimize the escape of dust into the atmosphere;

    iii. Dust collection bags shall be inspected at least daily for rips, tears, or insecure connection to the discharge chutes of the ESP hoppers;

    iv. Dust collection bags shall be inspected after removal from, and connection to, the discharge chutes of the ESP hoppers;

v. Ripped or torn bags shall be taken out of service and transported as soon as practicable in a covered truck.

25. Fugitive emissions of particulate matter from any roadway or parking area shall not exceed an opacity of 5%, pursuant to 35 Ill. Adm. code 212.316(e)(1).

26a. UNPAVED ROADS: On unpaved roads that are part of normal traffic patterns as identified in attachment B (including roads B, C, E, N, F-F, and CS(2)) the Permittee shall apply a chemical dust suppressant at least three times a month, with the following exceptions:

i. Road segment G-G, which shall be sprayed at least quarterly;

ii. Road segments P, V, Z, D-D, E-E, and H, which shall be sprayed at least 4 times per month until paving is completed. Paving shall be completed on these roads no later than July 31, 1996;

iii. Road segment L, which shall be sprayed at least 4 times per month.

b. All other unpaved roads shall be treated as necessary.

c. Applications of suppressant may be less frequent than specified above if weather conditions, i.e., precipitation or temperature, interfere with the schedule for spraying, provided each such instance shall be recorded in accordance with the daily records for on-site fugitive dust control required by this permit.

27a. PAVED ROADWAYS AND AREAS: Paved roadways and areas shall be maintained in good condition.

b. On paved roadways and other areas, the Permittee shall sweep or flush as follows:

i. Road segments D, K, M, F, G, J, R, and O shall be swept or flushed at least daily;

ii. Road segments P, V, W, X, Z, D-D, E-E, and CS(1) shall be swept or flushed at least five days per week;

iii. Road segments S and T shall be swept or flushed at least every other day;

iv. Road segments A and H shall be swept or flushed at least once per month;

v. All gate areas leading from the Steelworks area shall be swept or flushed at least daily;

vi. All gate areas leading from the iron making area shall be swept or flushed at least five times per week.

28. The above on-site dust control measures shall be conducted to maximize their effectiveness by performing said measures when the roads or areas are not normally obstructed by parked vehicles and by preferentially using filter sweeping (e.g., Enviro-Whirl sweeper) for the gate areas, the roads and areas surrounding the BOF and BOF ESP, and other key areas.

29. The Permittee shall maintain daily records relative to the on-site fugitive dust control program which includes the following information as a minimum:

    a. The date (and time for the gate areas) each road or area was treated;

    b. The manner in which the road or area was treated (i.e., filter sweep, conventional sweep, suppressant spray or flush);

    c. Detailed information for use of dust suppressant, including but not limited to the application rate, dilution ratio, type of suppressant used, and the number of gallons of suppressant applied;

    d. Observations, if any, concerning the condition of the roadway, e.g., presence of parked vehicles, detection of potholes;

    e. The amount of precipitation and temperature recorded for each day, and if determination was made to suspend application of suppressant, include name and title of person who made determination to suspend application and explanation;

    f. Any and all suspensions or deviations from the designated control procedures, with date, description, and explanation for suspension of application.

OFF-SITE FUGITIVE DUST CONTROL

30. The Permittee or the Permittee's Agent shall sweep or flush the following Granite City street road areas:

    a. At least weekly, the quarter mile segment of Madison Avenue in front of the 16th street gate (i.e., 1/8 of a mile in either direction);

    b. At least weekly, segment of 20th street between Lee and Quincy roads;

    c. At least monthly, segment of 20th street between Madison and Route 203 (a.k.a. Edwardsville Road).

PM_{10} CONTINGENCY MEASURES

31. The Permittee shall comply with the additional control measures (e.g., PM_{10} contingency plan) required by 35 Ill Adm. Code Part 212 Subpart U.

COMPLIANCE DETERMINATIONS

32a. Compliance with the daily limits of this permit shall be determined from a monthly total of the relevant daily data divided by the number of days in the month.

b. Compliance with the monthly limits of this permit (e.g., fuel usage) shall be determined by direct comparison of monthly data to the applicable limit.

c. i. Compliance with the annual limits of this permit shall be determined based on a calendar year.

ii. A. Compliance with the production limits in conditions 2(b) and 6(b) shall also be determined on a month by month basis by showing that the actual production of iron and steel from the plant did not exceed the scheduled rate of production for a month given in the most recent production schedule provided to the Agency that shows compliance with the following requirements.

B. If no production schedule is submitted to the Agency by the Permittee for a particular year, the scheduled monthly production of iron and steel shall be set at one twelfth of the annual production limits in conditions 2(b) and 6(b).

C. 1. The Permittee may submit a schedule for iron and steel production for each month of the calendar year. Such schedule shall provide the scheduled monthly iron and steel production for each month and the total of such scheduled production shall not exceed the annual production limits in conditions 2(b) and 6(b). This schedule shall be submitted each year no later than December 15th of the preceding year.

2. During the course of the year, the Permittee may submit a revised production schedule which accounts for actual production levels which were below that scheduled for the previous months, provided that in no case shall the scheduled production for prior months in such a revised schedule be lowered to less than actual production levels or raised. Such revised schedule shall be submitted to the Agency no later than 15 days after the first day of the month for which scheduled production has been raised. Such schedule shall be accompanied by data on actual production in preceding months.

(Former Condition 33 has been removed from this revised permit.)

34a. Blast furnace hot metal production shall be measured at the BOF hot metal transfer station, and adjusted by documented slag and iron losses.

b. BOF liquid steel production shall be initially measured by a scale equipped crane and adjusted based upon documented steel production analysis of the continuous casters.

c. BFG usage shall be calculated based on the total BFG produced per net ton hot metal (NTHM) derived by the following formula and adjusted per analysis of documented BFG consumptions:

$$\text{mmft}^3 \text{ BFG per month} = \frac{(4.585277 \text{ NTHM/day} + 498.191)}{80} \times \begin{pmatrix} \text{Number of} \\ \text{days in} \\ \text{that month.} \end{pmatrix}$$

d. Natural gas usage shall be determined by metered volumes.

e. Fuel oil usage shall be determined by tank height differentials.

RECORD KEEPING

35. The Permittee shall keep records of the following items and such other items which may be appropriate to allow the Agency to review compliance:

a. Blast furnace hot metal production (total combined daily, monthly and annual in tons), including documentation on iron and slag losses;

b. BOF liquid steel production (total combined daily, monthly and annual in tons), including documentation on adjustments made due to production analysis and losses;

c. Fuel usage as follows; Usage of natural gas and BFG (total combined million ft^3 per month and year, each) and fuel oil (total combined gallons/month and year) for the blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

36. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Agency and USEPA upon request. Any records retained in a computer shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Agency request for records during the course of a source inspection.

TESTING

37. The special conditions of this permit supplement the special conditions of any existing operating permits for this source as of January 15, 1996 and supersede such conditions in cases where a conflict exists.

38a. The following tests shall be performed by no later than August 6, 1997 to demonstrate compliance with the conditions of this permit.

i. Fuel Combustion Units testing: The emissions of particulate matter from boiler #12 while burning blast furnace gas shall be measured. This test shall be designed to verify compliance with the requirements of this permit and the emission factor used (i.e., 2.9 lbs particulate emitted per mmcf BFG burned);

b. The test shall be performed by an approved independent testing service during conditions which are representative of maximum emissions and at the maximum production rates allowed, or as close to such rates as reasonable if the Permittee demonstrates to the Agency prior to testing that testing at such production rates within the time constraints of an Agency request to test is not practicable.

c. i. The following methods and procedures shall be used for the testing, unless another method is approved by the Agency: Refer to 40 CFR 60, Appendix A for USEPA test methods;

Location of sample points	USEPA Method 1
Gas flow and velocity	USEPA Method 2
Particulate Matter	USEPA Method 5

ii. All particulate measured shall be considered PM-10 unless emissions are tested by an appropriate USEPA test method for measurement of PM-10, as specified in 35 Ill. Adm. Code 212.110(e).

d. At least 30 days prior to the actual date of testing, a written test plan shall be submitted to the Agency for review and approval. This plan shall describe the specific procedures for testing, including as a minimum:

i. The persons who will be performing sampling and analysis and their experience with similar tests;

ii. The specific conditions under which testing will be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which operating parameters for the source and the emissions capture and control system will be determined;

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations;

iv. The test methods which will be used, with the specific analysis methods;

v. Any proposed use of an alternative test method, with detailed justification;

vii. The format and content of the Source Test Report.

e. The Agency shall be notified before these tests to enable the Agency to observe these tests. Notification for the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual date of the test. The Agency may at its discretion accept notifications with shorter advance notice provided that the Agency will not accept such notifications if it interferes with the Agency's ability to observe testing.

f. The Final Report of these tests shall include as a minimum:

i. A tabular summary of results which includes:

- process weight rate and/or fuel usage rate
- production rate
- allowable emission limit
- measured emission rate
- determined emission factor
- compliance demonstrated - Yes/No
- any other pertinent information

ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule;

iii. Detailed description of test conditions, including,

- pertinent process information (e.g. fuel or raw material consumption)
- control equipment information, i.e. equipment condition and operating parameters during testing;

iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration;

g. Copies of the Final Report for these tests shall be submitted to the Agency within 14 days after the test results are compiled and finalized.

h. Submittals of information shall be made as follows:

i. Notice of Test - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section;

ii. Final Report - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section.

Pertinent Addresses are:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

Illinois Environmental Protection Agency
Division of Air Pollution Control
Regional Office
2009 Mall Street
Collinsville, Illinois 62234

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

(Condition 38 required emission testing following the initial operation of the source with the expansion that has already been conducted by the Permittee. This revised permit does not require that this testing be repeated.)

REPORTING

39. Unless otherwise provided for by the provisions for reporting of deviations in the Clean Air Act Permit Program (CAAPP) permit for the source, if there is a deviation from the requirements of this permit, the Permittee shall submit a report to the Illinois EPA within 30 days after the deviation. The report shall include a description of the deviation, the probable cause of the deviation, the corrective actions that were taken and any preventative measures taken to prevent similar deviations in the future.

40. The Permittee shall submit the following additional information from the prior calendar year with the Annual Emissions Report, due May 1st of each year:

a. Iron and steel production (tons/month and tons/year, each);

b. Natural gas and BFG usage ($mmft^3$/month and $mmft^3$/year, each);

c. Fuel oil usage (thousand gallons/month and thousand gallons/year, for each type of oil).

APPLICABILITY OF MAJOR SOURCE RULES

41a. As a consequence of the above conditions, this permit is issued based upon the following changes in emissions, as further described in Table 6, accompanying increased production as allowed by this permit:

i. The increases in emissions of lead and VOM are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration;

ii. The increase in emissions of NO_x are being accompanied by contemporaneous emission decreases provided by the shutdown of equipment and operations such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

iii. The increase in emissions of PM and PM-10 are being accompanied by contemporaneous emission decreases provided by additional road dust control and BOF capture and control such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

Also, the Permittee has agreed to provide further additional dust control consisting of the sweeping of Granite City public streets and housekeeping measures in the area below and surrounding the BOF ESP. Attachment C is a listing of the emission reductions provided by these control measures.

b. The increases in emissions of SO_2 and CO are significant under 40 CFR 52.21 - Prevention of Significant Deterioration (PSD). Accordingly, the project is considered a major modification and must comply with the requirements of PSD. These requirements include a demonstration of best available control requirements for affected SO2 and CO emission units, an analysis of air quality impacts, an analysis of the impacts of the project on visibility, vegetation's and soils, and the application and proposed permit must undergo a public participation. The Agency has determined that these additional requirements have been met.

c. The changes in emissions pertinent to this project are summarized as follows:

Units = tons/year

* Emission increases which could occur from the project:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

* Creditable contemporaneous actual emission decreases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

- Other contemporaneous emission increases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

- Net emission changes:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

- Significant Levels:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

Explanatory Note:

PM	=	particulate matter = particulate;
PM_{10}	=	particulate matter less than or equal to 10 micrometers in size;
SO_2	=	sulfur dioxide;
NO_x	=	nitrogen oxides;
VOM	=	volatile organic material;
CO	=	carbon monoxide;
mm	=	million;
gr/dscf	=	grains per dry standard cubic foot;
acfm	=	actual cubic feet per minute;
mmcf	=	million cubic feet;
Mgal	=	thousands of gallons.

If you have any questions on this permit, please call Kevin Smith at 217/782-7048.

Edwin C. Bakowski, P.E.
Manager, Permit Section
Division of Air Pollution Control

Date Signed: December 17, 2012

DES:KLS:psj

cc: IEPA, FOS Region 3

TABLE 1

BLAST FURNACE OPERATIONS

Maximum Hot Metal Production = 3,165,000 net tons per year

1. Casthouse Baghouse (furnace tapping) - captured emissions ducted to baghouse, uncaptured emissions emitted through roof, other openings, etc.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0703	111.19
PM_{10}	0.0703	111.19
SO_2	0.2006	422.00
NO_x	0.0144	22.79
VOM	0.0946	149.68

2. Blast Furnace - uncaptured fugitives

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.031	49.06
PM_{10}	0.0155	24.53
SO_2	0.0104	21.94
NO_x	0.0007	1.14
VOM	0.0047	7.42

3. Blast Furnace Charging
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0024	5.17
PM_{10}	0.0024	5.17

4. Slag Pits

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00417	6.60
PM_{10}	0.00417	6.60
SO_2	0.0100	15.83

TABLE 1 (cont.)

5. Iron Spout Baghouse- captured emissions controlled by iron spout baghouse.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.02548	40.32
PM_{10}	0.02548	40.32
SO_2	0.0073	13.89

6. Iron Pellet Screen
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00279	6.01
PM_{10}	0.00279	6.01

TABLE 2

BOF SHOP

Maximum Liquid Steel Production = 3,580,000 net tons per year

1. BOF ESP Stack

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.16	262.80
PM_{10}	0.16	262.80
NO_x	0.0389	69.63
VOM	0.0060	10.74
CO	8.993	16,097.47
Lead	0.01934 lbs/hour	1.26 tons/year

2. BOF Roof Monitor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0987	176.71
PM_{10}	0.06614	118.40
Lead	0.0129 lbs/hour	0.08 tons/year

3. Desulfurization and Reladling - Hot Metal Transfer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.03721	58.88
PM_{10}	0.03721	58.88
VOM	0.0010	1.58
Lead	0.0133 lbs/hour	0.09 tons/year

4. BOF Additive System (i.e., fluxes) with Baghouse, a.k.a., BOF hopper baghouse

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00032	0.57
PM_{10}	0.00032	0.57

TABLE 2 (cont.)

5. Flux conveyor & transfer pits, bin floor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0016	2.86
PM_{10}	0.0016	2.86

6. Hot metal charging ladle slag skimmer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0050	7.94
PM_{10}	0.0050	7.94

TABLE 3

CONTINUOUS CASTING OPERATIONS

Maximum Liquid Steel Throughput = 3,580,000 net tons per year

1. Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00715	12.80
PM_{10}	0.00715	12.80

2. Deslagging Station and Material HS.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00355	6.35
PM_{10}	0.00355	6.35

3. Caster Molds - Casting

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.006	10.74
PM_{10}	0.006	10.74
NO_x	0.050	89.50

4. Casters Spray Chambers

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00852	15.25
PM_{10}	0.00852	15.25

5. Slab Cut-off

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0071	12.71
PM_{10}	0.0071	12.71

TABLE 3 (cont.)

6. Slab Ripping

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00722	12.92
PM_{10}	0.00722	12.92

TABLE 4

CERTAIN FUEL COMBUSTION UNITS

1. 10 boilers (#'s 1 - 10)
2. 2 boilers (#'s 11 - 12)
3. Blast Furnace Stoves A & B.
4. BFG Flares
5. Ladle Drying Preheaters (5 heaters).

Total combined fuel usage from affected units (i.e., Boilers, BF stoves, BF Flares, ladle drying preheaters)

	Maximum Usage ($mmft^3$/Year)
Natural Gas (Total)	1,346
BFG	185,030
Fuel Oil	365 thousand gallons/year

1. Natural Gas

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	5.1	3.43
PM_{10}	5.1	3.43
SO_2	0.6	0.40
NO_x	306.0	205.94
VOM	2.8	1.88
CO	40.0	26.92

2. BFG

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	2.9	268.29
PM_{10}	2.9	268.29
SO_2	6.65	615.22
NO_x	5.28	488.48
CO	13.7	1,267.46

TABLE 4 (cont.)

3. Fuel Oil

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	9.72	1.77
PM_{10}	9.72	1.77
SO_2	141.3	25.79
NO_x	55.0	10.04
VOM	0.28	0.05
CO	5.0	0.91
Lead	0.336	0.06 (waste oil)

TABLE 5

LIMITS ON EMISSIONS FROM MAJOR PROCESSES AND ACTIVITIES

Units = tons/year

	PM	PM_{10}	SO_2	NO_x	VOM	CO	Lead
Blast Furnace Operations	218	194	474	24	157	---	---
BOF Shop	510	451	---	70	12	16,097	1.43
Continuous Casting Operations	71	71	---	90	---	---	---
Certain Fuel Combustion Units[A]	274	274	641	706	2	1,295	0.06
Roadways	27	27	---	---	---	---	---
Material Handling	2	2	---	---	---	---	---
Total	1,102	1,019	1,115	890	171	17,392	1.49

[A] Blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

TABLE 6

EMISSIONS SUMMARY

Units = tons/year

* Emission increases which could occur from the project:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

* Creditable contemporaneous actual emission decreases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

* Other contemporaneous emission increases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

* Net emission changes:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

* Significant Levels:

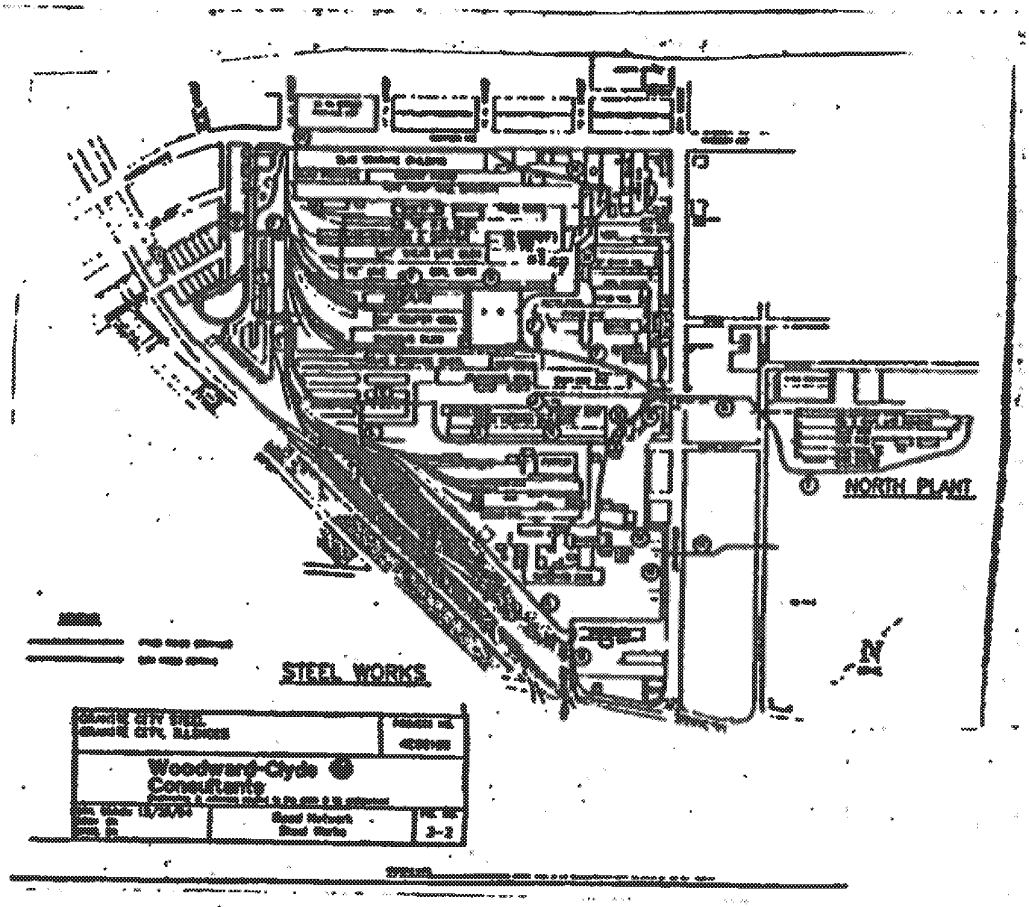
PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

ATTACHMENT A

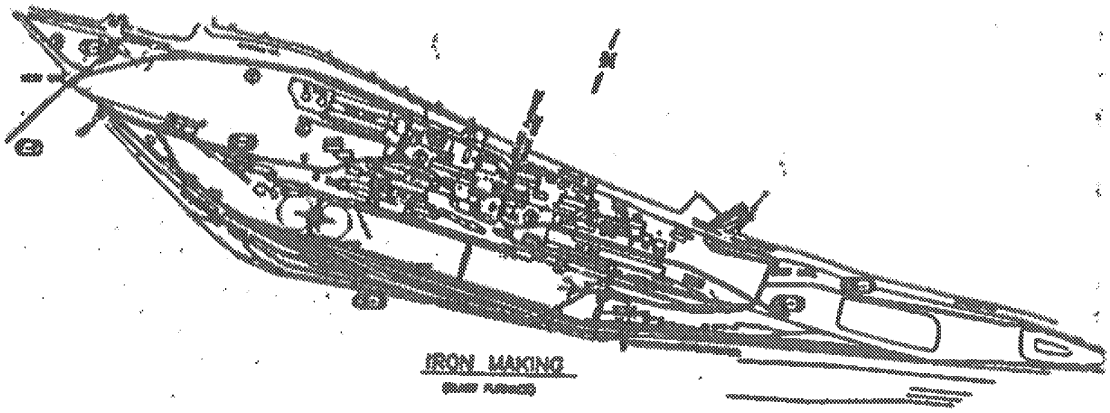
(Former Attachment A has been removed in this revised permit.)

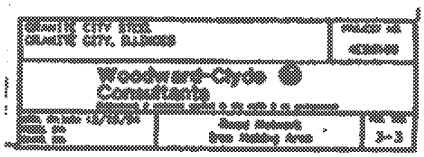
ATTACHMENT 2

ON-SITE FUGITIVE DUST ROADWAY CONTROL MEASURES AND MAPS SHOWING THE ROAD SEGMENTS

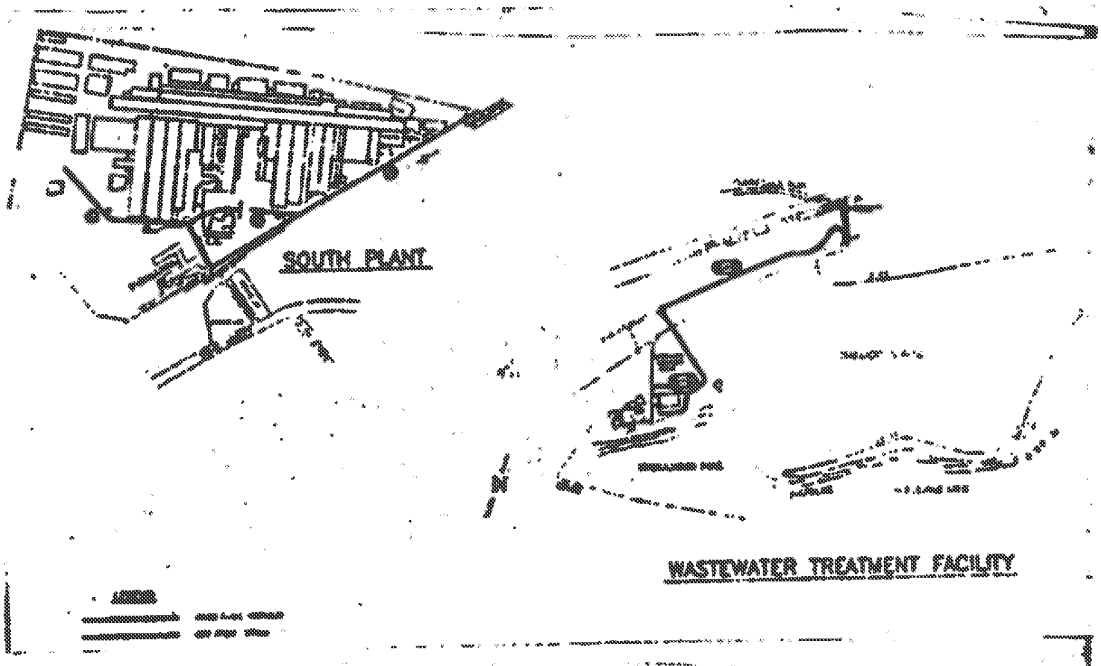


ATTACHMENT B (cont.)





ATTACHMENT B (cont.)



ATTACHMENT C

CONTEMPORANEOUS REDUCTIONS IN THE
EMISSIONS OF PM_{10}

- Historic roadway emissions of 428 tons/year, minus future potential roadway emissions of 27 tons/year, equals a resulting reduction in roadway emissions of 401 tons/year

- Historic material handling emissions of 17 tons/year minus future potential material handling emissions of 2 tons/year, equals a resulting reduction in material handling emissions of 15 tons/year.

- Emission reductions resulting from the sweeping of city streets = 52 tons/year*

- Emission reductions resulting from sweeping and housekeeping of areas below and around BOF ESP = 12 tons/year*

Total reductions in the emissions of PM_{10} as a result of the additional dust control measures required by Illinois' SIP and the special conditions of this permit = 480 tons/year

* These are considered reasonable estimates of reductions and are subject to change upon further investigation of the actual reductions which will occur as a result of the control measures required by this permit.

KLS:psj

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director
217/782-2113

P. O. Box 19506, Springfield, IL 62794-9506

CONSTRUCTION PERMIT

PERMITTEE

Granite City Division
of National Steel Corporation
Attn: Joseph S. Kocot
20th and State Street
Granite City, Illinois 62040

Application No.: 95010001 I.D. No.: 119813AAI
Applicant's Designation: Date Received: January 3, 1995
Subject: Production Increase
Date Issued: January 25, 1996
Location: Southeastern Granite City

Permit is hereby granted to the above-designated Permittee for an increase in the allowable production rate of iron (from 2,372,500 to 3,165,000 net tons per year) and steel (from 2,774,000 to 3,580,000 net tons per year) as described in the above-referenced application. This permit is subject to standard conditions attached hereto and the following special conditions:

1. Prior to issuance of this permit, a draft of this permit has undergone a public notice and comment period, and a public hearing was held.

BLAST FURNACE OPERATIONS

2a. Total combined production of hot metal (a.k.a., iron) from blast furnaces A and B shall not exceed 9,849 net tons per day, averaged over any calendar month, and;

b. Total combined production of hot metal from blast furnaces A and B shall not exceed 3,165,000 net tons per year.

3a. Particulate emissions from the blast furnace casthouse baghouse and iron spout baghouse shall not exceed 0.010 gr/dscf, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

b. The opacity of emissions from the blast furnace casthouse baghouse and the iron spout baghouse shall not exceed 10% on a 6 minute rolling average basis, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

4a. Emissions of particulate matter from any opening in the blast furnace casthouse shall not exceed 20% opacity on a 6-minute rolling average basis beginning from initiation of the opening of the tap hole up to the point where iron and slag stops flowing in the troughs, pursuant to 35 Ill. Adm. Code 212.445(a)(2).

5. Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.

BASIC OXYGEN FURNACE SHOP

6a. Total combined production of liquid steel from the Basic Oxygen Furnaces (BOF's) shall not exceed 11,000 net tons per day, averaged over any calendar month, and;

b. Total combined production of liquid steel from the BOF's shall not exceed 3,580,000 net tons per year.

7. The emissions of PM-10 from the BOF ESP stack for the total of all BOF processes (i.e., operations from the beginning of the charging process through the end of the tapping process) shall not exceed 60.0 lbs/hr and 0.225 lbs per ton of steel in process, pursuant to 35 Ill. Adm. Code 212.458(b)(23).

8. Visible emissions from any opening in the BOF shop (e.g., roof monitor) shall not exceed 20% on a 3 minute rolling average basis.

9a. The Permittee shall determine the opacity from the openings BOF shop on at least a weekly basis. Observations shall be conducted for at least an hour or the entire BOF cycle, whichever is greater.

b. The Permittee shall determine the opacity from the BOF ESP stack for at least one hour on any normal work day (i.e., Monday through Friday) that the continuous opacity monitor on the BOF ESP stack has an outage that exceeds two consecutive hours and is still down. The readings shall commence as soon as possible after the opacity monitor has been down for two consecutive hours. If meteorological conditions or lack of visibility preclude these observations from being conducted, then this shall be noted in the log book.

c. The opacity shall be determined in accordance with the observation procedures set out in 40 CFR Part 60, Appendix A, Method 9 including the requirement that readings be taken by a certified observer.

d. These determinations shall be recorded in a log book, which at a minimum shall include the date and time of observations, name and title of observer, individual opacity readings, calculated opacity so as to determine compliance with Section 212.123, and calculated opacity relative to 20% opacity on a three minute rolling average basis.

10. The Permittee shall follow the BOF operating procedures and requirements specified in attachment A. These requirements are designed to ensure proper operation of the BOF control system. These procedures shall be posted in the BOF pulpit (a.k.a., control room).

11. Flame suppression shall be used and maintained during the entire tapping process.

12a. The stack gas pulpit set point of the BOF ESP control system shall be set in accordance with the following, so as to establish sufficient particulate matter capture efficiency of the charging and primary hoods:

i. Set point requirements while only a single BOF vessel is in operation;

A. Minimum set point during charging process: 550,000 cfm;

B. Minimum set point during refining process: 650,000 cfm;

C. Minimum set point during tapping process: 200,000 cfm (until one minute after completing alloy addition);

ii. During dual operation of BOF vessels (a.k.a., overlapping BOF operation) the set point shall be set to establish the total draft necessary to control the corresponding portion of the process which is occurring on each vessel during the overlap. For example, minimum set point while charging at one vessel and tapping at the other would be equal to that necessary to establish a flow of 700,000 cfm (i.e., 550,000 + 150,000).

iii. Overlapping operations of the BOF vessels is allowed only as specified in operating permit application number 72080043.

iv. The BOF capture system shall be operated at the above minimum set points until and unless the Agency approves a lower minimum set point based on a demonstration that a better level of particulate matter control will occur, except for purposes of emissions testing as related to the set point.

b. The Permittee shall calibrate, operate, and maintain a continuous strip chart recorder of the ESP stack gas flow rate as measured by the stack gas flow meter during ESP use.

c. The Permittee shall record for each steel production cycle the various stack gas flow rates for each process (i.e., for each charge, each refine, each tap) of each steel production cycle. That is, the Permittee shall be able to distinguish the measured flow rate of stack gas during each production cycle.

d. The stack gas flow meter shall be calibrated on at least a quarterly basis.

13a. Within 270 days of the date issued of this permit, the Permittee shall install, calibrate, operate, and maintain a monitoring device that continually measures and records for each process (i.e., for each charge, each refine, each tap) of each steel production cycle the various exhaust ventilation rates or levels of exhaust ventilation through the main downcommer duct of the ESP emissions capture and transport system.

b. The monitoring system shall be designed to be used as a mechanism to ensure sufficient draft is maintained in the emissions capture hoods and transport ducts so as to maximize emissions capture and transport and minimize uncaptured emissions and emission leaks.

c. The monitoring system shall be operated, tested and maintained to ensure accurate and useful data.

d. The Agency may allow an equivalent system or method instead of the above monitoring system provided the Permittee demonstrates, and the Agency approves, that such system or method will ensure sufficient draft is maintained in the emissions capture hoods and transport ducts so as to maximize emissions capture and transport and minimize uncaptured emissions and emission leaks in an equivalent manner, and that such system or method can be installed and operated within the time period required for the monitoring system as stated in this permit.

14a. The Permittee shall visually inspect at least monthly all visible BOF vessel enclosures, hooding and ducts used to capture and transport emissions for the BOF ESP control system.

b. A log shall maintained of these inspections which includes observations of the physical appearance of the capture system and any noted deficiencies (e.g., the presence of any holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion).

c. Any leaks or areas otherwise noted to be in need of repair, shall be repaired as soon as practicable.

15a. The Permittee shall operate, maintain, and repair the BOF ESP in a manner that assures compliance with the conditions of this permit.

b. An adequate inventory of spare parts for the BOF ESP shall be maintained.

16. Written operating procedures for the BOF ESP shall be maintained and updated describing proper normal process and equipment operating parameters, monitoring and instrumentation for measuring control equipment operating parameters, control equipment inspection and maintenance practices, and the availability of spare parts from inventory, local suppliers and other sources.

17. The Permittee shall keep operating records, a maintenance log, and inspection log for the BOF ESP and associated control systems which includes the following:

a. Operating time of the BOF;

b. Operating time of the capture systems and performance parameters, including air flow and fan amperage through the fan motors, gas temperature at inlet to ESP, damper settings, and steam injection rate;

c. Operating time of the ESP and performance parameters, including voltage and amperage of each transformer/rectifier set, number of sections in use;

d. All routine and nonroutine maintenance performed, including dates and duration of outages, inspection schedule and findings, leaks detected, repair actions, and replacements.

18. Emissions from the BOF Shop shall not exceed the limits in attached Tables 2 and 5.

Note: For purposes of this permit, a BOF cycle is defined as the period from the beginning of the charging process through the end of the tapping process. The cycle is comprised of three main processes which are charging, refining, and tapping.

CONTINUOUS CASTING OPERATIONS

19. The continuous casting operations shall comply with 35 Ill. Adm. Code 212.450 and 212.458(b)(8).

20. Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5.

FUEL COMBUSTION

21. Total fuel usage for blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares shall not exceed the following limits:

    a. Natural Gas usage: 190 million ft^3 per month and 1,145 million ft3 per year;

    b. Blast Furnace Gas (BFG) usage: 30,800 million ft3 per month and 185,030 million ft3 per year;

    c. Fuel Oil usage: 60 thousand gallons per month and 365 thousand gallons per year.

22. Emissions from the fuel combustion units listed above shall not exceed the limits in Tables 4 and 5.

ON-SITE FUGITIVE DUST CONTROL

(Refer to Attachment B for a table which summarizes the required on-site fugitive dust roadway control measures and maps indicating the referred to road segments)

23. The Permittee shall immediately initiate and maintain the on-site fugitive dust control measures specified in this permit so as eliminate dust spillage on in-plant and out-of-plant roadways.

24a. The Permittee shall sweep or flush at least every day the paved access area below the BOF ESP where ESP dust collection bags are used, stored and transported.

b. The Permittee shall implement a housekeeping program for the non-roadway areas below and around the BOF ESP. This program shall, at a minimum, contain the following:

    i. The ground and other accessible areas where dust may gather shall be swept or cleaned at least every day;

ii. Cleaning shall be performed in such a manner as to minimize the escape of dust into the atmosphere;

iii. Dust collection bags shall be inspected at least daily for rips, tears, or insecure connection to the discharge chutes of the ESP hoppers;

iv. Dust collection bags shall be inspected after removal from, and connection to, the discharge chutes of the ESP hoppers;

v. Ripped or torn bags shall be taken out of service and transported as soon as practicable in a covered truck.

25. Fugitive emissions of particulate matter from any roadway or parking area shall not exceed an opacity of 5%, pursuant to 35 Ill. Adm. code 212.316(e)(1).

26a. UNPAVED ROADS: On unpaved roads that are part of normal traffic patterns as identified in attachment B (including roads B, C, E, N, F-F, and CS(2)) the Permittee shall apply a chemical dust suppressant at least three times a month, with the following exceptions:

i. Road segment G-G, which shall be sprayed at least quarterly;

ii. Road segments P, V, Z, D-D, E-E, and H, which shall be sprayed at least 4 times per month until paving is completed. Paving shall be completed on these roads no later than July 31, 1996;

iii. Road segment L, which shall be sprayed at least 4 times per month.

b. All other unpaved roads shall be treated as necessary.

c. Applications of suppressant may be less frequent than specified above if weather conditions, i.e., precipitation or temperature, interfere with the schedule for spraying, provided each such instance shall be recorded in accordance with the daily records for on-site fugitive dust control required by this permit.

27a. PAVED ROADWAYS AND AREAS: Paved roadways and areas shall be maintained in good condition.

b. On paved roadways and other areas, the Permittee shall sweep or flush as follows:

i. Road segments D, K, M, F, G, J, R, and O shall be swept or flushed at least daily;

ii. Road segments P, V, W, X, Z, D-D, E-E, and CS(1) shall be swept or flushed at least five days per week;

iii. Road segments S and T shall be swept or flushed at least every other day;

iv. Road segments A and H shall be swept or flushed at least once per month;

v. All gate areas leading from the Steelworks area shall be swept or flushed at least daily;

vi. All gate areas leading from the iron making area shall be swept or flushed at least five times per week.

28. The above on-site dust control measures shall be conducted to maximize their effectiveness by performing said measures when the roads or areas are not normally obstructed by parked vehicles and by preferentially using filter sweeping (e.g., Enviro-Whirl sweeper) for the gate areas, the roads and areas surrounding the BOF and BOF ESP, and other key areas.

29. The Permittee shall maintain daily records relative to the on-site fugitive dust control program which includes the following information as a minimum:

a. The date (and time for the gate areas) each road or area was treated;

b. The manner in which the road or area was treated (i.e., filter sweep, conventional sweep, suppressant spray or flush);

c. Detailed information for use of dust suppressant, including but not limited to the application rate, dilution ratio, type of suppressant used, and the number of gallons of suppressant applied;

d. Observations, if any, concerning the condition of the roadway, e.g., presence of parked vehicles, detection of potholes;

e. The amount of precipitation and temperature recorded for each day, and if determination was made to suspend application of suppressant, include name and title of person who made determination to suspend application and explanation;

f. Any and all suspensions or deviations from the designated control procedures, with date, description, and explanation for suspension of application.

OFF-SITE FUGITIVE DUST CONTROL

30. The Permittee or the Permittee's Agent shall sweep or flush the following Granite City street road areas:

a. At least weekly, the quarter mile segment of Madison Avenue in front of the 16th street gate (i.e., 1/8 of a mile in either direction);

b. At least weekly, segment of 20th street between Lee and Quincy roads;

c. At least monthly, segment of 20th street between Madison and Route 203 (a.k.a. Edwardsville Road).

PM-10 CONTINGENCY MEASURES

31. The Permittee shall comply with the additional control measures (e.g., PM-10 contingency plan) required by 35 Ill Adm. Code Part 212 Subpart U.

COMPLIANCE DETERMINATIONS

32a. Compliance with the daily limits of this permit shall be determined from a monthly total of the relevant daily data divided by the number of days in the month.

b. Compliance with the monthly limits of this permit (e.g., fuel usage) shall be determined by direct comparison of monthly data to the applicable limit.

c. i. Compliance with the annual limits of this permit shall be determined based on a calendar year.

ii. A. Compliance with the production limits in conditions 2(b) and 6(b) shall also be determined on a month by month basis by showing that the actual production of iron and steel from the plant did not exceed the scheduled rate of production for a month given in the most recent production schedule provided to the Agency that shows compliance with the following requirements.

B. If no production schedule is submitted to the Agency by the Permittee for a particular year, the scheduled monthly production of iron and steel shall be set at one twelfth of the annual production limits in conditions 2(b) and 6(b).

C. 1. The Permittee may submit a schedule for iron and steel production for each month of the calendar year. Such schedule shall provide the scheduled monthly iron and steel production for each month and the total of such scheduled production shall not exceed the annual production limits in conditions 2(b) and 6(b). This schedule shall be submitted each year no later than December 15th of the preceding year.

2. During the course of the year, the Permittee may submit a revised production schedule which accounts for actual production levels which were below that scheduled for the previous months, provided that in no case shall the scheduled production for prior months in such a revised schedule be lowered to less than actual production levels or raised. Such revised schedule shall be submitted to the Agency no later than 15 days

after the first day of the month for which scheduled production has been raised. Such schedule shall be accompanied by data on actual production in preceding months.

33a. Compliance with opacity limits and measurements of opacity shall be made by opacity readings taken in accordance with the observation procedures set out in 40 CFR Part 60, Appendix A, Method 9.

b. The Permittee shall have at least two employees or agents experienced in making opacity readings to the extent that it is reasonably possible to do so, who shall be able to make the opacity readings required by this permit.

34a. Blast furnace hot metal production shall be measured at the BOF hot metal transfer station, and adjusted by documented slag and iron losses.

b. BOF liquid steel production shall be initially measured by a scale equipped crane and adjusted based upon documented steel production analysis of the continuous casters.

c. BFG usage shall be calculated based on 0.05846 mmft^3 BFG generated per net ton of hot metal produced.

d. Natural gas usage shall be determined by metered volumes.

e. Fuel oil usage shall be determined by tank height differentials.

RECORD KEEPING

35. The Permittee shall keep records of the following items and such other items which may be appropriate to allow the Agency to review compliance:

a. Blast Furnace hot metal production (total combined daily, monthly and annual in tons), including documentation on iron and slag losses;

b. BOF liquid steel production (total combined daily, monthly and annual in tons), including documentation on adjustments made due to production analysis and losses;

c. Fuel usage as follows; Usage of natural gas and BFG (total combined million ft^3 per month and year, each) and fuel oil (total combined gallons/month and year) for the blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

36. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Agency and USEPA upon request. Any records retained in a computer shall be capable of being retrieved and

printed on paper during normal source office hours so as to be able to respond to an Agency request for records during the course of a source inspection.

STARTUP AND TESTING

37. The special conditions of this permit supplement the special conditions of any existing operating permits for this source, and supersede such conditions in cases where a conflict exists.

38. Operation at the increased production rates specified in this permit is allowed for 270 days from the date issued under this construction permit.

39a. The following tests shall be performed to demonstrate compliance with the conditions of this permit within 270 days from the date issued of this permit:

i. Blast Furnace testing: The emissions of particulate matter, volatile organic material, sulfur dioxide, nitrogen oxides, and the opacity from the blast furnace casthouse stack shall be measured. These tests shall be designed to verify compliance with 35 Ill. Adm. Code 212.445 and the requirements of this permit;

ii. Hot Metal Desulfurization testing: The emissions of particulate matter from the desulfurization baghouse shall be measured. These tests shall be designed to verify compliance with the requirements of this permit and 35 Ill. Adm. Code 212.446(b)(2);

iii. BOF testing: The emissions of particulate matter, carbon monoxide, and lead from the BOF ESP stack, and the opacity from both the BOF ESP stack and BOF Shop shall be measured. These tests shall be designed to verify compliance with 35 Ill. Adm. Code 212.446, 212.458 and the requirements of this permit;

iv. Fuel Combustion Units testing: The emissions of particulate matter from a representative boiler while burning blast furnace gas shall be measured. This test shall be designed to verify compliance with the requirements of this permit and the emission factor used (i.e., 2.9 lbs particulate emitted per mmcf BFG burned);

v. BFG generation testing: The amount of blast furnace gas generated ($mmft^3$) per ton of hot metal produced shall be determined. The Agency may waive this requirement for testing providing the Permittee submit a sufficient explanation of how BFG generation is determined with justification that such determination is appropriate for purposes of compliance determinations with this permit.

b. These tests shall be performed by an approved independent testing service during conditions which are representative of maximum emissions and at the maximum production rates allowed, or as close

to such rates as reasonable if the Permittee demonstrates to the Agency prior to testing that testing at such production rates within the time constraints of an Agency request to test is not practicable.

c. i. The following methods and procedures shall be used for the testing, unless another method is approved by the Agency: Refer to 40 CFR 60, Appendix A for USEPA test methods;

Location of sample points	USEPA Method 1
Gas flow and velocity	USEPA Method 2
Particulate Matter	USEPA Method 5
Sulfur Dioxide	USEPA Method 6
Nitrogen Oxides	USEPA Method 7
Opacity	USEPA Method 9
Carbon Monoxide	USEPA Method 10
Lead	USEPA Method 12

ii. All particulate measured shall be considered PM-10 unless emissions are tested by an appropriate USEPA test method for measurement of PM-10, as specified in 35 Ill. Adm. Code 212.110(e).

d. At least 60 days prior to the actual date of testing of the BOF, a written test plan shall be submitted to the Agency for review and approval. This plan shall be describe the specific procedures for testing the BOF, including as a minimum:

i. The persons who will be performing sampling and analysis and their experience with similar tests;

ii. The specific conditions under which testing will be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which operating parameters for the source and the emissions capture and control system will be determined;

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations;

iv. The test methods which will be used, with the specific analysis methods;

v. Any proposed use of an alternative test method, with detailed justification;

vii. The format and content of the Source Test Report.

e. The Agency shall be notified before these tests to enable the Agency to observe these tests. Notification for the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual date of the test. The Agency may at its discretion

accept notifications with shorter advance notice provided that the Agency will not accept such notifications if it interferes with the Agency's ability to observe testing.

f. The Final Report of these tests shall include as a minimum:

i. A tabular summary of results which includes:

- process weight rate and/or fuel usage rate
- production rate
- allowable emission limit
- measured emission rate
- determined emission factor
- compliance demonstrated - Yes/No
- other pertinent information (e.g., for the BOF, pulpit set point for each process of the BOF cycle - charging, refining, and tapping);

ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule;

iii. Detailed description of test conditions, including,

- pertinent process information (e.g. fuel or raw material consumption)
- control equipment information, i.e. equipment condition and operating parameters during testing;

iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration;

g. Copies of the Final Report for these tests shall be submitted to the Agency within 14 days after the test results are compiled and finalized and in no case later than upon the submittal of the operating permit application for this production increase.

h. Submittals of information shall be made as follows:

i. Notice of Test - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section;

ii. Final Report - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section.

Pertinent Addresses are:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Source Emission Test Specialist
Intercontinental Center
1701 1st Avenue
Maywood, Illinois 60153

Illinois Environmental Protection Agency
Division of Air Pollution Control
Regional Office
2009 Mall Street
Collinsville, Illinois 62234

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

REPORTING

40. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Agency's Compliance Unit in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the record keeping requirements, a copy of the relevant records, and a description of the exceedance or violation, cause of the exceedance, and efforts to reduce emissions and future occurrences. This report shall be sent to:

Illinois EPA
Bureau of Air
Compliance Unit (#39)
P.O. Box 19276
Springfield, Illinois 62794-9276

41. The Permittee shall submit the following additional information from the prior calendar year with the Annual Emissions Report, due May 1st of each year:

a. Iron and steel production (tons/month and tons/yr, each);

b. Natural gas and BFG usage (mmft3/month and mmft3/yr, each);

c. Fuel oil usage (thousand gallons/month and thousand gallons/yr, for each type of oil).

APPLICABILITY OF MAJOR SOURCE RULES

42a. As a consequence of the above conditions, this permit is issued based upon the following changes in emissions, as further described in Table 6, accompanying increased production as allowed by this permit:

i. The increases in emissions of lead and VOM are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration;

ii. The increase in emissions of NO_x are being accompanied by contemporaneous emission decreases provided by the shutdown of equipment and operations such that the net emissions change is

not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

iii. The increase in emissions of PM and PM-10 are being accompanied by contemporaneous emission decreases provided by additional road dust control and BOF capture and control such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

Also, the Permittee has agreed to provide further additional dust control consisting of the sweeping of Granite City public streets and housekeeping measures in the area below and surrounding the BOF ESP. Attachment C is a listing of the emission reductions provided by these control measures.

b. The increases in emissions of SO_2 and CO are significant under 40 CFR 52.21 - Prevention of Significant Deterioration (PSD). Accordingly, the project is considered a major modification and must comply with the requirements of PSD. These requirements include a demonstration of best available control requirements for affected SO2 and CO emission units, an analysis of air quality impacts, an analysis of the impacts of the project on visibility, vegetation's and soils, and the application and proposed permit must undergo a public participation. The Agency has determined that these additional requirements have been met.

c. The changes in emissions pertinent to this project are summarized as follows:

Units = tons/year

- Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	- 52.0	238.8	476.0	5,685	59.3	0.54

- Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

- Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

- Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

* Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

Explanatory Note:

PM	=	particulate matter = particulate;
PM-10	=	particulate matter less than or equal to 10 micrometers in size;
SO_2	=	sulfur dioxide;
NO_x	=	nitrogen oxides;
VOM	=	volatile organic material;
CO	=	carbon monoxide;
mm	=	million;
gr/dscf	=	grains per dry standard cubic foot;
acfm	=	actual cubic feet per minute;
mmcf	=	million cubic feet;
Mgal	=	thousands of gallons.

If you have any questions on this permit, please call Jim Ross at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:JRR:jar

cc: IEPA, FOS Region 3

COPY
Original Signed by
Donald E. Sutton, P.E.

Permit Application #95010001

TABLE 1

BLAST FURNACE OPERATIONS

Maximum Hot Metal Production = 3,165,000 net tons per year

1. Casthouse Baghouse (furnace tapping)- captured emissions ducted to baghouse, uncaptured emissions emitted through roof, other openings, etc.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0703	111.19
PM-10	0.0703	111.19
SO_2	0.2006	422.0
NO_x	0.0144	22.79
VOM	0.0946	149.68

2. Blast Furnace - uncaptured fugitives

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.031	49.06
PM-10	0.0155	24.53
SO_2	0.0104	21.94
NO_x	0.0007	1.14
VOM	0.0047	7.42

3. Blast Furnace Charging
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0024	5.17
PM-10	0.0024	5.17

4. Slag Pits

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00417	6.60
PM-10	0.00417	6.60
SO_2	0.0100	15.83

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TABLE 1 (cont.)

5. Iron Spout Baghouse- captured emissions controlled by iron spout baghouse.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.02548	40.32
PM-10	0.02548	40.32
SO_2	0.0073	13.89

6. Iron Pellet Screen
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00279	6.01
PM-10	0.00279	6.01

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TABLE 2

BOF SHOP

Maximum Liquid Steel Production = 3,580,000 net tons per year

1. BOF ESP Stack (charge, refine, tap)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.16	262.80
PM-10	0.16	262.80
NO_x	0.0389	69.63
VOM	0.0060	10.74
CO	8.993	16,097.47
Lead	0.1934 lbs/hr	1.26 tons/yr

2. BOF Roof Monitor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0987	176.71
PM-10	0.06614	118.40
Lead	0.0129 lbs/hr	0.08 tons/yr

3. Desulfurization and Reladling - Hot Metal Transfer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.03721	58.88
PM-10	0.03721	58.88
VOM	0.0010	1.58
Lead	0.0133 lbs/hr	0.09 tons/yr

4. BOF Additive System (i.e., fluxes) with Baghouse, a.k.a., BOF hopper baghouse

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00032	0.57
PM-10	0.00032	0.57

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TABLE 2 (cont.)

5. Flux conveyor & transfer pits, bin floor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0016	2.86
PM-10	0.0016	2.86

6. Hot metal charging ladle slag skimmer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0050	7.94
PM-10	0.0050	7.94

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TABLE 3

CONTINUOUS CASTING OPERATIONS

Maximum Liquid Steel Throughput = 3,580,000 net tons per year

1. Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00715	12.80
PM-10	0.00715	12.80

2. Deslagging Station and Material HS.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00355	6.35
PM-10	0.00355	6.35

3. Caster Molds - Casting

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.006	10.74
PM-10	0.006	10.74
NO_x	0.050	89.50

4. Casters Spray Chambers

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00852	15.25
PM-10	0.00852	15.25

5. Slab Cut-off

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0071	12.71
PM-10	0.0071	12.71

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TABLE 3 (cont.)

6. Slab Ripping

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00722	12.92
PM-10	0.00722	12.92

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TABLE 4

CERTAIN FUEL COMBUSTION UNITS

1. 10 boilers (#'s 1 - 10)
2. 2 boilers (#'s 11 - 12)
3. Blast Furnace Stoves A & B.
4. BFG Flares
5. Ladle Drying Preheaters (5 heaters).

Total combined fuel usage from affected units (i.e., Boilers, BF stoves, BF Flares, ladle drying preheaters)

	Maximum Usage ($mmft^3/Yr$)
NATURAL Gas (Total)	1,145
BFG	185,030
Fuel Oil	365 thousand gallons/yr

1. Natural Gas

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	5.1	2.92
PM-10	5.1	2.92
SO_2	0.6	0.34
NO_x	306	175.19
VOM	2.8	1.60
CO	40	22.90

2. BFG

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	2.9	268.29
PM-10	2.9	268.29
SO_2	6.65	615.22
NO_x	5.28	488.48
CO	13.7	1,267.46

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TABLE 4 (cont.)

3. Fuel Oil

Pollutant	Emission Factor (Lbs/Mgal)	Maximum Emissions (Tons/Yr)
PM	9.72	1.77
PM-10	9.72	1.77
SO_2	141.3	25.79
NO_x	55	10.04
VOM	0.28	0.05
CO	5.0	0.91
Lead	0.336	0.06 (waste oil)

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TABLE 5

LIMITS ON EMISSIONS FROM MAJOR PROCESSES AND ACTIVITIES

Units = tons/year

	PM	PM-10	SO_2	NO_x	VOM	CO	Lead
Blast Furnace Operations	218	194	474	24	157	--	--
BOF Shop	510	451	--	70	12	16,097	1.43
Continuous Casting Operations	71	71	--	90	--	--	--
Certain Fuel Combustion Units[A]	273	273	641	674	2	1,291	0.06
Roadways	27	27	--	--	--	--	--
Material Handling	2	2	--	--	--	--	--
	PM	PM-10	SO_2	NO_x	VOM	CO	Lead
TOTAL	1,101	1,018	1,115	858	171	17,388	1.49

[A] Blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

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TABLE 6

EMISSIONS SUMMARY

Units = tons/year

* Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

* Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

* Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

* Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

* Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

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ATTACHMENT A

PROCEDURES TO ENSURE PROPER OPERATION
OF BOF ESP CONTROL SYSTEM

1. The emissions control operator shall:

   a. Check on a regular basis and report to the emissions control foreman or melter:

      i. Any ESP fields down;

      ii. Any ESP fields in which the meter readings are showing no current or a fault;

   b. Check on a regular basis that doors on all hopper screws are closed;

   c. Inspect on a regular basis the fans and motors for unusual sounds and/or visual problems. Any abnormalities will be immediately reported to the melter or maintenance foreman for investigation.

2. The melter shall:

   a. Check on a regular basis and report to the emissions control foreman or the area electrician any fields which the pulpit precipitator field short indicators shows as having a short and is able to reset;

   b. Check on a regular basis and report to the emissions control foreman or the maintenance foreman any draft or fan problems;

   c. Check the ESP stack opacity monitor on a regular basis and initiate the following in the event that the stack opacity level, as determined by the opacity monitor, exceeds 30% opacity on a six minute average:

      i. Check the pulpit indicators for proper operation of the steam and spray water system. Report any problems to emission control foreman or maintenance foreman;

      ii. Check the stack gas pulpit set point for proper setting;

      iii. Call the emissions control operator who shall perform the following steps;

         A. Check the AVC operation and power level. Report any problems to electrical maintenance foreman or area electrician;

         B. Check to ensure that doors on all hopper screws are closed;

   d. Check oxygen blow rates and adjust, if necessary;

   e. Check hot metal chemistry;

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ATTACHMENT A (cont.)

f. A log shall be maintained of the above checks and any actions taken as a result.

3. The emission control foreman shall:

   a. Check on a regular basis the opacity monitor exceedances and trends. The control specialist shall be contacted to correct any problems;

   b. Check on a regular basis the draft rate set points;

   c. Check on a regular basis primary and secondary damper settings;

   d. Check on a regular basis ESP operation, including the following:

      i. Fields down;

      ii. Fields indicating shorts and unable to reset;

      iii. Hopper screw doors are closed;

   e. Check on a regular basis blow rates;

   f. Check on a regular basis spray water system operation;

   g. Check on a regular basis steam injection rate;

   h. Contact the area manager regarding electrical maintenance and to schedule the ESP repair work;

   i. Contact the area manger for mechanical maintenance to schedule the isolation of the ESP channel by closing the inlet and outlet gates of that chamber and opening the top hatches for entry into the chamber;

   j. Notify the emissions control operator and melter when isolation work begins;

   k. A log shall be maintained of the above checks and any actions taken as a result.

4. The crane operator shall use the following procedures, as appropriate, to minimize emissions and maximize emissions capture by the hoods:

   a. Use controlled pouring of the hot metal into the BOF vessel;

   b. Use careful positioning of the hot metal ladle with respect to the hood face and furnace mouth;

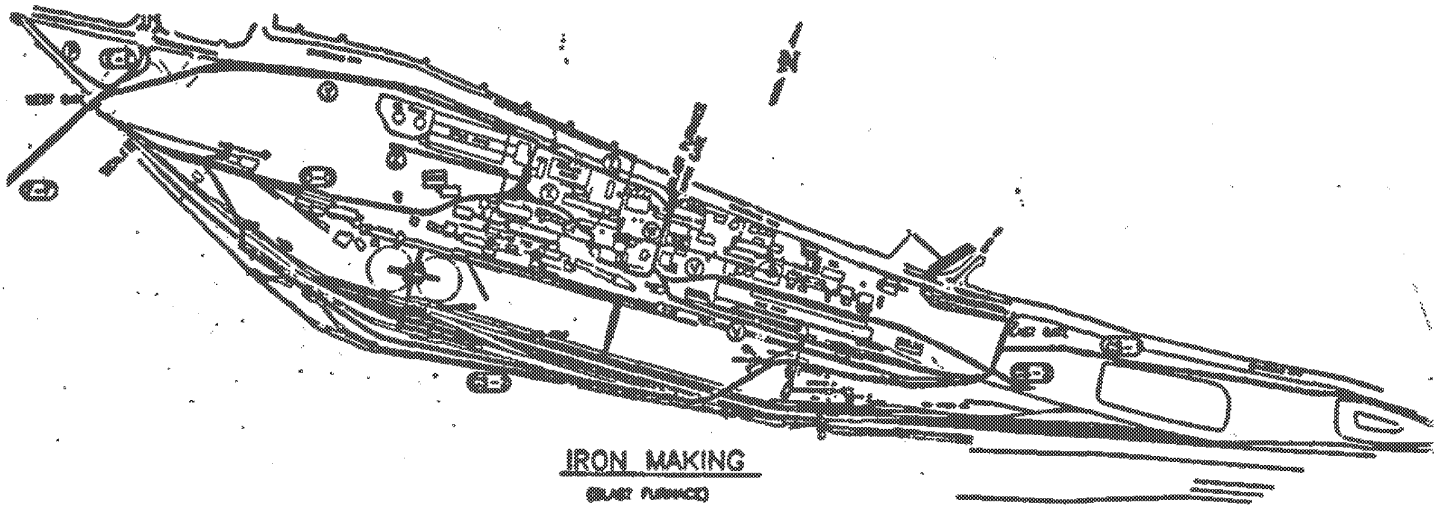
   c. Use the most beneficial furnace tilt angle;

   d. These procedures shall be posted in the crane operator booth.

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ATTACHMENT B

ON-SITE FUGITIVE DUST ROADWAY CONTROL MEASURES AND
MAPS SHOWING THE ROAD SEGMENTS



GRANITE CITY STEEL
GRANITE CITY, ILLINOIS

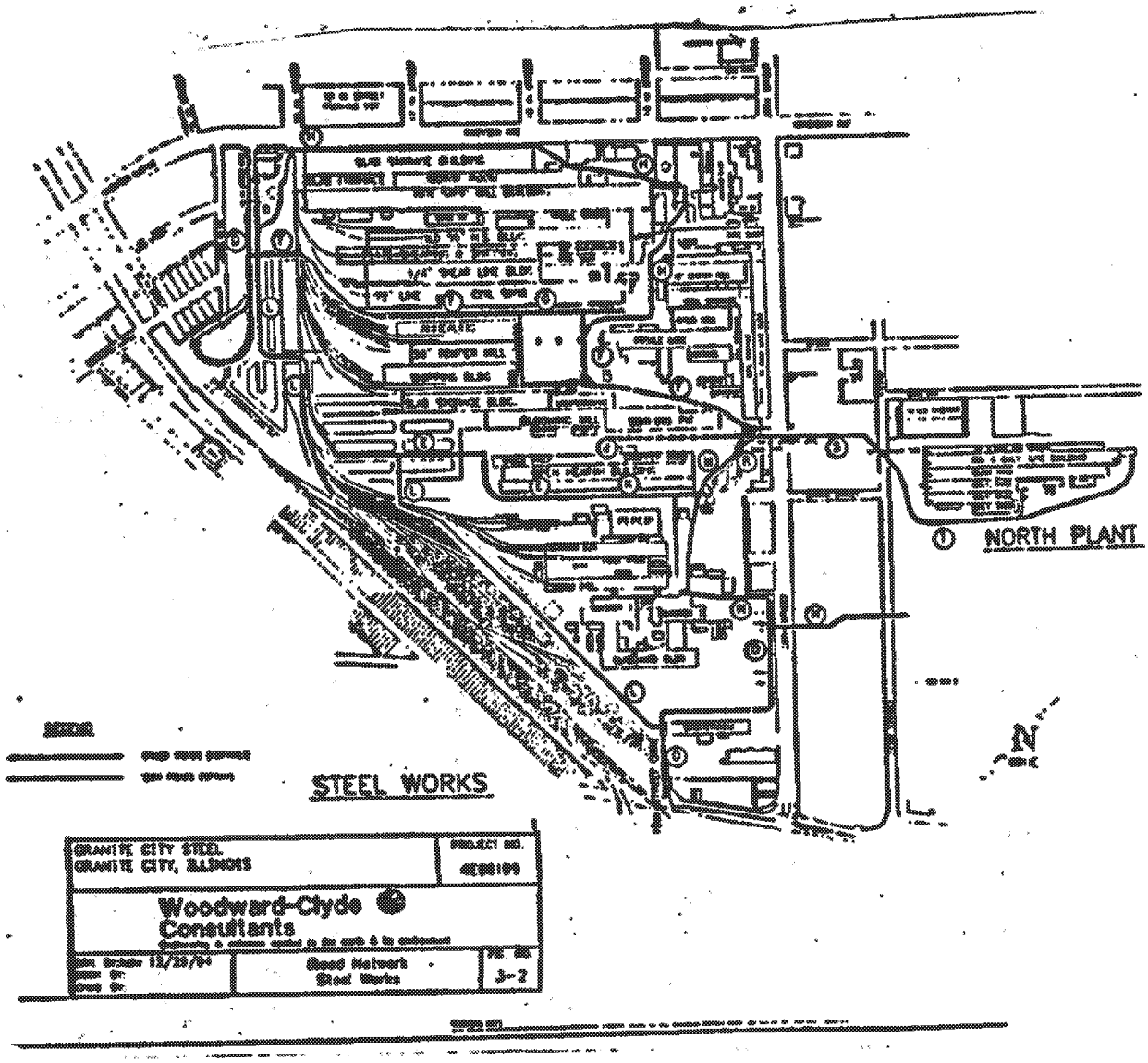
Woodward-Clyde Consultants

Road Network
Iron Making Area

3-3

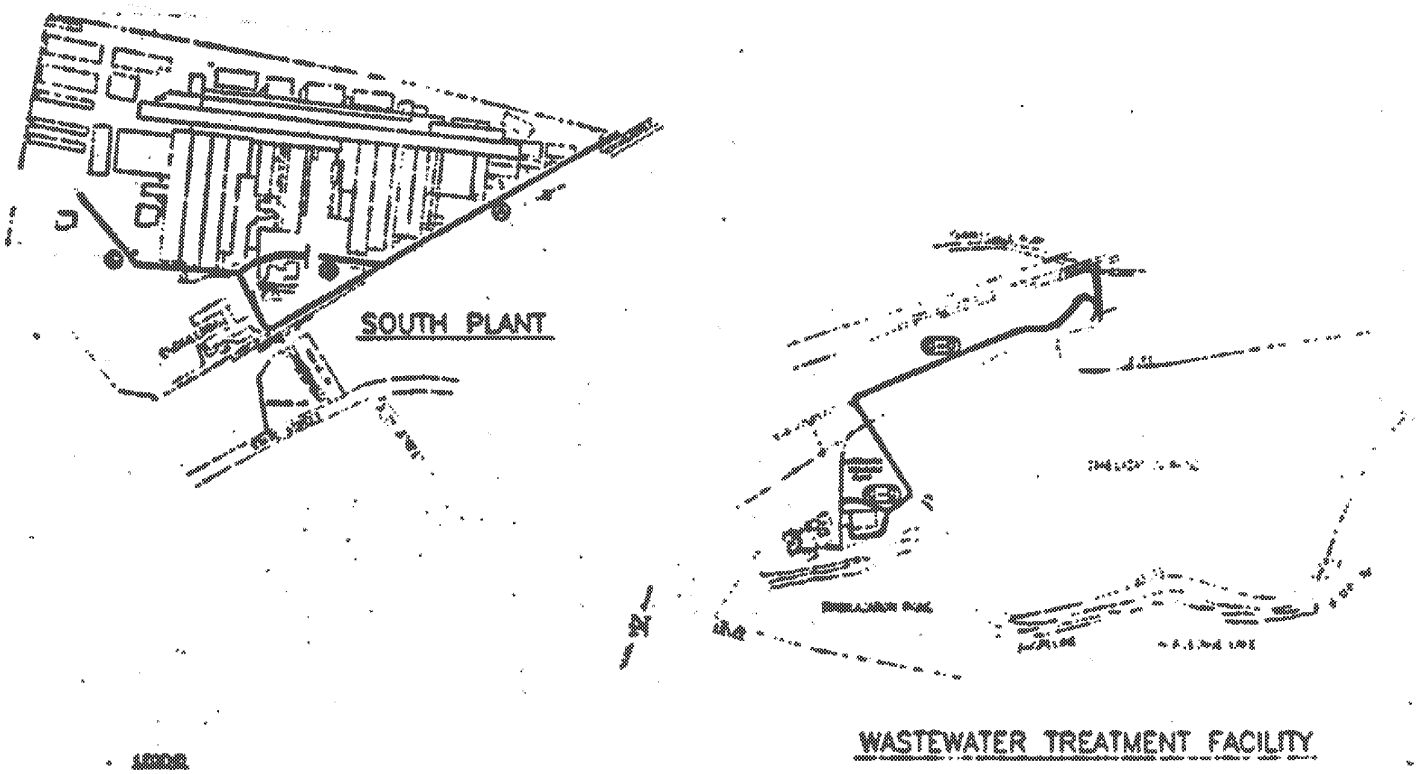
Permit Application #95010001

ATTACHMENT B (cont.)



Permit Application #95010001

ATTACHMENT B (cont.)



GRANITE CITY STEEL
GRANITE CITY, ILLINOIS

Woodward-Clyde Consultants

Sewer Network
South Plant & WWTP

J-1

Permit Application #95010001

ATTACHMENT C

CONTEMPORANEOUS REDUCTIONS IN THE
EMISSIONS OF PM-10

- Historic roadway emissions of 428 tons/yr, minus future potential roadway emissions of 27 tons/yr, equals a resulting reduction in roadway emissions of 401 tons/yr
- Historic material handling emissions of 17 tons/yr minus future potential material handling emissions of 2 tons/yr, equals a resulting reduction in material handling emissions of 15 tons/yr.
- Emission reductions resulting from the sweeping of city streets = 52 tons/yr*
- Emission reductions resulting from sweeping and housekeeping of areas below and around BOF ESP = 12 tons/yr*

Total reductions in the emissions of PM-10 as a result of the additional dust control measures required by Illinois' SIP and the special conditions of this permit = 480 tons/yr

* These are considered reasonable estimates of reductions and are subject to change upon further investigation of the actual reductions which will occur as a result of the control measures required by this permit.

JRR:jar

Appendix E – Copies of EPA Determinations

IN RE SHELL OFFSHORE, INC.

OCS Appeal Nos. 11-05, 11-06 & 11-07

ORDER DENYING PETITIONS FOR REVIEW

Decided March 30, 2012

Syllabus

This decision addresses petitions for review that challenge an Outer Continental Shelf ("OCS") Permit to Construct and Title V Air Quality Operating Permit ("Permit") Region 10 ("Region") of the U.S. Environmental Protection Agency ("EPA" or "Agency") issued to Shell Offshore, Inc. ("Shell"). The Region issued the Permit on October 21, 2011, pursuant to Clean Air Act ("CAA or "Act") section 328, 42 U.S.C. § 7627, and applicable regulations governing air emissions from OCS sources at 40 C.F.R. part 55, and pursuant to Title V of the CAA, 42 U.S.C. § 7661, and implementing regulations at 40 C.F.R. part 71, as well as applicable Alaska code and regulatory provisions. The Permit authorizes Shell to "construct and operate the Conical Drilling Unit *Kulluk* and associated air emission units and to conduct other air pollutant emitting activities" within Shell's lease blocks in the Beaufort Sea off the North Slope of Alaska. The Permit also provides for the use of an associated fleet of support ships, including icebreakers, supply ships, and oil spill response vessels in addition to the *Kulluk*.

The Board received three petitions for review of the Permit. One petition was filed by Resisting Environmental Destruction of Indigenous Lands ("REDOIL"), Alaska Wilderness League, Center for Biological Diversity, Natural Resources Defense Council, Northern Alaska Environmental Center, Oceana, Pacific Environment, Sierra Club, and the Wilderness Society (collectively, "REDOIL Petitioners"). A second petition was filed by the Inupiat Community of the Arctic Slope ("ICAS"). The third petition was filed by Mr. Daniel Lum.

The three petitions collectively raise seven issues for review: (1) Have Petitioners demonstrated that the Region clearly erred in establishing limitations to restrict the *Kulluk* drilling unit's potential to emit? (2) Have REDOIL Petitioners demonstrated that the Region clearly erred in declining to require prevention of significant deterioration ("PSD") increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process? (3) Did REDOIL Petitioners raise below their contention that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance? (4) Have REDOIL Petitioners demonstrated that the Region clearly erred in its ambient air exemption determination? (5) Have Petitioners demonstrated that the Region failed to satisfy its obligation to consider environmental justice under Executive Order 12898 and comply with applicable Board precedent? (6) Has ICAS demonstrated that the Region clearly erred or abused its discretion in providing forty-six days to comment on the draft permit and in denying ICAS's request for non-overlapping comment periods? (7) Has ICAS demonstrated that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review?

Held: The Board denies review of the Permit. Petitioners have not met their burden of demonstrating that review is warranted on any of the grounds presented.

(1) Limitations on Potential to Emit. The Board concludes that Petitioners have failed to demonstrate that the Region erred in establishing limitations to restrict the potential to emit nitrogen dioxide ("NO_2"), carbon monoxide ("CO"), sulfur dioxide ("SO_2"), and greenhouse gases ("GHGs") for emission units located on the *Kulluk* and on the Associated Fleet when operating within twenty-five miles of the *Kulluk* while it is an OCS source. The Region exercised its discretion and applied its technical expertise to establish practically enforceable source-wide emission limits that accommodate the substantial and unpredictable variations in emissions based on the atypical nature of Shell's operations. The Region explained in the record its rationale, based on the Region's technical expertise and applied in certain limited circumstances, for supplementing source-specific emission factors derived for most of the emission units or groups of emission units with either AP-42 emission factors, or emission factors derived from source test data Shell submitted to the Region in support of two separate, previously issued OCS PSD permits authorizing Shell to conduct exploratory activities in the Chukchi and Beaufort Seas using the *Discoverer* drillship.

(2) PSD Increment Consumption Analyses. The Board concludes that REDOIL Petitioners failed to demonstrate clear error in the Region's decision not to require PSD increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process. The Board holds that the Region provided a reasonable interpretation of CAA section 504(e), which imposes permitting requirements on "temporary" stationary sources, in its Response to Comments document. The Region determined that "PSD major sources are subject to NAAQS and increment in the permitting process, whereas non-PSD sources are subject only to the NAAQS unless the applicable minor source program also includes the [PSD] increment[s]." The Region concluded that the State of Alaska's minor source preconstruction program does not require permanent minor sources to demonstrate compliance with PSD increments as a condition of construction, so neither would it require such compliance of temporary minor sources. The Board finds REDOIL Petitioners' series of challenges to this basic analysis to be deficient in a variety of ways and therefore upholds the Region's decision.

(3) Ambient Air Quality Analysis. REDOIL Petitioners contend that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance. Upon examination of the administrative record, the Board concludes that REDOIL Petitioners failed to raise this issue during the comment period. This issue, therefore, was not preserved for review.

(4) Ambient Air Exemption Determination. The Board concludes that REDOIL Petitioners have not shown that the Region clearly erred in its decision to exempt the area within a 500 meter radius from the *Kulluk* – the area within the U.S. Coast Guard safety zone – from the definition of "ambient air." The Region, in its Response to Comments, provided a reasonable interpretation of the ambient air regulation and the Agency's longstanding interpretation of that regulation as applied in the OCS context.

(5) Environmental Justice Analysis. The Board concludes that ICAS and Mr. Lum have not demonstrated that the Region failed to satisfy its obligations to comply with Executive Order 12898 and applicable Board precedent. The Region conducted an environmental justice analysis that demonstrated compliance with the NAAQS and endeavored to include and analyze data that is germane to the environmental justice issues raised during the comment period. The Region appropriately determined that it was not required to analyze the mobile source emissions from vessels that operate outside of twenty-five miles from the *Kulluk* while it is an OCS source where, as here, the Title V permit did not address these

mobile source emissions, and the record lacked sufficient data for such an analysis. In addition, in the remaining arguments they put forth in their petitions, ICAS and Mr. Lum do not demonstrate how the Region's responses to comments are inadequate, overcome the particularly heavy burden a petitioner must meet to demonstrate that review of the Region's technical decisions is warranted, or raise issues within the Board's jurisdiction.

(6) Public Comment Period. The Board concludes that ICAS has failed to show that the Region clearly erred or abused its discretion in either selecting a 46-day comment period or in denying ICAS's request for nonconcurrent comment periods. The length of time the Region provided for comment on this permit was 16 days more than the 30-day regulatory minimum and 1 day more than the amount of time ICAS had specifically requested. ICAS's attempt to recalculate the length of the comment period based on an unexplained mathematical formula involving the number and lengths of other comment periods is unconvincing. Furthermore, ICAS has not pointed to any regulations that prohibit the Agency from issuing concurrent permits or that require – or even specify – a different comment period length when the Agency does issue concurrent permits. Finally, it is clear from the administrative record that the Region appropriately balanced conflicting considerations in deciding on the length of the comment period for this permit and in denying the request for nonoverlapping periods, and ICAS has failed to demonstrate otherwise.

(7) Public Hearing. The Board concludes that ICAS has failed to demonstrate that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review. ICAS has not shown that the Region violated any part 71 or 124 procedural regulation. Moreover, the alleged problems ICAS has identified do not, even if the Board were to find them to constitute a deficiency in some way, warrant Board review.

Before Environmental Appeals Judges Charles J. Sheehan, Kathie A. Stein, and Anna L. Wolgast.

Opinion of the Board by Judge Stein:

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I. *STATEMENT OF THE CASE*

A group of conservation petitioners ("REDOIL Petitioners"),[1] the Inupiat Community of the Arctic Slope ("ICAS"), and Mr. Daniel Lum each petitioned[2] the Environmental Appeals Board ("Board") to review an Outer Continental Shelf ("OCS") Permit to Construct and Title V Air Quality Operating Permit ("Permit") that U.S. Environmental Protection Agency ("EPA" or "Agency") Region 10 ("Region") had issued to Shell Offshore, Inc. ("Shell"). *See generally* OCS Permit to Construct and Title V Air Quality Operating Permit, Permit No. R10 OCS030000 (Oct. 21, 2011) (Administrative Record ("A.R.") J-2). The Region issued the Permit pursuant to Clean Air Act ("CAA" or "Act") section 328, 42 U.S.C. § 7627, and applicable regulations governing air emissions from OCS sources at 40 C.F.R. part 55, and pursuant to Title V of the CAA, 42 U.S.C. § 7661, and implementing regulations at 40 C.F.R. part 71, as well as applicable Alaska code and regulatory provisions.[3] *See* Permit at 6 (citing all relevant provisions).

The Permit authorizes Shell to construct and operate the *Kulluk* drilling unit and associated air emission drilling units in certain lease blocks within the Beaufort Sea. *Id.* at 1. The Region and Shell each filed a response to the petitions. Thereafter, both REDOIL Petitioners and ICAS filed motions requesting leave to file reply briefs. These motions are currently pending before the Board and are addressed below in Part V. The Board did not hold oral argument in this case. For the reasons discussed below, the Board denies review of the Permit.

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[1] REDOIL Petitioners include Resisting Environmental Destruction of Indigenous Lands ("REDOIL"), Alaska Wilderness League, Center for Biological Diversity, Natural Resources Defense Council, Northern Alaska Environmental Center, Oceana, Pacific Environment, Sierra Club, and The Wilderness Society.

[2] Mr. Lum's petition was designated as OCS Appeal No. 11-05, REDOIL Petitioners' petition was designated as OCS Appeal No. 11-06, and ICAS's petition was designated as OCS Appeal No. 11-07.

[3] The Permit was issued under multiple CAA and Alaska air pollution provisions because it is a consolidation of three air permits. According to the Region, it consolidated "an OCS/Title V permit under 40 CFR Parts 55 and 71 for operations beyond 25 miles of Alaska's seaward boundary; an OCS/minor permit for air quality protection under 40 CFR Part 55 and 18 Alaska Administrative Code (AAC) 50.502 and for owner requested limitations under 40 CFR Part 55 and 18 AAC 50.508 for operations within 25 miles of Alaska's seaward boundary; and an OCS/Title V permit under 40 CFR Part 55 and 18 AAC 50.326 for operations within 25 miles of Alaska's seaward boundary." Response to Comments for OCS Permit to Construct and Title V Air Quality Operating Permit Conical Drilling Unit Kulluk at 1 (A.R. J-3).

II. *ISSUES*

The Board has determined that the three petitions filed in this case, collectively, present the following seven issues for review:

A. Have Petitioners demonstrated that the Region clearly erred in establishing limitations to restrict the *Kulluk* drilling unit's potential to emit?

B. Have REDOIL Petitioners demonstrated that the Region clearly erred in declining to require PSD increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process?

C. Did REDOIL Petitioners raise below their contention that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance?

D. Have REDOIL Petitioners demonstrated that the Region clearly erred in its ambient air exemption determination?

E. Have Petitioners demonstrated that the Region failed to satisfy its obligation to consider environmental justice under Executive Order 12898 and comply with applicable Board precedent?

F. Has ICAS demonstrated that the Region clearly erred or abused its discretion in providing 46 days to comment on the draft permit and in denying ICAS's request for nonoverlapping comment periods?

G. Has ICAS demonstrated that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review?

III. *STANDARD OF REVIEW*

Under the part 124 procedural regulations, which apply to OCS permits,[4] the Board will not ordinarily review a permit unless it is based on a clearly erroneous finding of fact or conclusion of law, or involves a matter of policy or exercise of discretion that warrants review. 40 C.F.R. § 124.19(a); Consolidated Per-

[4] The OCS regulations direct the Agency to follow the applicable part 124 permit regulations in processing OCS permits. 40 C.F.R. § 55.6(a)(3). Accordingly, the part 124 permit appeal provision, 40 C.F.R. § 124.19, applies here. *See In re Shell Gulf of Mex., Inc.*, 15 E.A.D. 470, 476 (EAD 2012) [hereinafter *Shell Discoverer 2012*].

mit Regulations, 45 Fed. Reg. 33,290, 33,412 (May 19, 1980). The Board also applies this standard in reviewing Title V permits issued under part 71.[5] *See* 40 C.F.R. § 71.11(*l*)(1); *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 32-33 (EAB 2005). When analyzing permits, the Board is cognizant of the preamble to section 124.19, in which the Agency states that the Board's power of review "should be only sparingly exercised" and that "most permit conditions should be finally determined at the [permit issuer's] level." Consolidated Permit Regulations, 45 Fed. Reg. at 33,412; *accord In re Cardinal FG Co.*, 12 E.A.D. 153, 160 (EAB 2005); *see also Peabody*, 12 E.A.D. at 33 (applying these same principles in the context of a part 71 permit appeal).

The petitioner bears the burden of demonstrating that review is warranted. *See* 40 C.F.R. § 124.19; *id.* § 71.11(l)(1). To meet this burden, the petitioner must satisfy threshold pleading requirements including timeliness, standing, and issue preservation. *See* 40 C.F.R. § 124.19; *id.* § 71.11(l)(1); *In re Russell City Energy Ctr., LLC* ("*Russell City II*"), 15 E.A.D. 1, 10 (EAB 2010), *appeal docketed sub nom. Chabot-Las Positas Cmty. Coll. Dist. v. EPA*, No. 10-73870 (9th Cir. Dec. 20, 2010); *In re BP Cherry Point*, 12 E.A.D. 209, 216 (EAB 2005). For example, a petitioner seeking review must file an appeal of the permit decision within 30 days of service of the decision, and must have filed comments on the draft permit or participated in the public hearing. 40 C.F.R. § 124.19(a); *accord Russell City II*, 15 E.A.D. at 10. In addition, a petitioner must not only specify objections to the permit, but also explain why the permit issuer's previous response to those objections is clearly erroneous or otherwise warrants review. *See* 40 C.F.R. § 124.13 (requiring that all persons who believe a condition of a draft permit is inappropriate "must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period"); *id.* § 124.19(a) (stating that a petition for review to the Board "shall include * * * a demonstration that any issues being raised were raised during the public comment period"); *see also In re Avenal Power Ctr., LLC*, 15 E.A.D. 384, 387 (EAB 2011), *appeals docketed sub nom. Sierra Club v. EPA*, No. 11-73342 (9th Cir. Nov. 3, 2011), *El Pueblo Para el Aire y Agua Limpio v. EPA*, No. 11-73356 (9th Cir. Nov. 4, 2011); *BP Cherry Point*, 12 E.A.D. at 216-17. The petitioner's burden is particularly heavy in cases where a petitioner seeks review of an issue that is fundamentally technical or scientific in nature, as the Board will typically defer to a permit issuer's technical expertise and experience on such matters if the permit issuer adequately explains its rationale and supports its reasoning in the administrative record. *See, e.g., In re Dominion Energy Brayton Point, LLC*, 12 E.A.D. 490, 510 (EAB 2006); *Peabody*, 12 E.A.D. at 33-34; *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567-68 (EAB

[5] The part 71 regulatory language governing Title V permit appeals is nearly identical to the part 124 regulatory language governing review of other types of permits. *Compare* 40 C.F.R. § 71.11(l)(1) *with* 40 C.F.R. § 124.19; *see also Peabody*, 12 E.A.D. at 33 n.26.

1998), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3rd Cir. 1999); *see also In re Ash Grove Cement Co.*, 7 E.A.D. 387, 404 (EAB 1997).

When evaluating a permit appeal, the Board examines the administrative record prepared in support of the permit to determine whether the permit issuer exercised his or her "considered judgment." *Ash Grove Cement*, 7 E.A.D. at 417-18; *accord In re Cape Wind Assocs., LLC*, 15 E.A.D. 327, 330 (EAB 2011); *In re GSX Servs. of S.C., Inc.*, 4 E.A.D. 451, 454 (EAB 1992). The permit issuer must articulate with reasonable clarity the reasons supporting its conclusion and the significance of the crucial facts it relied upon when reaching its conclusion. *E.g., In re Shell Offshore, Inc. ("Shell 2007")*, 13 E.A.D. 357, 386 (EAB 2007) (citing *In re Carolina Light & Power Co.*, 1 E.A.D. 448, 451 (Act'g Adm'r 1978)); *Ash Grove Cement*, 7 E.A.D. at 417 (same). As a whole, the record must demonstrate that the permit issuer "duly considered the issues raised in the comments and [that] the approach ultimately adopted by the [permit issuer] is rational in light of all information in the record." *In re Gov't of D.C. Mun. Separate Storm Sewer Sys.*, 10 E.A.D. 323, 342 (EAB 2005); *accord In re City of Moscow*, 10 E.A.D. 135, 142 (EAB 2001); *NE Hub*, 7 E.A.D. at 568.

Finally, the Board endeavors to construe liberally objections raised by parties unrepresented by counsel (i.e., those proceeding pro se), so as to fairly identify the substance of the arguments being raised. *In re Sutter Power Plant*, 8 E.A.D. 680, 687 & n.9 (EAB 1999); *accord In re Shell Gulf of Mex., Inc. ("Shell Discoverer 2012")*, 15 E.A.D. 470, 478 (EAB 2012); *Russell City II*, 15 E.A.D. at 12. While the Board does not expect such petitions to contain sophisticated legal arguments or to utilize precise technical or legal terms, the Board nonetheless expects such petitions "to articulate some supportable reason or reasons as to why the permitting authority erred or why review is otherwise warranted." *Sutter*, 8 E.A.D. at 687-88 (citing *In re Beckman Prod. Servs.*, 5 E.A.D. 10, 19 (EAB 1994)).

IV. *SUMMARY OF DECISION*

For all of the reasons stated below, the Board concludes that: (a) Petitioners failed to demonstrate that the Region clearly erred in establishing limits to restrict the *Kulluk's* potential to emit; (b) REDOIL Petitioners failed to demonstrate that the Region clearly erred in declining to require PSD increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process; (c) REDOIL Petitioners failed to raise below their contention that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance; (d) REDOIL Petitioners failed to demonstrate that the Region clearly erred in its ambient air exemption determination; (e) Petitioners have not demonstrated that the Region's environmental justice analysis and related conclusions

failed to satisfy its obligation to comply with Executive Order 12898 and applicable Board precedent; (f) ICAS failed to demonstrate that the Region clearly erred or abused its discretion in providing 46 days to comment on the draft permit and in denying ICAS's request for nonoverlapping comment periods; and (g) ICAS failed to demonstrate that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review. Accordingly, the Board denies review of the Permit.

V. *RELEVANT PROCEDURAL AND FACTUAL HISTORY*

On July 22, 2011, the Region issued a draft permit consolidating three permits that regulated air pollution from Shell's proposed exploratory drilling operations on OCS lease blocks in the Beaufort Sea off the North Slope of Alaska, as authorized by the United States Bureau of Ocean Energy Management, Regulation and Enforcement ("BOEMRE").[6] The Region solicited public comment on the draft permit from July 22, 2011, through September 6, 2011. *See* Statement of Basis for Draft OCS Permit to Construct and Title V Air Quality Operating Permit ("Statement of Basis") at 10 (A.R. H-4). In addition, the Region held an informational meeting and public hearing on the draft permit on August 23, 2011, in Barrow, Alaska, and a separate public hearing on August 26, 2011, in Anchorage, Alaska. *Id.* at 11. All of the petitioners submitted comments on the draft permit. *See* E-mail from Daniel Lum to EPA Region 10 (Aug. 10, 2011) (A.R. I-31) [hereinafter Lum Comments]; E-mail from Alaska Wilderness League, Audubon Alaska, Center for Biological Diversity, Defenders of Wildlife, Earthjustice, Eyak Preservation Council, Greenpeace, National Wildlife Federation, Natural Resources Defense Council, Northern Alaska Environmental Center, Ocean Conservancy, Oceana, Pacific Environment, REDOIL, Sierra Club, The Wilderness Society, and World Wildlife Fund to EPA Region 10 (Sept. 6, 2011) (A.R. I-53) [hereinafter REDOIL Comments]; Letter from North Slope Borough, AEWC, and ICAS to Doug Hardesty, Air Permits Project Manager, EPA Region 10 (Sept. 6, 2011) (A.R. I-54) [hereinafter ICAS Comments]; *see also* Lum Petition at 1 (noting that he also provided comments at the public hearing).

On October 21, 2011, the Region issued the Permit. *See* Permit at 1. At the same time, the Region issued a response to both the written comments it had received on the draft permit and the oral comments that had been presented at the public hearings. *See generally* Response to Comments for OCS Permit to Construct and Title V Air Quality Operating Permit Conical Drilling Unit Kulluk ("RTC") (A.R. J-3); *see id.* at 2 (describing comments to which the document responded). The Permit authorizes Shell to conduct air pollutant emitting activities for the purpose of oil exploration with the conical drilling unit *Kulluk* on lease

[6] For a description of the three permits, *see supra* note 3.

blocks in the Beaufort Sea. The Permit provides for the use of an associated fleet of support vessels ("Associated Fleet"), such as icebreakers, oil spill response vessels ("OSRVs"), and a supply ship, in addition to the *Kulluk*.

The Board received three timely petitions for review of the Permit: one from Mr. Lum, one from REDOIL Petitioners, and one from ICAS. The Region and Shell each filed a single response to those petitions. ICAS and REDOIL Petitioners each filed motions requesting leave to file reply briefs and attached their proposed reply briefs. Shell filed an opposition to the motions for leave to file replies. Before addressing the issues raised by the petitions, the Board first considers whether it is appropriate to grant Petitioners' motions.

A petitioner seeking leave to file a reply brief in an appeal of a new source review ("NSR") permit issued pursuant to the CAA, such as the OCS Permit at issue here, must state "with particularity the arguments to which the Petitioner seeks to respond and the reasons the Petitioner believes it is both necessary to file a reply to those arguments * * * and how those reasons overcome the presumption in the Standing Order."[7] *Shell Discoverer 2012*, 15 E.A.D. at 481 (citing Order Governing Petitions for Review of Clean Air Act New Source Review Permits 3 (Apr. 19, 2011) ("Standing Order"), *available at* http://www.epa.gov/eab (click on Standing Orders)).

Upon consideration of Petitioners' motions to file reply briefs and proposed reply briefs, the Board finds that only two select issues within REDOIL Petitioners' and ICAS's reply briefs meet the high threshold required to overcome the presumption against reply briefs that the Board applies in NSR appeals. *See* Standing Order at 3. In particular, in its reply brief, ICAS responds to arguments concerning ICAS's challenge to the public hearing procedures that the Region advances for the first time in the response brief. ICAS could not have responded to these particular arguments prior to the Region's response because a portion of the Region's rationale in its response brief does not appear in the administrative record. In addition, both ICAS and REDOIL Petitioners assert that the Region referenced for the first time in its response a decision by the Administrator as support for the Region's rationale that the Agency has previously concluded that rolling emission limits accompanied by prescribed emission factors and appropriate monitoring and recordkeeping sufficiently restrict a source's potential to emit. *See* Region Response at 17 (citing *In re Pope & Talbot, Inc.*, Petition No. VIII-2006-04 (Adm'r 2007) (A.R. B-24)). ICAS and REDOIL Petitioners did not have an op-

[7] In April 2011, the Board issued a standing order in which it adopted certain procedures intended to facilitate expeditious resolution of petitions requesting review of permits issued under the CAA NSR program, including OCS permits. *See* Standing Order at 1 n.2; *see also* 40 C.F.R. § 124.19. Among other things, the Board will apply a presumption against the filing of reply briefs and sur-replies in NSR appeals. *See* Standing Order at 3. However, the Board maintains discretion to modify these procedures as appropriate on a case-specific basis. *Id.* at 6.

portunity to review the Administrator's decision in the context of this appeal or to analyze its relevance to the Region's stated rationale until the Region cited it for support in its response brief. Accordingly, the Board grants, in part, ICAS's and REDOIL Petitioners' motions for leave to file a reply brief. Thus the Board, in reaching its conclusions set forth in this order, has considered the portions of ICAS's reply brief and REDOIL Petitioners' reply brief that address the public process for the permit and the Region's inclusion of the *Pope & Talbot* decision as support for the Region's PTE decisions. *See* ICAS Reply at 3, 6-7; REDOIL Petition at 9-10. The Board denies REDOIL Petitioners' and ICAS's motions for leave to file a reply brief with respect to all other issues.[8]

The Board analyzes the parties' arguments and sets forth its determinations below.

VI. *ANALYSIS*

A. *ICAS and REDOIL Petitioners Have Not Demonstrated That the Region Clearly Erred in Establishing Limitations to Restrict the Kulluk Drilling Unit's PTE*

ICAS and REDOIL Petitioners both challenge the Region's determination of the *Kulluk's* potential to emit ("PTE") and argue that the Region should require Shell to obtain a preconstruction prevention of significant deterioration ("PSD") permit. They complain that the PTE restrictions Shell requested and the Region included in the permit to ensure that the *Kulluk* remains a synthetic minor source for nitrogen oxides ("NO_x"), carbon monoxide ("CO"), greenhouse gases ("GHGs"), and sulfur dioxide ("SO_2") are practically unenforceable.[9] The Region counters that the restrictions it imposed in the permit that reduce Shell's emissions below the PSD threshold levels for all criteria pollutants are practically enforceable and constitute fundamentally technical decisions that are consistent with CAA statutory and regulatory authority as well as Agency guidance and past practice. This PTE question is central to the Board's analysis because the Region uses the potential to emit to determine which provisions of the CAA, including both the Title V permit requirements and the PSD preconstruction permit requirements, apply to the *Kulluk*. The question the Board must resolve, then, is whether the restrictions the Region included in the permit to limit the *Kulluk's* PTE are both

[8] The Board notes that Mr. Lum attempted to file by e-mail a request to file a reply brief and a request for oral argument. *See* E-mail from Daniel Lum to Eurika Durr, Clerk of the Board, Environmental Appeals Board, U.S. EPA (Nov. 4, 2011 6:18 pm EDT). The Board denies Mr. Lum's requests.

[9] While ICAS challenges the Region's PTE limitations for all of these pollutants, REDOIL Petitioners only challenge the Region's PTE limitations with respect to NO, and CO. *See* ICAS Petition at 10-28; REDOIL Petition at 9-14.

practically enforceable and reasonable in light of the applicable statutory and regulatory authorities as well as Agency guidance and practice, and whether the Region provided adequate support for its decisions in the administrative record.

Before addressing the parties' arguments, a brief review of the relevant statutory and regulatory authorities is warranted.

1. *Statutory and Regulatory Context*

a. *CAA Section 328 and OCS Air Regulations*

Section 328 of the CAA, 42 U.S.C. § 7627, establishes air pollution controls for OCS sources[18] and requires OCS sources to "attain and maintain Federal and State ambient air quality standards" and to comply with the PSD provisions contained in CAA Title I, part C. EPA promulgated the Outer Continental Shelf Air Regulations, 40 C.F.R. part 55, to implement CAA section 328 and established within part 55 "the air pollution control requirements for OCS sources and the procedures for implementation and enforcement of the requirements." 40 C.F.R. § 55.1.

Section 328(a)(1), 42 U.S.C. § 7627(a)(1), also requires that, for OCS sources located within 25 miles of a state's seaward boundary, the requirements shall be the same as would apply if the source were located in the corresponding onshore area ("COA"), including, but not limited to, state and local requirements for emission controls, emission limitations, offsets, permitting, monitoring, testing, and reporting. As the Board has explained before, "OCS sources must obtain

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[18] Section 328 defines an OCS source as follows:

> The terms "Outer Continental Shelf source" and "OCS source" include any equipment, activity, or facility which –
>
> (i) emits or has the potential to emit any air pollutant,
>
> (ii) is regulated or authorized under the Outer Continental Shelf Lands Act [43 U.S.C. § 1331 et seq.], and
>
> (iii) is located on the Outer Continental Shelf or in or on waters above the Outer Continental Shelf.
>
> Such activities include, but are not limited to, platform and drill ship exploration, construction, development, production, processing, and transportation. For purposes of this subsection, emissions from any vessel servicing or associated with an OCS source, including emissions while at the OCS source or en route to or from the OCS source within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.

CAA § 328(a)(4)(C), 42 U.S.C. § 7627(a)(4)(c).

a preconstruction permit from either EPA or an EPA-delegated agency if the OCS source is located within twenty-five miles of a state's seaward boundary and is subject to either federal or state requirements listed in 40 C.F.R. §§ 55.13 or 55.14."[11] *Shell 2007*, 13 E.A.D. at 365 (citing 40 C.F.R. §§ 55.6(b)(1), 55.11 and CAA § 328(a)(3), 42 U.S.C. § 7627(a)(3)). The Agency has retained the authority to implement and enforce section 328 in the OCS off the coast of Alaska as opposed to delegating that authority to the state. Accordingly, as mentioned above, Shell submitted its permit applications to the Region, and the procedural rules contained at 40 C.F.R. part 124 apply. 40 C.F.R. § 55.6(a)(3).

Because requirements for these OCS sources are based on onshore requirements, which may change, section 328(a)(1) and the corresponding regulations in part 55 require EPA to update the OCS requirements as necessary to maintain consistency with onshore requirements. *See* CAA § 328(a)(1), 42 U.S.C. § 7627(a)(1); 40 C.F.R. §§ 55.6(b)(2), 55.12; *see also Shell 2007*, 13 E.A.D. at 364 & n.6. In response to Shell's December 10, 2010, notice of intent submitted to the Agency pursuant to 40 C.F.R. § 55.4, the Agency first proposed in the Federal Register a consistency update on February 10, 2011, and later published the final consistency update on June 27, 2011, subsequent to a public notice and comment period. *See* Outer Continental Shelf Air Regulations Consistency Update for Alaska, 76 Fed. Reg. 37,274 (June 27, 2011) (codified at 40 C.F.R. § 55.14(e) & appx. A); Statement of Basis at 17. This most recent consistency update incorporated, except where specifically noted, Alaska Administrative Code title 18, articles 1 through 5 and article 9, into part 55. 76 Fed. Reg. at 37,279-80; Statement of Basis at 17. In particular, articles 3 and 5 establish the minor source and major source permitting requirements with which the *Kulluk* must comply. *See Shell 2007*, 13 E.A.D. at 364 & n.6.

In addition, because the permit authorizes the *Kulluk* to operate on a group of lease blocks located both within 25 miles and beyond 25 miles of the state's seaward boundary, the permit conditions that refer to lease blocks wholly or partially located beyond 25 miles of the seaward boundary are designated as "outer

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[11] Section 55.13 states, among other things, that the PSD program applies to OCS sources located within 25 miles of a state's seaward boundary whenever the OCS source requires construction of a new major stationary source or a modification at an existing major source and the COA is classified under the PSD program as in attainment or unclassifiable. 40 C.F.R. § 55.13(d)(1) ("40 C.F.R. [§] 52.21 shall apply to OCS sources [l]ocated within 25 miles of a state's seaward boundary if the requirements of 40 C.F.R. [§] 52.21 are in effect in the COA."); *see also Shell 2007*, 13 E.A.D. at 364.

Section 55.14 incorporates by reference regulatory requirements that states which border the OCS in the Pacific, Atlantic, and Arctic Oceans and the Gulf of Mexico have promulgated to meet the national ambient air quality standards ("NAAQS"). 40 C.F.R. § 55.14(d); CAA § 328(a)(1), 42 U.S.C. § 7627(a)(1) (defining the geographic scope of EPA authority to regulate air pollution from OCS sources). These state regulations are known as state implementation plans ("SIPs") and are created pursuant to CAA § 110, 42 U.S.C. § 7410.

OCS." and conditions that refer to lease blocks wholly or partially located within 25 miles of the seaward boundary are designated as "COA." Permit at 9 (noting that conditions identified with "COA" are those that apply on the "inner OCS," within 25 miles of the state's seaward boundary, and that all other conditions not identified as "COA" or "outer OCS" apply to lease blocks on both the inner and outer OCS); *see also* Statement of Basis at 7.

b. *The PSD Program and PTE*

The PSD program is a preconstruction NSR program that applies to areas designated as either in attainment with the national ambient air quality standards ("NAAQS")[12] or unclassifiable and requires new major stationary sources[13] to limit their impact on ambient air quality by obtaining a PSD permit before construction begins. CAA §§ 160-169, 42 U.S.C. §§ 7470-7479; 40 C.F.R. § 52.21(a)(2).

A source's PTE relates to its inherent ability to emit air pollutants. *Shell 2007*, 13 E.A.D. at 365; *Peabody*, 12 E.A.D. at 30. Under the PSD program, a permitting authority must determine a source's PTE to identify which sources are "major sources" subject to regulation under the applicable PSD requirements, making PTE a technical determination that "is jurisdictional in nature." *Ala. Power Co. v. Costle*, 636 F.3d 323, 352 (D.C. Cir. 1979), *quoted in Peabody*, 12 E.A.D. at 30; *see also* CAA § 165(a), 42 U.S.C. § 7475(a) (requiring a PSD permit for any "major emitting facility"); *Shell Discoverer 2012*, 15 E.A.D. at 515 n.58. The regulations that implement the PSD program define PTE as:

[12] The NAAQS are maximum ambient air concentrations for specific pollutants that EPA has determined are necessary to protect public health and welfare. *See* CAA §§ 108(a)(1)(A), 109, 42 U.S.C. §§ 7408(a)(1)(A), 7409; 40 C.F.R. § 50.4-.12.

[13] EPA regulations define a major stationary source as any of certain specifically listed stationary sources that emit or have a potential to emit 100 tons per year ("tpy") or more of any regulated NSR pollutant, *see* 40 C.F.R. § 52.21(b)(50), or any other stationary source that emits, or has the potential to emit, 250 tpy or more of a regulated NSR pollutant. 40 C.F.R. § 52.21(b)(1)(i)(a)-(b); *accord* CAA § 169(1), 42 U.S.C. § 7479(1) (defining a "major emitting facility" in the same way).

Alaska regulations, which incorporate large parts of the federal PSD regulations into title 18 of the Alaska Administrative Code, provide that a new PSD permit is required prior to actual construction of a new major stationary source. Alaska Admin. Code tit. 18, § 50.040 (adopting federal standards by reference); *id.* §§ 50.302(a)(1), 50.306. The Alaska regulations also define a major stationary source as any of certain specifically listed stationary sources that emit or have a potential to emit 100 tpy or more of any regulated NSR pollutant, or any other stationary source that emits, or has the potential to emit, 250 tpy or more of a regulated NSR pollutant. *Id.* § 50.990(52) (incorporating by reference definition of major stationary source from 40 C.F.R. § 51.166(b)(1)); *accord* Alaska Stat. § 46.14.990 (same).

> [T]he maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

40 C.F.R. § 52.21(b)(4).[14] In sum, PTE reflects a source's maximum emissions capacity considering the application of any emission control equipment, or other capacity-limiting restrictions, that effectively and enforceably limit emissions capacity. *Shell 2007*, 13 E.A.D. at 366; *Peabody*, 12 E.A.D. at 31 (citing Part 71 Rulemaking, 61 Fed.Reg. 34,202, 34,212 (July 1, 1996)).

Alaska regulations require that, under certain circumstances, a stationary source with a PTE of less than 250 tons per year ("tpy") obtain a minor source permit. Alaska Admin. Code tit. 18, § 50.502. Specifically in terms of the *Kulluk's* operations, Alaska regulations require a minor source permit prior to the construction of a new stationary source with the potential to emit more than 40 tpy of NO_x. *Id.* § 50.502(c)(1)(B). Thus, as the Board noted in *Shell 2007*, under the Alaska PSD program, a new stationary source that has a PTE between 40 and 250 tpy of NO_x must obtain a minor source permit before commencing construction, and a stationary source with a PTE greater than 250 tpy of NO_x must obtain a major source permit. 13 E.A.D. at 366.

A source that would otherwise exceed the applicable PSD major source threshold of 250 tpy of any regulated NSR pollutant may, as in this instance, seek to avoid regulation as a major source under the PSD program by requesting that the permitting authority impose enforceable permit restrictions on the source's PTE. *Shell* 2007, 13 E.A.D. at 366, *cited in* RTC at 20; *see also Peabody*, 12 E.A.D. at 26 & n.11, 31. A Title V permit may function as a vehicle for a permitting authority to establish enforceable permit limits that restrict the source's potential to emit air pollutants to a level below the PSD major source threshold, in this instance 250 tpy, allowing the source to qualify instead as a "synthetic minor" source.[15] *Peabody*, 12 E.A.D. at 31 & n.21.

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[14] The OCS regulations define the term "potential emissions" almost identically to the PTE definition in part 52, with the exception of first sentence, which instead states that "[p]otential emissions means the maximum emissions of a pollutant from an OCS source." 40 C.F.R. § 55.2.

[15] EPA guidance defines the term "synthetic minor" as "air pollution sources whose maximum capacity to emit air pollution under their physical and operational design is large enough to exceed the

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If a source accepts limitations that restrict its potential to emit air pollutants to a level below the PSD threshold, that source will be a synthetic minor source for purposes of the PSD program and will therefore not be subject to PSD permitting requirements "unless future facility modifications increase emission capacity enough to exceed the PSD major source threshold." *Id.* at 31-32. As the Board noted in *Peabody*, in order for a capacity restriction to be cognizable as a PTE limit, it must be practically enforceable, which Agency guidance has interpreted to mean that:

> [T]he permit's provisions must specify: (1) a technically accurate limitation and the portions of the source subject to the limitation; (2) the time period for the limitation (hourly, daily, monthly, and annual limits such as rolling annual limits); and (3) the method to determine compliance including appropriate monitoring, recordkeeping, and reporting.

12 E.A.D. at 32 (quoting Memorandum from John Seitz, Dir., Office of Air Quality Planning & Standards, U.S. EPA, to EPA Reg'l Air Div. Dirs., *Options for Limiting the Potential to Emit (PTE) of a Stationary Source Under Section 112 and Title V of the Clean Air Act* 5-6 (Jan. 25, 1995) [hereinafter *Options for Limiting PTE*] (A.R. B-9)).

In this instance, the pre-permit PTE for units located on the *Kulluk*, and on the Associated Fleet when operating within 25 miles of the *Kulluk* while it is an OCS source,[16] exceeded applicable PSD thresholds for NO_x, CO, SO_2, and GHGs. Statement of Basis at 24-25 & tbl. 2-1.[17] To avoid exceeding the PSD major

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major source threshold but [is] limited by an enforceable emissions restriction that prevents this physical potential from being realized." Memorandum from John Seitz, Dir., Office of Air Quality Planning & Standards, U.S. EPA, & Eric Schaeffer, Dir., Office of Regulatory Enforcement, U.S. EPA, *Potential to Emit Transition Policy for Part 71 Implementation in Indian Country* 2 n.2 (Mar. 7, 1999), *quoted in Shell Discoverer 2012*, 15 E.A.D. at 515-16 n.59, and *Peabody*, 12 E.A.D. at 31 n.21.

Alaska regulations refer to such a limitation as an owner requested limit ("ORL"), which can be used to "avoid one or more permit classifications * * * at a stationary source that will still be subject to at least one permit classification; a limitation approved under an ORL is an enforceable limitation for the purpose of determining * * * a stationary source's potential to emit." Alaska Admin. Code tit. 18, § 50.508(5).

[16] The permit states that the *Kulluk* will be an OCS source at any time it is attached to the seabed at a drill site by at least one anchor. Permit at 8; Statement of Basis at 17, 19-20 (A.R. B-4).

[17] The primary emission sources on the *Kulluk* and the Associated Fleet are internal combustion engines that consume diesel fuel. Statement of Basis at 9, 12-14. Incinerators, heaters, boilers, and seldom used sources on the *Kulluk* and the Associated Fleet also emit pollution but to a far lesser extent. *Id.*

source thresholds, Shell requested that the Region include in the permit practically enforceable restrictions that will reduce the *Kulluk's* PTE below PSD threshold levels for each of the four pollutants. *See* Letter from Susan Childs, Alaska Venture Support Integrator Manager, Shell Offshore Inc., to Doug Hardesty, EPA Region 10, attach. 2 (Apr. 29, 2011) (describing Shell's proposed restrictions and how they would affect emissions) (A.R. E-17). The final permit authorizing the *Kulluk* to operate within the Beaufort Sea contains source-wide emission limits, operational restrictions, and monitoring, recordkeeping and reporting requirements intended to ensure that the *Kulluk* can operate as a synthetic minor source. Permit Conditions D.1-D.4.

With this framework in mind, the Board now turns its attention to Petitioners' arguments presented in these appeals.

2. *The Region Did Not Clearly Err in Establishing Source-Wide Emission Limits to Restrict PTE for NO_x and CO*

The Permit restricts emissions from the *Kulluk* and the Associated Fleet to no more than 240 tpy of NO_x and no more than 200 tpy of CO.[18] Permit Conditions D.4.1, D.4.2. For both pollutants, the PTE limits are determined on a rolling 365-day basis by calculating emissions for each day and adding the emissions calculated for the previous 364 days. *Id.* For both NO_x and CO, daily emissions from each emission unit or group of emission units "shall be determined by multiplying the appropriate emission factor (lb/unit) specified in Tables D.2.1 – D.2.2 (until a test-derived emission factor has been determined according to Permit Condition E.2) by the recorded daily operation rate (units/day) and dividing by 2000 lb/ton." *Id.* The Region further explained that "[c]ompliance with the emissions limits for NO_x and CO is determined by applying the relevant emission factor to the amount of fuel combusted by each emission unit (or hours of operation for incinerators)." RTC at 29. The Permit also includes conditions that require source-wide recordkeeping and monitoring to ensure that Shell complies with the source-wide limits. Permit at 56-61 (including operations and fuel monitoring in Permit Condition F.2 as well as selective catalytic reduction ("SCR") and oxida-

[18] ICAS asserts that the Region should include a 5-10% buffer zone between the PSD threshold emissions level of 250 tpy and the *Kulluk's* restricted PTE, and that the NO_x emission limit of 240 tpy does not provide this. ICAS Petition at 15 (citing a comment letter from Region 9 to the Nevada Division of Environmental Protection in which Region 9 "encourage[d] a 5-10% buffer between the permitted emission limits and the federal threshold" for a permit that established a CO synthetic minor limit of 249 tpy). However, the 240 tpy emission limit for NO_x contained in the current Permit represents a 4% buffer between the synthetic minor limit and the PSD threshold emission level of 250 tpy, which is ten times larger than the 0.4% buffer between a 249 tpy emission limit and the PSD threshold of 250 tpy contained in the Nevada permit. The Board agrees with the Region that Congress established specific thresholds to determine when a source would be considered major for purposes of PSD review. *See* RTC at 30. The buffer that ICAS requests is neither a legal requirement nor an established Agency policy, and thus the Region appropriately declined ICAS's request.

tion catalyst ("OxyCat") control device monitoring in Permit Conditions F.3 – F.4).

REDOIL Petitioners and ICAS make several challenges to the Region's decision to restrict the *Kulluk's* PTE for NO_x and CO using source-wide emission limits. Both petitioners assert that the Region's decision to limit CO and NO_x emissions using source-wide limits in effect applies blanket emission limits, which Agency guidance expressly prohibits because they are practically unenforceable, and that the limited exception in the Agency guidance that allows for source-wide limits is inapplicable to the *Kulluk's* operations. REDOIL Petition at 10-11; ICAS Petition at 11. Both petitioners also object to the Region's use of generic emission factors[19] to calculate source-wide emission limits. In particular, both petitioners assert that (1) the Region should have developed source-specific emission factors for all units of the OCS source; (2) the AP-42 emission factors applied to the emergency generator, the OSRVs, and heaters and boilers lead to inaccurate and underestimated emissions for those sources; and (3) the Region did not require Shell to conduct enough stack tests to accurately calculate source-specific emission factors. ICAS Petition at 15-20; REDOIL Petition at 11-14.

The Region responds that Agency guidance documents generally "illustrate that the Clean Air Act and the implementing regulations allow for a flexible, case-by-case evaluation of appropriate methods for ensuring practical enforceability of PTE limits." Region Response at 14-15 (quoting *In re Orange Recycling & Ethanol Prod. Facility*, Pet. No. II-2001-05, at 5 (Adm'r Apr. 8, 2002) (A.R. B-17)). Specifically, the Region asserts that source-wide emission limits for NO_x and CO are indeed practically enforceable and are most appropriate given the uncertainty of a number of factors that otherwise preclude the Region from establishing PTE restrictions based on operational limits. *Id.* at 18; RTC at 26-27, 29-30. In addition, the Region asserts that the emission factors used to calculate NO_x and CO emissions provide reliable emission calculations. Region Response at 19-23. In particular, the Region asserts that it made an appropriate technical determination to apply AP-42 emission factors or emission factors derived from *Discoverer*[20] data rather than source-specific emission factors for certain emission units. *Id.* The Region adds that the permit conditions that apply to source-specific

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[19] *See infra* Part VI.A.2.b.

[20] The Region issued Shell two OCS PSD permits to conduct exploratory drilling activities in the Chukchi and Beaufort Seas utilizing the drillship *Discoverer* that were twice appealed to the Board, first in 2010, and then again in 2011 subsequent to a Board remand of the permits to the Region. *See Shell Discoverer 2012*, 15 E.A.D. at 474-75 (describing history of *Discoverer* permit proceedings). In preparing the permit applications for the *Discoverer*'s operations, Shell conducted source-specific emission tests for various emission units on the *Discoverer* and an associated fleet of support ships, including icebreakers, supply ships, and oil spill response vessels. *See id.*, 15 E.A.D. at 479-80 (describing associated fleet).

emission factors require source tests that are inadequate in frequency and unrepresentative of the variation in Shell's proposed operations to allow the Region to derive accurate emission factors. *Id.*

a. *Blanket Emission Limits and Practical Enforceability*

ICAS and REDOIL Petitioners correctly assert that the use of blanket emission limits alone, essentially statements that actual emissions of a pollutant will not exceed a particular quantity, is generally prohibited to restrict PTE because such limits are not enforceable as a practical matter. *See United States v. La.-Pac. Corp.*, 682 F. Supp. 1122, 1133 (D. Colo. 1987) ("[C]ompliance with blanket restrictions on actual emissions would be virtually impossible to verify or enforce."), *quoted in* REDOIL Petition at 11; *see also* Office of Air Quality Planning & Standards, U.S. EPA, *New Source Review Workshop Manual* at C.4 (draft Oct. 1990) [hereinafter *NSR Manual*] ("Blanket emissions limits alone (e.g., tons/[year], lb/[hour]) are virtually impossible to verify or enforce, and are therefore not enforceable as a practical matter."), *quoted in* ICAS Petition at 13; Memorandum from Terrell Hunt, Assoc. Enforcement Counsel, U.S. EPA, & John Seitz, Dir., Stationary Source Compliance Div., U.S. EPA, *Guidance on Limiting Potential to Emit in New Source Permitting* 7 (June 13, 1989) (A.R. B-4) [hereinafter *1989 Guidance on Limiting PTE*].[21] However, the Petitioners' characterization of the source-wide emission limits for NO_x and CO contained in the Permit as blanket emission limits must fail. ICAS and REDOIL Petitioners do not acknowledge the Region's explanation in the Response to Comments for why it chose to apply source-wide emission limits in the Permit, nor do they establish that the Region's fundamentally technical determinations contravene Agency guidance.

The Region made clear in the Response to Comments that its decision to employ source-wide emission limits calculated as rolling 365-day limits to restrict NO_x and CO was based in large part on the substantial and unpredictable variations in emissions based on the atypical nature of Shell's operations. RTC at 26-27; Region Response at 18. Variability in Shell's exploratory operations, multiple engines and generators located on both the *Kulluk* and numerous vessels in the Associated Fleet, the state of the weather and the sea, ice thickness, and the changing nature of the activities that Shell may need to conduct all influenced the Region's conclusion that the need for operational flexibility made it impractical to establish unit-specific limits or operating parameters for some pollutants, such as NO_x and CO, that might typically be applied to limit a stationary source's PTE. RTC at 27; *see* Statement of Basis at 38. The Region continued that, in its judgment, the choice to restrict the *Kulluk*'s PTE for NO_x and CO using source-wide emissions limits "accounts for variability in operations and emissions, yet still

[21] Appendix C of the NSR Manual is based largely on the 1989 Guidance on Limiting PTE. *NSR Manual* at C.1 n.1.

provides assurance that limits on potential to emit can be enforced as a practical matter." RTC at 28.

Although the restrictions to limit the PTE of emission units located on the *Kulluk* and the Associated Fleet utilize a rolling 365-day limit, a longer time period than generally recommended in Agency guidance,[22] as the Region points out, the continuous monitoring and recording of fuel usage and the application of source-test derived or specified emission factors have the practical effect of constraining Shell's fuel use, thus ensuring compliance with the PTE limits. Region Response at 15, 17 (citing *In re Pope & Talbot, Inc.*, Petition No. VIII-2006-04 (Adm'r 2007) (A.R. B-24), in which rolling emission limits in addition to prescribed emission factors and appropriate monitoring and recordkeeping were sufficient to restrict PTE).[23] In essence, although the Region could not incorporate more traditional operational limits into the Permit based on the atypical nature of the permitted activities, the daily calculation of NO_x and CO emissions in conjunction with continuous monitoring and recording of fuel usage ensure that the NO_x and CO PTE restrictions can be practically enforced.

Despite the Region's explanation in the Response to Comments regarding the need to consider the facts unique to this Permit, neither ICAS nor REDOIL Petitioners explain why, especially in light of the *Kulluk*'s atypical operations as

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[22] The 1989 Guidance on Limiting PTE recommends that the time limit over which production or operational limits extend should be "as short term as possible" in order for such limitations to be enforceable as a practical matter, and generally not exceeding one month, but the Guidance also recognizes that in rare circumstances a limit spanning a longer time may be appropriate. *1989 Guidance on Limiting PTE* at 9. The Guidance specifies that a limit spanning a longer time is appropriate if it is rolling and that it should not exceed an annual limit rolled on a monthly basis. *Id.* The Guidance also notes that

> [P]ermits where longer rolling limits are used to restrict production should be issued only to sources with substantial and unpredictable annual variation in production[] * * * Rolling limits could be used as well for sources which shut down or curtail operation during part of a year on a regular seasonal cycle, but the permitting authority should first explore the possibility of imposing a month-by-month limit.

Id. at 9-10. In this instance, although the Guidance was written prior to Congress authorizing EPA to regulate air emissions from sources located on certain areas of the OCS, *see* Region Response at 17, including the Arctic, the circumstances the Guidance anticipates that would make a longer time limit appropriate apply in this instance to the *Kulluk* permit, where the operations are seasonal and thus variation in production would be substantial. *See 1989 Guidance on Limiting PTE* at 9-10.

[23] Although the Board agrees with Petitioners that the Region did not cite this decision until it submitted its response to the petitions for review, and thus accepts their reply briefs with respect to this point, *see supra* Part V, the Board nonetheless disagrees that this publicly available decision of the Administrator is inapposite to the current appeal. The *Pope & Talbot* decision underscores the Agency's ability to exercise its discretion and its technical expertise in order to craft practically enforceable synthetic minor limits.

compared to other stationary sources, the Permit's PTE limits are not practically enforceable. *See* Region Response at 17. Rather, Petitioners hew closely to the language in the 1989 Guidance on Limiting PTE prohibiting blanket emissions, asserting instead that because the Permit does not contain production or operational limits to restrict PTE, the NO_x and CO emission limits constitute blanket emission limits that contravene Agency guidance. ICAS Petition at 11-14; REDOIL Petition at 9-11. The 1989 Guidance on Limiting PTE sets forth the types of limitations that will restrict a source's PTE and states in relevant part:

> To appropriately limit potential to emit * * * permits * * * must contain a production or operational limitation in addition to the emission limitation in cases where the emission limitation does not reflect the maximum emissions of the source operating at full design capacity without pollution control equipment. Restrictions on production or operation that will limit potential to emit include limitations on quantities of raw materials consumed, fuel combusted, hours of operation, or conditions which specify that the source must install and maintain controls that reduce emissions to a specified emission rate or to a specified efficiency level.

1989 Guidance on Limiting PTE at 5-6.[24] In addition, neither ICAS nor REDOIL Petitioners address the operational limits included in the Permit and discussed in

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[24] The Guidance also acknowledges that the "particular circumstances of some individual sources make it difficult to state operating parameters for control equipment limits in a manner that is easily enforceable as a practical matter" and lists two exceptions. *1989 Guidance on Limiting PTE* at 7. Although the Guidance preceded EPA's authority to regulate air emissions on parts of the OCS, *see* Region Response at 17, and thus could not have anticipated the circumstances of the permit at issue in these appeals, the Region nonetheless asserts that the circumstances surrounding the current permit are sufficiently analogous to the second exception for volatile organic compound ("VOC") surface coating operations, which contemplates no add-on controls but allows for the restriction of PTE by limiting the VOC contents and quantities of coatings used. *Id.* at 17-19 (referring to *1989 Guidance on Limiting PTE* at 8).

The VOC exception focuses on circumstances where operating and production parameters could not be readily set due to the wide variety of coatings and products and due to the unpredictable nature of the operations. *1989 Guidance on Limiting PTE* at 8. The Region asserted that the rationale informing the VOC surface coating operation exception is sufficiently similar to the present circumstances and analogized that an effective way to restrict NO_x and CO was through source-wide emissions limits supported by test-derived or specified emission factors, similar to the VOC content of coatings, continuous monitoring and recording of operational parameters, and tracking the quantity of VOC coating used. RTC at 30; Region Response at 18. REDOIL Petitioners and ICAS assert that the VOC exception should be construed quite narrowly and that the VOC surface coating operation exception within the 1989 Guidance on Limiting PTE could not apply to the *Kulluk* and the Associated Fleet. *See* ICAS Petition at 20; REDOIL Petition at 13-14. Petitioners do not state more than a differ-

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the Response to Comments. *See* RTC at 29 (discussing hourly operational limits on mudline cellar drilling and overall drilling activity and the installation of SCR and OcyCat controls to limit NO_x emissions).

Finally, ICAS challenges the Region's inclusion of requirements in the Permit to calculate daily emissions for NO_x and CO on a weekly basis, arguing that it is a "critical flaw to enforceability of the permit because it means that Shell will only know where it stands vis-a-vie [sic] its NO_x and CO permit limits once a week." ICAS Petition at 14 (citing Permit Conditions D.1.1, D.1.2). The Board finds ICAS's argument here unavailing in light of the Region's thorough explanation in the Response to Comments. *See* RTC at 44; Region Response at 19, 23. The Region explained that although the calculations of emission limits will be conducted weekly, data is continuously collected and recorded and will eventually be generated in the same terms as the emission limits. *See* RTC at 44; Region Response at 23. Moreover, the Region points out that Shell is required to process data from numerous emission units across multiple vessels for 168 individual hours (24 hours x 7 days). RTC at 44. The permit requirements to continuously monitor and record data necessary to conduct daily emissions calculations ensures, as ICAS raises, the ability to assess and verify compliance immediately should an inspector, the Region, or Shell require it. RTC at 44; Region Response at 23. In this instance, ICAS does not acknowledge the Region's response or address why that response is inadequate and thus warrants review. As this Board has previously stated, "[p]etitions for review may not simply repeat objections made during the comment period; instead they must demonstrate why the permitting authority's response to those objections warrants review." *Peabody*, 12 E.A.D. at 46 n.58; *accord In re Knauf Fiber Glass GmbH, ("Knauf II")*, 9 E.A.D. 1, 5 (EAB 2000); *see also* standard of review discussion *supra* Part III.

In addition, as the Board noted above in Part VI.A.1.b, the determination of a source's PTE is inherently an exercise that requires technical expertise. Neither REDOIL Petitioners nor ICAS have met the particularly heavy burden of demonstrating that review of the Region's decisions to employ source-wide emission limits to restrict the *Kulluk*'s PTE is warranted. *See, e.g.*, *Peabody*, 12 E.A.D. at 33; *NE Hub*, 7 E.A.D. at 567 ("When issues raised on appeal challenge a Region's technical judgments, clear error or a reviewable exercise of discretion is not

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ence of opinion or alternative view on a technical issue. *See NE Hub*, 7 E.A.D. at 567. Without more, petitioners cannot sustain the burden of demonstrating that review of the Region's exercise of its technical judgment is warranted. *See Peabody*, 12 E.A.D. at 33; *In re Teck Cominco Alaska Inc.*, 11 E.A.D. 457, 473 (EAB 2004).

established simply because petitioners document a difference in opinion or an alternative theory regarding a technical matter.").

b. *Emission Factors*

An emission factor is a representative value used to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. U.S. EPA, AP-42, *Compilation of Air Pollutant Emission Factors*, Volume I: Stationary Point and Area Sources 1 (Jan. 1995) (5th ed.) ("AP-42 Guidance"). Emission factors essentially represent an average of a range of emission rates of the subject sources. *Id.* at 2. As stated above in Part VI.A.2, in this instance compliance with the PTE restrictions for NO_x and CO are determined by calculating daily emissions of each pollutant, which requires multiplying the appropriate emission factor by the recorded daily operation rate and dividing by 2000 lb/ton. Permit Conditions D.4.1, D.4.2.

REDOIL Petitioners and ICAS challenge several aspects of the Region's use of emission factors to assist in calculating compliance with the restricted PTE for both NO_x and CO. Both petitioners challenge the Region's decision to forgo source-specific emission testing to establish emission factors for all emission units on the *Kulluk* and the Associated Fleet and further assert that this will cause the Region and Shell to underestimate the quantities of NO_x and CO emitted by the OCS source. ICAS Petition at 15-19; REDOIL Petition at 11-13. REDOIL Petitioners and ICAS assert that the use of AP-42 emission factors and emission factors derived from *Discoverer* test results for those emission units that will not undergo source-specific testing constitutes clear error because these more generic emission factors will likely lead to an underestimation of emissions from the units to which they are applied. ICAS Petition at 16-18; REDOIL Petition at 11-12 (referring to AP-42 emission factors as "notoriously inaccurate default factors"). Finally, ICAS challenges the frequency and number of stack tests used to develop source-specific emission factors for emission units and further asserts that by Shell's own admission there is a 15% variability in stack test data that results in a less conservative emission factor than the Region claims. ICAS Petition at 16-17.

The Board notes at the outset that the development of emission factors for use in calculating daily emissions to determine compliance with PTE restrictions requires the sort of quintessential technical expertise the permit issuer possesses, here the Region, to which the Board will defer if "the record demonstrates that the Region duly considered the issues raised in the comments and if the approach ultimately selected by the Region is rational in light all of the information in the record." *NE Hub*, 7 E.A.D. at 567-68, *quoted in Peabody*, 12 E.A.D. at 34; *see also Avenal Energy Ctr.*, 15 E.A.D. at 387. As explained more fully below, for each challenge regarding the derivation and use of emission factors set forth in the Permit, REDOIL Petitioners and ICAS have failed to sustain the particularly heavy burden petitioners must overcome to demonstrate that review of a funda-

mentally technical decision is warranted. *See, e.g., Peabody*, 12 E.A.D. at 33; *NE Hub*, 7 E.A.D. at 567-68.

The Region fully explained in the Response to Comments its rationale for supplementing source-specific emission factors derived for most of the emission units or groups of emission units located on the *Kulluk* or the Associated Fleet with either AP-42 emission factors[25] or emission factors derived from *Discoverer* source test data for a minority of units. RTC at 32-33; *see also* Region Response at 20-21. In support of its decision to utilize a mix of source-specific testing for emission factors in addition to using AP-42 and *Discoverer* test data emission factors, the Region stated that it "believes the permit strikes an appropriate balance between the need for accurate emission factors to reliably calculate emis-

[25] ICAS's attempt to analogize the situation the Board confronted in *Peabody* to the current permit appeal falls short. Although *Peabody* discusses the use of AP-42 emission factors in a PTE calculation where the source was seeking synthetic minor status, ICAS fails to acknowledge critical factual elements that distinguish *Peabody* from the current appeal.

In *Peabody*, the permittee was a large coal-processing plant built prior to the effective date of the PSD program that requested a PTE limit for particulate matter with a diameter of 10 microns or less ("PM_{10}") in the permittee's Title V permit so that the facility could remain a synthetic minor source for PM_{10} emissions should it conduct any major modifications in the future. *See Peabody*, 12 E.A.D. at 24-34. Of critical importance, the facility's emissions were primarily fugitive, and thus, emission testing to directly measure PM_{10} emissions was not feasible. *Id.* at 34. The permittee consequently submitted a request for a PTE limit based on a quantitative estimate of the facility's capacity to emit PM_{10}, which in turn relied on estimates of uncontrolled emissions from each unit based on the application of AP-42 emission factors that were then used to estimate net emissions by applying assumed emission control efficiencies for the emission control equipment in use. *Id.* at 34-35 & n.31. Peabody's proposed compliance regimen did not include direct measurement of PM_{10} emissions. As the Board stated, "[b]ecause Peabody's approach would rely entirely on the application of emission factors and assumed control efficiencies, for purposes of both estimating maximum emissions capacity and monitoring ongoing compliance, the accuracy and appropriateness of the emission factors and the control efficiency assumptions were the focal point of Region IX's analysis of Peabody's proposal." *Id.* at 35-36.

Contrary to the facility in *Peabody*, in this instance the use of AP-42 factors to calculate compliance with restricted PTE for NO, and CO was essentially a last resort method for calculating compliance, whereas the emission units that accounted for at least 90% of the NO, and CO emissions were subject to source-specific emission testing. *See id.* at 32-33. The Region made clear that in the relatively small number of instances where an AP-42 emission factor was employed to calculate compliance with PTE, the Region chose conservatively higher emission factors. In *Peabody*, the Region made a technical determination and "concluded that Peabody had not sufficiently demonstrated that it met the central criteria for establishing [PTE] – technical accuracy and a reliable method of determining compliance." *Id.* at 39. In this instance, the Region made a technical determination that Shell has sufficiently demonstrated that the *Kulluk* could demonstrate compliance with the NO, and CO PTE limits included in the permit in a manner that is technically accurate, and that the compliance of the emission units can be verified based on source-specific testing. The Region's exercise of its technical expertise to conclude that in limited circumstances AP-42 emission factors were appropriate to demonstrate compliance with the restricted PTE is rational in light of all of the information in the record. Thus, ICAS's contention that *Peabody* governs the appeal currently before the Board is unpersuasive.

sions for comparison to permit limits and the complexity of testing numerous emission units in a short period of time." RTC at 33. The Region also noted that, in response to comments received, it decided to require source-specific emission testing for incinerators and that, after that change, the permit will require source testing of emission units that constitute 91% of NO_x and 97% of CO emissions. *Id.* at 32. Of the remaining units that were not required to undergo source testing to develop an emission factor, the Region set forth in detail why it had chosen emission factors derived from *Discoverer* source test data or the AP-42 emission factors, in many instances raising the value of an emission factor to provide a more conservative estimate of emissions.[26] *Id.* at 32-33; *see also* Region Response at 20; Statement of Basis at 38 (noting that testing for source-specific emission factors (Permit Condition E.2) uses a protocol that results in conservatively high unit-specific emission factors that in turn help to ensure compliance with PTE).

[26] The Region explained in the Statement of Basis that an important element of Permit Condition E.2, which catalogues the procedures for conducting tests to determine equipment-specific emission factors, "is the selection of worst[-]case emission factors for each emission unit or group of emission units tested." Statement of Basis at 43; *see also* Permit at 52-56. The record demonstrates that the Region thoughtfully and judiciously employed emission factors derived from *Discoverer* test data and AP-42 emission factors, and consistently chose higher, more conservative emission factors when there was any question or discrepancy. For example, for those NO_x emission units for which the Permit does not require source testing and that rely on emission factors based on *Discoverer* test data, the Region adjusted the emission factor to reflect the conservative 90th percentile (or higher) values from the test data. RTC at 32. The Region further explained that for heaters and boilers – the only remaining group of NO_x emission units that rely on AP-42 for emission factors – the Region expects the AP-42 emission factor to be a conservative representation of actual emissions. *Id.* (noting that while AP-42 predicted an NO_x emission factor for heaters and boilers of 0.02 lb/gal, Shell testing of *Discoverer* boilers shows a range of values between 0.011 lb/gal and 0.015 lb/gal); *see also* RTC at 46 (noting that the boiler and heater NO_x emission factor used in the *Kulluk* permit is "lower than the *Discoverer* BACT limit for similar equipment, but is higher than available test data for a similar source"). ICAS challenged the Region's use of an NO_x emission factor in the Permit that is lower than the one in the *Discoverer* permits, *see* ICAS Petition at 18-19, but ICAS failed in its petition to even acknowledge the Region's response to its comment regarding the NO_x emission factor for heaters and boilers, let alone "substantively confront the permit issuer's subsequent explanation." *Peabody*, 12 E.A.D. at 33 (citing *In re Zion Energy, LLC*, 9 E.A.D. 701, 705 (EAB 2011)).

With respect to emission units that will not undergo source testing to verify CO emission factors, the Region similarly explained that it believed emission factors are reasonable for use in the permit given that AP-42 emission factors will represent only 3% of the total CO emissions. RTC at 32. In addition, the Region notes that the CO emissions from tests conducted for two boilers on the *Discoverer* were nearly identical to the AP-42 emission factor. *Id.* at 33 (explaining that the Region chose the highest, most conservative emission factor of the three). Finally, the Region notes that one of the potential oil spill and response boats has an actual CO emission factor for its propulsion engine that is based on the manufacturer's data and is one tenth of what the AP-42 factor predicts. *Id.*; *see also* Permit Table D.2.2 (demonstrating that the Region chose to include the much higher AP-42 emission factor for the OSRV propulsion engine).

While REDOIL Petitioners[27] and ICAS may disagree with the Region's approach, Petitioners do not demonstrate that the Region's choices in deriving emission factors for emission units will result in an underestimation of pollutants emitted by the *Kulluk* and the Associated Fleet. The Region has demonstrated that it balanced its primary task of accurately calculating NO_x and CO emission factors to ensure that the *Kulluk* and the Associated Fleet will not exceed the restricted PTE with the practical need to calculate emission factors for numerous and varied emission units aboard both the *Kulluk* and the Associated Fleet. The Board has frequently stated that it will not grant review where, as here, the record demonstrates a bona fide difference of opinion or alternative theory regarding a technical matter but the approach the Region ultimately selected is rational in light of all the information in the record. *Peabody*, 12 E.A.D. at 34 (quoting *NE Hub*, 7 E.A.D. at 567).

Finally, ICAS asserts that the *Discoverer* source test data is not sufficient to accurately generate worst-case scenario emission factors for *Kulluk* emission units because similar sources tested on the *Discoverer* were subject to BACT, and further, that in using stack test results from the *Discoverer* to develop emission factors for the *Kulluk* permit, the Region never accounted for "15% variability in Shell's stack tests," resulting in inadequate emission factors. ICAS Petition at 17-19. The Region points out, however, that the *Discoverer* stack tests on which the Region relied to calculate the 90th percentile value and assess the appropriateness of AP-42 factors were not subject to post-combustion controls limiting NO_x or CO and thus provided an appropriate comparison for purposes of deriving emission factors for the *Kulluk*. Region Response at 21 (citing *Discoverer* stack test results and communications discussing them in the administrative record, specifically A.R. B-55, B-63, C-406, and C-489). With respect to the 15% variability in stack test results[28] that ICAS alleges, the Region points to the technical litera-

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[27] REDOIL Petitioners contend that the Region's recognition that Shell's approach involves "inherent uncertainty" regarding what equipment will be aboard the *Kulluk* and the Associated Fleet, which in turn requires "thorough source testing," coupled with the Region's refusal to require source testing for all equipment, is "internally inconsistent and thus arbitrary and unlawful." REDOIL Petition at 12. However, the Region responded that it used its technical expertise to determine that in this instance, a mix of both source-specific testing to derive emission factors, in addition to using AP-42 factors and emission factors derived from *Discoverer* test data where appropriate, was reasonable and not inconsistent. Region Response at 20-21. The Board agrees with the Region that the decision to use source-specific testing to derive emission factors, in conjunction with the emission factors developed from *Discoverer* data and from AP-42, is inherently technical. In order to effectively exercise its expertise, the Region should not, as REDOIL Petitioners suggest, be cabined by a rigid interpretation of how emission factors should be determined. REDOIL Petitioners have failed to meet the particularly high threshold for demonstrating that Board review of the Region's fundamentally technical decision is warranted. *Peabody*, 12 E.A.D. at 33-34.

[28] ICAS also asserts that stack tests are "conducted once a year for one or two years depending on the source," at three different loads, and even when the worst-case emissions are used, the stack tests fail to account for Shell's varying emissions. ICAS Petition at 16. The Region explained in re-
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ture Shell referenced in Shell's comments, which addresses "uncertainty in determining front-half PM [particulate matter] emission rates" and does not directly address procedures for deriving NO_X and CO emission factors. *Id.* at 22-23; *see also* Permit Conditions E.1.2, E.1.7, E.1.14 (requiring Shell to submit a testing plan and follow EPA-approved test methods, and establishing Region's authority to require additional stack tests if necessary). As the Region correctly points out, ICAS has not demonstrated that the worst-case stack test results, which embody the Region's fundamentally technical determinations, will be biased low and underreport emissions. Region Response at 22-23; *see, e.g.*, *Teck Cominco*, 11 E.A.D. at 473 (discussing heavy burden assigned to petitioners seeking review of issues that are essentially technical in nature).

3. *ICAS Has Failed to Demonstrate That the Region Clearly Erred in Restricting the Kulluk and the Associated Fleet's Potential to Emit GHGs*

ICAS also challenges the Permit's GHG emission limit, which restricts Shell's annual GHG emissions to 80,000 tpy of carbon dioxide equivalent ("CO_2e").[29] *See* ICAS Petition at 21-26; *see also* Permit Condition D.4.4; RTC at 28. EPA promulgated regulations, commonly referred to as the "Tailoring Rule," that set forth applicability criteria to determine which GHG emission sources become subject to the PSD and Title V programs under the Act.[30] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514, 31,516 (June 3, 2010). In this instance, despite the fact that

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sponse that Permit Condition E.2.1 requires each source-tested unit to be tested prior to each of the first two drilling seasons and subsequently every two or five years depending on any variability observed in the results of the two initial tests. Region Response at 22; *see also* Statement of Basis at 44 (frequency of source-specific emission factor testing after first two years based on variability of results). Further, each test requires three 1-hour runs at each of the three tested operating loads, which results in nine results total for each aggregate source test. Region Response at 22. Without more than its bare assertion that the current source tests do not adequately address Shell's varying emissions when the data is used to derive emission factors, ICAS cannot demonstrate that the permit conditions that dictate the frequency and parameters of source tests warrant Board review.

[29] GHGs are defined as "the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydroflourocarbons, perflourocarbons, and sulfur hexaflouride." 40 C.F.R. § 52.21(b)(49)(i). CO_2e represents the amount of GHGs emitted and is computed by "[m]ultiplying the mass amount of emissions (tpy), for each of the six greenhouse gases in the pollutant GHGs, by the gas's associated global warming potential published at Table A-1 subpart A of [40 C.F.R.] part 98 of this chapter – Global Warming Potentials." *Id.* § 52.21(b)(49)(ii)(a).

[30] The regulations provide that any source that is considered a new major source for a regulated NSR pollutant other than GHGs will also be subject to regulation for GHGs if it emits or has the potential to emit 75,000 tpy or more of CO_2e. 40 C.F.R. § 52.21(b)(49)(iv). New stationary sources that emit or have the potential to emit more than 100,000 tpy or more of CO_2e are also subject to regulation for GHGs. *Id.* § 52.21(b)(49)(v).

the OCS source's pre-permitted potential to emit exceeded 100,000 tpy of CO_2e, *see* Statement of Basis at 24, the Permit restricts the potential to emit GHGs to 80,000 tpy of CO_2e and thus prevents Shell from being subject to regulation for GHGs under the PSD program. *See* RTC at 24.

As noted previously, the vast majority of emissions, including GHG emissions, from both the *Kulluk* and the Associated Fleet result from internal combustion sources such as engines and boilers, along with incinerators. Statement of Basis at 12, 14, 39; RTC at 35. The Permit contains operational restrictions on the amount of time a source can operate, the amount of fuel and waste combusted, and the type of fuel combusted to ensure compliance with the Permit's GHG emission limit.[31] *See* Statement of Basis at 37-39; RTC at 33-36; *id.* at 34-35 (noting that in response to comments the Region adjusted the methane emission factor upward by a factor of four to represent a reasonable upper-bound estimate of the number of wells that could be drilled in a single season, which in turn required a small reduction to the total amount of fuel that may be combusted in engines and boilers during any rolling 12-month period). In addition to the combustion sources and the incinerators, a relatively small amount of GHG emissions in the form of methane results from the drilling mud system ("DMS").[32] *See* RTC at 35. GHG emissions from the DMS, calculated at 85 tpy of CO_2e, represent only 0.11% of the total GHG emissions allowed under the permit, 80,000 tpy of CO_2e. *Id.* The Region calculated an unrestricted PTE for methane emissions of 1,596 lbs/month,

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[31] The Permit imposes annual limits of 120 days of operation as an OCS source during a drilling season, which spans from July 1 through November 30, and 1,632 hours of total drilling activity in a drilling season, of which only 480 hours may be used to conduct mudline cellar drilling activity, which is expected to generate the most air pollution. *See* Permit Conditions D.3.1-D.3.5. The Permit also limits the total aggregate combustion of fuel over a 12-month rolling period, the type of fuel combusted, and the total aggregate daily waste-combusting capacity of incinerators. *See* Permit Conditions D.4.6-.7, .9; *see also* RTC at 34-35. In addition, the Permit includes various monitoring and recordkeeping requirements to document when emissions should be counted toward emission limits, testing requirements for the derivation of source-specific emission factors, tracking and documentation requirements for the fuel and waste combusted, and maintenance requirements to ensure that emission units are properly operated and maintained. *See* Permit Conditions D.1-.4, D.8, F.2.1-.7; *see also* RTC at 36-37, 43.

[32] The Region explained methane emissions from the DMS as follows:

> When wells are drilled through porous, hydrocarbon[-]bearing rock, drilling fluids (mud) circulated through the drill bit can carry gaseous hydrocarbons from the well back to [the] Kulluk. These gases are typically released as fugitive emissions when the mud is processed for reuse on the Kulluk or stored and shipped away; however, some of the emissions pass through a vent.

Statement of Basis at 38.

the equivalent of 17 tons per month ("tpm") of CO_2e.[33] *Id.* The Permit accounts in Condition 4.4.2 for methane emissions encompassing the source's full unrestricted PTE of 17 tpm of CO_2e, which are added to GHG emissions from combustion sources when calculating total GHG emissions. *See* Statement of Basis at 39; *Shell Discoverer 2012*, 15 E.A.D. at 516.

ICAS raises several challenges to the Permit's GHG emission limit. Similar to its challenges of the Permit's synthetic minor limits for NO_x, CO, and SO_2, ICAS contends that the Permit contains a blanket emission limit for GHGs that is practically unenforceable and further asserts that the requirement that GHG emissions only be calculated monthly to determine compliance with the established rolling 12-month limit is inadequate to verify compliance "in a given moment." ICAS Petition at 21-22 (citing *NSR Manual* at C.3, C.5, H.5); *see* Permit Conditions D.1.3-.4. In addition, ICAS asserts that the Region clearly erred by accepting an owner-requested limit for methane attributable to mud off-gassing from the DMS that is not only unenforceable, but also less than the "maximum expected capacity" or "upper-bound projection" ConocoPhillips submitted in another Arctic OCS permit proceeding. *Id.* at 22-26.

Based on the foregoing information, ICAS's general assertion that the GHG emission limit is practically unenforceable must fail. The Region has demonstrated in both the Permit and the documentation in the record supporting the Permit that it crafted a synthetic minor limit that would not only prevent Shell from being subject to regulation under the PSD program for GHG emissions, but also

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[33] In calculating the unrestricted PTE for DMS methane emissions, the Region included several conservative assumptions to ensure a wide margin of safety for total methane emissions over Shell's five-month period of operation. *See* RTC at 34; *Options for Limiting PTE* at 8 (noting that for sources with inherent physical limitations that restrict the potential emissions of an emissions unit, if such limitations can be documented and confirmed, the permitting authority may factor them into estimates of a stationary source's PTE). For example, the Region assumed that the total unrestricted PTE for DMS methane emissions for the entire five months of drilling operations would be emitted during each of the five months. RTC at 35.

In addition, despite much of the methane emissions being fugitive emissions that are not counted towards PSD applicability for exploratory drill rigs, *see* 40 C.F.R. § 52.21(b)(1)(iii), Shell agreed to consider all of the methane emissions from the DMS as point source emissions that would count towards Shell's potential to emit GHGs. *See* RTC at 35; *see also* Statement of Basis at 38-39. In its petition, ICAS disputes the Region's claim that counting such fugitive emissions towards PTE represents a conservative approach that lends a "measure of safety" and asserts that the part 71 regulations governing Title V permits require such fugitive emissions to be included. ICAS Petition at 24 (citing 40 C.F.R. § 71.3(d), which states that fugitive emissions from a part 71 source "shall be included in the permit application and the part 71 permit in the same manner as stack emissions"). However, as the Region correctly points out in its response, the definitions of major source in both 40 C.F.R. § 52.21(b)(1)(iii) and 40 C.F.R. § 71.2 make clear that fugitive emissions are not considered when determining whether a source is a major source. Region's Response at 26 n.21 (citing the Tailoring Rule and noting that it retained this approach of determining whether a source becomes subject to regulation for GHGs).

would be practically enforceable as a result of the numerous operational restrictions in combination with monitoring, recordkeeping, and reporting requirements contained in the Permit. While ICAS acknowledges the operational limits contained in the Permit, ICAS simultaneously disputes their efficacy without explaining why such operational limits will not have their intended effect of restricting Shell's potential to emit GHGs.[34] *See* ICAS Petition at 21-22. Without stating more than mere disagreement, ICAS cannot meet the especially high threshold of demonstrating that the Region's inherently technical decisions regarding the GHG emission limit warrant Board review. *See, e.g.*, *NE Hub Partners*, 7 E.A.D. at 567; *Shell Discoverer 2012*, 15 E.A.D. at 501.

ICAS's more specific contention that the Region clearly erred by accepting an owner requested restriction for methane from mud off-gassing that is practically unenforceable is unavailing. *See* ICAS Petition at 22-26. ICAS raised this same argument in previous appeals of two OCS PSD permits the Region issued to Shell for operations in the Chukchi Sea of the Arctic OCS. *See Shell Discoverer 2012*, 15 E.A.D. at 514-19; *see also supra* note 20. In brief, the monthly calculation of methane to be released in mud off-gassing in both *Shell Discoverer 2012* and the current appeal are not only the same amount, 17 tpm, they also both reflect the unrestricted PTE for methane emissions from DMS operations. *See* RTC at 34-35; *Shell Discoverer 2012*, 15 E.A.D. at 517-18. The Board rejects ICAS's assertion in this instance, relying on the same reasons it gave in *Shell Discoverer 2012*:

> [T]he Permit[] in this case do[es] not include owner requested limits on PTE for methane emissions. Rather, * * * methane emissions were assumed to occur at the source['s] full PTE for the five-month drilling season

[34] Similarly, ICAS's contention that the Region clearly erred by not requiring more frequent calculations of GHG emissions than the monthly calculations the Permit requires, *see* Conditions D.1.3-.4, falls short. The Region explained that its decision to calculate emissions on a monthly basis stemmed from "good confidence in the overall [GHG emission] compliance technique and therefore 'yearly' emissions are required to be summed only monthly." Statement of Basis at 38. Although GHG emission calculations will be calculated once a month based on the Region's stated confidence in its compliance method, the data required to make such calculations is collected continuously through fuel usage monitoring. RTC at 43-44 ("Shell is generally required to continuously measure and record, on an hourly basis, the fuel consumed by each emission unit or group of emission units."); *see also* Region Response at 24 (citing *1989 Guidance on Limiting PTE* and noting that "in light of annual variations in operations and the fact that the source operates during only part of the year" the Region determined that a 12-month rolling limit for CO_2e was appropriate as stated). Again, ICAS has failed to meet its burden of demonstrating that review is warranted, where, as here, it has not addressed the Region's stated rationale for requiring only monthly calculation of GHG emissions and has not demonstrated that monthly calculation of GHG emission would inhibit verification of compliance with the GHG emission limit. *See supra* Part III.

> (0.798 tons per month),[35] and the Permit[] count[s] these emissions towards the total GHG limitation * * * . The Region determined that because these unrestricted emissions of methane (when combined with GHG emissions from combustion sources) would not result in an exceedance of the Permit['s] total GHG emissions limit, additional permitting restriction limits were not required.
>
> Under these circumstances, ICAS's reliance on the requirement that permits include conditions ensuring the enforceability of limitations on a source's PTE is misplaced, as the Permits do not contain owner requested limits on methane emissions or otherwise limit the source['s] PTE from DMS operations.

Shell Discoverer 2012, 15 E.A.D. at 517-18 (citations omitted).

In addition, ICAS has not demonstrated that the Region's calculation of methane emissions from the DMS underestimated the "upper-limit" projection that is in turn used to identify the "maximum capacity" of a source based on an "inherent physical limitation." RTC at 34 (citing *Options for Limiting PTE* at 8 and Memorandum from John Seitz, Dir., Office of Air Quality Planning & Standards, to Reg'l Air Dirs., U.S. EPA, *Calculating Potential to Emit (PTE) and Other Guidance for Grain Handling Facilities* at 4-5 (Nov. 14, 1995) (A.R. B-10) [hereinafter *Grain Handling Guidance*]). ICAS's assertion is premised on ConocoPhillips' higher estimate of DMS methane emissions submitted to the Region in another permit proceeding concerning exploratory drilling in the Arctic OCS. ICAS Petition at 23-26. However, ICAS simply states that the discrepancy between Shell's and ConocoPhillips' calculations of DMS methane emissions means that the Region clearly erred in accepting Shell's methane calculations, but it does not acknowledge or evaluate the record information Shell submitted that explains in depth the causes for the divergent methane calculations.[36] Upon considering this

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[35] This is the same unrestricted PTE for methane emissions as in the *Kulluk* permit (1596 lb / 2000 lb = 0.798 tons).

[36] In *Shell Discoverer 2012*, ICAS asserted that it was unable to evaluate the basis for Shell's estimates of DMS methane emissions that the Region had relied on to calculate PTE because Shell did not release its estimates until after the close of the comment period. 15 E.A.D. at 517 n.63. In that instance, the Board concluded that the Region was authorized to supplement the record with previously unavailable information confirming that Shell's estimate of methane PTE was a reasonable upper-bound estimation, and "[t]hus, ICAS had the opportunity to evaluate the basis for Shell's PTE estimates and the Region's assessment of those estimates in preparing its appeal to this Board." *Id.* (citing *In re Cape Wind Assoc., LLC*, 15 E.A.D. 327, 332-33, 335 (EAB 2011), and 40 C.F.R. §§ 124.17(a)-(b), .18(b)).

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information, the Region exercised its technical expertise in concluding that Shell's estimates of methane emissions from the DMS were permissible, especially given the conservative assumptions the Region incorporated when calculating PTE. ICAS does not address either the record information that supports the Region's decision to accept Shell's methane estimate or the Region's stated rationale for concluding that methane monitoring is not required. *See* RTC at 35-36 (explaining that, based on the inherent limitations that exist and the relatively small contribution of the DMS to overall GHG emissions, the Region does not believe monitoring of DMS emissions or operations is necessary in addition to the monitoring already required in the permit). As this Board has often stated, a petitioner cannot demonstrate that review is warranted if the petitioner fails to substantively confront a permit issuer's response. *Peabody*, 12 E.A.D. at 33 (noting that to obtain review a petitioner must "explain why, in light of the permit issuer's rationale, the permit is clearly erroneous or otherwise deserving of review"); *see also In re BP Cherry Point*, 12 E.A.D. 209, 217 (EAB 2005). Moreover, as stated above, the Region's decision regarding the GHG emission limit is inherently technical in nature, and ICAS has fallen short of the particularly high threshold it must meet to demonstrate that review of the Region's technical determination is warranted. *See Peabody*, 12 E.A.D. at 33-34; *see also NE Hub*, 7 E.A.D. at 567-68.

4. *The Region Did Not Clearly Err in Restricting OCS Source's Potential to Emit SO_2*

The Permit restricts SO_2 emissions from the *Kulluk* and the Associated Fleet to no more than 10 tpy, well below the 250 tpy PSD threshold level. *See* Permit Condition D.4.3. Compliance with this limit is determined on a rolling 12-month basis and is achieved by requiring that Shell not combust any liquid fuel with sulfur content greater than 0.01 percent by weight in any emission unit on the *Kulluk* or the Associated Fleet and that all fuel purchased for use in emission units on the *Kulluk* and Associated Fleet have a maximum sulfur content of 0.0015 percent by weight. Permit Conditions D.4.5, D.4.9. Shell is required to keep diesel

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The material in question is not only in the record submitted with the *Discoverer* appeals, it also appears in the record for the instant appeal. *See* E-mail from Susan Childs, Shell, to Doug Hardesty, EPA Region 10 (Sept. 16, 2011 14:31 pm PDT) (A.R. CCC-438 in *Shell Discoverer 2012* and A.R. C-575 in the current appeal). Thus in the current appeal there is no question that the information from Shell clarifying and explaining its estimate of DMS methane emissions, including the highly conservative assumptions Shell included in its estimate, was at ICAS's disposal. In addition, Shell submitted further clarification of its DMS methane estimates as compared to ConocoPhillips' in order to "explain how different assumptions led to different results, and why Shell believes that ConocoPhillips' estimate is unrealistically high." E-mail from Susan Childs, Shell, to EPA Region 10 (Sept. 20, 2011 17:57 pm PDT) (A.R. C-577). ICAS's petition does not address either of these record submissions or the Region's reliance on this information to determine that the Region's calculation of methane emissions from the DMS represents "a reasonable upper-bound projection for Shell's operations [that] is not expected to be exceeded under any reasonably anticipated operating scenario." RTC at 35.

fuel purchase records documenting sulfur content for each batch of fuel purchased. Permit Condition D.4.9.2. In addition, the total amount of fuel combusted in engines and boilers must not exceed 7,004,428 gallons during any rolling 12-month period. Permit Condition D.4.6; *see also* Permit Condition F.2.4 (requiring Shell to (1) obtain representative fuel samples and determine fuel sulfur content in parts per million from fuel storage tanks on the *Kulluk* and the Associated Fleet prior to their mobilization, (2) determine the sulfur content of each delivery of fuel to the *Kulluk* and the Associated Fleet once the vessels are mobilized, and (3) maintain records of all sampling and analysis).

ICAS asserts that the Region justifies its blanket SO_2 emissions limits by including "purported 'operational limits'" that restrict fuel content and usage and concludes that compliance with the restricted PTE for SO_2 is practically unenforceable because these operational limits are not unit-specific and because the overall limit is based on a 12-month rolling limit. ICAS Petition at 26-27. ICAS offers no explanation as to why the operational limits and averaging time the Region chose to include in the Permit, both of which are clearly considered legitimate in Agency guidance, nonetheless constitute clear error. *See* Region Response at 28; *Options on Limiting PTE* attach. 1 at 5 ("[L]imitations on sulfur dioxide emissions could be based on specified sulfur content of fuel and the source's obligation to limit usage to certain maximum amounts."); *1989 Guidance on Limiting PTE* at 9-10 (noting that in certain situations a rolling limit of up to a year may be appropriate for sources with "substantial and unpredictable annual variation in production," including "source which shut down or curtail operation during part of the year on a regular seasonal cycle").

ICAS also challenges the monitoring provisions for small and/or infrequently used emission units that are not required to have fuel flow monitors. ICAS Petition at 27. As the Region correctly points out, however, ICAS makes no attempt to explain why the specified fuel measurement alternatives, together with the requirement to measure and record fuel usage before and after operation, do not allow for a reliable and accurate assessment of fuel usage. Region Response at 28 (citing Permit Condition F.2.2.2). Here again, ICAS offers nothing more than a bald assertion of clear error without any analysis of why the Region erred. Where, as here, the Region's decision was technical in nature, ICAS has failed to meet the particularly high threshold for establishing that review of the Region's technical determination is warranted.

5. *Shell's Minor Source Permit Is Not a "Sham" Permit*

ICAS asserts that in order to ensure the *Kulluk*'s status as a minor source, Shell has agreed to operational limitations in its OCS/Title V permit that are not represented in other authorizations and permit applications for Shell's exploratory activities in the Beaufort Sea. ICAS Petition at 28. ICAS alleges that Shell's incidental hazard assessment, required under the Marine Mammal Protection Act,

16 U.S.C. § 1371(a)(5)(A), (D), authorizes 78 days of drilling whereas the OCS/Title V permit only authorizes 68 days of drilling. *Id.* Based on this single discrepancy, ICAS categorically concludes that "Shell is submitting permit applications and seeking authorization from other agencies with different plans than are provided for in its air permit." ICAS Petition at 28-29. ICAS also asserts that the Region did not adequately respond to its concern that Shell's application for a minor source permit is a sham.[37] *Id.*

At the outset, the Board notes that ICAS's assertion that Shell has secured a sham minor source permit with the intention to avoid preconstruction review as a major source under the PSD program is wholly unsupported in the record.[38] As the Region noted in the Response to Comments, there is nothing to indicate that Shell intends to later apply to the Region to remove the synthetic limits contained in the Permit. RTC at 22. The Region continued that, regardless of what the incidental hazard assessment says regarding the number of days Shell may drill, Shell nonetheless "must comply with all requirements of the Kulluk Permit and failure to do so is a violation of the CAA." *Id.* (citing Permit Condition A.3). Finally, the Region made clear that whether an original request for a minor source permit is a "sham" may be evaluated when the Region receives a request to remove the synthetic limits. *Id.*

ICAS rejects the Region's statement that there is nothing to suggest that Shell intends to obtain a minor source permit now and then apply for a major source permit down the road, and baldly asserts that "this is not the proper test." ICAS Petition at 28. ICAS ignores the element of intent to obtain a minor source

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[37] The NSR Manual defines a sham permit as follows:

> A sham permit is a federally enforceable permit with operating restrictions limiting a source's potential to emit such that potential emissions do not exceed the major or de minimis levels for the purpose of allowing construction to commence prior to applying for a major source permit. Permits with conditions that do not reflect a source's *planned* mode of operation may be considered void and cannot shield the source from the requirement to undergo major source preconstruction review. In other words, if a source accepts operational limits to obtain a minor source construction permit but intends to operate the source in excess of those limitations once the unit is built, the permit is considered a sham.

NSR Manual at C.6.

[38] ICAS asserts that its concern with the potential for Shell to obtain a minor source sham permit arose because "Region 10 has provided no assurance that reporting mechanisms in the permit will provide sufficient time for Shell to halt drilling with enough of an emissions buffer remaining to secure a partially drilled well for the entire winter season * * *." ICAS Petition at 29. ICAS also acknowledges that any exceedance of an emission limit would allow the Agency to exercise its enforcement powers. *Id.* Without more, ICAS cannot demonstrate that the Region clearly erred in determining that Shell's minor source permit is not a sham.

sham permit that both the Region in the Response to Comments and the 1989 Guidance on Limiting PTE discuss and instead quotes the NSR Manual language for the proposition that the "proper test" is a permit that does not reflect a source's "*planned* mode of operation." ICAS Petition at 28 (citing *NSR Manual* at C.6) (emphasis in original); *see also 1989 Guidance on Limiting PTE* at 12. However, the 1989 Guidance on Limiting PTE contains guidelines for determining, based on an evaluation of specific facts and evidence in each individual case, when minor source construction permits are shams and includes two of four criteria that discuss the intent of the source to circumvent the PSD preconstruction review process. *1989 Guidance on Limiting PTE* at 14-15.[39]

ICAS has not identified any information in the record that supports its assertion that Shell is seeking to avoid preconstruction review. Moreover, minor source sham permits are generally discovered when a source seeks another air emissions permit that requests the permit issuer to relax the synthetic limits in the minor permit, *see 1989 Guidance on Limiting PTE* at 12-14, rather than when the source seeks another authorization under a different statute such as the Marine Mammals Protection Act. Finally, ICAS has not demonstrated any deficiency in the Region's response to its comment regarding sham permits. *See, e.g., Russell City II*, 15 E.A.D. at 24 (noting that the part 124 regulations require a response to comments document to "demonstrate that all significant comments were considered but does not require a permit issuer to respond to each comment in an individualized manner or require the permit issuer's response to be of the same length or level of detail as comment") (citation omitted).

For all of the reasons stated above, the Board denies review of this issue.

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[39] Specifically, the guidelines for determining when minor source construction permits are shams state in relevant part:

> 1. Filing a PSD or nonattainment NSR permit application
>
> If a major source or major modification permit application is filed simultaneously with or at the same time as the minor source construction permit, this is strong evidence of *an intent to circumvent the requirements of preconstruction review*.
>
> * * *
>
> 4. Statement of authorized representatives of the source regarding plans for operation
>
> Statements by representatives of the source to EPA or to state or local permitting agencies about the source's plans for operation can be evidence *to show intent to circumvent preconstruction review requirements*.

1989 Guidance on Limiting PTE at 14-15 (emphasis added).

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B. *REDOIL Petitioners Have Not Demonstrated That the Region Clearly Erred in Declining to Require PSD Increment Consumption Analyses for the Kulluk's Proposed Emissions as Part of the Title V Permitting Process*

1. *Section 504(e) of CAA Title V Imposes Permitting Requirements on "Temporary" Stationary Sources*

The CAA's PSD program requires permit applicants to demonstrate compliance with ambient air quality "increments" (also called "PSD increments") for specific air pollutants. *See* CAA §§ 161, 163, 165(a)(3)(A), 42 U.S.C. §§ 7471, 7473, 7475(a)(3)(A); 40 C.F.R. § 52.21(c), (k). Such increments are maximum allowable increases in pollutant concentrations that may occur in particular areas.[40] They are designed to "prevent significant deterioration" of air quality in locations that already have relatively clean air by ensuring that contaminants contributed by proposed new sources, combined with levels of contamination already present in the ambient air as of a specific baseline date, fall within bounds established by the Agency. *See generally NSR Manual* ch. C.

As noted in Part VI.A.1.b above, Congress designed the PSD program to regulate "major" sources of air pollution, which have potential to emit certain specific pollutants in amounts exceeding major source threshold levels. "Minor" sources, which have projected emissions that fall below the PSD major source thresholds, generally are not regulated under the PSD program. The Board determined above that the *Kulluk* qualifies as a minor source for PSD purposes, and so it is not required to obtain a PSD permit. The *Kulluk* nonetheless is still subject to permitting under the CAA's Title V program. The question presented is whether section 504(e) of Title V imposes PSD increment requirements in this circumstance.

In section 504(e) of Title V Congress set out permitting requirements for "temporary" stationary sources of air pollution as follows:

> The permitting authority may issue a single [Title V] permit authorizing emissions from similar operations at multiple temporary locations. No such permit shall be issued unless it includes conditions that will assure compliance with all the requirements of this chapter [i.e., the CAA] at

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[40] To date, EPA has established PSD increments for four pollutants – SO_2, NO_2, PM_{10} and $PM_{2.5}$. The increments consist of numeric concentrations, measured in micrograms of pollutant per cubic meter of air, that vary according to averaging period (3-hour, 24-hour, or annual averages) and geographic location (areas designated as "Class I," "Class II," or "Class III"). *See* 40 C.F.R. § 52.21(c) (table of increment levels).

> all authorized locations, including, but not limited to, ambient standards and compliance with any applicable increment or visibility requirements under part C of subchapter I of this chapter [i.e., the PSD program].

CAA § 504(e), 42 U.S.C. § 7661c(e). In allowing for a streamlined permitting process in which a single permit could authorize emissions at multiple temporary locations, Congress explained:

> Some sources requiring [Title V] permits do not operate at fixed locations. These might include asbestos demolition contractors and certain asphalt plants. Subsection (e) allows the permittee to receive a permit allowing operations, after notification to the permitting authority, at numerous fixed locations without requiring a new permit at each site. Any such permit must assure compliance at all locations of operation with all applicable requirements of the Act, including visibility protection and PSD requirements and ambient standards.

H.R. Rep. No. 101-490, pt. 1, at 350 (1990).

The parties' dispute centers on competing interpretations of section 504(e) and whether, in providing for a streamlined permitting process for temporary sources, Congress intended temporary minor sources to have increment provisions in their Title V permits where the state implementation plans do not otherwise impose increment provisions on such sources.

Section 504(e) is an unusual provision, not only because it addresses temporary rather than permanent stationary sources of air pollution (which comprise the majority of Title V sources), but also because it imposes substantive air requirements on temporary sources. As a general matter, Title V is a procedural rather than a substantive statute. It serves as a vehicle for collecting diverse CAA requirements otherwise applicable to a source into one all-encompassing air permit for that source. *See, e.g., Ohio Pub. Interest Research Grp., Inc. v. Whitman*, 386 F.3d 792, 794 (6th Cir. 2004) ("Title V does not impose new obligations; rather, it consolidates pre-existing requirements into a single, comprehensive document for each source"); Operating Permit Program, 57 Fed. Reg. 32,250, 32,251 (July 21, 1992) (explaining that Title V "generally does not impose substantive new requirements" on sources but instead attempts to "clarify, in a single document, which requirements apply to a source," thereby enabling all parties to better understand and track that source's CAA compliance). For the most part, requirements that are "applicable" to a source's emissions units under a Title V permit are directly imposed not by Title V itself but, rather, by state or federal implementation plans, preconstruction permits, the air toxics or acid rain programs, and other

substantive CAA provisions. *See* 40 C.F.R. §§ 70.2, 71.2 (definitions of "applicable requirements" under state and federal operating permit program regulations, respectively).

To ensure adequate regulation of temporary sources, Congress directed that Title V permits for such sources must include, as noted above, "conditions that will assure compliance with all the requirements of [the CAA] at all authorized locations, including, but not limited to, ambient standards and compliance with any applicable increment or visibility requirements under [the PSD program]." CAA § 504(e), 42 U.S.C. § 7661c(e). The parties do not dispute that this language serves to impose, through Title V itself, substantive CAA requirements on temporary sources. *See* REDOIL Petition at 19-25; Region Response at 5-6. Indeed, they agree that, because of section 504(e), the *Kulluk*'s Title V permit "must contain terms and conditions that ensure compliance with the NAAQS at all relevant locations." Statement of Basis at 26, *quoted in* Region Response at 5; *see* REDOIL Petition at 21. The parties strongly dispute, however, whether PSD increments should also be included in the complement of substantive requirements for the *Kulluk*.

2. *Under the Region's Interpretation, PSD Increment Compliance Demonstrations Are Not Mandatory for Temporary Minor Sources but May Be Required by States*

The Region's basic position is that section 504(e) uniformly imposes ambient standards (i.e., NAAQS) compliance requirements on all temporary sources, but that it does not uniformly so impose PSD increment requirements. The Region initially based this distinction on the language of section 504(e) and the implementing regulations, as well as on a prior Agency interpretation of these authorities. *See* Statement of Basis at 25-27. The distinction hinged primarily on Congress' insertion of the adjective "applicable" in section 504(e) to modify not "ambient standards" but only "increment or visibility requirements under [the PSD program]." *Id.* at 26; *see* CAA § 504(e), 42 U.S.C. § 7661c(e). PSD increments are only "applicable" to a temporary source, the Region reasoned, if the source also qualifies as a PSD major source, obligated to obtain a PSD permit. Statement of Basis at 26 ("applicable" increment requirements are those applicable "under [the PSD program]" (i.e., part C of subchapter I of the CAA), which covers only PSD major sources). By this logic, the *Kulluk*, a PSD minor source, would not have to demonstrate compliance with PSD increments at any of its authorized locations. *Id.*

Commentors on the *Kulluk*'s draft permit pressed the Region on this point, which prompted it to take a closer look at the entire issue. The Region prepared a lengthy, detailed Response to Comments document, in which it repeated the above points, but also added a far more robust discussion of the preconstruction permitting programs for major and minor sources. The Region explained that,

under the statute and implementing regulations, states have discretion to impose PSD increment requirements on PSD minor sources as part of their minor source construction permitting programs, if the states deem such requirements necessary to prevent significant deterioration of air quality. *See* RTC at 102-09 (citing and discussing, e.g., CAA §§ 110(a)(2)(C), 161, 163, 165(a)(3)(A), 504(e), 42 U.S.C. §§ 7410(a)(2)(C), 7471, 7473, 7475(a)(3)(A), 7661c(e); 40 C.F.R. §§ 51.160(a)(2), (b)(2), .166(a)(1), (3), 70.2, 71.2, 71.6(e)). The Region emphasized that states are not *obliged* to do this but have discretionary authority to pursue this course if they deem it necessary to fulfill their obligations under CAA sections 161 and 163(a). *See id.* at 103-06.

These clarifications led the Region to encapsulate its understanding of section 504(e) and the preconstruction programs in the following way: "PSD major sources are subject to NAAQS and increment in the permitting process, whereas non-PSD sources are subject only to the NAAQS unless the applicable minor source program also includes the [PSD] increment[s]." *Id.* at 107. The Region concluded that the State of Alaska's minor source preconstruction program does not require permanent minor sources to demonstrate compliance with PSD increments as a condition of construction, so neither would it require such compliance of temporary minor sources. *See id.* at 103-04, 107-08; *see also* Region Response at 12, 11 n.7. For this reason, the Region declined to require that Shell conduct PSD increment compliance analyses for *Kulluk* emissions at any of its authorized locations in the Beaufort Sea.

The Region's statutory and regulatory interpretation of the Title V temporary source program finds support in Board case law that recognizes the states' primary role in using PSD increments to manage economic growth. In *In re West Suburban Recycling & Energy Center, LP*, 8 E.A.D. 192 (EAB 1999), the Board observed the following:

> From the beginning of the PSD program, EPA has acknowledged that decisions about how increment should be used or allocated are primarily within the province of the states. For example, in the preamble to the original PSD regulations, EPA noted that allocation of PSD increment could affect economic development and that EPA should endeavor to preserve the states' authority on issues of economic development and growth:
>
> > "EPA should not make decisions [that] would have a significant impact upon future growth options of the [s]tates."

8 E.A.D. at 196 (quoting Approval and Promulgation of State Implementation Plans, 43 Fed. Reg. 26,388, 26,401 (June 19, 1978)); *accord In re Commonwealth*

Chesapeake Corp., 6 E.A.D. 764, 768 (EAB 1997) ("'The PSD requirements provide for a system of area classifications [that] affords [s]tates an opportunity to identify local land use goals. * * * Each classification differs in terms of the amount of [industrial or other] growth it will permit before significant air quality deterioration would be deemed to occur.'" (quoting *NSR Manual* at C.4-.5)).

3. *REDOIL Petitioners Have Not Demonstrated That the Region's Interpretation Is Clearly Erroneous*

On appeal, REDOIL Petitioners claim on a number of grounds that the Region's interpretation is clearly erroneous and thus a basis for remand of this permit. REDOIL Petition at 19-37. REDOIL Petitioners' central contention is that the plain language, structure, and purpose of section 504(e) reveal Congress' "unambiguously expressed intent" to tie increment requirement applicability to the increment status of the geographic area or areas in which a temporary source will emit pollutants. *See id.* at 20-32. REDOIL Petitioners also contend that the Agency's implementing regulations confirm the plain meaning of the statutory language and, additionally, contain provisions that "at least imply" independent obligations to ensure PSD increment compliance. *Id.* at 33-35.

REDOIL Petitioners observe that section 504(e) distinguishes between ambient standards (i.e., NAAQS), which apply to all temporary sources "at all times and in all locations," *id.* at 21, and PSD increment standards, which do not apply at all times and in all locations because they "are not universally applicable to all areas." *Id.* Rather, as designed by Congress, PSD increments "apply" only in areas where they specifically have been triggered, by means of the submission of an initial, complete PSD permit application to emit in a particular area. *Id.*; *see* CAA §§ 163, 169(4), 42 U.S.C. §§ 7473, 7479(4); 40 C.F.R. § 52.21(b)(14)(ii), (15)(i). The concentration of pollutants in such an area's ambient air is measured at the time the initial application is submitted (the "baseline date") and then fixed as the "baseline concentration" for that area. *See NSR Manual* at C.6-.8, .12-.15. From that point forward, PSD increments serve as the maximum allowable increases that pollutant concentrations may rise above the established baseline levels. CAA § 163, 42 U.S.C. § 7473; 40 C.F.R. § 52.21(c).

REDOIL Petitioners reason from this basic design that Congress intended "applicable increment * * * requirements" in section 504(e) to be area-dependent rather than source-dependent. *See* REDOIL Petition at 21-22, 25-27, 29. By this logic, any new source, including any new temporary minor source, that proposes to emit in geographic areas where increments previously have been triggered would be obligated to demonstrate compliance with such increments as "applicable" requirements under section 504(e). Only in areas where increments have not yet been triggered would PSD increments be inapplicable to temporary minor sources. *See id.* REDOIL Petitioners claim the Agency's implementing regula-

tions are fully in accord with this interpretation and thus do not bar increment compliance demonstrations prior to issuance of Title V permits. *Id.* at 33-35.

As described below, the Region did not clearly err in its own interpretation of these authorities. The Board agrees with the Region that its interpretation more fully comports with the structure and language of the CAA and the implementing regulations, and rejects REDOIL Petitioners' assertion that the statutory language is so plain that there is no ambiguity about whether Congress intended to impose increment provisions on temporary minor sources where the state implementation plan does not otherwise impose increment requirements on such sources. REDOIL Petitioners misapprehend or fail to grapple with several key points that formed the basis for the Region's interpretation in its final permitting decision and Response to Comments.

a. *REDOIL Petitioners Misunderstand Portions of the Region's Response to Comments*

In several of its points of advocacy before this Board, REDOIL Petitioners reveal a misunderstanding of the explanations the Region set forth in the Response to Comments. In the most significant example, REDOIL Petitioners argue that the Region erroneously construes "any applicable increment * * * requirements under Part C" in section 504(e) to mean that only those temporary sources that are also PSD major sources must demonstrate PSD increment compliance. REDOIL Petition at 29, 33-34. While this description reflects the position the Region advanced in the Statement of Basis,[41] it fails to acknowledge the very substantial further interpretive exegesis the Region developed and presented in its Response to Comments on the draft permitting record (which included the Statement of Basis). In that later and more comprehensive analysis, the Region made clear that, in its view, states have discretionary authority in their minor source preconstruction programs to impose PSD increment requirements on temporary minor sources, either as implementation plan requirements or on a case-by-case basis, as they deem necessary to protect the NAAQS. *See* RTC at 103-06. REDOIL Petitioners fail to address or demonstrate why the Region's position, as more fully articulated in the Response to Comments, is clearly erroneous. Because REDOIL Petitioners have failed to substantively confront the Region's Response to Comments, they cannot prevail on this ground. *See, e.g., In re Guam Waterworks Auth.*, 15 E.A.D. 437, 450 (EAB 2011) (petitioners "must substantively confront the permit issuer's explanations in its response to comments document"); *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 33 (EAB 2005) (same).

[41] The Region acknowledges that statements in the Statement of Basis could be read to suggest such an approach. Region Response at 8.

REDOIL Petitioners also misunderstand the interplay of sections 161, 165, and 504(e) of the Act, as those provisions are discussed by the Region in the Response to Comments. *See* RTC at 103-06. REDOIL Petitioners point out that section 163, not section 165, is the source of increment requirements within the PSD program and contends that the Region "ignore[d]" this provision in interpreting section 504(e). REDOIL Petition at 30. In so arguing, REDOIL Petitioners take the position that section 504(e) makes the section 163 increments directly applicable to temporary sources. *See id.* at 30-31. The plain language of section 163, however, is to the contrary. It provides that "each applicable implementation plan shall contain measures assuring that maximum allowable increases over baseline concentrations [i.e., increments] * * * shall not be exceeded." CAA § 163(a), 42 U.S.C. § 7473(a). Moreover, the text of section 161, which establishes implementation plan requirements, provides that such plans "shall contain emission limitations and such other measures as may be necessary * * * to prevent significant deterioration of air quality." CAA § 161, 42 U.S.C. § 7471.

Increments, in other words, are not directly imposed by section 504(e). Instead, they must be implemented (i.e., applied to a source) through either of two means: (1) a state implementation plan, per section 161 and 40 C.F.R. § 51.166(a)(1); or (2) the PSD major source permitting program, per section 165(a)(3)(A) and 40 C.F.R. § 52.21. *See* RTC at 103-04. Thus, while section 504(e) can serve as the direct source of NAAQS compliance requirements and other CAA requirements for temporary sources (*see infra* note 44 and accompanying text), it only imposes PSD increment requirements to the extent such requirements are "applicable" to the source.

Finally, REDOIL Petitioners also suggest that the State of Alaska's operating permit regulations are "more lenient" than the federal regulations because they do not require PSD minor sources to demonstrate compliance with PSD increments as a preconstruction condition. REDOIL Petition at 27-28. Noting that the Alaska rules apply to sources on the inner OCS only, and not on the outer OCS, REDOIL Petitioners suggest that the purportedly more stringent federal operating permit rules in effect on the outer OCS require temporary sources situated on the outer OCS to demonstrate compliance with PSD increments. *Id.* at 28 (citing 40 C.F.R. §§ 71.2, 71.6(e)). REDOIL Petitioners claim, therefore, that Shell must conduct, at the very least, a PSD increment analysis for the *Kulluk*'s authorized locations on the outer OCS. *Id.*

This argument reveals a misunderstanding of the Region's discussion of relevant legal requirements on the inner versus outer OCS. In the Response to Comments, the Region explained:

> In this case, the requirements for Title V temporary sources in the inner OCS and outer OCS off of Alaska are the same because Alaska has adopted EPA's Part 71 rules

> with respect to Title V temporary sources by reference for application onshore and Region 10 has in turn adopted these requirements into the [Corresponding Onshore Area] regulations for application in the inner OCS.

RTC at 109. As the Region explained, PSD increments are not applicable to any temporary minor sources, wherever they might be located on the OCS, *unless* a state exercises its discretion to require minor source compliance with such increments. A state, of course, has limited jurisdiction, and its authority does not extend beyond its borders. *E.g.*, CAA § 107(a), 42 U.S.C. § 7407(a) ("[e]ach [s]tate shall have the primary responsibility for assuring air quality within the entire geographic area comprising such [s]tate"). That would mean, therefore, that in the outer OCS or other places where only federal operating permit rules apply, PSD increments would not be applicable to temporary minor sources, *unless* federal OCS regulations required it or EPA chose to add increment compliance obligations under 40 C.F.R. § 55.13(h)[42] once the source becomes operational. *See* RTC at 109. REDOIL Petitioners fail to squarely confront this legal landscape, which results in a failure to demonstrate how the Region's interpretation is clearly erroneous. *See, e.g.*, *In re Teck Cominco Alaska, Inc.*, 11 E.A.D. 457, 494-95 (EAB 2004) (burden of demonstrating review is warranted rests with the petitioner, who must raise objections to the permit and explain why the permit issuer's previous response to those objections is clearly erroneous or otherwise warrants review); *In re Westborough*, 10 E.A.D. 297, 305, 311-12 (EAB 2002) (same).

b. *REDOIL Petitioners Mischaracterize the Title V Regulatory Scheme*

REDOIL Petitioners' notion that "applicable increment requirements" in section 504(e) mean "applicable to the *area*" rather than "applicable to the *source*" is not supported by the Title V regulatory model as a whole. A Title V permit for a temporary source to operate at multiple locations must include, among other things, "[c]onditions that will assure compliance with all applicable requirements at all authorized locations." 40 C.F.R. §§ 70.6(e)(1), 71.6(e)(1). Broadly speaking, the Board has recognized that "'[a]pplicable requirement' is a term of art in the Title V program that, in general, refers to any substantive requirement that applies to an *emissions source* under any CAA regulatory provisions." *Peabody*,

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[42] This OCS-specific regulation provides:

> If the Administrator determines that additional requirements are necessary to protect [f]ederal and [s]tate ambient air quality standards or to comply with part C of title I, such requirements will be incorporated in this part.

40 C.F.R. § 55.13(h).

12 E.A.D. at 28 n.14 (emphasis added) (citing 40 C.F.R. § 71.2). Further, the regulations implementing the federal Title V program provide that "[a]pplicable requirement means all of the following as they apply to *emissions units in a part 71 source*." 40 C.F.R. § 71.2 (emphasis added). In turn, the term "emissions unit" means "any part or activity of a *stationary source* that emits or has the potential to emit any regulated air pollutant." *Id.* (emphasis added).

Accordingly, the Region's interpretation of the term "applicable" in section 504(e) as meaning "applicable to the source" is consistent with the Agency's Title V regulations, in which applicability is determined by reference to the *source*, not the *area*. REDOIL Petitioners fail to present legal authorities supporting their own novel view of applicability in a way sufficient to demonstrate that the Region's different approach is clearly erroneous.

c. REDOIL Petitioners Confuse Air Quality Management Obligations with Permitting Obligations

REDOIL Petitioners argue that the Region's interpretation of section 504(e) should be rejected because it is inherently inconsistent. REDOIL Petition at 31-32. On the one hand, REDOIL Petitioners note, the Region explicitly recognized that the *Kulluk* will consume a portion of the available PSD increments in its authorized drilling areas, but the Region nonetheless refused to impose preconstruction increment compliance requirements in the Title V permit, finding them "inapplicable." RTC at 102, 105-06. On the other hand, the Region acknowledged that after the *Kulluk* becomes operational, it might be necessary to impose increment-related restrictions; i.e., increments would be "applicable." In the Response to Comments, the Region stated:

> If, at any time after the *Kulluk* begins operation under its Title V/OCS permit, Region 10 determines that the actual emissions increases from the permitted OCS source cause or contribute to an increment violation, Region 10 has authority to adopt additional requirements to ensure that increments are not violated.

Id. at 106 (footnote omitted). REDOIL Petitioners argue that the Region cannot have it both ways, contending on this basis that the Region's interpretation should not be sustained. REDOIL Petition at 32.

The Board perceives no conflict between the Region's purportedly "inconsistent" positions on increment applicability. As the Region noted in its Response to Comments, EPA has authority, separate and apart from section 504(e) and the preconstruction programs, to address violations of increment standards that might arise once sources become operational. *See* RTC at 106 (citing CAA §§ 301, 328, 42 U.S.C. §§ 7601, 7627; 40 C.F.R. § 55.13(h)). Moreover, states have authority

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to revise their implementation plans to adopt emission limits and other remedial control measures in cases where existing controls are not adequately protecting air quality increments. 40 C.F.R. § 51.166(a)(3), *cited in* RTC at 106.[43] REDOIL Petitioners confuse permitting obligations with ongoing air quality management obligations, but the two are distinct. *See* RTC at 105-06. Simply positing that the Region's view of "applicable" increments is inconsistent is not sufficient to overcome the specific statutory and regulatory authority the Region references in support of its position. The Board therefore finds no showing of clear error justifying a remand on this ground.

d. *REDOIL Petitioners Misconstrue the Regulations*

The Agency's Title V implementing regulations for state and federal operating permit programs closely parallel the language of section 504(e). *Compare* CAA § 504(e), 42 U.S.C. § 7661c(e), *with* 40 C.F.R. §§ 70.6(e), 71.6(e). The regulations define "applicable requirement" for Title V purposes as (among other things): "(2) [a]ny term or condition of any preconstruction permits" issued under parts C or D of title I; and "(13) [a]ny [NAAQS] or increment or visibility requirement under part C of title I of the Act, but only as it would apply to temporary sources permitted pursuant to section 504(e) of the Act." 40 C.F.R. §§ 70.2, 71.2. REDOIL Petitioners argue on appeal, as commentors did on the draft permit, that the Region's interpretation of "applicable requirement" improperly reads the thirteenth requirement out of the regulations by subsuming it within the second requirement. REDOIL Petition at 33-34.

The Region explained in the Response to Comments why this was not so. *See* RTC at 107-08. The Region stated that "the intent of the Title V temporary source provisions is to relieve sources of the burden of applying for Title V permits for each new location, while at the same time[] assuring compliance with all requirements to which the source would be subject if it were a new [permanent] source at each such new location." *Id.* at 108. For a temporary source that is also a PSD major source, this would include ensuring that the NAAQS and increment standards are met at each future location – a requirement that, the Region pointed out, would exceed the requirements otherwise applicable to the source under the

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[43] This state implementation plan regulation provides, in relevant part:

> If the [s]tate or the Administrator determines that a[n implementation] plan is substantially inadequate to prevent significant deterioration or that an applicable increment is being violated, the plan shall be revised to correct the inadequacy or the violation.

40 C.F.R. § 51.166(a)(3). The regulations also provide, in the next subsection, that the state "shall review the adequacy of a[n implementation] plan on a periodic basis and within 60 days of such time as information becomes available that an applicable increment is being violated." *Id.* § 51.166(a)(4).

PSD program alone.[44] *Id.* at 107. For a temporary source that is also a PSD minor source, this would include ensuring that the NAAQS and, if required under the implementation plan for minor permanent sources, PSD increment standards are met at each future location, even if the implementation plan did not require such a demonstration for temporary minor sources. *See id.* at 107-08; Region Response at 12.

REDOIL Petitioners fail to meaningfully confront the Region's reasoning on this issue or demonstrate why it is clearly erroneous. Instead, REDOIL Petitioners reference an irrelevant minor permit modification provision (40 C.F.R. § 71.7(e)(1)(i)(A)(3)), rather than a minor source provision, as support for their position. REDOIL Petition at 34. REDOIL Petitioners also suggest that the Title V permitting regulations in sections 70.6(e) and 71.6(e) establish a more expansive regulatory program than the one the Region finds present in section 504(e); indeed, one that would even be broad enough to require the *Kulluk* to demonstrate PSD increment compliance. *Id.* at 33. The Board finds otherwise, in light of the fact that sections 70.6(e) and 71.6(e) are expressly limited by a reference to section 504(e) itself and therefore cannot expand the meaning of the statute. *See* RTC at 107-08.

4. *Increment Section Conclusion*

The Board has carefully examined each of REDOIL Petitioners' increment-related arguments and determined that none have merit. Petitioners' burden is to show clear error, but REDOIL Petitioners have failed in all instances to achieve this standard. The Board therefore denies review of the Permit on this ground.[45]

C. *REDOIL Petitioners Failed to Raise Below Their Contention That Shell's Ambient Air Quality Analysis Was Flawed in That It Failed to Conform to Applicable Agency Guidance*

On February 9, 2010, EPA published in the Federal Register a final rule (effective April 12, 2010) revising the primary NO_2 NAAQS "in order to provide requisite protection of public health as appropriate under section 109 of the Clean Air Act." Primary NAAQS for NO_2, 75 Fed. Reg. 6474, 6475 (Feb. 9, 2010); *see also Shell 2010*, 15 E.A.D. at 149-50 & n.74. This rule set the new 1-hour NO_2

[44] As such, the NAAQS and PSD increment requirements for future locations would be "additional" requirements imposed on the temporary source by section 504(e). RTC at 107-08.

[45] In light of the Board's decision to uphold the Region's interpretation of section 504(e) and the implementing regulations, the Board need not reach REDOIL Petitioners' final argument, which challenges the Region's finding that air quality modeling establishes the *Kulluk*'s emissions will not violate the PSD increments.

NAAQS standard (hereinafter "the 1-hour NO_2 NAAQS") at 100 parts per billion ("ppb") to supplement the existing annual standard, set at 53 ppb. 75 Fed. Reg. at 6475. EPA regulations specify how attainment of the standard is to be calculated, providing that the 100 ppb standard is met "when the annual 98th percentile of the daily maximum 1-hour average concentration is less than or equal to 100 ppb, as determined in accordance with Appendix S of this part for the 1-hour standard." 40 C.F.R. § 50.11(f). This calculation is sometimes referred to as "the form."[46] *See* 75 Fed. Reg. at 6477 n.5, 6492-93. The 100 ppb standard reflects the maximum allowable NO_2 concentrations anywhere in an area. *Id.* at 6493, 6502. EPA has issued guidance clarifying procedures for demonstrating compliance with the new 1-hour NO_2 NAAQS. *See* REDOIL Petition Ex. 16 (Memorandum from Stephen D. Page, Dir., Office of Air Quality Planning & Standards, U.S. EPA, to Reg'l Air Dirs., U.S. EPA, *Guidance Concerning the Implementation of the 1-Hour NO_2 NAAQS for the Prevention of Significant Deterioration* (June 29, 2010) ("Page Memo"));[47] Memorandum from Tyler Fox, Leader, Air Quality Monitoring Grp., Office of Air Quality Planning & Standards, U.S. EPA, to Reg'l Air Dirs., U.S. EPA, *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard* (Mar. 1, 2011) ("Fox Memo") (A.R. BB-83).

REDOIL Petitioners assert that Shell's ambient air quality analysis was flawed.[48] In particular, REDOIL Petitioners state that in "identifying the Kulluk's

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[46] The 98th percentile form corresponds approximately to the 7th or 8th highest daily maximum concentration in a year. 75 Fed. Reg. at 6492.

[47] According to the Page Memo, the guidance was issued in response to reports that sources were modeling potential violations of the 1-hour NO_2 NAAQS. Page Memo at 1. The Memo states that "[t]o respond to these reports and facilitate the PSD permitting of new and modified major stationary sources, we are issuing the attached guidance in the form of two memoranda." *Id.* The attached memoranda are titled "General Guidance for Implementing the 1-hour NO_2 National Ambient Quality Standard in Prevention of Significant Deterioration Permits, Including an Interim 1-hour NO_2 Significant Impact Level" and "Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard." *Id.* at 1-2. Although the Page Memo attaches these two memoranda, the Memo is consecutively numbered as a single document.

[48] In order to establish compliance with the NAAQS and PSD increments, permit applicants must conduct an "ambient air quality analysis," which applicants must prepare under the permitting rules for each regulated pollutant their proposed facilities will emit in "significant" amounts. 40 C.F.R. § 52.21(b)(23)(i), (m)(1)(i). This analysis predicts a pollutant's future concentration in the ambient air by modeling a proposed facility's expected emissions of the pollutant against the backdrop of existing ambient conditions. To conduct an air quality analysis, a permit applicant compiles data on the proposed facility's physical specifications and anticipated emission rates, local topography, existing ambient air quality, meteorology, and related factors. *See, e.g.*, *id.* § 52.21(l), (m); *id.* pt. 51 app. W (Guideline on Air Quality Models); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 145-48 (EAB 1999); *NSR Manual* at C.16-.23, .31-.50. These data are then processed using mathematical models that calculate the rates at which pollutants are likely to disperse into the atmosphere under various climatological conditions, with the goals of determining whether emissions from the proposed source will cause or

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98th percentile cumulative impact – *i.e.*, the Kulluk's impact added to background levels of pollutants – for comparison to the 1-hour NO_2 standard, Shell used an approach that the Region admits is 'less conservative.' More specifically, Shell used background values that were already adjusted to the 98th percentile, instead of basing its calculations on the full distribution of background values." REDOIL Petition at 38 (footnote omitted). According to REDOIL Petitioners, this method for demonstrating compliance with the 1-hour NAAQS was rejected in the Page Memo as "not being protective of the [NAAQS]." *Id.* at 38-39 (quoting Page Memo at 18). REDOIL Petitioners then cite to a portion of the more recent Fox Memo which, according to them, allows for the method Shell used to calculate background values. *Id.* at 39. That is, the Fox Memo states that the approach used in the Page Memo was overly conservative and should not be used in certain cases. *Id.* (citing Fox Memo at 17-20). REDOIL Petitioners assert that the Region allowed Shell to demonstrate compliance with the form of the 1-hour NAAQS using the approach permitted in the Fox Memo without providing an explanation as to why the determination in the Page Memo was incorrect. *Id.* at 40. REDOIL Petitioners argue that "[b]ecause neither EPA nor the Region provided any explanation about whether and, if so, how, its earlier conclusion [in the Page Memo] that the use of the 98th percentile background values is 'not protective' of the national ambient air quality standard was incorrect, EPA's new guidance and the approach taken by the Region here in reliance on it are arbitrary." *Id.* (quoting Page Memo at 17-20). REDOIL Petitioners contend that the Region had an obligation to explain this "departure from its prior analysis." *Id.* at 40-41.

Upon examination of the record, the Board concludes that this issue was not adequately raised during the comment period and was therefore not preserved for review. As stated above, the regulations require any person who believes that a permit condition is inappropriate to raise "all reasonably ascertainable issues and * * * all reasonably available arguments supporting [petitioner's] position" during the comment period on the draft permit. 40 C.F.R. § 124.13. That requirement is made a prerequisite to appeal by 40 C.F.R. § 124.19(a), which requires any petitioner to "demonstrat[e] that any issue[] being raised [was] raised during the public comment period * * * to the extent required[.]". *In re ConocoPhillips Co.*, 13 E.A.D. 768, 800-01 (EAB 2008); *accord In re Christian Cnty. Generation, LLC*, 13 E.A.D. 449, 457 (EAB 2008); *Shell 2007*, 13 E.A.D. at 394 n.55.

The requirement that an issue must have been raised during the public comment period in order to preserve it for review is not an arbitrary hurdle placed in the path of potential petitioners. *Russell City II*, 15 E.A.D. at 10; *In re City of Marlborough*, 12 E.A.D. 235, 244 n.13 (EAB 2005), *appeal dismissed for lack of*

(continued)
contribute to a violation of either the NAAQS or the PSD increments. *See* 40 C.F.R. § 52.21(i); *id.* pt. 51 app. W; *NSR Manual* at C.24–.27, .51–.70.

juris., No. 05-2022 (1st Cir. Sept. 30, 2005); *In re BP Cherry Point*, 12 E.A.D. 209, 219 (EAB 2005). Rather, the requirement serves an important function related to the efficiency and integrity of the overall administrative permitting scheme. *Marlborough*, 12 E.A.D. at 244 n.13. The intent of the rule is to ensure that the permitting authority first has the opportunity to address permit objections and to give some finality to the permitting process. *Id.*; *In re Sutter Power Plant*, 8 E.A.D. 680, 687 (EAB 1999). As the Board has explained, "[t]he effective, efficient and predictable administration of the permitting process demands that the permit issuer be given the opportunity to address potential problems with draft permits before they become final." *In re Teck Cominco*, 11 E.A.D. 457, 481 (EAB 2004) (quoting *In re Encogen Cogeneration Facility*, 8 E.A.D. 244, 250 (EAB 1999)). "In this manner, the permit issuer can make timely and appropriate adjustments to the permit determination, or, if no adjustments are made, the permit issuer can include an explanation of why none are necessary." *In re Essex Cnty. (N.J.) Res. Recovery Facility*, 5 E.A.D. 218, 224 (EAB 1994).

Although REDOIL Petitioners' comments on the draft permit asserted that Shell had used background ambient air data in a manner that understated the impact of its operations, *see* REDOIL Comments at 9-11, nowhere in these comments did Petitioners assert that Shell's approach conflicted with the Page Memo or that the Region had any obligation to provide an explanation for its alleged departure from the Page Memo. Indeed, REDOIL Petitioners' comments recognized that, according to the Fox Memo, Shell's approach is appropriate in some circumstances. *Id.* at 11. The comments, however, did not assert any conflict between the Page Memo and the Fox Memo nor is it clear to this Board that any such conflict exists. Thus, this "battle of the memos" issue was not preserved for review.[49] *See Shell Discoverer 2012*, 15 E.A.D. at 507.

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[49] *See Teck Cominco*, 11 E.A.D. at 481-82 (denying review where issue was not specifically raised during the comment period). The Board notes that the issue REDOIL Petitioners did raise during the comment period was fully and adequately addressed in the Region's Response to Comments. Specifically, in commenting on the draft permit, REDOIL Petitioners raised the argument that Shell had failed to demonstrate compliance with the 1-hour NO_2 NAAQS because, according to REDOIL Petitioners, Shell used background ambient air data in a manner that understated the impact of its operations. REDOIL Comments at 10-11. As stated above, REDOIL Petitioners' comments recognized that Shell's approach to analyzing background data was consistent with the Fox Memo, but argued that Shell's approach was inconsistent with the 1-hour NO_2 NAAQS standard itself. *Id.* at 11. The Region provided a detailed response to this assertion in the Response to Comments. RTC at 74-78. Nothing in the REDOIL Petition indicates why the Region's response on this issue was erroneous or otherwise warrants Board review, nor does the Board find anything erroneous in the Region's response. Thus, even if Petitioners had preserved this issue, the Board would deny review. *See, e.g.*, *In re Guam Waterworks Auth.*, 15 E.A.D. 437, 450 (EAB 2011) (stating that "a petitioner may not simply reiterate comments made during the public comment period, but must substantively confront the permit issuer's explanations in its response to comments document"); *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 33 (EAB 2005) (same).

D. *REDOIL Petitioners Have Not Demonstrated That the Region Clearly Erred in Its Ambient Air Exemption Determination*

REDOIL Petitioners allege that the Region clearly erred in exempting the area within a 500 meter radius from the *Kulluk* from the definition of "ambient air."[50] REDOIL Petition at 15. This area is also referred to throughout the record as the United States Coast Guard ("USCG") "safety zone." *See, e.g.*, RTC at 52-54. REDOIL Petitioners claim that the Region's decision "contravenes both EPA's definition of 'ambient air' as well as EPA's longstanding interpretation of that regulation." REDOIL Petition at 16. In particular, they assert that the Region's 500 meter ambient air boundary fails to meet either of the two criteria the Agency has previously used in evaluating the appropriateness of an exemption. *Id.* at 16-18. According to REDOIL Petitioners, the Region's decision essentially allows Shell to emit more pollution, and possibly with fewer controls, than would otherwise be lawful.[51] *Id.* at 15-16.

The CAA regulations define "ambient air" as "that portion of the atmosphere, external to buildings, to which the general public has access." 40 C.F.R. § 50.1(e). Based on this definition, the Agency has, on occasion, exempted certain areas from the definition of ambient air. *E.g.*, Letter from Steven C. Riva, Chief, Permitting Sec., U.S. EPA Region 2, to Leon Sedefian, Air Pollution Meteorologist, N.Y. State Dep't of Env't Conservation, at 1-2 (Oct. 9, 2007) (A.R. BB-19) [hereinafter Broadwater Letter]; Letter from Douglas M. Costle, Adm'r, U.S. EPA, to Sen. Jennings Randolf, Chairman, Env't & Pub. Works Comm., at 1 (Dec. 19, 1980) (A.R. BB-1) [hereinafter Costle Letter]; *see also* Letter from Nancy Helm, Fed. & Delegated Air Programs, U.S. EPA, to John Kuterbach, Alaska Dep't of Envtl. Quality, at 2 (Sept. 11, 2007) (area exempt if certain conditions met) [hereinafter Helm Letter]. The parties agree that the Agency's "longstanding interpretation" of this exemption is set forth in a letter signed by former EPA Administrator Douglas Costle, which states that "the exemption from ambi-

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[50] For an area that is not considered within the definition of "ambient air," Shell would not have to demonstrate compliance with the NAAQS. *See* CAA §§ 109(b), 160, 163, 42 U.S.C. §§ 7409(b), 7470,7473 (NAAQS apply to areas meeting the definition of ambient air); 40 C.F.R. § 50.1(e) (definition of "ambient air"); *In re Hibbing Taconite Co.*, 2 E.A.D. 838, 848 & nn.23-24 (Adm'r 1989); RTC at 53.

[51] REDOIL Petitioners additionally argue that, should the Region's response contain a "natural physical feature" argument similar to an argument the Region raised in its response brief in *Shell Discoverer 2012*, the Board should consider such an argument a "*post hoc* rationalization" and should disallow it. REDOIL Petition at 19; *see also Shell Discoverer 2012*, 15 E.A.D. at 510 n.52 (discussing this issue). REDOIL Petitioners also reserve the right to request leave to file a reply brief addressing this issue. REDOIL Petition at 19. Unlike the situation in *Shell Discoverer 2012*, the Board does not find that the Region's response brief contains an explanation that is clearly different than the rationale set forth in the Response to Comments. Moreover, REDOIL Petitioners do not raise this particular issue in their reply brief. Consequently, the Board does not consider REDOIL Petitioners' "post hoc rationalization" argument further.

ent air is available only for the atmosphere over land owned or controlled by the source and to which the public access is precluded by a fence or other physical barriers." Costle Letter at 1; REDOIL Petition at 16 (quoting same letter); Region Response at 29-30 (referring to same letter); Shell Response at 26-27 & n.27 (same); *see also* RTC at 51 (same). The Costle Letter also indicates that, in determining whether the exemption applies, the Agency reviews "individual situations on a case-by-case basis." Costle Letter at 1; *see also* Approval and Promulgation of State Implementation Plans, 50 Fed. Reg. 7056, 7057 (Feb. 20, 1985) (noting that, in considering ambient air exemptions, "individual variations in the type of land and nature of the limitation on access necessitate a case-by-case evaluation of the facts, and application of the principles involved in this determination").

Here, in its permitting decisions, the Region determined that, as long as certain permit conditions were being met, it was appropriate to set the ambient air boundary at a 500 meter radius from the *Kulluk*, or, in other words, the 500 meter radius "safety zone" was exempt from the ambient air definition. RTC at 51-52; *see also* Statement of Basis at 40. The terms and conditions upon which the Region relied to exempt this area prohibit the operation of vessels and emissions units unless (1) the USCG establishes a safety zone within at least 500 meters from the center of the *Kulluk*, (2) members of the public are precluded from entering the safety zone, and (3) Shell develops and implements a "public access control program."[53] Permit at 42-43. The Region determined that, as long as these safety zone and public access restriction permit conditions are complied with, ex-

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[53] The precise terms and conditions of the Permit are as follows:

> The permit does not authorize operation unless:
>
> > 5.1.1. The Kulluk is subject to a currently effective safety zone established by the [USCG] which encompasses an area within at least 500 meters from the hull of the Kulluk and which prohibits members of the public from entering this area except for attending vessels or vessels authorized by the USCG (such area shall be referred to as the "Safety Zone"); and
> >
> > 5.1.2. The permittee has developed in writing and is implementing a public access control program to:
> >
> > 5.1.2.1. Locate, identify, and intercept the general public by radio, physical contact, or other reasonable measures to inform the public that they are prohibited by Coast Guard regulations from entering the Safety Zone; and
> >
> > 5.1.2.2. Communicate to the North Slope communities on the Beaufort Sea on a periodic basis when exploration activities are expected to begin and end at a drill site, the location of the drill site, and any restrictions on activities in the vicinity of the Kulluk's exploration operations.

Permit at 42-43.

empting the area within the safety zone from the ambient air definition would generally be consistent with previous Agency interpretations. RTC at 51-52. In so finding, the Region noted that "[g]iven that the permitted activities occur over open water in the Arctic, the[] criteria [for exemption included in the Costle Letter] must be adapted to some extent when applied to this environment." *Id.* In specifically considering the applicability of the two exemption criteria, the Region stated:

> Region 10 recognizes that Shell does not "own" the areas of the Beaufort Sea on which the Kulluk will be operating as might be the case for a stationary source on land. Shell has a lease authorizing the company to use these areas for the activities covered by the permits. A Coast Guard safety zone establishes legal authority for excluding the general public from the area inside the zone. EPA has previously recognized a safety zone established by the Coast Guard as evidence of sufficient ownership or control by a source over areas over water so as to qualify as a boundary for defining ambient air where that safety zone is monitored to pose a barrier to public access. Letter from Steven C. Riva, EPA Region 2, to Leon Sedefian, New York State Department of Conservation, re: Ambient Air for the Offshore LNG Broadwater Project, dated October 9, 2007 (Broadwater Letter).
>
> To meet the second of the criteria applied by EPA and ensure the source actually takes steps to preclude public access, Shell proposed and Region 10 required as a condition of operation under the permits that Shell develop in writing and implement a public access control program to locate, identify, and intercept the general public by radio, physical contact, or other reasonable measures to inform the public that they are prohibited by Coast Guard regulations from entering the area within 500 meters of the hull of the Kulluk. Region 10 believes that, for the overwater locations in the arctic environment at issue in these permitting actions, such a program of monitoring and notification is sufficiently similar to a fence or physical barrier on land such that the area within the Coast Guard safety zone qualifies for exclusion from ambient air. *See* Broadwater Letter at 2.

RTC at 52.[53]

Upon consideration of the administrative record and the parties' arguments, the Board concludes that Petitioners have not shown that the Region clearly erred in its decision to exempt the area within the USCG safety zone from the definition of "ambient air." The Region, in its Response to Comments, provided a reasonable interpretation of the ambient air regulation and the Agency's "longstanding interpretation" of that regulation as applied in the OCS context.[54] Furthermore, the Region's analysis was entirely consistent with a similar analysis undertaken by Region 2 in which that Region determined that it was appropriate for a permittee to use the USCG safety zone to define an ambient air boundary around a proposed offshore liquefied natural gas facility. *See* Broadwater Letter at 2. The Broadwater Letter, moreover, suggests that Region 2's analysis, as well as Region 10's, is not unique, stating that *"[i]n previous permitting decisions involving * * * drilling operations, EPA Regional offices have used the USCG's safety zone as the boundary for defining ambient air." Id.* at 2 (emphasis added). The letter explains that the Agency has found that "[t]he 'safety zone' approach represents a reasonable surrogate for a source's fence or physical barrier and thus could act as an ambient air boundary." *Id.*

Thus, while it is true, as Petitioners allege, that the Agency has generally required the source to own or control access over the area in question for that area to meet the first criterion, REDOIL Petition at 16-17, this requirement has been limited to sources located on land.[55] *See, e.g.*, Helm Letter at 1 (referring to possi-

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[53] REDOIL Petitioners also seem to suggest that the Region's approach is flawed because it "is based upon an assumption that Shell will request, and the [USCG] will establish, a safety zone restricting the passage of other vessels." REDOIL Petition at 15 & n.45. This argument is unpersuasive because it fails to recognize that, as the permit conditions quoted in note 52 state, operation is prohibited unless these two conditions are met. *See* Permit at 42-43.

[54] As the Region rightly noted, *see* RTC at 51-52, the regulation and the Costle Letter, by their very terms, were clearly written with overland situations in mind. *See* 40 C.F.R. § 50.1(e) (referring to "buildings"); Costle Letter at 1 (referring to "land" and "fences").

[55] In support of their contention, REDOIL Petitioners rely on a previous Agency determination that leased property could not be exempted from the definition of ambient air because the lessee did not have control over access to its leased property (only the landlord did). REDOIL Petition at 17 & n.52 (citing Helm Letter). Petitioners assert that this onshore interpretation must apply equally to an OCS lease BOEMRE issued. *Id.* As the Petitioners themselves note, federal courts have found agency action to be arbitrary when the agency's "explanation 'runs counter to the evidence,'" *id.* at 17 (quoting *Motor Vehicle Mfrs. Ass'n of the U.S., Inc. v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983)), and "'the agency offer[s] insufficient reasons for treating similar situations differently.'" *id.* (quoting *Transactive Corp. v. United States*, 91 F.3d 232, 237 (D.C. Cir. 1996)); *see also FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 514-15, 129 S.Ct. 1800, 1810-11 (2009) (discussing standard of review of an agency's policy change). Here, not only are the situations dissimilar enough to arguably not be governed by these cases, but the Agency did offer persuasive reasons for treating the two situations differently.

ble exemption near coal-fired power plant); Memorandum from Steven D. Page, Director, Office of Air Quality Planning & Standards, U.S. EPA, to Reg'l Air Div. Dirs., U.S. EPA, *Interpretation of "Ambient Air" in Situations Involving Leased Land Under the Regulations for the Prevention of Significant Deterioration (PSD)* (June 22, 2007) (A.R. B-26) (discussing the applicability of the exemption where a source is located on "land" leased to them by another source). The Region (and the Agency before it) reasonably determined that application of the regulation and the interpretive letter to an "overwater" situation requires some leeway. REDOIL Petitioners' reliance solely on land-based exemption decisions is thus unpersuasive.[56] Finally, as mentioned above, the Agency has consistently taken the position that ambient air exemption determinations are analyzed on a case-by-case basis.

For all the reasons stated above, REDOIL Petitioners have not shown that the Region clearly erred in its ambient air exemption determination.[57] Consequently, review of the Permit based on this issue is denied.

E. *ICAS and Mr. Lum Have Not Demonstrated That the Region Failed to Satisfy Its Obligation to Comply with Executive Order 12898 and Applicable Board Precedent*

ICAS and Mr. Lum argue that the Region's environmental justice analysis lacked a valid basis on which to conclude that Shell's oil exploration activities in the Beaufort Sea will not have a disproportionately high and adverse effect on the health of the Alaska Native population living on the North Slope. ICAS alleges that the Region's environmental justice analysis fails to account for the impacts of short-term NO_2 and ozone exposures on the Alaska Native population residing on the North Slope, and also asserts that the opportunities for public participation were inadequate. Mr. Lum challenges the lack of analysis regarding the impacts

[56] REDOIL Petitioners' arguments that the Region's determination fails to meet the second criteria because the safety zone "fails to effectuate a barrier that 'precludes' public access" are equally unpersuasive. REDOIL Petition at 17. REDOIL Petitioners focus on the fact that the USCG will limit access to the area based on safety concerns rather than for air quality considerations. *Id.* at 17-18. The important fact is that access within the zone will be strictly limited, not the reason behind it. Moreover, REDOIL Petitioners do not address the other condition of the permit that the Region relied upon for its ambient air boundary determination: the public access control program Shell is required to implement. The Board does not find clear error in the Region's conclusion that, based on the USCG limiting access to the safety zone and the permittee implementing a public access control program, the latter of which will include notification to the local residents of the location of the drilling and the fact that the public is restricted from the safety zone, the general public will be denied access to the area inside the safety zone.

[57] The Board came to the same conclusion in *Shell Discoverer 2012*. *See* 15 E.A.D. at 513-14. In that case, the Region had adopted and followed the same or a very similar interpretation as described in the text above. *See id.* 15 E.A.D. at 511-13. Nothing REDOIL Petitioners offer in the present case convinces the Board that anything in the prior analysis – and reiterated here – was in error.

emissions from Shell's activities in the Beaufort Sea could have on traditional subsistence food sources and also challenges Shell's oil spill response capabilities. The Region counters that its environmental justice analysis and resulting conclusions comply with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" ("Executive Order"). The issue the Board must resolve is: did the Region satisfy its obligation to comply with the Executive Order and applicable Board precedent?

The Executive Order states in relevant part:

> *Agency Responsibilities.* To the greatest extent practicable and permitted by law, and consistent with principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice a part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations * * * .

Exec. Order 12898, 59 Fed. Reg. 7629, 7629 (Feb. 11, 1994) (A.R. FF-1). Federal agencies are required to implement the Executive Order "consistent with, and to the extent permitted by, existing law." *Id.* at 7632. The Board has held that a permit issuer should exercise its discretion to examine any "superficially plausible" claim that a minority or low-income population[58] may be disproportionately affected by a particular facility seeking a PSD permit. *In re EcoEléctrica, LP*, 7 E.A.D. 56, 69 n.17 (EAB 1997); *accord Shell 2010*, 15 E.A.D. at 148-49 & n.71 (citing PSD cases).

At the outset, the Board notes that both ICAS and Mr. Lum recently challenged the Region's environmental justice analysis in *Shell Discoverer 2012*. *See* 15 E.A.D. at 493-501. In addition, the environmental justice analysis the Region prepared in the current matter is reminiscent of the environmental justice analysis prepared for the *Discoverer* permits that were the subject of the Board's *Shell Discoverer 2012* decision. Moreover, while their petitions for review in *Shell Discoverer 2012* and the current appeal are not identical, both ICAS and Mr. Lum raise substantially similar arguments in their current appeals as they did in their appeals of the *Discoverer* permits.[59] *Compare* Lum Petition *with* Eskimo

[58] Under the Executive Order, the Alaska Native population residing on the North Slope qualifies as a minority population. *See* Statement of Basis at 55; ICAS Petition at 30.

[59] ICAS's remaining challenges to the amount and quality of public participation opportunities available pertaining to the environmental justice analysis appear to mirror its more general arguments

Continued

Whaler Petition for Review, *Shell Discoverer 2012* (Doc. No. 24), *and* ICAS Petition *with* ICAS and AEWC Petition for Review, *Shell Discoverer 2012* (Doc. No. 7).

1. *Region's Environmental Justice Analysis*

The Region included a fifteen-page environmental justice analysis in the administrative record to accompany the Permit and to allow for public comment on the analysis. Environmental Justice Analysis for Proposed OCS Permit No. R10 OCS030000 Kulluk Drilling Unit (undated) ("EJ Analysis") (A.R. F-1). The Region's analysis begins with a discussion of environmental justice in the permitting context and notes that "[t]he Title V operating permit program does not generally impose new substantive air quality control requirements."[60] EJ Analysis at 2. In addition, the analysis includes a discussion of how the national ambient air quality standards ("NAAQS") are crafted by integrating scientific information and evidence from rigorously reviewed studies, and a summary of the Board's case law stating that the Board views compliance with the NAAQS as "emblematic of achieving a level of public health protection that, based on the level of protection afforded by the NAAQS, demonstrates that minority or low-income populations will not experience disproportionately high and adverse human health or environmental effects due to exposure to relevant criteria pollutants." *Id.* (quoting *Shell 2010*, 15 E.A.D. at 156) (citations omitted); *see also* Statement of Basis at 54-55.

(continued)
regarding the public participation process. *See* ICAS Petition at 6-10, 38-39. Accordingly, the Board addresses ICAS's challenges to the adequacy of the public participation process, both generally and with respect to the environmental justice analysis, in Parts VI.F and VI.G below.

[60] The Region further explained that:

> [T]he Title V operating permit program is generally a vehicle for ensuring that existing air quality control requirements are appropriately applied to facility emission units and that compliance with these requirements is assured. Accordingly, the primary means of addressing environmental justice issues in the Title V program is through increased public participation and review by permitting agencies, and conditions to assure compliance with applicable requirements. As discussed above, the Title V permit at issue in this case is unusual in that it requires the source, as a Title V temporary source, to meet the NAAQS and also establishes limits on the potential to emit. Region 10 has considered environmental justice concerns in this permitting action where possible in the context of assuring compliance with applicable requirements for the source, in particular assuring compliance with the NAAQS as a Title V temporary source and establishing PSD avoidance limits.

EJ Analysis at 2; *see also* Statement of Basis at 54.

The analysis goes on to catalogue the distances between Inupiat communities on the coast of the North Slope that are closest to Shell's lease blocks in the Beaufort Sea, and discusses the importance of subsistence foods obtained through hunting, fishing, and whaling to the Inupiat diet, and more generally the nexus between subsistence activities and Inupiat culture. EJ Analysis at 3, 5. The Region also included an illustration that juxtaposes the location of Shell's lease blocks, including proposed exploration sites, with onshore and offshore subsistence use areas for the northern Inupiat communities.[61] *Id.* at 4; *see also* Statement of Basis at 56.

The Region then proceeded to analyze demographic, health-related, and air quality data.[62] The demographic analysis indicates that 68% of residents living in the North Slope Borough classify themselves as Alaska Natives. EJ Analysis at 7. In addition, nearly half of North Slope residents speak a language other than English at home. *Id.* at 8. The analysis of health data revealed, among other things, that from 1990 to 2007 there has been a 158% rate of increase in the prevalence of diabetes for Alaska Natives residing on the Arctic Slope, whereas during the same time period there has been a 117% rate of increase in the prevalence in diabetes for Alaska Natives statewide.[63] *Id.* at 9. In addition, there is a higher incidence of outpatient visits for respiratory problems ranging from the common cold to pneumonia in the Arctic Slope than in the rest of Alaska. *Id.*

In the air impacts analysis, the Region first noted that the North Slope Borough is currently designated as attainment/unclassifiable for all of the NAAQS, meaning that the North Slope has sufficient data to determine that the area is meeting the NAAQS or that, due to no data or insufficient data, EPA cannot make a determination. *Id.* at 11 & n.15 (citing CAA § 107(d), 42 U.S.C. § 7407(d)). The

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[61] The analysis also includes, for some of the northern Inupiat communities, the distances residents have reported traveling offshore to hunt for traditional subsistence food sources. *See* EJ Analysis at 6 (noting that Nuiqsut residents have traveled up to 60 miles offshore to the north and as far east as Camden Bay to hunt for bowhead whale and that Kaktovik residents have traveled as far as 35 miles offshore to hunt for bowhead whale and walrus); Statement of Basis at 55; *see also Shell 2010*, 15 E.A.D. at 155 n.80 (noting that subsistence activities, which can take Inupiat residents living on the North Slope far from their local communities and closer to emissions sources, are a potential environmental justice consideration that may be unique to the OCS PSD permitting context); *Shell Discoverer 2012*, 15 E.A.D. at 496 n.32 (same).

[62] The Region used demographic information gathered from the 2000 U.S. Census to compare the population of the North Slope Borough to the populations of both the State of Alaska and the entire United States, which served as reference populations for the demographic analysis. EJ Analysis at 6-8 & n.6. The North Slope Borough consists of the following eight incorporated villages: Point Hope, Point Lay, Wainwright, Atqasuk, Barrow, Nuiqsut, Kaktovik, and Anaktuvuk Pass. *See* Statement of Basis at 55.

[63] The Region utilized data from the Alaska Native Health Status Report 2009, which the Alaska Native Epidemiology Center and the Alaska Native Tribal Health Consortium had prepared to analyze health conditions in the North Slope Borough. *See* EJ Analysis at 8-10 & n.11.

Region then examined the total modeled concentrations of NO_2, particulate matter with a diameter of 10 micrometers or less ("PM_{10}"), particulate matter with a diameter of 2.5 micrometers or less ("$PM_{2.5}$"), SO_2, and CO,[84] including background concentrations and maximum concentrations from the *Kulluk* and the Associated Fleet.[85] *Id.* at 13-14 & tbl.6. The Region compared the total modeled concentrations for each of the three nearest communities while the source is in operation and found that the total maximum modeled concentrations demonstrate that the NAAQS will be attained at all locations beyond the 500-meter boundary, and that the modeled concentrations in the North Slope communities and in areas where the communities conduct subsistence activities will be below the relevant standard.[86] *Id.* at 14. Finally, the Region noted that a majority of the total impacts result from background concentrations. *Id.*

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[84] The Board notes that the information included in table 5 of the air quality analysis includes modeled impacts in the nearest onshore communities from operation of the *Kulluk* alone, without impacts from the Associated Fleet or background concentrations. EJ Analysis at 12 & tbl.5. The Region explains that the maximum modeled concentrations in Nuiqsut, Deadhorse, and Kaktovik listed in table 5 are all below the significant impact levels ("SILs") established for each criteria pollutant. *Id.* at 12. In the PSD program, SILs function as threshold levels for ambient concentrations of a given pollutant; for a given pollutant and averaging period, any source that has a measured concentration that is below the SIL is considered too small to cause or contribute to a violation of the NAAQS. *Id.*

The Region made clear earlier in the environmental justice analysis that emissions from the Associated Fleet while operating within 25 miles of the *Kulluk*, together with emissions from the *Kulluk*, are considered in conducting an ambient air quality analysis to determine whether emissions from the project will cause or contribute to a violation of the NAAQS. *Id.* at 4. The Region's analysis repeatedly emphasized that compliance with the NAAQS is "emblematic of achieving a level of public health protection" that demonstrates that minority or low-income populations will not experience disproportionately high and adverse human health or environmental impacts due to exposure to relevant criteria pollutants. *Id.* at 4-5 (quoting *Shell 2010*, 15 E.A.D. at 156). While the inclusion of information on modeled impacts of emissions from the *Kulluk* alone on the nearest onshore communities is illustrative regarding the *Kulluk*'s contribution to the overall emissions profile, it is the information that encompasses both background concentrations and emissions from the *Kulluk* and the Associated Fleet when it is within 25 miles of the *Kulluk* that establishes the Region has satisfied its obligation to comply with the Executive Order.

[85] Monitoring data from Prudhoe Bay, Deadhorse, and Endicott were used for background values. EJ Analysis at 13. The Region also noted that the modeled impacts are based on conservative assumptions, including that all four wells are drilled at the same location to account for overlapping plumes, even though the drilling of four wells at a fixed location and the overlap of plumes will not occur. *Id.*

[86] Specifically, the Region noted that in Kaktovik, located 8 miles from Shell's closest lease block in the Beaufort Sea, the total maximum modeled concentrations, assuming Shell's *Discoverer* is in operation and considering background concentrations, are measured at the following percentages of the NAAQS: 11% for the 1-hour NO_2 NAAQS; 20% for the 24-hour $PM_{2.5}$ NAAQS; 35% for the 24-hour PM_{10} NAAQS, and; 20% for the annual $PM_{2.5}$ NAAQS. EJ Analysis at 13-14 & tbl.6. Similarly, in Nuiqsut, located 33 miles from Shell's closest lease block in the Beaufort Sea, and applying the same assumptions, the total maximum modeled concentrations are measured at the following percentages of the NAAQS: 50% for the 1-hour NO_2 NAAQS, 48% for the 24-hour $PM_{2.5}$ NAAQS, 35% for the 24-hour PM_{10} NAAQS, and 26% for the annual $PM_{2.5}$ NAAQS. *Id.*

Overall, the Region concluded that Shell's proposed OCS activities in the Beaufort Sea will not result in disproportionately high and adverse human health or environmental effects with respect to Alaska Natives residing on the North Slope, and further, in reaching this conclusion the Region considered the impact on these communities while engaging in subsistence activities in the areas where such activities are regularly conducted. *Id.* at 15. With this background in mind, the Board now turns to the specific assertions both ICAS and Mr. Lum make in support of their arguments that the Region has not complied with its obligation under the Executive Order.

2. *One-Hour NO_2 NAAQS Analysis*

ICAS challenges the Region's consideration of 1-hour NO_2 NAAQS[67] compliance in the environmental justice analysis on several grounds, arguing that it is "insufficient and ignores salient record evidence." ICAS Petition at 34. ICAS asserts that in addition to NO_2 emissions from the *Kulluk* when it is an OCS source and from the Associated Fleet when it is within 25 miles of the *Kulluk*, the Region must also account for mobile source NO_2 emissions that remain unregulated by the Permit when assessing potentially adverse health impacts of NO_2 emissions on North Slope communities. *Id.* at 35-38. In addition, ICAS challenges the Region's "fatal flaw of the environmental justice analysis," namely the failure to *analyze* the impacts of Shell's emissions on residents of the North Slope conducting subsistence activities offshore. *Id.* at 36-37 (emphasis in original). Finally, ICAS challenges the Region's analysis of Shell's 1-hour NO_2 NAAQS compliance based on several technical decisions the Region made. *Id.* at 37-38.

ICAS asserts that the Region's environmental justice analysis is inadequate because it does not account for emissions from mobile sources that are not included in the air quality impact analysis conducted to determine whether emissions from the project will cause or contribute to a violation of the NAAQS. *See id.* at 34 & n.30; EJ Analysis at 4. The Board disagrees.

The Region appropriately determined that it was not required to analyze these mobile source emissions where, as here, the Title V permit did not address mobile source emissions, and the record lacked sufficient data for such an analy-

[67] NAAQS are health based-standards, designed to protect public health with an adequate margin of safety, including sensitive populations such as children, the elderly, and asthmatics. *See In re AES Puerto Rico, L.P.*, 8 E.A.D. 324, 351 (EAB 1999), *aff'd sub nom. Sur Contra La Contaminacion v. EPA*, 202 F.3d 443 (1st Cir. 2000), *cited in Shell 2010*, 15 E.A.D. at 149 n.72. The Administrator is required to carry out periodic reviews of the air quality criteria published under section 108 of the CAA, 42 U.S.C. § 7408, as well as the NAAQS, and to revise the criteria and standards as appropriate. CAA § 109(d)(1), 42 U.S.C. § 7409(d)(1). The Board outlined the history of the NO_2 NAAQS reviews in its December 2010 remand order. *See Shell 2010*, 15 E.A.D at 150 nn.73-74.

sis.[68] RTC at 114; Statement of Basis at 54; *see also* EJ Analysis at 2; Region Response at 36 n.34. The Region acknowledged that the Title V permit at issue in this case is unusual in that it requires a temporary Title V source to meet the NAAQS, and the permit also establishes limits on PTE. EJ Analysis at 2; Statement of Basis at 54; RTC at 114. However, the Title V permit does not regulate mobile source emissions.[69]

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[68] ICAS asserts that the Board should remand the *Kulluk* permit so that the Region can assess mobile source emissions included in Shell's emissions inventory submitted to BOEMRE as part of Shell's Exploration Plan, both because it "shows that the additional emissions estimates are not as hard to obtain as Region 10 implies," and because once the Region assesses the accuracy of the inventory it can "use the information to conduct an EJ analysis that accounts *for all* of Shell's emissions." ICAS Petition at 35 (emphasis in original).

Nowhere in its petition does ICAS acknowledge the Region's statement, in the Response to Comments, that "[t]he Exploration Plan * * * does not include estimates of air emissions from these other vessels during the time they are more than 25 miles from the Kulluk or before the Kulluk becomes an OCS source." RTC at 15. The Board has consistently stated that, in order to sustain its burden of demonstrating that review is warranted, the petitioner must address the permit issuer's responses to relevant comments made during the permit proceeding. *See, e.g.*, *Peabody*, 12 E.A.D. at 33 ("[T]he petitioner may not simply reiterate comments made during the public comment period, but must substantively confront the permit issuer's subsequent explanations.").

Furthermore, ICAS's suggestion that the Region should "compile rough estimates" of these mobile source emissions because "[s]ome additional steps are particularly necessary here" is similarly unavailing. ICAS Petition at 36. ICAS has acknowledged its ongoing concern regarding emissions that are not included in the PTE analysis, along with its efforts to compel Region 10 to consider non-PTE emissions as OCS source emissions in prior appeals to this Board. ICAS Petition at 34. Despite its concerns, ICAS cannot demonstrate that review is warranted where, as here, ICAS offers a generalized objection to the Region's consideration of mobile sources in the environmental justice analysis, and the Region has demonstrated that it lacks sufficient data to reach a determinative conclusion regarding these mobile source emissions in the environmental justice context. *See Avenal*, 15 E.A.D. at 401-02; *see also In re Cape Wind Assocs., LLC*, 15 E.A.D. 327, 330 (EAB 2011) (noting that petitioners "must raise specific objections to the permit"); *In re BP Cherry Point*, 12 E.A.D. 209, 217 (EAB 2005) (same).

[69] In a memorandum addressing environmental justice in the permitting context, the Agency stated:

> Unlike PSD/[New Source Review] permitting, Title V generally does not impose substantive emission control requirements, but rather requires all applicable requirements to be included in a Title V operating permit. * * * Because Title V does not directly impose substantive emissions control requirements, it is not clear whether or how EPA could take environmental justice issues into account in Title V permitting – other than to allow public participation to serve as a motivating factor for applying closer scrutiny to a Title V permit's compliance with applicable CAA requirements.

Memorandum from Gary Guzy, General Counsel, U.S. EPA, to Assistant Administrators, U.S. EPA, *EPA Statutory and Regulatory Authorities Under Which Environmental Justice Issues May Be Addressed in Permitting* 13 (Dec. 1, 2000) (A.R. FF-7).

Despite the fact that mobile source emissions are not regulated under the Title V permit, the Region did go beyond its required review to consider mobile source emissions with respect to environmental justice in the Response to Comments. *See* RTC at 114-15. The Region was unable to reach a determinative conclusion with respect to these emissions due to insufficient information.

ICAS's attempt to construe the Executive Order and Board precedent to *require* in this instance the analysis of emissions from mobile sources that the Region may not have accurate or sufficient data to complete in the context of a Title V permit is unpersuasive. Notably, the Board has held that it will decline to review a permit issuer's environmental justice analysis that cannot reach a determinative conclusion due to the insufficiency of available valid data. *See* RTC at 115; *Avenal*, 15 E.A.D. at 401-02 (stating that where a permit issuer conducts a substantive environmental justice analysis that endeavors to include and analyze data that is germane to the environmental justice issue raised during the comment period, and the permit issuer demonstrated it exercised its considered judgment when determining that it cannot reach a determinative conclusion due to the insufficiency of available data, the Board will decline to grant review of the environmental justice analysis). Moreover, "[t]he plain language of the Executive Order imparts considerable leeway to federal agencies in determining how to comply with the spirit and letter of the Executive Order." *Avenal*, 15 E.A.D. at 401. ICAS overreads *Avenal* when it suggests that *Avenal* compels the analysis of these mobile source emissions in the context of this permit. *See* ICAS Petition at 35 ("The Agency has considered mobile emissions previously in its EJ analyses and should be required to do so here." (citing *Avenal*, 15 E.A.D. at 399)).[70]

ICAS's challenge also fails because ICAS never responded to the Region's stated rationale in the administrative record that Title V permits generally do not impose new substantive air quality control requirements. A petitioner cannot sim-

[70] ICAS includes a citation to *Avenal* for the proposition that "motor vehicle emissions are by far the greatest concern," in support of its contention that mobile source emissions should be included in the short-term NO_2 NAAQS assessment included in the environmental justice analysis, but the quote is taken out of context and does not support ICAS's position. *See* ICAS Petition at 35. The circumstances in *Avenal* are markedly different than those in the present case. In *Avenal*, the Agency conducted an environmental justice analysis that focused in particular on short-term NO_2 impacts in support of a PSD permit to build a 600-megawatt power plant. 15 E.A.D. at 399. The Agency noted that in the area surrounding the proposed site for the new source, motor vehicles accounted for 91% of NO_2 emissions locally, as compared to 61% of NO_2 emissions nationwide. *Id.* In addition, the environmental justice analysis in *Avenal* noted that the area surrounding the proposed facility was designated as extreme nonattainment for ozone, and NO_2 is a precursor emission. *Id.* Finally, the Agency further explained that NO_2 concentrations on or near major *roadways* have appreciably higher emissions than those measured at monitors in the Agency-approved network. *Id.* ICAS has not demonstrated that the need to assess NO_2 impacts from mobile sources in *Avenal*, where NO_2 emissions near roadways were known to be much higher, translates into a requirement that the Agency account for these mobile emissions on the Arctic OCS to demonstrate that its environmental justice analysis is sufficient.

ply repeat comments made during the comment period, but must substantively confront the permit issuer's substantive explanations in order to demonstrate that review of a particular issue is warranted. *Peabody*, 12 E.A.D. at 33.

Further, ICAS's assertion that the Region failed "to *analyze* the impacts of Shell's emissions on subsistence hunters and fishers while offshore," is unsupported by the record. ICAS Petition at 36-37 (emphasis in original); *see also Shell Discoverer 2012*, 15 E.A.D. at 500. The environmental justice analysis stated that mobile source emissions will dissipate while vessels are in transit. RTC at 115, and the environmental justice analysis analyzed how the subsistence areas located in close proximity to Shell's lease blocks might be affected by Shell's OCS activities. EJ Analysis at 5; *id.* at 6 (discussing distances subsistence hunters, whalers, and fishermen have traveled offshore in search of subsistence foods); *id.* at 4 (depicting subsistence use areas mapped over Shell exploration plan well sites). In addition to demonstrating compliance with the applicable NAAQS, the Region conducted an environmental justice analysis that included and analyzed data that is germane to the environmental justice issues raised during the comment period. *See Shell 2010*, 15 E.A.D. at 160-61 n.87. Although ICAS may disagree with the contents or conclusions of the Region's environmental justice analysis, ICAS has not demonstrated that this difference in opinion equates to an insufficient effort on the Region's part regarding environmental justice, or that the Region failed to analyze impacts. *See Shell Discoverer 2012*, 15 E.A.D. at 500.

Finally, ICAS enumerates several problems with the Region's environmental justice analysis that amount to challenges to the Region's technical expertise. *See* ICAS Petition at 37; Region Response at 43-44; *see also Shell 2012*, 15 E.A.D. at 500-01. Without elaborating any further, ICAS expresses "significant concerns" with, among other things, installed NO_2 controls and their ability to function properly in cold weather, the use of generic NO_x/NO_2 ratios in lieu of actual source tests, the use of "diurnal pairing" of NO_2 data, and the need for additional "tracer experiments" to supply data for the AERMOD model. ICAS Petition at 37. It is axiomatic that a challenge to the fundamental technical expertise of a permit issuer requires a petitioner to overcome a particularly heavy burden, and that a successful challenge to a permit issuer's technical expertise must consist of more than just a difference of opinion. *Shell 2012*, 15 E.A.D. at 501; *accord In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567 (EAB 1998), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3rd Cir. 1999). Here, ICAS has failed to overcome this particularly heavy burden because it does nothing more than list its broad objections to the Region's environmental justice analysis.

3. *Ozone NAAQS Analysis*

ICAS also challenges the Region's compliance with its obligation under the Executive Order based on the Region's alleged failure to adequately address both the latest scientific findings regarding ozone and the potential impacts of ozone on

local communities. ICAS Petition at 31. ICAS's assertions focus in large part on the Region's decision to demonstrate compliance with the current 8-hour ozone NAAQS, which is set at 0.75 parts per million ("ppm"), as opposed to the range of 0.60 to 0.70 ppm for the 8-hour ozone NAAQS that EPA's Administrator proposed in January 2010 but never finalized. *See id.* at 30-34; Region Response at 40-42; RTC at 96-98, 119-20. On September 2, 2011, four days before the close of the public comment period and prior to the Region issuing the Permit, the President requested that the Administrator withdraw the proposed 8-hour ozone NAAQS standard and instead enforce the current 8-hour ozone standard of 0.75 ppm until the ozone standard is reconsidered again in 2013. Statement on the Ozone National Ambient Air Quality Standards, 2011 Daily Comp. Pres. Doc. 607, at 1 (Sept. 2, 2011), *available at* http://www.gpo.gov/fdsys/ (click on Compilation of Presidential Documents). ICAS also asserts that the Region's conclusion not to model emissions from ozone precursors based on available background data that does not account for the cumulative impacts of proposed activities on the Arctic OCS was in error, and that the Region's response to its comments regarding ozone were inadequate. ICAS Petition at 33.

The Region responds that ICAS's petition raises issues that are largely technical, and that the Region appropriately relied on the Agency's current legal standard of 0.75 ppm when assessing Shell's compliance with the 8-hour ozone NAAQS. Region Response at 40. The Region further asserts that it exercised its technical expertise to determine that ozone levels in the area were not expected to exceed even the lowest level of 0.60 ppm that EPA included in its proposed 8-hour ozone NAAQS. *Id.* at 42. Finally, the Region asserts that it appropriately responded to comments received, including comments specifically raising concerns about the cumulative impacts of proposed OCS operations with respect to attaining the ozone NAAQS. *Id.*

Although ICAS argues to the contrary, the current, enforceable 8-hour ozone NAAQS that Shell must demonstrate compliance with is 0.75 ppm. As this Board has stated previously, "[a] permit issuer must apply the statutes and implementing regulations in effect at the time the final permit decision is made." *Russell City II*, 15 E.A.D. at 81 n.98 (quoting *In re Phelps Dodge Corp.*, 10 E.A.D. 460, 478 n.10 (EAB 2002)). The Region's decision to require Shell to comply with the 0.75 ppm 8-hour ozone NAAQS is consistent with applicable law and the corresponding regulations in effect at the time the Region issued the Permit.

In addition, ICAS does not demonstrate that the Region's analysis of the impacts the 8-hour ozone NAAQS may have on Alaska Natives residing on the North Slope would result in a disproportionately high or adverse impact on the

health of Alaska Natives.[71] In the Response to Comments supporting the Permit, the Region stated that it "stands by its decision" to forego regional photochemical modeling and further explained that "Region 10 reviewed ozone monitoring data along with existing precursor emissions that will impact ozone formation. Based on this review, Region 10 determined further analysis of ozone was not warranted." RTC at 97. In addition, the Region explained that the most recent ozone data indicates that current ozone levels in the Beaufort Sea are well below 0.60 ppm, which represents the low end of the range of the proposed 8-hour ozone NAAQS.[72] *Id.* at 97-98, 120.

Finally, ICAS's assertion that the Region failed to consider the cumulative impacts of emissions from proposed Arctic OCS operations is unavailing. *See* ICAS Petition at 33. ICAS's petition for review not only lacks any further support for this statement, it also fails to substantively confront the Region's explanation in the Response to Comments. *See Peabody*, 12 E.A.D. at 33 (petitioner must

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[71] ICAS's assertion that in the context of an environmental justice analysis the Region's treatment of the 8-hour ozone standard in the current appeal is analogous to the Region's treatment of the newly promulgated 1-hour NO_2 NAAQS in *Shell 2010* must also fail. *See* ICAS Petition at 32. As the Board recently explained, the context of the challenge to the environmental justice analysis in *Shell 2010* was unusual in that the OCS PSD permits at issue were finalized in the interim between the Administrator's publication of the final rule establishing the hourly NO_2 NAAQS in the Federal Register on February 9, 2010, and the effective date of the new hourly NO_2 standard, April 12, 2010. *Arenal*, 15 E.A.D. at 401. The Board emphasized that the environmental justice aspect of the *Shell 2010* remand order turned on the Region's scant environmental justice analysis, which provided no examination or analysis of short-term NO_2 impacts whatsoever. *Id.*

Here, the Region not only analyzed impacts from ozone emissions, *see* RTC at 96-98, 119-20, it further explained that current levels of ozone in the area are well below the low end of the range EPA had requested comment on in the proposed ozone NAAQS, and that emissions of ozone precursors would also not lead to an exceedance of the low range of the proposed ozone NAAQS. *Id.* at 120; *see also* Region Response at 41 n.37 (noting that the discussion of ozone in the Region's environmental justice analysis was brief, but that both the Response to Comments and the technical support document contained in the administrative record provide more detailed discussions of the Region's determination regarding ozone). Of equal importance, and unlike the events leading up to the Board's remand order in *Shell 2010*, in this instance the Agency has not made a final determination or issued a final rule stating that the current 8-hour ozone standard is inadequate. *See* Region Response at 41. ICAS has not demonstrated that the Region's consideration of the ozone NAAQS in the current appeal warrants Board review based on similarities to the Region's treatment of the hourly NO_2 NAAQS in *Shell 2010*.

[72] ICAS challenges the Region's conclusion not to model emissions of ozone and ozone precursors, and alleges that the "limited background data" that exists does not demonstrate that current ozone levels are well below the proposed ozone NAAQS. ICAS Petition at 33. ICAS does not provide any citation or reference as support for this statement, which amounts to a challenge to the Region's technical expertise. This Board recently stated that "it is axiomatic that a challenge to the fundamental technical expertise of a permit issuer requires a petitioner to overcome a particularly heavy burden, and that a successful challenge to a permit issuer's technical expertise must consist of more than just a difference of opinion." *Shell Discoverer 2012*, 15 E.A.D. at 501 (citing *Shell 2011*, 15 E.A.D. at 203, and *NE Hub*, 7 E.A.D. at 567). ICAS's bald assertion that background ozone data was limited and does not support the Region's conclusions cannot overcome this particularly heavy burden.

demonstrate why a permitting authority's response to objections made during the public comment period warrants review). In this instance, the Region explained:

> [T]he Clean Air Act permitting programs are essentially 'first come, first served' programs and each subsequent permitting action needs to account for all of those that went before but not any actions that will occur subsequent to that action. The permits for the Discoverer drill ship in the Chukchi Sea and Beaufort Sea are the first permits in their respective vicinities and they only need to assess their impacts on the existing air quality situation.
>
> The Kulluk drill rig in the Beaufort Sea is the second permit and EPA has addressed cumulative impacts by including conditions in the permit that prevent Shell from operating the Kulluk drill rig and the Discoverer drill ship in the Beaufort Sea during the same drilling season. Permit Condition D.4.8. As such, only one of the two drill rigs can operate in the Beaufort in any year so there will be no overlapping impacts with respect to compliance with short[]term NAAQS. * * *
>
> As discussed above, ConocoPhillips has withdrawn its permit application for operation of a jack-up drill rig in the Chukchi Sea.

RTC at 101; *see also* EJ Analysis at 14 (reporting total maximum modeled concentrations for criteria pollutants in Kaktovik and Nuiqsut, which account for both the *Discoverer*'s operation and background concentrations); Region Response at 42 n.39 (noting that "[p]otential OCS operations in the Chukchi Sea and the Beaufort Sea are over 200 miles apart at the closest point"). Aside from its plain statement that the Region did not consider the emissions from all proposed OCS operations, ICAS does not address the Region's response to its comment, and thus cannot demonstrate that this issue warrants Board review. *Peabody*, 12 E.A.D. at 33.

4. *Oil Spill Response Capabilities*

Mr. Lum asserts that EPA has failed to require Shell to demonstrate its oil spill response capabilities in "clear, windy, broken ice and sheet ice conditions." Lum Petition at 1-2. The Region responds that this issue is outside the scope of these permit proceedings and thus is not properly subject to review. Region Response at 47.

The Board has previously emphasized that "[t]he PSD review process is not an open forum for consideration of every environmental aspect of a proposed project, or even every issue that bears on air quality."[73] *In re Knauf Fiber Glass GmbH*, 8 E.A.D. 121, 127 (EAB 1999) ("*Knauf I*"), *quoted in In re Sutter Power Plant*, 8 E.A.D. 680, 688 (EAB 1999); *see also In re Encogen Cogeneration Facility*, 8 E.A.D. 244, 259-60 (EAB 1999). The Board has jurisdiction "to review issues directly related to permit conditions that implement the federal PSD program," *Sutter*, 8 E.A.D. at 688, but will deny review of issues not governed by the PSD regulations because it lacks jurisdiction over them. *Id.*; *see also Encogen*, 8 E.A.D. at 259 (noting that petitioners had not shown how the issues they requested the Board to review fell within the Board's PSD jurisdiction). Moreover, there are often other regulatory programs in place that may address environmental concerns that fall outside the Board's scope of review. *Knauf I*, 8 E.A.D. at 162; *see also Shell 2007*, 13 E.A.D. at 405 n.66.

EPA's jurisdiction over portions of the OCS applies to air emissions subject to the CAA and its implementing regulations. In this instance, BOEMRE[74] is responsible for implementing regulations that address oil spill and response capabilities.[75] The Board does not have jurisdiction to consider Shell's oil spill and re-

[73] As noted above, see Part VI.A.1.a, the OCS air regulations require that OCS permit proceedings follow the procedures used to issue PSD permits contained in 40 C.F.R. part 124. 40 C.F.R. § 55.6(a)(3).

[74] As the Board has noted in previous *Shell* decisions, in May 2010 the Secretary of the Department of the Interior ("DOI") signed a Secretarial Order reorganizing the former Minerals Management Service ("MMS") into three independent entities to better carry out its three missions of: (1) improving the management, oversight, and accountability of activities on the OCS; (2) ensuring a fair return to the taxpayer from offshore royalty and revenue collection and disbursement activities; and (3) providing independent safety and environmental oversight and enforcement of offshore activities. *Shell 2012*, 15 E.A.D. at 492 n.29; *see also Shell 2010*, 15 E.A.D. at 112 n.7; U.S. DOI, Departmental Manual, pts. 118 & 119, ch. 1 (Sept. 30, 2011), *available at* http://elips.doi.gov/app_dm/dm.cfm ("Departmental Manual") (establishing the creation, authorities, objectives, and reporting relationships for the Bureau of Ocean Energy Management ("BOEM") and Bureau of Safety and Environmental Enforcement ("BSEE")). BOEMRE assumed all of MMS's responsibilities in the interim until the full implementation of the reorganization into the three separate entities was complete. *Shell 2012*, 15 E.A.D. at 492 n.29; *see Shell 2010*, 15 E.A.D. at 112 n.7. The transfer of the revenue collection function to the Office of Natural Resources Revenue was completed on October 1, 2010. *See* Secretary of the Interior, U.S. DOI, Order No. 3306, *Organizational Changes Under the Assistant Secretary – Policy, Management and Budget* (Sept. 20, 2010), *available at* http://elips.doi.gov/app_SO/so.cfm; Departmental Manual, pt. 112, ch. 34 (Apr. 15, 2011). One year later, on October 1, 2011, the reorganization was completed when BOEMRE was replaced by BOEM and BSEE. *See* Departmental Manual, pts. 118 & 119. For consistency the Board refers to BOEMRE because the Permit and the supporting documentation refer exclusively to BOEMRE.

[75] On August 4, 2011, BOEMRE (now BOEM, see note 74 above) conditionally approved Shell's exploration plan for the Beaufort Sea. Letter from Jeff Walker, Regional Supervisor, Field Operations, Alaska OCS Region, BOEMRE, U.S. DOI, to Susan Childs, Shell Offshore, Inc. (Aug. 4,

Continued

sponse capabilities in the Arctic OCS, and thus, the Board denies Mr. Lum's petition for review on these grounds.

5. *Impacts of Air Emissions on Traditional Subsistence Food Sources*

Mr. Lum asserts that the *Kulluk*'s operations in the Beaufort Sea will introduce toxins into the ocean "via the exhaust [from the *Kulluk*] that settles down into it," and contaminate the marine mammals and fish the coastal Inupiat consume as part of their indigenous diet. Lum Petition at 2-3. Mr. Lum continues that this will not only contaminate the food supply but also alter traditional Inupiat culture. *Id.* The Region responds that this issue is outside the scope of these permit proceedings and thus is not properly subject to Board review. Region Response at 47. The Board construes Mr. Lum's assertions as a challenge to the adequacy of the Region's compliance with the Executive Order.

Mr. Lum also raised this issue in the appeals that led to the Board's *Shell Discoverer 2012* decision. *See* 15 E.A.D. at 502. In *Shell Discoverer 2012*, the Board denied review on procedural grounds because the impacts of air emissions on traditional subsistence food sources was not raised at the time of the first appeals.[76] *Id.* In the current appeal, Mr. Lum timely submitted comments on this issue and thus his petition for review is procedurally sound. *See* Lum Comments at 1. The Board, however, has previously held that "[i]mpacts on subsistence hunting and fishing are outside the scope of the PSD program and therefore the Board's jurisdiction." *Shell 2007*, 13 E.A.D. at 405 n.66 (citing *Knauf I*, 8 E.A.D. at 161-62), *quoted in* RTC at 125. The Board does not have jurisdiction to consider the impacts of air emissions on traditional subsistence food sources and Inupiat culture, and thus, the Board denies Mr. Lum's petition for review on these grounds.

(continued)
2011) [hereinafter Beaufort EP Letter]. The approval of the Beaufort Sea exploration plan was conditioned, among other things, on Shell submitting to BOEMRE prior to the commencement of exploratory drilling operations documentation regarding the subsea well capping and containment system Shell has committed to have at its disposal. *Id.* at 3. Specifically, Shell must "submit documentation on the procedures for deployment, installation, and operation of the system under anticipated environmental conditions, including the potential presence of sea ice for approval by BOEMRE. Shell will also be required to conduct a field exercise to demonstrate Shell's ability to deploy the system." *Id.*

[76] As mentioned above, the Board remanded to the Region two OCS PSD permits in December 2010. *See generally Shell 2010*, 15 E.A.D. at 161-62. In the subsequent appeals of the permits issued upon completion of remand proceedings, the Board unequivocally stated that "in the current appeals, '[n]o new issues may be raised that could have been raised, but were not raised,' in the previous appeals." *Shell Discoverer 2012*, 15 E.A.D. at 477 (quoting *Shell 2010*, 15 E.A.D. at 162).

For all of the foregoing reasons, the Board declines to review the Region's compliance with the Executive Order and applicable Board precedent.

F. *ICAS Has Failed to Demonstrate That the Region Clearly Erred or Abused Its Discretion in Providing 46 Days for Comment on the Draft Permit and in Denying ICAS's Request for Nonoverlapping Comment Periods*

ICAS claims that the Region "committed clear legal error by failing to provide the public an adequate opportunity to comment on" the draft permit.[77] ICAS Petition at 6. More specifically, ICAS alleges that the Region failed to meet the parts 71 and 124 procedural requirements that require permit issuers to "allow *at least* 30 days for public comment" on draft permits. *Id.* at 7 (citing 40 C.F.R. §§ 71.11(d)(2)(i), 124.1) (emphasis added by Petitioners). Although ICAS acknowledges that the comment periods for the Permit ran from July 22, 2011, to September 6, 2011, an interval of 46 days, ICAS contends that, because the Region issued the draft *Kulluk* permit for comment at the same time it issued another draft minor source air permit for comment and in the middle of comment periods for two major source air permits for another Shell drillship,[78] in reality, ICAS only "had 16 days to comment on each of the[] permits," rather than the required minimum of 30. *Id.* at 7. This is because, according to ICAS, it "does not have the resources to comment on more than one air permit at a time." *Id.* ICAS further claims that "the short and overlapping comment periods * * * deprived [them] of a meaningful opportunity to comment on Shell's new air modeling results." *Id.* at 8.

In a related argument, ICAS asserts that the Region clearly erred in denying its request that the Region "hold nonoverlapping comment periods on the OCS permits and [] provide 45 days to comment on each permit." *Id.* at 8-9. ICAS claims that it met the regulatory standard for demonstrating the need for additional time to prepare comments. *Id.* (referring to the standard at 40 C.F.R. § 71.11(g)); *see also id.* attach. 8 (Letter from Harry Brower, Chairman, Alaska Eskimo Whaling Commission ("AEWC"), et al., to Doug Hardesty, Air Permits Project Manager, U.S. EPA Region 10 (June 15, 2011) (A.R. C-487)) (AEWC and ICAS request for nonoverlapping comment periods) [hereinafter ICAS Let-

[77] The Board also considers ICAS's claim under an abuse of discretion standard. *See infra* note 89.

[78] The Region had issued two draft permits for Shell's *Discoverer* drillship earlier in July of 2011. *See Shell Discoverer 2012*, 15 E.A.D. at 480. The comment period for those two permits ran from July 6 to August 5, 2011. *Id.*; ICAS Petition at 7. In addition, on the same date the Region had issued the *Kulluk* draft permit, it had also issued a draft permit for ConocoPhillips to operate a jackup drill rig in the Chukchi Sea. ICAS Petition at 7. The comment period for this permit originally ended at the same time as the *Kulluk* draft permit, but was later extended to September 21, 2011. ICAS Petition at 8-9; RTC at 7.

ter]; *id.* attach. 9 (Letter from Richard Albright, Director, Office of Air, Waste, & Toxics, U.S. EPA Region 10, to Harry Brower, AEWC Chairman, et al. (July 21, 2011) (A.R. C-532)) (EPA response).

The part 71 procedural regulation governing public notices and public comment periods specifically provides that "[p]ublic notice of the preparation of a draft permit * * * shall allow at least 30 days for public comment." 40 C.F.R. § 71.11(d)(2)(i). The part 124 procedural regulations, which also apply to the Permit,[79] contain the same language. *See* 40 C.F.R. § 124.10(b). The Board has traditionally read these regulations to establish a minimum comment period length of 30 days, recognizing that the regulations clearly allow the permit issuer, in its discretion, to grant a longer comment period. *Shell Discoverer 2012*, 15 E.A.D. at 520-21 (discussing the applicable part 124 regulation); *see also In re Genesee Power Station*, 4 E.A.D. 832, 841 (EAB 1993) (noting that the part 124 regulation governing public comment periods "only require[s them] to last 30 days"). In addition, as ICAS points out, part 71 contains a separate provision specifically authorizing a permit issuer to grant additional time. It states that "[a] comment period longer than 30 days may be necessary to give commenters a reasonable opportunity to comply with the requirements of this section. Additional time shall be granted to the extent that a commenter who requests additional time demonstrates the need for such time."[80] 40 C.F.R. § 71.11(g)).

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[79] As the Region explained, the Permit is subject to the procedural requirements of both part 55 (and consequently part 124) as well as part 71:

> The portion of this permit that is a Part 71 permit (e.g., the portion of the permit that applies on the Outer OCS) is issued under 40 CFR Part 55 and 40 CFR Part 71 and subject to the procedural requirements of 40 CFR Part 71 as provided in 40 CFR § 71.4(d). The portion of this permit that is a COA Title V permit and a COA minor source permit (e.g., the portion of the permit that applies on the Inner OCS) is issued under 40 CFR Part 55 and, in the absence of other applicable procedures, subject to the permit issuance procedures for PSD permits under 40 CFR Part 124, Subpart A and C. *See* 40 CFR §§ 55.6(a) (3) and 124.1.

RTC at 6 n.3.

[80] Because the regulations authorize the permit issuer to grant a longer comment period upon an adequate showing of need, the Board also considers ICAS's challenge under an abuse of discretion even though ICAS did not clearly present its challenge as such, alleging instead only "clear error." *See Shell Discoverer 2012*, 15 E.A.D. at 521 (considering similar argument as raising an abuse of discretion claim); *In re Guam Waterworks Auth.*, 15 E.A.D. 437, 443 n.7 (EAB 2011) (explaining Board's standard in reviewing claims involving a permit issuer's exercise of discretion); *In re Desert Rock Energy Co.*, 14 E.A.D. 484, 530 (EAB 2009) (using an abuse of discretion standard where the permit issuer had "broad discretion" in making the challenged determination). The Board similarly reads ICAS's challenge to the Region's denial of nonoverlapping comment periods as raising an abuse of discretion claim.

In the present case, the Region provided a 46 day public comment period for the *Kulluk* draft permit, albeit a comment period that partially overlapped with several other comment periods. The Region, in its Response to Comments, provided a lengthy, well-reasoned explanation for its establishment of a 46 day comment period for the *Kulluk* permit and for its denial of ICAS's request for nonconcurrent comment periods. *See* RTC at 5-8. In addressing comments on these topics, the Region pointed out that it had granted a period longer than the regulatory minimum for this permit and had also extended the comment period for one of the other permits, the ConocoPhillips permit. *Id.* at 6; *accord id.* at 7. The Region further noted that the ConocoPhillips permit, for which it had extended the comment period to 60 days, was for a proposed 2013 operation, whereas Shell "intends to begin its exploratory drill operations with the Kulluk in July 2012." *Id.* at 7. The Region also enumerated the many steps it had taken before and during the public comment period "to promote meaningful public involvement." *Id.* at 6.

In addition, the Region observed that, while "it agree[d] with the commenters that some aspects of the Draft Permit are technically and legally complex," on the other hand, "[t]he comments submitted * * * demonstrate[d] that the public was able to review, evaluate, and comment on many complex issues during the comment period provided." RTC at 8. The Region noted that among the more than 14,500 public comments it had received, a number of them had contained "substantive comments on, among other issues, the definition of OCS Source, limits on the source's potential to emit, choice of model, modeling data, ambient air boundary, source testing, emission factors, air quality analysis, applicability of increments and visibility, and cumulative impacts." *Id.* Accordingly, the Region believed that "[t]he volume of comments received and the substantive issues addressing technically and legally complex issues demonstrate[d] that the public was able to meaningfully review and comment on the Draft Permit." *Id.*

The Region also explained that "40 CFR § 71.7(a)(2) requires that it take a final action on a Title V permit application within 18 months of receiving a complete application. In conducting the permitting process, Region 10 must strike a balance between its obligation to provide for meaningful public participation and its responsibility to make a final permitting decision in a timely manner." *Id.* Based on all these factors, the Region had determined that "the commenters have not demonstrated that a period of more than 46 days is necessary to give the public a reasonable opportunity to comment." *Id.* at 7 (citing 40 C.F.R. §§ 71.11(g) and 124.13).

In its petition, ICAS does not explain why the Region's response to these comments is clearly erroneous or an abuse of discretion. In fact, ICAS does not even address the Region's response. ICAS's failure to address the Region's response is, in and of itself, sufficient to deny its claims of procedural error con-

cerning the comment period.[81]

Nevertheless, even if the Board considered ICAS's claim of procedural error, the Board would deny review of this claim for several reasons. First, the length of time the Region provided for comment on this permit – 46 days – is 16 days more than the regulatory minimum required by 40 C.F.R. §§ 71.11(d)(2)(i) and 124.10(b). It is also one day more than the amount of time ICAS had specifically requested for each permit in its letter.[82] *See* ICAS Letter at 2 (requesting nonconcurrent comment periods of 45 days). ICAS's attempt to recalculate the length of the comment period as "16 days" based on an unexplained mathematical formula involving the number and lengths of other comment periods is unconvincing and does not demonstrate clear error. *See Shell Discoverer 2012*, 15 E.A.D. at 521; *see also Russell City II*, 15 E.A.D. at 95-98 (denying review of a procedural error claim where petitioners fail to point to a part 124 procedural regulation that was violated); *Knauf II*, 9 E.A.D. at 17 (denying review where the permit issuer fulfilled the applicable regulatory obligations, but did not go beyond those requirements).

Furthermore, while it is true that the Region did not grant ICAS's request for nonoverlapping comment periods, ICAS has not pointed to any regulations that prohibit the Agency from issuing concurrent permits or that require – or even specify – a different comment period length when the Agency does issue concurrent permits. To the contrary, the relevant regulations authorize the Agency to issue a single public notice to "describe more than one permit or permit actions," 40 C.F.R. §§ 71.11(d)(1)(iii), 124.10 (a)(3), without mentioning a different time frame for public comment when concurrent permits are issued. While section 71.11(g) authorizes the Agency to extend a particular comment period on a case-by-case basis where a commenter has demonstrated the need for additional time – which would thereby provide an avenue for commenters to obtain longer comment periods in situations where comment periods overlap[83] – the provision does not prohibit, or even mention, overlapping comment periods.

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[81] As the Board discussed above in Part III, a petitioner must explain why the permit issuer's previous response to those objections is clearly erroneous or otherwise warrants review. "[A] petitioner's failure to address the permit issuer's response is fatal to its request for review." *In re Indeck-Elwood LLC*, 13 E.A.D. 126, 143, 170 (EAB 2006); *accord Russell City II*, 15 E.A.D. at 10.

[82] Notably, therefore, for this permit, by providing a longer comment period, the Region did in essence partially grant ICAS's request.

[83] And, in this case, the Region did, provide additional time for comment on two of the permits whose comment period overlapped. The Region increased the comment period for the Shell *Kulluk* permit to 46 days and the comment period for the ConocoPhillips permit to 60 days. *See supra* note 78.

Finally, it is clear from the administrative record that the Region appropriately balanced conflicting considerations in deciding on the length of the comment period for this permit and in denying the request for nonoverlapping periods. ICAS has not demonstrated otherwise[84] and has therefore failed to show that the Region clearly erred or abused its discretion in either selecting a 46 day comment period or in denying ICAS's request for nonconcurrent comment periods. *See Shell Discoverer 2012*, 15 E.A.D. at 523 (denying review of a similar claim based on similar facts). Review of the Permit is therefore denied on this issue.

G. *ICAS Has Failed to Demonstrate That the Region Clearly Erred in Its Public Hearing Procedures or That Any of the Alleged Procedural Deficiencies Otherwise Warrant Review*

As noted above in Part V, the Region held two public hearings on the draft permit, one in Barrow, and a second in Anchorage. The Region also held an informational meeting prior to the Barrow public hearing. *See* Statement of Basis at 11 (scheduling informational hearing from 5:00-6:30 pm, public hearing from 7:00-9:00 pm); RTC at 6-7.

ICAS claims that the Region "committed clear legal error by failing to provide the public an adequate opportunity" to participate in the Barrow public hearing. ICAS Petition at 6; *see also id.* at 9-10. ICAS alleges three procedural problems with the Barrow hearing. *Id.* at 9-10. ICAS first claims that the Region continued with the hearing despite difficulties with the teleconference phone system that allegedly impaired the ability of the Region to hear all comments. *Id.* at 9. ICAS next alleges that, "for a significant portion of the hearing," the Region discussed a PowerPoint presentation that was not made available to the public attending the hearing. *Id.* at 9-10. Finally, ICAS contends that the Region failed to sufficiently inform those attending the public hearing that it had procured an

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[84] The Board is unpersuaded by ICAS's argument that it had difficulty locating an expert to review the air modeling. *See* ICAS Petition at 8. As the Region indicated in its Response to Comments, RTC at 8, other commenters provided substantive, technical comments on the air modeling, which suggests that the comment period was sufficient to allow opportunity for meaningful comment. *See Fla. Power & Light Co. v. United States*, 846 F.2d 765, 772 (D.C. Cir. 1988) (upholding a short comment period as sufficient where the agency had received numerous comments, some lengthy, and the comments had had a "measurable impact" on the final rule); *Conference of State Bank Supervisors v. Office of Thrift Supervision*, 792 F. Supp. 837, 844 (D.D.C. 1992) (holding length of comment period not unreasonable especially in light of the comments that plaintiffs and other parties submitted). Furthermore, as the Region points out, it notified ICAS in May that the comment periods would begin in July. *See* Letter from Doug Hardesty, EPA, to North Slope Borough et al. (May 25, 2011) (A.R. III-1). The Region also conducted three separate informational meetings in Barrow and Kaktovik, Alaska, more than a month prior to the start of the public comment period for the Permit "to inform the North Slope community of the draft permit and to describe opportunities for public participation." RTC at 6.

Inupiat interpreter for the hearing.[85] *Id.* at 10. ICAS asserts that making an interpreter "available in this fashion is akin to not having [one] at all." *Id.*

Part 71 and part 124 each contain a provision governing public hearings. *See* 40 C.F.R. §§ 71.11(f), 124.12. Both public hearing regulations require the permitting authority to hold a public hearing when the permitting authority "finds, on the basis of requests, a significant degree of public interest in a draft permit." *Id.* §§ 71.11(f)(1), 124.12(a)(1). The regulations also authorize the permitting authority to hold a public hearing "at its discretion, whenever, for instance, such a hearing might clarify one or more issues involved in the permit decision." *Id.* §§ 71.11(f)(2), 124.12(a)(2); *accord In re Russell City Energy Ctr.* ("*Russell City I*"), 14 E.A.D. 159, 164 n.6 (EAB 2008). The public hearing regulations also prescribe the method of giving public notice of the hearing, 40 C.F.R. §§ 71.11(f)(3), 124.12 (a)(4), the procedure for designating a presiding officer to preside at the hearing, *id.* §§ 71.11(f)(4), 124.12 (b), and the procedures for the public to comment at the hearing, *id.* §§ 71.11(f)(5), 124.12 (c). Finally, both regulations require that a tape recording or written transcript of the hearing be made publically available. *Id.* §§ 71.11(f)(6), 124.12 (d).

Parts 71 and 124 also both require the permit issuer, in making its final decision, to consider all comments it receives during the public comment period and at any public hearings and to issue a "response to comments." *Id.* §§ 71.11(j), 124.17(a); *see also id.* §§ 71.11(e), 124.11. More particularly, these provisions require the permit issuer to "[b]riefly describe and respond to all significant comments on the draft permit * * * raised during the public comment period, or during any hearing" in the response to comments document issued at the same time the final permit decision is issued. *Id.* §§ 77.11(j)(1)(ii), 124.17(a)(1). Importantly, none of the aforementioned regulations refer to, or in any way mention, a requirement to provide an interpreter or a requirement to provide written materials at the hearing.

Upon review of the administrative record and the parties' arguments, the Board concludes that ICAS has not shown that the Region clearly erred in its handling of the Barrow public hearing for any of the three reasons ICAS advances. Not only does ICAS fail to point to any specific regulatory provision that the Region violated, but none of the alleged problems otherwise warrant Board review. The Board addresses each alleged deficiency in more detail below.

ICAS's first contention – that the Region committed clear error because it was allegedly unable to adequately obtain input from the public due to telecom-

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[85] According to ICAS, although the Region may have noted that an interpreter was available at the top of the hearing's sign-in sheet, it did not make a public announcement of this fact at the outset of the hearing. ICAS Petition at 10; ICAS Reply at 6; *see also infra* note 89.

munication problems during the hearing – is unpersuasive. The Region addressed this concern in its Response to Comments. *See* RTC at 9. There, the Region explained that, because such telecommunication problems are common on the North Slope, it had "recorded the public hearing in addition to having the hearing transcribed by a court reporter. From these *two* sources, Region 10 was able to capture the comments provided during the public hearing." *Id.* (emphasis added); *see also* Public Hearing Transcript ("Pub. Hrg Tr.") at 3 (explaining that the hearing was recorded on the teleconference line as a "safety net"). In response, ICAS merely asserts that "this does not change the fact that people were not able to be heard via phone." ICAS Petition at 9. Significantly, however, ICAS does not identify any comment that the Region failed to hear or for which the Region failed to provide a response.[86] *See id.* at 9; ICAS Reply at 6. Nor has any commenter come forward alleging that the Region failed to respond to his or her public hearing comments. The fact that the call center experienced some telecommunications problems during the public hearing – which the Region appears to have adequately anticipated and addressed by utilizing two methods of note taking – does not, without more, constitute clear legal error. Speculative claims that a permitting authority may have failed to hear a comment are insufficient to warrant Board review.

ICAS's contention that the Region committed clear procedural error by failing to provide pre-meeting copies of a Powerpoint presentation is inapposite. In its response to the petition, the Region explains that this presentation was given during the informational meeting, not during the public hearing. Region Response at 39; *see also* Statement of Basis at 11 (scheduling informational hearing prior to public hearing); RTC at 6-7 (mentioning informational meeting). ICAS does not dispute this.[87] *See* ICAS Reply at 5-7. Furthermore, nowhere do the regulations require a permitting authority to provide informational handouts at an informational meeting (or at a public hearing).[88] Thus, while it may be useful for a permit

[86] As discussed above, the regulatory requirement is for a permit issuer to respond to significant comments. *See* 40 C.F.R. § 77.11(j)(1)(ii), 124.17(a)(1). Thus, had ICAS identified significant comments raised at the public hearing that the Region failed to address, ICAS's arguments would have been more persuasive. *See, e.g., In re Rockgen Energy Ctr.*, 8 E.A.D. 536, 557 (EAB 1999) (remanding so that permit issuer could demonstrate it had given thoughtful and full consideration to public comments); *In re W. Suburban Recycling & Energy Ctr., L.P.*, 6 E.A.D. 692, 710-12 (EAB 1996) (remanding permit and requiring permit issuer to comply with procedures under part 124 including provision requiring a response to all significant comments received); *see also In re N. Mich. Univ.*, 14 E.A.D. 283, 317-18 (EAB 2009) (discussing part 124 requirement to adequately respond to comments).

[87] The Region's explanation makes sense in light of the purpose of the two meetings. While the permitting authority may present its analyses, findings, and conclusions about the draft permit at an informational meeting, the purpose of the public hearing is to obtain comments *from* the public.

[88] The only document the public hearing regulations require a permit issuer make available to the public is the transcript of the hearing. 40 C.F.R. §§ 71.11(f)(6), 124.12 (d).

issuer to provide copies of a presentation to the audience attending an informational meeting, failure to do so at the meeting – or at a subsequent public hearing – does not constitute clear error or otherwise warrant Board review.

ICAS's final contention – that the Region committed clear procedural error by not adequately informing the public that an interpreter was available at the public hearing – is also unconvincing. Importantly, as noted above, there is no regulatory requirement for an interpreter in either part 71 or part 124, nor is there a provision specifying the method a permit issuer should use to inform the public of the availability of an interpreter at the public hearing.[89] ICAS has not pointed to any other requirement, regulatory or otherwise, requiring an interpreter or prescribing the method for announcing one. Accordingly, while it may be preferable for the permit issuer to formally announce the availability of an interpreter at the beginning of the public hearing, and in both languages, failure to do so does not constitute clear error or otherwise warrant Board review.

In sum, ICAS has failed to demonstrate that the public hearing procedures utilized by the Region constituted clear error. ICAS has not shown that the Region violated any part 71 or 124 procedural regulation. Moreover, the alleged problems ICAS has identified do not, even if the Board were to find them to constitute a deficiency in some way, warrant Board review. Consequently, the Board denies review of the Permit on this ground.

VII. *CONCLUSION AND ORDER*

For the foregoing reasons, the Board concludes that none of the petitioners have demonstrated that review of Permit No. R10 OCS030000 is warranted on any of the grounds presented. The Board therefore denies review of the Permit.

So ordered.

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[89] The parties seemingly dispute the method in which the Region notified the public of the availability of the interpreter. The Region stated in its Response to Comments that, "[p]rior to the Barrow public hearing, Region 10 contacted [ICAS] to arrange for an Inupiat speaker to be available to provide Inupiat interpretation at the hearing if requested by any participant. At the beginning of the hearing, participants were provided the opportunity to request Inupiat interpretation during the hearing. No participant requested translation and therefore an interpreter was not used." RTC at 10-11. In response, ICAS claims that attendees only recall mention of an interpreter on the sign-up sheet, and only in English. ICAS Petition at 10. ICAS further asserts that the transcript of the public hearing does not indicate that an announcement was made. ICAS Reply at 6. In light of the Board's conclusion on this issue, it is unnecessary to determine the precise methodology the Region used to notify the public of the interpreter's availability.

IN RE TUCSON ELECTRIC POWER

PSD Appeal No. 18-02

ORDER DENYING REVIEW

Decided December 3, 2018

Syllabus

The Sierra Club petitions the Environmental Appeals Board ("Board") to review a decision by the Department of Environmental Quality for Pima County, Arizona ("Pima County") to issue a federal Prevention of Significant Deterioration ("PSD") permit to Tucson Electric Power. The permit authorizes Tucson Electric Power to construct and operate up to ten additional electricity-generating units ("Units") at its Irvington Generating Station facility. Sierra Club challenges Pima County's determination that PSD requirements do not apply to the nitrogen oxide ("NO_x") emissions from the modified facility. Although the permit contains a cap that limits NO_x emissions below the level triggering PSD requirements, Sierra Club argues that the permit's monitoring requirements are not adequate to render the NO_x emissions cap practically enforceable and thus PSD requirements should apply.

The permit imposes several monitoring requirements to verify compliance with the NO_x emissions cap. Those requirements include, among other things: (i) biennial performance (stack) tests to determine how much NO_x each Unit emits; (ii) calculation of monthly and yearly NO_x emissions using information from the required stack tests and monitoring of ongoing operations; and (iii) monitoring of the pollution control devices for the new Units to ensure that the devices are working properly. Pima County concluded that these compliance monitoring requirements were sufficient to make the NO_x emissions cap practically enforceable.

Held: The Board denies Sierra Club's Petition for Review. Sierra Club has not carried its burden of showing that Pima County clearly erred or abused its discretion in determining that the NO_x emissions cap is practically enforceable.

Sierra Club's argument that the NO_x emissions cap is not practically enforceable because the permit's compliance monitoring requirements rely solely on biennial stack tests lacks merit because monitoring of the facility's pollution control devices is also an integral part of the permit's compliance monitoring requirements. Sierra Club's contention that the monitoring of the pollution control devices does not cure the problem with the permit's reliance on biennial stack tests was not preserved for review because that assertion

was not raised during the public comment period. In any event, Sierra Club's contention is not responsive to the role of monitoring of the pollution control devices as described by Pima County. Additionally, Sierra Club does not substantiate its argument that Pima County failed to support in the administrative record its conclusion that the method for calculating monthly and yearly NO_x emissions would likely overstate emissions. Lastly, Pima County adequately responded to Sierra Club's comments on the practical enforceability of the NO_x emissions cap. Pima County responded to Sierra Club's generalized claims on the inadequacy of biennial stack testing to monitor compliance throughout the year by providing a description of all the elements of the permit's compliance monitoring requirements. Given the general nature of Sierra Club's comments, more was not required.

Before Environmental Appeals Judges Aaron P. Avila, Mary Kay Lynch, and Mary Beth Ward.

Opinion of the Board by Judge Ward:

I. *STATEMENT OF THE CASE*

This case involves a challenge by the Sierra Club to a determination in a federal Clean Air Act permit that the Act's Prevention of Significant Deterioration ("PSD") requirements do not apply to the emissions of nitrogen oxides – commonly referred to as NO_x – from a facility owned and operated by Tucson Electric Power ("Tucson Electric"). Potential NO_x emissions from the facility are reduced by pollution control devices, and the permit imposes a limit (or cap) on NO_x emissions consistent with the control devices' ability to reduce emissions. In such circumstances, the applicability of PSD requirements is based on the facility's emission rate, as reduced by the control devices, so long as the cap on the reduced emissions is enforceable as a practical matter. The specific issue presented here is whether the challenged permit's compliance monitoring requirements are sufficient to make the NO_x emissions cap practically enforceable.

In August 2018, the Department of Environmental Quality for Pima County, Arizona ("Pima County") issued a federal PSD permit ("Permit") to Tucson Electric authorizing the construction and operation of up to ten additional electricity-generating units ("Units") at Tucson Electric's Irvington Generating Station facility. Although the expanded facility would emit several pollutants above levels that trigger PSD requirements, the Permit imposes certain requirements as to NO_x emissions that bring those emissions below levels that trigger such requirements. Specifically, the Permit requires two existing electricity-generating units at the facility to be shut down, mandates the use of pollution control devices on the new Units that reduce NO_x emissions, and imposes a NO_x emissions cap consistent with that reduction.

The Permit further imposes monitoring and recordkeeping requirements to verify compliance with the NO_x emissions cap. Those compliance monitoring requirements include, among other things: (i) biennial performance (stack) tests to determine how much NO_x each Unit emits; (ii) calculation of monthly and yearly NO_x emissions using information from the required stack tests and monitoring of ongoing operations; and (iii) monitoring of pollution control devices to ensure that they are working properly. Finding that these compliance monitoring requirements made the NO_x emissions cap practically enforceable, Pima County concluded that PSD requirements do not apply to the new Units as to their NO_x emissions.

In its Petition for Review, Sierra Club argues that the NO_x emissions cap is not practically enforceable – that is, compliance with the cap cannot be verified – because the stack tests are conducted too infrequently, the monthly and yearly emission calculations rely solely on these infrequent stack tests, and the monitoring of pollution control devices does not cure the problem with the infrequent stack tests. As a consequence, Sierra Club contends that PSD requirements should apply to the facility's increased NO_x emissions resulting from its proposed expansion.

We conclude that Sierra Club has not carried its burden of showing that Pima County clearly erred or abused its discretion in determining that the NO_x emissions cap is practically enforceable. The Petition for Review is therefore denied.

II. *PRINCIPLES GOVERNING BOARD REVIEW*

In considering a petition filed under 40 C.F.R. § 124.19(a), the Board first evaluates whether the petitioner has met threshold procedural requirements such as timeliness, standing, issue preservation, and specificity. *In re Indeck-Elwood, LLC*, 13 E.A.D. 126, 143 (EAB 2006). For example, a petitioner must demonstrate that any issues and arguments it raises on appeal have been preserved for Board review (i.e., were raised during the public comment period or public hearing on the proposed permit), unless the issues or arguments were not reasonably ascertainable at the time. 40 C.F.R. §§ 124.13, .19(a)(4)(ii); *see, e.g.*, *In re City of Attleboro*, 14 E.A.D. 398, 405-06, 444 (EAB 2009); *In re City of Moscow*, 10 E.A.D. 135, 141, 149-50 (EAB 2001).

Under part 124, the petitioner bears the burden of demonstrating that review is warranted. *See* 40 C.F.R. § 124.19(a)(4). Ordinarily, the Board will deny review of a permit decision and thus not remand it unless the petitioner demonstrates that the permit decision is based on a clearly erroneous finding of fact or conclusion of law or involves a matter of policy or exercise of discretion that warrants review. *Id.* § 124.19(a)(4)(i)(A)-(B); *see, e.g.*, *In re La Paloma Energy Ctr., LLC*,

16 E.A.D. 267, 269 (EAB 2014). The Board's power to grant review "should be only sparingly exercised," and "most permit conditions should be finally determined at the [permit issuer's] level." Consolidated Permit Regulations, 45 Fed. Reg. 33,290, 33,412 (May 19, 1980); *see also* Revisions to Procedural Rules Applicable in Permit Appeals, 78 Fed. Reg. 5281, 5282 (Jan. 25, 2013).

When evaluating a permit decision for clear error, the Board examines the administrative record that serves as the basis for the permit to determine whether the permit issuer exercised "considered judgment" in rendering its decision. *See, e.g.*, *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 191, 224-25 (EAB 2000); *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 417-18 (EAB 1997). Similarly, the Board will uphold a permitting authority's exercise of discretion if that decision is cogently explained and supported in the record. *See, e.g.*, *La Paloma Energy Ctr.*, 16 E.A.D. at 270, 284, 292. The Board does not find clear error or an abuse of discretion simply because petitioner presents a difference of opinion or alternative theory regarding a matter. *See In re Town of Ashland Wastewater Treatment Facility*, 9 E.A.D. 661, 667 (EAB 2001); *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567-68 (EAB 1998), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3d Cir. 1999). And on matters that are fundamentally technical or scientific in nature, the Board typically defers to a permit issuer's technical expertise and experience, as long as the permit issuer has adequately explained its rationale and supported its reasoning in the administrative record. *See, e.g.*, *In re FutureGen Indus. All., Inc.*, 16 E.A.D. 717, 733-35 (EAB 2015), *review dismissed as moot sub nom. DJL Farm LLC v. EPA*, 813 F.3d 1048 (7th Cir. 2016).

III. *STATUTORY AND REGULATORY HISTORY*

The PSD provisions of the Clean Air Act govern air pollution both in "attainment" areas, where the air quality meets or is cleaner than the Environmental Protection Agency's ("EPA") national ambient air quality standards, and in "unclassifiable" areas where EPA has not categorized the air quality as having attainment or nonattainment status. Clean Air Act ("CAA") §§ 160-169, 42 U.S.C. §§ 7470-7479; *see also In re Palmdale Energy, LLC*, PSD Appeal No. 18-01, slip op. at 4-7 (EAB Oct. 23, 2018), 17 E.A.D. ___ (providing in-depth description of the PSD program). In both these areas, the PSD program requires that new "major stationary sources" of air pollutants or "major modifications" to such sources obtain a permit prior to construction.[1] *See* CAA § 165, 42 U.S.C. § 7475; 40 C.F.R.

[1] The actual term in the PSD statutory provisions is "major emitting facility." *See* CAA § 169(1), (2)(C), 42 U.S.C. § 7479(1), (2)(C). The related term "major stationary source" is used elsewhere in the Clean Air Act, *see* CAA § 111(a), (f), 40 U.S.C. § 7411(a),

§ 52.21. Among other things, an applicant for a PSD permit must show that its facility will achieve emission limits attainable by the "best available control technology" for pollutants emitted from the facility above designated levels. CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(b)(23), (j)(2)-(3).

Under the regulations implementing the PSD program, a "major stationary source" is, among other things, any source from certain source categories (including fossil fuel-fired steam electric power plants such as the facility here) that have the "potential to emit" 100 tons per year or more of any of several regulated pollutants, including NO_x.[2] 40 C.F.R. § 52.21(b)(1)(i). A "major modification" is "any physical change in or change in the method of operation of a major stationary source" that would result in: (1) a "significant emissions increase" of any of such pollutants; and (2) a "significant net emissions increase" of any of such pollutants. *Id.* § 52.21(b)(2)(i). The regulations define a significant emissions increase and significant net emissions increase on a pollutant-by-pollutant basis. *Id.* § 52.21(b)(23), (40). For NO_x, a significant increase and a significant net increase are both defined as an increase of 40 tons per year. *Id.*

A critical aspect of determining whether a new source or the modification of a source would be a major source or major modification, respectively, is ascertaining the new source or modification's "potential to emit" pollutants and whether that potential meets or exceeds designated levels. "Potential to emit" has been defined by regulation as requiring consideration of "[a]ny physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment." *Id.* § 52.21(b)(4). However, the definition makes clear that a pollution control device's limitation on capacity can only be considered in determining a facility's potential to emit "if the limitation or the effect it would have on emissions is federally enforceable." *Id.*

(f). The Act recognizes the similarity between the two terms by defining "major stationary source" and "major emitting facility" as synonymous "[e]xcept as otherwise expressly provided." CAA § 302(j), 42 U.S.C. § 7602(j); *see Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837, 860 (1984). In implementing the PSD program, EPA uses the terms "major stationary source" and "major modification," 40 C.F.R. § 52.21(b)(1), (2), and, therefore, the Board will use that terminology as well. *See* U.S. EPA, *New Source Review Workshop Manual*, at A.1 (draft Oct. 1990).

[2] The applicable regulation defines these pollutants as including "[a]ny pollutant for which a national ambient air quality standard has been promulgated." 40 C.F.R. § 50.21(b)(50)(i).

Whether a physical or operational limitation on a source's emissions is "federally enforceable" has been interpreted by EPA as meaning that the emission limit reflecting the physical or operational limitation is "enforceable as a practical matter," or "practically enforceable." Memorandum from John S. Seitz, Dir., Office of Air Quality Planning & Standards, U.S. EPA, and Robert I. Van Heuvelen, Dir., Office of Regulatory Enf't, U.S. EPA, to EPA Reg'l Air Div. Dirs., Options for Limiting the Potential to Emit (PTE) of a Stationary Source Under Section 112 and Title V of the Clean Air Act 3 & attach. 3, at 1 (Jan. 25, 1995) ("Seitz Memorandum"); *see also In re Peabody W. Coal Co.*, 12 E.A.D. 22, 32 (EAB 2005). To be practically enforceable, a permit must, among other things, specify "the method to determine compliance including appropriate monitoring, recordkeeping, and reporting." Seitz Memorandum at 6; *cf.* 40 C.F.R. § 49.152 (defining "enforceable as a practical matter" in a similar manner for air quality planning and management in Indian country). To be appropriate, such monitoring, recordkeeping, and reporting must be sufficient to allow a permitting agency to verify a source's compliance with the permit's emission limit. *See In re Shell Offshore, Inc.*, 15 E.A.D. 536, 557, 559 n.25 (EAB 2012) (holding that the permit issuer did not clearly err in concluding that emission limits were practically enforceable because the permit's monitoring requirements provided "the ability to assess and verify compliance"); *Peabody*, 12 E.A.D. at 39-41 (finding no clear error by the permit issuer in determining that the permittee's proposed monitoring requirements were insufficient to make an emission limit practically enforceable because the requirements did not provide "a reliable method of determining compliance"); *In re Pencor-Masada Oxynol, LLC*, Pet. No. II-2001-05, 2002 EPA CAA Title V LEXIS 44, at *16 (Adm'r Apr. 8, 2002) (stating that for an emission limit to be practically enforceable, the permit must contain terms and conditions sufficient "to determine whether the limit has been exceeded").

Pima County's Department of Environmental Quality administers the federal PSD permitting program within Pima County, Arizona pursuant to a delegation from EPA. *See* Agreement for Delegation of Source Review under the Federal Prevention of Significant Deterioration (PSD) Program Set Forth in 40 CFR 52.21 by the United States Environmental Protection Agency, Region 9 to the Pima County Air Quality Control District (June 5, 2018). Accordingly, the Tucson Electric Permit is a federally-issued permit appealable to the Board under section 124.19 of Title 40 of the Code of Federal Regulations. 40 C.F.R. § 124.19(a)(1).

IV. *FACTUAL AND PROCEDURAL HISTORY*

A. *Tucson Electric's Proposed Expansion of the Irvington Generating Station Facility*

Tucson Electric is proposing to expand its fossil fuel-fired steam electric power plant, known as the Irvington Generating Station, by building up to ten new internal combustion engine units ("Units"). Pima Cty. Dep't of Envtl. Quality, *Prevention of Significant Deterioration Air Quality Permit, Permit No. 1052*, at 4 (Aug. 8, 2018) (Administrative Record ("A.R.") 23) ("Permit"). Tucson Electric plans to use these new Units to support increased use of wind and solar-generated electrical power sources. The new Units can compensate for the variability of wind and solar power sources by providing "[r]eliable, efficient, grid-balancing resources which can ramp up quickly and provide 100 percent of their [effective load carrying capability] during multiple peak periods of any length." Tucson Elec. Power, *Application for a Prevention of Significant Deterioration (PSD) Authorization and Significant Revision to Class I Air Quality Permit for Irvington Generating Station* 2-2, 2-5 (July 2017) (A.R. 2) ("Permit Application").

The Irvington Generating Station is a major stationary source subject to the Clean Air Act's PSD program and is in an area designated by EPA as in attainment. Permit at 4. Because the proposed addition of ten new Units would significantly increase potential emissions of several regulated pollutants, this expansion of the facility qualifies as a major modification and triggers PSD requirements. *Id.* Accordingly, Tucson Electric applied to Pima County to amend its existing air quality permit (referred to as a Class I permit) and convert it to a combined PSD permit and Class I permit.[3]

The modified facility would have triggered PSD requirements for its NO_x emissions; however, Tucson Electric requested a limit on NO_x emissions – referred to by the parties as a NO_x emissions cap – for the new Units to keep their emissions below the PSD threshold.[4] *See* Letter from Conrad Spencer, Tucson Elec. Power,

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[3] The Class I permit was required to allow construction and operation of the original facility under the Arizona Administrative Code, *see* Ariz. Admin. Code § R18-2-302, which implements Arizona's operating permits program, authorized by EPA under Title V of the Clean Air Act, 42 U.S.C. §§ 7661-7661f. *See* Clean Air Act Full Approval of the Arizona Operating Permits Program, 66 Fed. Reg. 63,175 (Dec. 5, 2001) (final rule fully approving Arizona's operating permits program).

[4] In the Administrative Record, the limitation on NO_x emissions is described interchangeably as a "cap" and a "limit." *See, e.g.*, Permit at Part B § II.A.1. For clarity

to Rupesh Patel, Pima Cty. Dep't of Envtl. Prot. (Feb. 23, 2018) (A.R. 13) (requesting NO_x emissions cap of 170 tons per year). Tucson Electric also identified in its permit application three other aspects of the modified facility that would curtail NO_x emissions from the new Units or the overall facility. First, each new Unit would be equipped with a selective catalytic reduction device that would substantially reduce NO_x emissions. *See* Permit Application at 2-6, 3-3. Second, the Units would be limited to five startups per day. *See id.* at 2-6. Third, two existing steam-generating units at the facility would be permanently shut down offsetting, in part, the increase in NO_x emissions from the addition of the ten new Units. *See id.* at 2-5, 4-9. In combination, these terms of operation would limit the net increase in NO_x emissions from the expansion of the Irvington facility to an amount that is below the "significant" level of 40 tons per year.[5] Permit at 4.

We describe below: (i) the terms of the proposed combined PSD and Class I permit ("Proposed Permit") noticed for public comment with a focus on the compliance monitoring requirements pertaining to the NO_x emissions cap, *see* Part IV.B; and (ii) Sierra Club's comments on the Proposed Permit and Pima County's response to those comments, *see* Part IV.C.

B. *The Proposed Permit's Requirements Concerning the NO_x Emissions Cap*

In February 2018, Pima County issued the Proposed Permit for public comment. The Proposed Permit included the conditions necessary to restrict NO_x emissions below the level triggering PSD requirements – requiring use of selective catalytic reduction devices on each new Unit, limiting startups of the new Units to five per day, retiring two existing steam-generating units, and a 170 tons per year NO_x emissions cap – and imposed requirements to verify compliance with the NO_x

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and consistency, the Board will use the term "cap" to refer to the limitation on NO_x emissions.

[5] The to-be-eliminated steam units emit approximately 140 tons per year of NO_x. Thus, the replacement of these units with the ten new Units (limited to a combined total of 170 tons per year of NO_x) would result in a net legally-allowed increase of NO_x of approximately 30 tons per year. *See* Pima Cty. Dep't of Envtl. Quality, *Responses to Public Comments* 7 (Aug. 8, 2018) (A.R. 22) ("RTC"). Further, Pima County estimated that the ten Units would emit 152.8 tons per year of NO_x – i.e., less than the 170 tons per year cap – based on the manufacturer's specifications on NO_x emissions from the Units with selective catalytic reduction devices and assuming five startups per day, the maximum allowed under the Permit. Pima Cty. Dep't of Envtl. Quality, *Technical Support Document* attach. B at 2 tbl.B-2 (Aug. 2018) (A.R. 24).

emissions cap. Pima Cty. Dep't of Envtl. Quality, *Proposed Prevention of Significant Deterioration Air Quality Permit, Permit No. 1052*, at 4 & Part B § V.E (Feb. 9, 2018) (A.R. 12.1) ("Proposed Permit").

As to the verification of compliance, the Proposed Permit specified that "[c]ompliance with the NO_x emission [cap] shall be demonstrated by performance tests as detailed in Condition II.D, monitoring as detailed in Condition II.B, and recordkeeping as detailed in Condition II.C." *Id.* at Part B § II.A.1.b. The performance tests, monitoring, and recordkeeping required for compliance are described further below.

First, the Proposed Permit called for performance tests – also referred to as "stack tests" – for each of the new Units to be conducted "using the methods and procedures in 40 C.F.R. § 60.4244 and Table 2 of 40 C.F.R. part 60, subpart JJJJ." Proposed Permit at Part B § II.D.2.a. For NO_x emissions, these stack tests measure "the concentration of NO_x in the engine exhaust" during operation of the facility at periods other than at startup (i.e., non-startup operating periods). 40 C.F.R. § 60.4244(b), (d). Because the selective catalytic reduction devices must be operated "at all times while fuel is flowing to the [Unit], excluding periods of startup," stack tests reflect the impact the selective catalytic reduction devices have on NO_x emissions. *See* Proposed Permit at Part B § II.A.c.

In addition to the regulatory procedures for stack tests, the Proposed Permit specified that the tests "shall be performed at 25, 40, 70, and 100 percent of peak load" or at the minimum and peak load levels based on the prior twelve months of operation. *Id.* at Part B § II.D.2.b. As to the frequency of testing, each Unit must be tested "within 60 days after achieving the maximum production rate, but not later than 180 days after initial startup." *Id.* at Part B § II.D.1. Thereafter, each Unit must be subjected to a stack test "no less frequently than once in each period of two consecutive calendar years," but at least five of the Units must be tested each calendar year. *Id.* This means that each Unit will be tested at least once every two years.

Second, the Proposed Permit imposed several monitoring and recordkeeping requirements to verify continuing compliance with the NO_x emissions cap. These monitoring and recordkeeping requirements established a procedure for calculating monthly and yearly NO_x emissions and a program for ensuring that the selective catalytic reduction devices are operated properly at all times. *See id.* at Part B § II.C.

The Proposed Permit required the calculation of NO_x emissions on a monthly and yearly basis for non-startup and startup operating periods. For non-

startup operating periods, the Proposed Permit required that monthly NO_x emissions be calculated by combining information on NO_x emission rates measured in required stack tests with monitoring data on the operation of the Units. Specifically, the Proposed Permit required that Tucson Electric calculate a NO_x "emission factor" from the most recent stack test expressed in terms of pounds of NO_x emitted per the heat input measured in British thermal units ("BTUs") of natural gas used to power the Unit. *Id.* at Part B § II.D.2.c. Additionally, the Proposed Permit required Tucson Electric to monitor and record the hours of operation of each Unit and natural gas consumption in BTUs during operation. *Id.* at Part B § II.B.1. The Proposed Permit then directed that Tucson Electric calculate monthly NO_x emissions during non-startup operating periods on a Unit-by-Unit basis by multiplying each Unit's emission factor by the BTUs of heat input used by the Unit over the month during these operating periods. *Id.* at Part B § II.C.9.

For startup operating periods, the Proposed Permit required that monthly NO_x emissions be calculated by multiplying the number of startups per Unit in a month by the manufacturer-supplied NO_x rate of emissions for startup ("startup emission rate") of the Unit. *Id.* at Part B § II.C.9. To implement this requirement, the Proposed Permit specified that Tucson Electric monitor the number of startups for all Units and record the number and duration of all startups. *Id.* at Part B § II.B.2, II.C.1. Emission calculations for startup operating periods are then combined with emission calculations for non-startup operating periods to calculate total monthly emissions and a twelve-month (i.e., yearly) rolling average of NO_x emissions. *Id.* at Part B § II.C.9.

Lastly, the Proposed Permit imposed additional requirements as to the selective catalytic reduction devices to assure proper functioning of these devices. These monitoring and recordkeeping requirements included the following: (i) the devices must be maintained and operated in a manner consistent with good air pollution control practice for minimizing NOx emissions; (ii) the catalyst in the devices must be cleaned and replaced according to the manufacturer's recommendations; (iii) two key operating parameters of the devices – ammonia injection rate and temperature – must be monitored and recorded at least once every fifteen minutes; (iv) if ammonia injection to a device fails and cannot be restored in ten minutes, the Unit must be shut down; (v) records must be kept of any instance in which ammonia injection fails for more than two minutes; and (vi) the selective catalytic reduction devices must have a continuous NO_x process monitor (which measures NO_x concentration and adjusts ammonia injection levels to achieve desired NO_x reduction). Proposed Permit at Part B § II.A.1.c, II.B.3, II.C.4; *see* Hug Eng'g, *Operating Manual: Control Unit SNQ* 1 (v03.00 Mar. 6, 2013) (A.R. 12).

C. *Sierra Club's Comments on the Proposed Permit and Pima County's Response*

Sierra Club submitted comments on the Proposed Permit arguing, among other things, that the NO_x emissions cap is not "practically enforceable,"[6] and thus the cap cannot be considered a limitation on the facility's potential to emit NO_x. Sierra Club, *Intent to Approve: Proposed Revision to the existing Air Quality Permit No. 1052 to Tucson Electric Power (TEP) Irvington/H. Wilson Sundt Generating Station (IGS)* 8-9 & attach. at 20 (Mar. 29, 2018) (A.R. 21.2) ("Sierra Club Comments"). Sierra Club contended that absent a practically enforceable limitation on the facility's potential to emit NO_x, Pima County erred in concluding that PSD requirements are not applicable to NO_x emissions. In its comments and in an expert report attached to its comments, Sierra Club advanced three arguments as to why the NO_x emissions cap is not practically enforceable.

First, Sierra Club contended that the Proposed Permit's compliance monitoring for NO_x was inadequate because it relied on stack tests that could be performed as infrequently as every two years. *Id.* at 2, 9. Sierra Club argued that "using stack tests once every two years to determine whether the [Units] are in compliance with the permit is woefully inadequate." *Id.* The expert report attached to Sierra Club's comments asserted that stack tests "may not be representative for emissions during routine operations" because stack tests do not provide data on whether pollution control devices at a facility are functioning at an effective level at times other than when the stack test is performed. *Id.* attach. at 21-22 & n.59 (citing to EPA comment letters on state permits that raise this concern as a reason to require additional compliance monitoring to supplement annual stack tests). The solution, according to the expert report, would be to require Continuous Emissions Monitors. *Id.* attach. at 23. The report argued that without Continuous Emissions Monitors, "community members will not be able to protect themselves against harmful emissions and local, state, and federal regulatory agencies cannot detect and cure violations of permit conditions." *Id.*

Second, Sierra Club argued that the NO_x emissions cap is not practically enforceable because the Permit does not contain an "unambiguous methodology for calculating NO_x emissions from the emission [stack] test." *Id.* attach. at 25; *see*

[6] Sierra Club uses the term "practicably enforceable" as well as "practically enforceable" in its Petition. *See, e.g.*, Petition for Review of Prevention of Significant Deterioration Permit 1, 6 (Sept. 7, 2018) ("Pet."). But as we see no difference between the two (and Sierra Club does not assert that there is), the Board will use the term "practically enforceable" for clarity and consistency.

also id. at 2, 9. Sierra Club requested that the Proposed Permit "be revised to include an equation that lays out the emission calculation in detail." *Id.* attach. at 25.

Third, Sierra Club asserted that there was no record support for a manufacturer-supplied NO_x emission rate during startup, which was to be used to calculate emissions during startup operating periods. *Id.* at 2, 9 & attach. at 25. Although the Proposed Permit referred to the NO_x startup emission rate as "guaranteed," Sierra Club noted that there was no manufacturer guarantee provided for a startup NO_x emission rate included in an attachment to the draft Technical Support Document. *Id.* attach. at 25.

In August 2018, Pima County issued the Permit and its response to the public comments ("Response to Comments") received on the Proposed Permit, including its response to each of Sierra Club's comments on whether the NO_x emissions cap is practically enforceable.

As to Sierra Club's comment about the adequacy of stack tests for determining continuing compliance with the NO_x emissions cap, Pima County acknowledged that "EPA has indicated * * * that annual [stack] tests alone are insufficient to assure compliance with emission limits." Pima Cty. Dep't of Envtl. Quality, *Responses to Public Comments* 10 (Aug. 8, 2018) (A.R. 22) ("RTC"). However, Pima County explained that the Permit does not rely solely on the results of stack tests to determine compliance. *Id.* Pima County detailed how monthly and yearly NO_x emissions would be calculated using conservative non-startup emission factors and a similarly conservative startup emission rate and how monitoring of the selective catalytic reduction devices would assure that these control devices function properly at all times. *Id.* at 10-13.

In response to the request for an unambiguous methodology in calculating NO_x emissions, Pima County revised the Permit to include "a more detailed compliance determination methodology, expressed in the form of an equation." *Id.* at 13. Pima County noted that "[t]his methodology clearly indicates the emission factors and monitored data that will be used when calculating total NO_x emissions from the engines." *Id.*; *compare* Proposed Permit at Part B § II.C.9 *with* Permit at Part B § II.C.9.

Finally, to address the concern with the manufacturer-supplied startup emission rates, Pima County clarified that it had meant to reference the manufacturer-specified, not manufacturer-guaranteed, startup emission rates, and it amended the Permit accordingly. RTC at 12; *see* Permit at Part B § II.C.9. Further, Pima County admitted it had not included the latest manufacturer data in the

administrative record and explained that it had corrected this error by obtaining a waiver of the manufacturer's confidentiality claim concerning this information and included the information on its website. RTC at 4, 12.

This appeal followed.

V. *ANALYSIS*

In its Petition for Review, Sierra Club renews its challenge to Pima County's determination that the Permit's inclusion of a NO_x emissions cap prevents the addition of the ten new Units to Tucson Electric's Irvington facility from triggering PSD requirements for NO_x emissions. The sole issue that Sierra Club raises on appeal is whether the NO_x emissions cap is practically enforceable.

Specifically, Sierra Club argues (as it did in its comments) that biennial stack tests – used to develop each Unit's emission factor for calculating non-startup operating period emissions – are too infrequent to verify compliance with the NO_x emissions cap. Petition for Review of Prevention of Significant Deterioration Permit 5, 7 (Sept. 7, 2018) ("Pet."). Sierra Club further contends that reliance on biennial stack testing is not cured by the Permit's compliance monitoring requirements for the selective catalytic reduction devices or by Pima County's assertion that the emission factors for non-startup operating periods are required to be calculated in a conservative fashion. *Id.* at 12, 16 n.37. In a related vein, Sierra Club also asserts that Pima County's response to its comments was inadequate because Pima County did not "show that the permit relies on sufficient monitoring data to assure accurate and continuous monthly compliance with the NO_x cap." *Id.* at 12.

Mirroring its response to Sierra Club's comments, Pima County defends the practical enforceability of the NO_x emissions cap in its Response to the Petition by emphasizing the interconnected relationship of the entire suite of the Permit's compliance monitoring requirements. Pima County's Response to Sierra Club's Petition for Review 15, 17-19 (Oct. 1, 2018) ("Pima County Resp."); *see also* Response of Permittee Tucson Electric Power to Petition for Review 10-15 (Sept. 28, 2018) ("Tucson Electric Resp.").[7] Pima County does not claim that biennial

[7] Additionally, Tucson Electric contends that the Petition should be summarily dismissed because the question of whether a permit's compliance monitoring requirements are sufficient to ensure the practical enforceability of an emissions cap is not a "novel issue," as the Board and the Administrator have upheld substantially similar challenges to the practical enforceability of an emissions cap in *In re Shell Offshore, Inc.*, 15 E.A.D. 536,

stack testing is sufficient to make the NO_x emissions cap practically enforceable. Pima County Resp. at 16. Nor do we read Pima County's Response to Comments or its Response to the Petition as contending that biennial stack testing combined with monthly and yearly emission calculations based on that testing would *alone* provide adequate compliance monitoring requirements for the expansion of the Irvington facility. *Id.* Rather, Pima County argues that the NO_x emissions cap is practically enforceable based on how the biennial stack testing and the monthly and yearly emission calculations requirements are complemented by: (i) the requirements pertaining to the use, operation, and monitoring of the selective catalytic reduction devices; and (ii) the Permit's conservative methodology for calculating emission factors. *Id.* at 15-19; *see also* Tucson Electric Resp. at 11-15.

Given the Permit's compliance monitoring requirements and Pima County's justification for the practical enforceability of the NO_x emissions cap, the issues before us are narrower than stated by Sierra Club. Sierra Club's objections to the adequacy of the biennial stack tests and stack test-derived emission factors are not responsive to the actual compliance monitoring requirements in this Permit – which include more than stack tests and stack-test derived emission factors – and Pima County's explanation of how compliance with the Permit's NO_x emissions cap will be verified.[8] Thus, we need not determine whether biennial stack tests and use of

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546-67 (EAB 2012), and *In re Pope & Talbot, Inc., Lumber Mill*, Pet. No. VIII-2006-04, 2007 EPA CAA Title V LEXIS 3, at *12-13 (Adm'r Mar. 22, 2007). Tucson Electric Resp. at 7. We reject this argument. The Board's two main decisions involving a similar issue, *Shell Offshore* and *Peabody*, 12 E.A.D. at 34-47, as well as the Administrator's decision in *Pope & Talbot*, turned on a fact-based analysis of the permit in question, the nature of the facility, and the claims of the petitioner. They do not stand for the proposition that any permit using emission factors and monitoring of control devices to verify compliance with an emissions cap can be summarily affirmed as sufficient to ensure the practical enforceability of that cap.

[8] At times, several of Sierra Club's statements in its Petition and its comments appear to question the adequacy of the regulatorily-established requirements for conducting performance (stack) tests in subpart JJJJ, 40 C.F.R. § 60.4244, to determine the compliance of internal combustion engines with NO_x emission limitations. *See* Pet. at 11 (arguing that stack tests provide inadequate emissions compliance data due to the shortness of the tests and because they are conducted under ideal, prearranged conditions); Sierra Club Comments attach. at 21-22 & n.59 (same). To the extent Sierra Club intends this Petition to be a challenge to the requirements for tests in subpart JJJJ, 40 C.F.R. § 60.4244, that question is not properly before the Board because challenges to Clean Air Act regulations must be brought in the U.S. Court of Appeals, District of Columbia Circuit, within 60 days of promulgation. 42 U.S.C. § 7607(b). Moreover, the Board does not

emission factors based on those biennial stack tests to project monthly and yearly emissions – standing alone – would be sufficient to verify compliance with the NO_x emissions cap. What remains at issue, however, are Sierra Club's challenges to: (i) Pima County's reliance on two aspects of the Permit's compliance monitoring requirements – monitoring of the selective catalytic reduction devices and the conservative methodology for calculating emission factors for non-startup operating periods – to ensure the NO_x emissions cap is practically enforceable; and (ii) the adequacy of Pima County's response to Sierra Club's comments on the practical enforceability of the NO_x emissions cap. We address these contentions in turn below.

A. *Sierra Club's Challenges to the Permit's Compliance Monitoring Requirements*

1. *Sierra Club Fails to Show Clear Error in Pima County's Reliance on Monitoring of the Selective Catalytic Reduction Devices to Ensure the NO_x Emissions Cap is Practically Enforceable*

As discussed, the Permit's compliance monitoring requirements have two main components in addition to stack tests. The first component involves calculating monthly and yearly NO_x emissions for each Unit during non-startup and startup operating periods. NO_x emissions for non-startup periods are based on NO_x emission factors derived from stack tests conducted every two years and for startup periods are based on manufacturer data. The second component is monitoring of the selective catalytic reduction devices.

In its Petition, Sierra Club contends that the monitoring requirements for the selective catalytic reduction devices do not cure the problem with the Permit's reliance on stack tests and stack test-derived emission factors because the monitoring does not produce data to be "included in the formula to establish the NO_x emission factor." Pet. at 12. To the extent Sierra Club is challenging Pima County's conclusion that the monitoring requirements for the selective catalytic reduction devices are, in combination with the Permit's other monitoring requirements, adequate to ensure the NO_x emissions cap is practically enforceable, this argument is raised for the first time in Sierra Club's Petition. As a result, it has not been preserved for Board review. The regulations governing Board review of

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review EPA regulations as part of permit appeals. *See In re FutureGen Indus. All., Inc.*, 16 E.A.D. 717, 724 (EAB 2015) (the Board "is not the appropriate forum" for raising dissatisfaction with an EPA regulation); *In re Tondu Energy Co.*, 9 E.A.D. 710, 715-16 (EAB 2001) ("As we have repeatedly stated, permit appeals are not appropriate fora for challenging Agency regulations.").

permit appeals, require that the party seeking review establish "that each issue being raised in the petition was raised during the public comment period (including any public hearing)," or demonstrate that the issue was not "reasonably ascertainable" at that time. 40 C.F.R. § 124.13, 19(a)(4)(ii); *see, e.g.*, *In re Seneca Res. Corp.*, 16 E.A.D. 411, 415 (EAD 2014). As the Board has previously explained, "[t]he effective, efficient and predictable administration of the permitting process demands that the permit issuer be given the opportunity to address potential problems with draft permits before they become final." *In re Encogen Cogeneration Facility*, 8 E.A.D. 244, 250 (EAB 1999). This is a particularly important requirement as to technical issues such as the adequacy of the compliance monitoring requirements presented here because "the locus of responsibility for important technical decisionmaking rests primarily with the permitting authority, which has the relevant specialized expertise and experience." *Peabody*, 12 E.A.D. at 33.

Although Sierra Club did challenge the practical enforceability of the NO_x emissions cap in its comments, Sierra Club did not include as part of that challenge any critique of the role that the monitoring requirements for the selective catalytic reduction devices play. In fact, Sierra Club's comments never even mentioned the Permit's monitoring requirements for the selective catalytic reduction devices.

The section in Sierra Club's comments addressing practical enforceability of the NO_x emissions cap contains four paragraphs: (1) two paragraphs describing in general terms the legal requirement for practically enforceable emission limits; (2) one paragraph arguing that the Permit contained nothing more than a "[b]lanket" emission limitation, which was not practically enforceable; and (3) a final paragraph raising the frequency of stack tests and two other unrelated concerns with practical enforceability of the NO_x emissions cap. Sierra Club Comments at 8-9. The two other concerns were described in that final paragraph as follows:

> [Sierra Club's] expert comments detail at length the enforceability issues with the proposed permit. Specifically, using stack tests once every two years to determine whether the [Units] are in compliance with the permit is woefully inadequate. *The permit does not contain an unambiguous methodology for demonstrating compliance with the annual NO_x emission cap, and there is no support for the applicant's "vendor-guaranteed" NO_x rate that is used to demonstrate compliance.*

Id. at 9 (emphasis added) (footnote omitted). While Sierra Club's expert report, which was attached to its comments, expanded on the concerns raised with stack

tests, the methodology issue as to emission factors, and the manufacturer data on NO_x emissions during startup, that report did not raise concerns with or otherwise discuss the Permit's monitoring requirements for the selective catalytic reduction devices. *See Id.* attach. at 20-25.

Sierra Club cannot claim that Pima County did not provide notice of the role that monitoring of the selective catalytic reduction devices plays in verifying compliance with the NO_x emissions cap. On its face, the Proposed Permit expressly stated that its requirements for monitoring of selective catalytic reduction devices are an element bearing on verifying compliance with the NO_x emissions cap. Condition II.A.1.b of the Proposed Permit provided that "[c]ompliance with the NO_x emission limit shall be demonstrated by performance [i.e. stack] tests as detailed in Condition II.D, monitoring as detailed in Condition II.B, and recordkeeping as detailed in Conditions II.C." Proposed Permit at Part B § II.A.1.b. And Conditions II.B and II.C on monitoring and recordkeeping, as well as Condition II.A addressing emission limitations, contain multiple requirements pertaining to monitoring of the selective catalytic reduction devices in addition to requirements as to stack tests and calculation of monthly and yearly emissions. *See id.* at Part B § II.A.1 (setting the 170 tons per year NO_x emission limit, requiring installation of selective catalytic reduction devices with continuous NO_x process monitors, and imposing operating requirements on such devices); *id.* at Part B § II.B (requiring monitoring of fuel consumption and startups of the new Units and monitoring of operating parameters – ammonia injection rate and temperature – for selective catalytic reduction devices); *id.* at Part B § II.C (requiring records be kept of the monitoring of fuel consumption, of startups of the engines, and of the operating parameters of the selective catalytic reduction devices; and specifying that monthly and yearly NO_x emissions must be calculated). Thus, the Permit's reliance on monitoring of the selective catalytic reduction devices as a key part of determining compliance with the NO_x emissions cap was reasonably ascertainable at the time of the comment period. Any challenge to the way in which the monitoring of the selective catalytic reduction devices functioned in verifying compliance with the NO_x emissions cap should have been presented to the permit issuer in the first instance.

In any event, even if Sierra Club's challenge to Pima County's reliance on the monitoring of the selective catalytic reduction devices to verify compliance with the NO_x emissions cap was preserved for Board review, Sierra Club's specific challenge (the monitoring results are not "included in the formula to establish the 'NO_x emission factor'") reflects a misunderstanding of how the Permit works. *See* Pet. at 12. In response to Sierra Club's general argument about the lack of practical enforceability of the NO_x emissions cap through reliance on biennial stack tests,

Pima County explained that it was not relying solely on stack tests to verify compliance. In addition to the required stack tests, Pima County pointed to the Permit's requirements to calculate monthly and yearly NO_x emissions and the monitoring of the selective catalytic reduction devices. RTC at 10-13. As to the latter, Pima County explained that monitoring of the selective catalytic reduction devices would assure that the devices were functioning properly "at all times." *Id.* at 10. Pima County's intent was not to obtain data from this monitoring to adjust the emission factors. Instead, the data are required to make sure the selective catalytic reduction devices are working properly at all times. Thus, Sierra Club's argument in its Petition is not responsive to the role of monitoring of the selective catalytic reduction devices as described by Pima County.

2. *Sierra Club Fails to Show Clear Error in Pima County's Determination that the Non-Startup Emission Factors Are Conservative*

In a footnote to its Petition, Sierra Club also takes issue with Pima County's assertion that the methodology for calculating emission factors for non-startup operating periods is conservative. Pet. at 16 n.37. Under Board case law, a determination such as this one by Pima County "requires the sort of quintessential technical expertise the permit issuer possesses." *In re Shell Offshore, Inc.*, 15 E.A.D. 536, 558 (EAB 2012) (upholding a permit issuer's choice of emission factors in a challenge to the practical enforceability of an emissions cap limiting a facility's potential to emit). Sierra Club has not met the "particularly heavy burden" it bears on this technical question. *See Peabody*, 12 E.A.D. at 41.

Sierra Club disputes that calculating non-startup emission factors from the highest emission rate produced during required stack tests will, as Pima County claims, result in an emission factor that "over-calculat[es]" NO_x emissions. Pet. at 16, n.37. Sierra Club maintains that there is no support in the record for this conclusion and no specific calculation of the quantitative extent of the over-calculation. We find no merit in Sierra Club's argument.[9]

[9] Sierra Club's argument here also appears for the first time in its Petition. However, neither the Proposed Permit nor draft Technical Support Document explained that the conservative nature of the methodology for calculating non-startup emission factors was a consideration bearing on the practical enforceability of the NO_x emissions cap. That explanation appears for the first time in the Response to Comments, RTC at 13, and thus Sierra Club's challenge to that rationale may be raised on appeal. *See In re Pio Pico Energy Ctr.*, 16 E.A.D.56, 102 (EAB 2013) (allowing consideration of an issue not

First, although Pima County does state at one point that the Permit's methodology for calculating emission factors based on stack tests will overstate actual emissions, the record as a whole suggests that Pima County did not design the procedure for establishing emission factors to overstate emissions by a specific quantitative amount but rather to guard against understating emissions. For example, Pima County introduced its emission factor methodology by explaining that "certain elements [of the methodology] * * * will inherently produce a conservative calculation of emissions (i.e., a tendency to over-calculate, rather than under-calculate, engine NO_x emissions)." RTC at 13. Nor does the record show that Pima County relied upon a specific quantitative degree of over-calculation in the emission factors to justify the practical enforceability of the NO_x emissions cap.

Second, the Permit's description of the methodology for establishing an emission factor for non-startup operating periods provides sufficient record support for Pima County's description of emission factors as conservative (i.e., likely to overstate emissions). The emission factor methodology requires Tucson Electric to identify the maximum NO_x emissions that will be emitted across the full range of load levels during non-startup operating periods. To do this, the Permit requires Tucson Electric to conduct each stack test across the full range of non-startup operating load levels. Permit at Part B § II.D.2.b. The methodology then requires that the emission factor be calculated using the maximum emission rate found in that test as the presumed emission rate whenever the engine is operating in non-startup conditions, irrespective of the load level at which it is operating. *Id.* at Part B § II.D.2.c. Given that the methodology requires that the highest measured emission rate from stack tests be used in the calculation of emission factors, it was reasonable for Pima County to conclude that this approach is a conservative one. Sierra Club's "bare assertion" to the contrary is not adequate to support the opposite conclusion. *See Shell Offshore*, 15 E.A.D. at 561 n.28 (the Board refuses to rely on a petitioner's "bare assertion" that stack tests supporting emission factors were too infrequent).[10]

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raised in a public comment "where the permit issuer's reasoning on an issue was not clearly ascertainable from the record at the draft permit stage").

[10] Additionally, Sierra Club ignores that the methodology for calculating emissions during startup operating periods is also designed to conservatively calculate emissions. NO_x emissions differ significantly between "cold" or "warm" startups with cold startups generating approximately three times the NO_x emissions as warm startups. Letter from Conrad Spencer, Tucson Elec. Power, to Rupesh Patel, Pima Cty. Dep't of Envtl. Prot. 6 (Sept. 21, 2017) (A.R. 6) (finding that a cold startup emits 10.3 pounds of NO_x compared

For all the above reasons, Sierra Club fails to substantiate its claim that the record does not support Pima County's determination that the emission factor methodology is likely to overstate, not understate, actual emissions.

3. *Conclusion*

Sierra Club failed to preserve for Board review its ability to challenge Pima County's reliance on monitoring of the selective catalytic reduction devices as a component of the Permit's compliance monitoring program. Sierra Club further did not substantiate its challenge to either the adequacy of that monitoring or the conservative emission factor methodology. Accordingly, the Board concludes that Sierra Club has not carried its burden to show that Pima County clearly erred in its determination that the Permit's NO_x emissions cap is practically enforceable.

B. *Sierra Club Fails to Show Pima County Clearly Erred in Responding to Sierra Club's Comments*

Sierra Club asserts that Pima County's "responses to Sierra Club's comments were inadequate." Pet. at 12. In support of that contention, Sierra Club argues that Pima County did not "otherwise show that the permit relies on sufficient monitoring data to assure accurate and continuous monthly compliance with the NO_x cap," and "did nothing to address the fact that the NO_x cap remains practically unenforceable." *Id.*

The adequacy of a permit issuer's response to comments must be evaluated in the context of the content, specificity, and precision of the submitted comments. The Board has held that "parties submitting comments on draft permits must present their concerns with sufficient precision and specificity to apprise the permitting authorities of the significant issues so that the permit issuer can make timely and appropriate adjustments to its permit determination, or, if no adjustments are made, can explain why none are necessary in its response to comments." *In re Pio Pico Energy Ctr.*, 16 E.A.D. 56, 85 (EAB 2013). Where a comment lacks specificity and precision, the permit issuer's obligation to respond is similarly tempered. It is well settled that "permit issuers need not guess the meaning behind imprecise comments and are under no obligation to speculate about possible concerns that were not articulated in the comments." *In re Scituate Wastewater*

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to a warm startup that emits 3.5 pounds). Nonetheless, the methodology for calculating emissions during startup requires Tucson Electric to assume that all startups are cold startups. Permit at Part B II.C.9.

Treatment Plant, 12 E.A.D. 708, 723 (EAB 2006) (quotations and citations omitted).

Sierra Club's comments on practical enforceability of the NO_x emissions cap focused on the adequacy of biennial stack testing as a form of compliance monitoring and were very general in nature.[11] In its comments, Sierra Club merely stated that "using stack tests once every two years to determine whether the [Units] are in compliance with the permit is woefully inadequate." Sierra Club Comments at 9. The expert report attached to Sierra Club's comments added some detail but not much more. *See id.* attach. at 20-25. The report explained that infrequent stack tests may not be representative of "routine operations" and noted that "EPA itself has stated that annual stack tests are not sufficient to assure compliance with emissions limits." *Id.* attach. at 21-22. The information cited to support this assertion showed that EPA was concerned that annual stack tests may not be adequate to demonstrate compliance throughout the remainder of the year, particularly where the proper functioning of pollution control technology is necessary for the source to meet applicable requirements. *Id.* attach. at 21 n.59. Instead of stack testing, Sierra Club's expert report recommended that the Permit require Continuous Emissions Monitors. *Id.* attach. at 23.

Pima County responded to these comments by first acknowledging that annual stack tests "are insufficient to assure compliance with emission limits." RTC at 10. Pima County then provided a detailed explanation of what other requirements it had included in the Permit to assure sufficient compliance monitoring during all periods of operation. That lengthy explanation touched on the requirements for use of stack test-derived emission factors and manufacturer emission rates to calculate monthly and yearly NO_x emissions, the conservative nature of these emission factors and emission rates, and the required monitoring of the selective catalytic reduction devices. *Id.* at 10-13. This level of detail was more than an adequate response to Sierra Club's comment that the Permit's compliance

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[11] As described in Part IV.B, Sierra Club also argued in its comments that the NO_x emissions cap was not practically enforceable because the Proposed Permit lacked a clear statement of the methodology for calculating NO_x emissions from emission factors and because Pima County had not included in the record the manufacturer data on startup emission rates that are required for calculating emissions during startup operating periods. Sierra Club Comments at 2, 9. In response, Pima County amended the Permit to include an equation for calculating NO_x emissions and included in the record the manufacturer data on startup emission rates. RTC at 4, 13. Sierra Club has not suggested these comment responses were inadequate.

monitoring was "woefully inadequate" and the expert report explanation that infrequent stack tests may not be representative of routine operations. As the Board has previously held, if "an issue is raised only generically during the public comment period, the permit issuer is not required to provide more than a generic justification for its decision, and the petitioners cannot raise more specific concerns for the first time on appeal." *Encogen*, 8 E.A.D. at 251 n.12; *see In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 146-47 (EAB 1999) (where commenter submitted comments challenging representativeness of air quality data without supplying reasons, permit issuer's response that the data is conservative was adequate given the generic nature of the comment).

To the extent Sierra Club now raises concerns about any of the specifics of that response, we have addressed those claims in Part V.A, above. Sierra Club provides no further detail to support its claim of an inadequate response to comments. In fact, a substantial portion of Sierra Club's Petition is composed of block quotes from Pima County's explanation in the Response to Comments of its basis for concluding that the NO_x emissions cap is practically enforceable. *See* Pet. at 13-16. But as the Board's regulations make clear, when a permit issuer has addressed a petitioner's comments in the record, the petitioner must do more than insist that the permit issuer's response is incorrect, the petitioner "must * * * explain why the Regional Administrator's response to the comment was clearly erroneous or otherwise warrants review." 40 C.F.R. § 124.19(a)(4)(ii); *see In re Windfall Oil & Gas, Inc.*, 16 E.A.D. 769, 797-98 (EAB 2015) ("Simply disagreeing with the Region and repeating concerns [raised in public comments] in a petition for review * * * does not satisfy the regulatory requirement that petitioners confront the permit issuer's responses and explain why the responses were clearly erroneous."). Accordingly, the Board concludes that Sierra Club has not shown Pima County clearly erred in the manner in which it responded to Sierra Club's comments.

VI. *CONCLUSION*

For the reasons stated above, the Board denies Sierra Club's Petition for Review.

So ordered.

United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

AIR QUALITY CONSTRUCTION PERMIT

Permit Number: **2020-49WION-001**

Issue Date: September 9, 2020 Effective Date: September 9, 2020

In accordance with the provisions of the Clean Air Act and the Federal Minor New Source Review Program in Indian Country, 40 C.F.R. §§ 49.151 – 49.165,

Cintas Corporation

is authorized to construct and operate air emissions units and to conduct other air pollutant emitting activities in accordance with the permit conditions listed in this permit.

This source is authorized to construct in the following location:

Cintas Corporation – Green Bay
800 Isbell Street
Green Bay, WI 54303

Cintas Corporation – Green Bay is located on reservation lands held by the United States government in trust for the Oneida Tribe.

All terms and conditions of the permit are enforceable by the U.S. Environmental Protection Agency and citizens under the Clean Air Act.

Genevieve Damico, Chief
Air Permits Section
Air and Radiation Division
U.S. EPA, Region 5

Date

Abbreviations and Acronyms

BTU	British Thermal Unit
CAA	Clean Air Act
C.F.R	Code of Federal Regulations
CO	Carbon Monoxide
DSCF	Dry Standard Cubic Foot
DSCM	Dry Standard Cubic Meter
EPA	U.S. Environmental Protection Agency
g	gram
hr	Hour
lb	Pound
MMBTU	Millions of BTUs
NAAQS	National Ambient Air Quality Standards
NSPS	New Source Performance Standards
NO_x	Oxides of Nitrogen
PM	Particulate Matter
PM_{10}	PM less than or equal to 10 microns diameter
$PM_{2.5}$	PM less than or equal to 2.5 microns diameter
PTE	Potential to Emit
PSD	Prevention of Significant Deterioration
tpy	Tons per year
VOC	Volatile Organic Compound

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SECTION I FACILITY DESCRIPTION

(A) General Source Information

Owner: Cintas Corporation
27 Whitney Drive
Milford, OH 45150

Facility: Cintas Corporation – Green Bay
800 Isbell Street
Green Bay, WI 54303

County: Brown

Reservation: Oneida Tribe of Wisconsin

SIC Code: 7218, Commercial and Industrial Laundering Facility

NAICS Code: 812332, Industrial Launderers

This permit authorizes Cintas Corporation to take synthetic minor limits for VOC in order to convert from a Part 71 to a Part 49 source at the Cintas Corporation – Green Bay facility located within the exterior boundaries of the Oneida Tribe of Wisconsin. The facility launders (cleans and reconditions) soiled industrial towels, coveralls, uniforms, and other textiles for industrial customers.

The permit establishes federally enforceable potential to emit emission limits for the industrial laundering facility. The Permittee shall not process more than 28,950,000 pounds of soiled shop towels during any 12 consecutive-month period to avoid major source Prevention of Significant Deterioration review. This is an existing facility and no modification, expansion, or change in the method of operation is being taken in this permitting action.

(B) Emission Unit Description

(1) Boiler B01 – 10.46 MMBtu/hr

(2) Process P01 – Industrial Washers, Indoor-vented
   a. Industrial Washing Machine (#3)
   b. Industrial Washing Machine (#4)
   c. Industrial Washing Machine (#5)
   d. Industrial Washing Machine (#6)
   e. Industrial Washing Machine (Unimac #1)

(3) Process P02 – Industrial Washers, Stack-vented
   a. Industrial Washing Machine (Unimac #3)
   b. Industrial Washing Machine (Unimac #2)
   c. Industrial Washing Machine (#1)
   d. Industrial Washing Machine (#2)

(4) Process P03 – Industrial Dryers Burning Natural Gas
   a. Industrial Dryer (Wash Tech), 0.25 MMBtu/hr
   b. Industrial Dryer (Cissell #2), 0.25 MMBtu/hr
   c. Industrial Dryer (#3), 2.75 MMBtu/hr
   d. Industrial Dryer (#4), 2.75 MMBtu/hr
   e. Industrial Dryer (Jensen #1), 2.5 MMBtu/hr
   f. Industrial Dryer (Jensen #2), 2.5 MMBtu/hr

(5) Process P04 – Wastewater Pretreatment System

(6) Insignificant Emission Sources
   a. Steam Tunnel, 3.0 MMBtu/hr
   b. Miscellaneous Natural Gas Combustion Units, Combined 11.6 MMBtu/hr
      i. Space Heating
      ii. Water Heating

SECTION II UNIT-SPECIFIC REQUIREMENTS

(A) Emissions Limitations and Standards

The Permittee shall comply with the following requirements:

(1) The Permittee shall not exceed the following emission limits:

Pollutant	Limit	Time Period/Monitoring/Emission Unit
1. NO_x	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
2. CO	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
3. VOC	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
4. SO_2	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
5. PM	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
6. PM	0.23 grams/DSCM Or 0.1 grains/DSCF	3-hour average for natural gas-fired Boiler
7. PM	0.12 grams/DSCM or 0.05 grains/DSCF	3-hour average for natural gas-fired Industrial Dryers and process vents.
8. PM_{10}	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
9. $PM_{2.5}$	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
10. Single HAP	9.9 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
11. Total HAPs	24.9 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.

(2) The Permittee shall not operate the facility to process more than 28,950,000 pounds of soiled shop towels per year based on a 12-month rolling time period as determined at the end of each calendar month.

(3) The permittee shall not dry or heat any soiled shop towels in any dryer unless they have first been washed in a washing machine included in Process P01 or Process P02.

(4) The Industrial Dryers may only be fired using natural gas.

(5) The Boiler may only be fired using natural gas.

(6) Lint filters or other particulate capture systems, installed as part of the equipment design, shall be operated at all times that each process is in operation.

(7) All emission units and associated equipment authorized by this permit, must be maintained in good working order and operated properly.

(8) Good Air Pollution Control Practices- At all times, including start-up, shut-down, and malfunction, the permittee shall maintain and operate all sources, including associated air pollution control equipment regulated by this permit in a manner consistent with good air pollution control practices for minimizing emissions. This includes, but is not limited to, operating emission units and the particulate matter control systems in accordance with the manufacturer's guidelines and following the instructions included in the owners' operations manual [40 CFR 49.125(d)(1) and (3)].

(B) Monitoring and Performance Testing [40 C.F.R. § 49.155(a)(3)]

(1) Monitoring

(a) The Permittee shall develop and follow guidelines and procedures for sorting and categorizing soiled materials to be washed and dried during industrial laundry operations. At minimum, these procedures shall document the method of classifying soiled materials as either soiled shop towels or non-VOC containing items.

(b) The Permittee shall develop and follow guidelines and procedures for sorting soiled shop towels to minimize fugitive VOC and HAP emissions in accordance with good work practices. Good work practices include, but are not limited to, storing soiled shop towels in covered containers prior to sorting or washing the towels.

(c) The facility shall sort, categorize, and weigh laundry by type (shop towel, other);

(d) The facility shall conduct daily visual inspections of the lint coup to ensure lint filters (screens) are installed and functioning properly;

(e) The Permittee shall calculate monthly VOC emissions using Equation 1:

(1) $E_M = U \times VOC_{ef} \div 2{,}000$

Where:

E_M is the total monthly VOC emissions from industrial laundry operations, in tons;
U is the total mass of soiled shop towels processed by the facility, in 1000 pounds;
VOC_{ef} is the VOC emission factor for soiled towels processed by the facility, in pounds of VOC per 1000 pounds of soiled shop towels, as applicable

(f) The permittee shall calculate the VOC emissions on a 12-month rolling period using Equation 2:

(2) $E_T = \sum_{i=1}^{12} E_{Mi}$

Where:
E_T is the total emissions of all VOCs during the previous 12 consecutive calendar months, in tons; and
E_{Mi} is the total VOC emissions during each of the previous 12 consecutive calendar months, in tons, as calculated using Equation 1.

(g) The permittee shall calculate monthly Federal HAP emissions using Equation 3:

(3) $E_i = U \times HAP_{ef} \div 2{,}000$

Where:
E_i is the monthly emissions of an individual HAP from industrial laundry operations, in tons;
U is the total mass of shop towels processed by the facility, in 1000 pounds; and
HAP_{ef} is the Federal HAP emission factor for soiled towels processed by the facility, in pounds of an individual HAP per 1000 pounds of soiled shop towels, as applicable.

(h) The permittee shall calculate monthly total of all Federal HAP emissions using Equation 4:

(4) $E_M = \sum_{i=1}^{n} E_i$

Where:
E_M is the monthly total of all federal HAP emissions from industrial laundry operations, in tons;
E_i is the monthly emissions of an individual federal HAP, calculated using Equation 3; and
n is the total number of federal HAPs emitted by the industrial laundry operations.

(i) The permittee shall calculate the emissions of total individual Federal HAP on a 12-month rolling period using Equation 5:

(5) $E_{Tl} = \sum_{i=1}^{12} EM_i$

Where:
E_{Tl} is the total emissions of an individual Federal HAP during the previous 12 consecutive months, in tons;
EM_i is the total of an individual Federal HAP during the previous 12 consecutive calendar months, in tons, as calculated using Equation 4.

(j) The permittee shall calculate the emissions of total Federal HAPs on a 12-month rolling period using Equation 6:

(6) $E_T = \sum_{i=1}^{12} EM_i$

Where:
E_T is the total emissions of all Federal HAPs during the previous 12 consecutive months, in tons;
EM_i is the total of all Federal HAP emissions during the previous 12 consecutive months, in tons, as calculated using Equation 4.

(k) The Permittee shall calculate the monthly and rolling 12-month NO_x, CO, SO_2, VOC, HAP, PM, PM_{10}, $PM_{2.5}$, and Lead emissions from all combustion units at the facility using AP-42 emission factors.

(l) The Permittee shall calculate the monthly and rolling 12-month NO_x, CO, SO_2, VOC, HAP, PM, PM_{10}, $PM_{2.5}$, and Lead emissions from all processes at the facility.

(2) Performance Testing

(a) Reference Test Methods. Upon request, the Permittee shall test for emissions of particulate matter, VOCs, and HAPs in accordance with the methods and procedures specified in Method 5 of 40 C.F.R. Part 60, Appendix A or an alternative method approved by the EPA.

(b) No less than 30 days prior to testing, the Permittee shall submit a complete test plan to the EPA. The EPA must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete test report of the test results to the EPA within 60 days following the last date of the test.

(c) Representative Testing Conditions. Performance tests shall be conducted under such conditions as the EPA shall specify to the facility operator based on representative performance of the affected facility. The permittee shall make available to the EPA such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

(d) Operating Conditions for Performance Testing. All performance tests shall be conducted at worst-case operating (non-malfunction) conditions for all emission units for each air pollutant.

(e) Failure to Demonstrate Compliance. Upon the EPA's written notice that the facility has failed to demonstrate compliance with an applicable emission limit, unless an alternative schedule is given in an applicable requirement or compliance document, the permittee shall:

(i) Conduct a retest within 30 days of receipt of the EPA written notice;
(ii) Submit to the EPA written notice of testing and submit a test plan for the retest; and
(iii) Submit a complete report of the results of the retest within 45 days after completion.

(C) Recordkeeping and Reporting [40 C.F.R. § 49.155(a)(4)]

(1) Recordkeeping

(a) The permittee shall maintain a file of all records required by this permit. The permittee shall retain all records required in this permit for at least 5 years. [40 C.F.R. § 49.155(a)(4)(ii)]

(b) The permittee shall retain records of all calibration and maintenance records, and copies of all reports required by the permit. The Permittee shall also maintain the following records of the monitoring required by this permit:

(i) Total weight of soiled towels processed by the facility per month sorted by category (shop towels, other) in 1,000 pounds;
(ii) Amount of natural gas used by the facility each month;
(iii) Total emissions of each individual Federal HAP emitted during each month, in tons;
(iv) Total emissions of each individual Federal HAP emitted during the previous 12 consecutive months, in tons;

(v) Total emissions of all Federal HAPs combined emitted during each month, in tons;
(vi) Total emissions of all Federal HAPs combined emitted during the previous 12 consecutive months, in tons;
(vii) Total emissions of NO_x, CO, SO_2, Lead, PM, PM_{10}, and $PM_{2.5}$ emitted during each month and the previous 12 consecutive months.
(viii) Documentation of the source and development of any Federal HAP emission factor used; and
(ix) Daily records of visual inspection of the lint coup and note the date when the lint coup collection fabric is replaced.

(2) Reporting

(a) Testing Notification. The Permittee shall submit notification of the proposed test date to EPA at least 30 days prior to the planned test date. The Permittee may submit the testing notification at the same time the test protocol is submitted. If there is a delay in conducting the scheduled performance test, the Permittee shall notify EPA as soon as possible, either by providing 7 days prior notice of the rescheduled date of the performance test or by arranging a rescheduled test date with EPA by mutual agreement.

(b) Test Protocol. The Permittee shall submit a test protocol to the EPA at least 30 days prior to testing. The test protocol shall contain, at a minimum, the following information:

(i) Name and address of the facility;
(ii) Emissions units to be tested;
(iii) Proposed operating conditions for each emissions unit to be tested;
(iv) Air pollution control equipment for each emission unit to be tested;
(v) Pollutants to be measured;
(vi) Proposed analytical techniques and test methods;
(vii) Emission points and sampling locations; and
(viii) Expected date of the test, if known.

(c) Test Reports. No later than 45 days following the completion of the initial or periodic performance tests required in Sections II(B)(2)(a) and (b) of this permit, the Permittee shall submit to EPA a written report of the test results obtained from the performance tests.

(d) Deviation Reporting. The Permittee shall promptly report to EPA any deviation from any permit requirements, including those attributable to upset conditions, the probable cause of such deviation, and any corrective

actions or preventative measures taken. "Promptly" shall mean within 30 business days of the deviation. [40 C.F.R. § 49.155(a)(5)(ii)]

(e) Annual Report. The Permittee shall submit an annual report of all required monitoring to assure compliance with the synthetic minor limits established in this permit. This report must include confirmation that the synthetic minor limit was maintained for the previous 12 months and must clearly list all instances of deviations from the permit requirements. The annual reporting period shall end on December 31, and the annual report shall be submitted by March 1. [40 C.F.R. § 49.155(a)(5)(i)] An annual report under this section shall include the following:

(i) The company name and address;
(ii) The beginning and ending dates of the reporting period;
(iii) Copies of records required to be maintained in Section II(C)(1)(b)(i) – (vii) of this permit;
(iv) All instances of deviations from permit requirements whether demonstrated by reference test method, monitoring, or through any other creditable evidence, the date on which each deviation occurred, and either the total duration of deviations indicated by such monitoring or the actual records of deviations.
(v) The name, title, and signature of the responsible official who is certifying the truth, accuracy, and completeness of the report.

SECTION III GENERAL PERMIT REQUIREMENTS

(A) Definitions

Terms and conditions in this permit have the meaning assigned to them in 40 C.F.R. § 49.152 unless other regulations or statutes are referenced or applicable.

(B) Submittals

(1) Unless otherwise directed by EPA or this permit, the Permittee shall submit a copy of all test plans, reports, certifications, notifications, and other information pertaining to compliance with this permit to:

Air Enforcement and Compliance
Assurance Branch (AE-18J)
Enforcement Division
EPA Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

Alternatively, the Permittee may submit the Annual Reports and Deviations Reports required under Section II(C)(2) of this permit through the Compliance and Emissions Data Reporting Interface (CEDRI).

(2) The Permittee shall submit permit applications, applications for permit amendments, MAP and other applicable permit information, which includes but is not limited to applications and information regarding installation of control equipment, replacement of an emissions unit, and requests for changes that contravene permit terms to:

Air Permits Section
Air Programs Branch (AR-18J)
EPA Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

(C) Severability [40 C.F.R. § 49.155(a)(6)]

The terms and conditions in this permit are distinct and severable. Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of this permit. If any term or condition in this permit is held invalid, such invalidity shall not affect the validity or application of other terms or conditions.

(D) Compliance with Permit Requirements [40 C.F.R. § 49.155(a)(7)(i)]

The Permittee shall comply with all conditions of this permit, including emission limitations that apply to the affected emissions units at the source. Noncompliance with any permit term or condition is a violation of the permit and may constitute a violation of the Clean Air Act and is grounds for enforcement action and for a permit termination or revocation.

(E) Prohibition on Violation of National Ambient Air Quality Standards and Prevention of Significant Deterioration Increments [40 C.F.R. § 49.155(a)(7)(ii)]

The permitted source shall not cause or contribute to a violation of a National Ambient Air Quality Standard or, in an attainment area, shall not cause or contribute to a Prevention of Significant Deterioration increment violation.

(F) Need to Halt or Reduce Activity Not a Defense [40 C.F.R. § 49.155(a)(7)(iii)]

It is not a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(G) Permit Revision, Reopening, Revocation and Reissuance, or Termination [40 C.F.R. § 49.155(a)(7)(iv)]

This permit may be revised, reopened, revoked and reissued or terminated for cause. The filing of a request by the Permittee for a permit revision, revocation and reissuance or termination or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

(H) Property Rights [40 C.F.R. § 49.155(a)(7)(v)]

This permit does not convey any property rights of any sort or any exclusive privilege.

(I) Duty to Provide Information [40 C.F.R. § 49.155(a)(7)(vi)]

The Permittee shall furnish to the EPA, within a reasonable time, any information that EPA may request in writing to determine whether cause exists for revising, revoking and reissuing, or terminating the permit or to determine compliance with the permit. For any such information claimed to be confidential, the Permittee must also submit a claim of confidentiality in accordance with 40 C.F.R. Part 2, Subpart B.

(J) Entry and Inspection [40 C.F.R. § 49.155(a)(7)(vii)]

Upon presentation of proper credentials, the Permittee shall allow a representative of the EPA to:

(1) Enter upon the premises where a source is located or emissions-related activity is conducted or where records are required to be kept under the conditions of the permit;

(2) Have access to and copy, at reasonable times, any records that are required to be kept under the conditions of the permit;

(3) Inspect, during normal business hours or while the source is in operation, any facilities, equipment (including monitoring and air pollution control equipment), practices or operations regulated or required under the permit;

(4) Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the permit or other applicable requirements; and

(5) Record any inspection by use of written, electronic, magnetic and photographic media.

(K) Permit Invalidation [40 C.F.R. §§ 49.155(a)(1)(i), (b)]

This permit becomes invalid if the Permittee does not commence construction within 18 months after the effective date of this permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The reviewing authority may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between construction of the approved phases of a phased construction project. The Permittee must commence construction of each phase within 18 months of the projected and approved commencement date.

(L) Construction Without a Permit

If the Permittee constructs or operates any source or modification not in accordance with the terms of any approval to construct, the Permittee shall be subject to appropriate enforcement actions.

(M) Construction Approval

(1) Nothing in this permit shall alter the requirement for the Permittee to obtain a construction permit before commencement of construction or modification of an emission unit.

(2) Approval for construction or installation shall not relieve the Permittee of the responsibility to comply fully with the applicable provisions of any other requirements of federal law or regulation, including Title V of the CAA.

(N) Circumvention

The Permittee shall not build, erect, install, or use any article, machine, equipment, or process, the use of which conceals any emission which would otherwise constitute a violation of an applicable standard.

Appendix F – Cost Spreadsheets for Control Technology Analysis

Data Inputs

Select the type of oxidizer [redacted]

Enter the following values for your emission unit:

Composition of Inlet Gas Stream

Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (vol%)	Heat of Combustion (BTU/scf)	Molecular Weight (lb/lb-mole)
Carbon monoxide	16	125,000	313	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below

Enter the design data for the proposed oxidizer:

Number of operating hours/year	8,760 hours/year	
Inlet volumetric flow rate(Q_{scfm}) at 77°F and 1 atm.	67,694 scfm	
Inlet volumetric flow rate(Q_{acfm}) (actual conditions)	74,892 acfm	
Pressure drop (dP)	35 inches of water	* 25 inches of water is the default pressure drop for thermal oxidizers, 10 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value if known
Motor/Fan Efficiency (η)	60 percent*	* 60% is a default fan efficiency. User should enter actual value if known
Inlet Waste Gas Temperature (T_{wg})	170.9 °F	
Operating Temperature (T_o)	1,900 °F	* Note: Default value for 3 or 2 BOP is for thermal regenerative oxidizers. Use actual value if known. TO for regenerative oxidizers typically between 1800 and 1900°F
Destruction and Removal Efficiency (DRE)	98 percent	
Estimated Equipment Life	20 Years*	* 20 years is the typical equipment life. User should enter actual value if known.
Heat Loss (η)	1 percent*	* 1 percent is a default value for the heat loss. User should enter actual value, if known. Heat loss typically between 0.1 and 5%

Percent Energy Recovery (PER) = [redacted]

Enter the cost data:

Desired dollar year	2022		
CEPCI* for 2022	797.6	Enter the CEPCI value for 2022	541.7 2016 CEPCI
Annual Interest Rate (i)	7 Percent		
Electricity ($Cost_{elec}$)	0.085 $/kWh		
Natural Gas Fuel Cost ($Cost_{ng}$)	0.00860 $/scf		
Operator Labor Rate	326.61 per hour		
Maintenance Labor rate	377.40 per hour		
Contingency Factor (CF)	10.0 Percent		

* 326.61 per hour is average operator labor rate from Bureau of Labor Statistics
* 377.40 per hour is 1.15 times operator labor rate. User should enter actual value, if known.
* Typical value is between 3 and 10 percent. User should enter actual value, if known. Value of 3 used for typical conditions.

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is merely meant to allow for escalation of a well-known cost index to the equipment years or other well known cost indexes (e.g., MACT) as acceptable

R004798

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Compound or other Constituent	Concentration in Waste Gas Stream [From Data Inputs Tab]	Adjusted Flow Available with Diluted Air [optional]
Carbon monoxide	16	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	16	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0 °F
Density of auxiliary fuel at 77 °F (ρ_{af}) =		0.0408 lb_m/ft^3
Heat input of auxiliary fuel ($-\Delta h_{af}$) =		21,502 Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739 lb_m/ft^3 (actual = 0.0486)
Mean Heat Capacity of Air ($C_{p_{mean}}$)	(For thermal oxidizers)	0.255 Btu/lb °F

Parameter	Equation	Calculated Value	Units	Value	Units
Sum of volume fraction of combustible components =	= ($\sum x_i$) =	16	ppmv		
Lower Explosive Limit of waste gas (LEL_{wg})	= $\frac{1}{\sum(x_i/LEL_i)}$ = $1/1.33$ =	825,000	ppmv		
	Where x_i is the volume fraction and LEL_i the lower explosive limit for each combustible component in the waste gas.				
% LEL_{wg}	= (Total Combustible Conc. in Mixture/LEL_{wg}) × 100 =	0.01	percent	* Note: Since the LEL of the waste gas stream is below 25%, no dilution air is needed	
Dilution Factor	= (LEL_{wg} × 0.25)/($\sum x_i$) =	Not Applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= (Total Adjusted Conc. With Dilution Air/LEL_{wg}) × 100 =	Not Applicable			
Inlet volumetric flow rate(Q_{wg}) at 77°F and 1 atm.	(From Data Inputs Tab) =	62,594	scfm		
Oxygen Content of gas stream	= 100 - ($\sum x_i$ × 100/10^6) = 0.209 =	20.98	percent		
Fan Power Consumption (FP)	= (Q_{wg} × 17 × 10^{-6}) × ΔP_{wg} × 746/x	376	x HP		
Q_{wg}	= Q_{wg} =	62,594	scfm		
Operating temperature of oxidizer (T_o)	(From Data Inputs Tab)	1,900	°F		
Temperature of waste gas at outlet to preheater (T_{wo})	= Heat Recovery = (T_o - T_{ai}) + T_{ai} =	1,381	°F		
Temperature of flue gas exiting the regenerative oxidizer (T_{fg})	= T_i + 0.95(T_o - T_{ai}) =	357	°F		
Heat input of waste gas ($-\Delta h_{wg}$)	= $\sum$ ($-\Delta h_c$) × Where ($-\Delta h_c$) is the heat of combustion and x, the fraction of components "i" at 77 °F.	0.01	Btu/scf	0.8	Btu/lb
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm.	(Calculated using Equation 2.45 in Appendix B)	2.25	scfm		
Auxiliary fuel Energy Input =		3,926	Btu/min		
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × ρ_{af} × Q_{af} × $C_{p_{mean}}$ × (T_o - T_{ref}) =	107,521	Btu/min		
Is the calculated auxiliary fuel sufficient to stabilize combustion? Auxiliary fuel energy input > 5% of Total Energy Input, then the auxiliary fuel is sufficient.)	(Note: If the	No		Note: Additional auxiliary fuel equivalent to 5% of total energy input is required to stabilize combustion.	
Auxiliary fuel flow (Qaf) (adjusted for fuel required for combustion stabilization)at 77°F and 1 atm. =		123	scfm		
Total Volumetric Throughput (Q_{tot}) at 77 °F and 1 atm	= Q_o = Q_{wg} + Q_a + Q_{af} + Q_{dil} =	62,717	scfm		

Capital Recovery Factor:

Cost Factor	Equation	Calculated Value
Capital Recovery Factor (CRF) =	= $i(1+i)^n/[(1+i)^n - 1]$ =	0.0944
	Where n = Equipment Life and i= Interest Rate	

Cost Estimate

Direct Costs

Total Purchased equipment costs (in 2022 dollars)

Incinerator + auxiliary equipment[a] (A) =		
Equipment Costs (EC) for Regenerative Oxidizer	=(2.664 × 100,000 × (13.98 × Qact)) × (2022 CEPI/2016 CEPCI) =	$1,688,237 in 2022 dollars
Instrumentation[b] =	0.10 × A =	$168,323
Sales taxes =	0.03 × A =	$50,497
Freight =	0.05 × A =	$84,163
	Total Purchased equipment costs (B) =	$1,986,207 in 2022 dollars

Footnotes

a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.

b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2022 dollars)

Foundations and Supports =	0.08 × B =	$158,897
Handling and Erection =	0.14 × B =	$278,069
Electrical =	0.04 × B =	$79,448
Piping =	0.02 × B =	$39,724
Insulation for Ductwork =	0.01 × B =	$19,862
Painting =	0.01 × B =	$19,862
Site Preparation (SP) =		$0
Buildings (Bldg) =		$0
	Total Direct Installation Costs =	$595,862
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$2,582,070 in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)

Engineering =	0.10 × B =	$198,621
Construction and field expenses =	0.05 × B =	$99,310
Contractor fees =	0.10 × B =	$198,621
Start-up =	0.02 × B =	$39,724
Performance test =	0.01 × B =	$19,862
	Total Indirect Costs (IC) =	$556,138
Contingency Cost (C) =	CF(IC+DC)=	$313,821
Total Capital Investment =	DC + IC + C =	$3,452,030 in 2022 dollars

Direct Annual Costs

Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$205,780
Annual Fuel Costs for Natural Gas	= $Cost_{NG}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$553,997
Operating Labor	Operator = 8 Shours/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569
	Supervisor = 15% of Operator	$2,185
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002
	Materials = 100% of maintenance labor	$15,002
Total Annual Costs (DC) =		$805,535 in 2022 dollars

Indirect Annual Costs

	= (60% of sum of operating, supervisor, maintenance labor and maintenance materials	
Overhead		$28,054
Administrative Charges	= 2% of IC	$69,041
Property Taxes	= 1% of IC	$34,520
Insurance	= 1% of IC	$34,520
Capital Recovery	= CRF(IC+) 0%(car Cost)]	$325,847
Annual Annual Costs (IC) =		$492,983 in 2022 dollars
Total Annual Cost =	DC + IC	$1,298,518 in 2022 dollars

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$1,298,518 per year in 2022 dollars
CO Destroyed =	17.4 tons/year
Cost Effectiveness =	$74,754 per ton of pollutants removed in 2022 dollars

Data Inputs

Select the type of oxidizer: Catalytic Oxidizer - Fixed Bed

Enter the following information for your off-gas source:

Composition of Inlet Gas Stream

Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion* (Btu/scf)	Molecular Weight
Carbon monoxide	16	125,000	323	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the proposed oxidizer:

Number of operating hours/year	8,760 hours/year	
Inlet volumetric flow rate(Q_{std}) at 77°F and 1 atm	82,894 scfm	
Inlet volumetric flow rate(Q_a) (actual conditions)	74,592 acfm	
Pressure drop (ΔP)	23 inches of water*	* 23 inches of water is the default pressure drop for thermal oxidizers, 59 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known.
Motor/Fan Efficiency (ε)	60 percent*	* 60% is a default for all fans. User can enter actual value, if known.
Inlet Waste Gas Temperature (T_{wg})	170.5 °F	
Operating Temperature (T_o)	900 °F	* Enter Default value for TO is 900°F for catalytic oxidizer. Use actual value if known. TO for catalytic oxidizers is typically between 300 and 900°F.
Destruction and Removal Efficiency (DRE)	98 percent	
Estimated Equipment Life	20 Years*	* 20 years is the default equipment life. User should enter actual value, if known.
Catalyst Data:		
Estimated catalyst life (y)	3 years	* 3 years is default value. User should enter actual value if known.
Catalyst Unit Cost (CC)	0 $/ft³	
Space velocity for catalyst (θ)	30,000 /hour	* 30 000 per hour is a default value. User should enter actual value, if known.

Cost Data, oil/gas:

Desired dollar year	2021	
CEPCI* for 2022	797.6 Enter the CEPCI value for 2022	390.6 1996 CEPCI
Annual Interest Rate (i)	7 Percent	
Electricity ($Cost_{elec}$)	0.085 $/kWh	
Natural Gas Fuel Cost ($Cost_{ng}$)	0.00860 $/scf	
Operator Labor Rate	$26.61 per hour	* $26.61 per hour is a default labor rate. User should enter actual value, if known.
Maintenance Labor rate	$27.40 per hour	* $27.40 per hour is a default labor rate. User should enter actual value, if known.
Contingency Factor (CF)	10.0 Percent	* 10 percent is a default value for construction cost engineers. Typically values between 5 and 15 percent.

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

R004801

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the curves shown on the *Cost Estimate* tab.

Component of Inlet Gas Stream	Concentration in Waste Gas Stream (Volume Fraction)	Adjusted Concentration with Dilution Air (Volume Fraction)
Carbon monoxide	0	NA
	0	NA
	0	NA
	0	NA
	0	NA
	0	NA
	0	NA
	0	NA
	0	NA
	0	NA
	0	NA
Total	0	0

Constant used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0 °F
Density of auxiliary fuel at 77 °F (ρ_{af}) =		0.0408 lb/ft^3
Heat input of auxiliary fuel ($-\Delta h_{af}$) =		21,502 Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739 lb/ft^3 (actual = 0.0486)
Mean Heat Capacity of Air ($K_{p,avg}$) =	(for catalytic oxidizer)	0 Btu/lb °F

Parameter	Equation	Calculated Value	Units	Value	Units
Sum of volume fraction of combustible components =	= $\Sigma[x_i]$ =	0	ppmw		
Lower Explosive limit of waste gas (LEL_{wg})	= $[\Sigma(x_i/LEL_i)]^{-1}$ =	125,000	ppmw		
	Where x_i is the volume fraction and LEL the lower explosive limit for each combustible component in the waste gas				
% LEL_{wg}	= [Total Combustible Conc. in Mixture/LEL_{wg}] × 100 =	0.01	percent	* Note: Since the %LEL of the waste gas stream is below 25% no dilution air is needed	
Dilution Factor	= (LEL_{wg} × 0.249)/[Σx_i] =	Not applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= [Total Adjusted Conc. With Dilution Air/LEL_{wg}] × 100 =	Not Applicable			
Inlet volumetric flow rate(Q_{wet}) at 77°F and 1 atm:	(From Data Inputs Tab) =	62,594	scfm		
Oxygen Content of gas stream	= 0.50 - [Σx_i × 1.50/2]* = (0.209 =	20.80	percent		
Fan Power Consumption (FP)	= [(1.17 × 10^{-5}) × Q_{wet} × ΔP]/η =	334.5	kW		
Q_{wet}	= Q_{wg} =	62,594	scfm		
Operating Temperature of oxidizer (T_{ox})	(From Data Input Tab)	900	°F		
Temperature of waste gas at outlet to preheater (T_{wo})	= (Heat Recovery × (T_{ox} - T_{wi})) + T_{wi} =	535	°F		
Temperature of flue gas exiting the oxidizer (T_{fg})	= T_{ox} - (T_{ox} - T_{wo}) =	535	°F		
Heat input of waste gas ($-\Delta h_{wg}$)	= Σ [$-\Delta h_i$] =	0.01	Btu/scf	0.1	Btu/lb
	Where ($-\Delta h_i$) = the heat of combustion and x_i the fraction of component "i" at 77°F.				
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm	(Calculated using Equation 2.21 in Chapter 2 of the Cost Manual)	590.38	scfm		
Auxiliary fuel Energy Input =		317,928	Btu/hr		
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × Q_{af} × $C_{p,avg}$ × [T_{ox} - T_{af}] =	47,652	Btu/hr		
Is the calculated auxiliary fuel sufficient to stabilize combustion?	(Enter 'Y' if the auxiliary fuel energy input > 5% of Total Energy Input, then the auxiliary fuel is sufficient.)	Yes			
Auxiliary fuel flow (Q_{af}) at 77 °F and 1 atm =		590	scfm		
Total Volumetric Throughput (Q_{tot}) at 77 °F and 1 atm	= Q_{wi} + $Q_{af,a}$ + Q_{af} + $Q_{af,c}$ + Q_{ao} + $Q_{af,o}$ =	63,185	scfm		
Calculation of Catalyst Volume and Estimated Temperature of Waste Gas Entering the Catalyst Bed					
Volumetric Flow Rate at 60 °F and 1 atm (Q_{std})	= Q_{tot} × (519/(77 °F + 460)) =	61,067	scfm		
Catalyst Volume (VOL_{cat})	= Q_{std}/SV	122.13	ft^3		
Estimated inlet temperature to the catalyst bed (T_{ci}) =	(Calculated using Equation 2.37 in Chapter 2 of the Cost Manual)	900	°F		

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i(1+i)^n/[(1+i)^n - 1]$ =	0.0964
	Where n = Equipment life and i = Interest Rate	

Cost Estimate

Direct Costs

Total Purchased equipment costs (in 2022 dollars)

Incinerator + auxiliary equipment[a] (A) =			
Equipment Costs (EC) for a Fixed Bed Catalytic Oxidizer	= [1.215 × Qtot^(0.5575)] x [2022 CEPI/1999 CEPCI] =		$1,377,527 in 2022 dollars
Instrumentation[b] =	0.10 × A =		$137,753
Sales taxes =	0.03 × A =		$95,326
Freight =	0.05 × A =		$68,876
		Total Purchased equipment costs (B) =	$1,389,483 in 2022 dollars

Footnotes:
a - Auxiliary equipment includes equipment (e.g., duct work) *normally not* included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2022 dollars)

Foundations and Supports =	0.08 × B =		$111,159
Handlong and Erection =	0.14 × B =		$194,528
Electrical =	0.04 × B =		$55,579
Piping =	0.02 × B =		$27,790
Insulation for Ductwork =	0.01 × B =		$13,895
Painting =	0.01 × B =		$13,895
Site Preparation (SP) =			$0
Buildings (Bldg) =			$0
		Total Direct Installaton Costs =	$416,845
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =		$1,806,327 in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)

Engineering =	0.10 × B =	$138,948
Construction and field expenses =	0.05 × B =	$69,474
Contractor fees =	0.10 × B =	$138,948
Start-up =	0.02 × B =	$27,790
Performance test =	0.01 × B =	$13,895
	Total Indirect Costs (IC) =	$389,055
Contingency Cost (C) =	CF(IC+DC)=	$219,538
Total Capital Investment =	DC + IC + C =	$2,414,920 in 2022 dollars

Direct Annual Costs

Catalyst Replacement Cost	= 1.08 × CC × Vol_{cat} × FWF Where CC is the $/ft^3 cost for the replacement catalyst; Vol_{cat} is the volume of catalyst required based on the waste gas flow rate (Q_s) and the catalyst space velocity (Θ); and FWF is the future worth factor.	$0
Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$249,102
Annual Fuel Costs for Natural Gas	= $Cost_{NG}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$2,668,605
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569
	Supervisor = 15% of Operator	$2,185
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002
	Materials = 100% of maintenance labor	$15,002
Direct Annual Cost (DC) =		$2,964,464 in 2022 dollars

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$28,054
Administrative Charges	= 2% of TCI	$48,298
Property Taxes	= 1% of TCI	$24,149
Insurance	= 1% of TCI	$24,149
Capital Recovery	= CRF(TCI-1.08(cat. Cost))	$227,951
Indirect Annual Costs (IC) =		$352,601 in 2022 dollars
Total Annual Cost =	DC + IC =	$3,317,068 in 2022 dollars

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$3,317,068 per year in 2022 dollars
CO Destroyed =	17.4 tons/year
Cost Effectiveness =	$190,959 per ton of pollutants removed in 2022 dollars

Data Inputs

Select the type of oxidizer: [Regenerative Thermal Oxidizer]

Enter the following information for your emission source:

Composition of Inlet Gas Stream				
Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Carbon monoxide	43	125,000	323	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the Proposed oxidizer:

Number of operating hours/year	8,760 hours/year	Percent Energy Recovery (HR) = [no value]
Inlet volumetric flow rate(Q_{std}) at 77°F and 1 atm.	266,617 scfm	
Inlet volumetric flow rate(Q_a) (actual conditions)	287,388 acfm	
Pressure drop (ΔP)	19 inches of water	* 10 inches of water is the default pressure drop for thermal oxidizers, 18 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known.
Motor/Fan Efficiency (ε)	60 percent*	* 50% is a default fan efficiency. Enter actual value, if known.
Inlet Waste Gas Temperature (T_a)	120 & °F	
Operating Temperature (T_o)	1,900 °F	* Note: Default value for T_o is 2000°F for thermal regenerative oxidizers. Use actual value if known. T_o for regenerative oxidizers typically between 1500 and 2000°F
Destruction and Removal Efficiency (DRE)	90 percent	
Estimated Equipment Life	20 Years*	* 20 years is the typical equipment life. User should enter actual value, if known.
Heat Loss (η)	1 percent*	* 1 percent is a default value for the heat loss. User should enter actual value, if known. Heat loss is typically between 0.1 and 1.5%.

Enter the cost data:

Desired dollar-year	2022		
CEPCI* for 2022	797.98	Enter the CEPCI value for 2022	543.712056 CEPCI
Annual interest Rate (i)	7 Percent		
Electricity ($Cost_{elec}$)	0.085 $/kWh		
Natural Gas Fuel Cost ($Cost_{fuel}$)	5.000000 $/scf		
Operator Labor Rate	538.61 per hour		* The $ per hour is a default value for this should enter actual value, if known.
Maintenance Labor rate	527.90 per hour		* $27.90 per hour is a default value for this should enter actual value, if known.
Contingency Factor (CF)	15.0 Percent		* Typical value is between 3 and 15 percent. For retrofit applications, percent 5 and 15 percent.

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

R004804

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the Data Inputs tab. These values were used to prepare the costs shown on the Cost Estimator tab.

Component of Inlet Gas Stream	Concentration in Waste Stream (ppmv) From Data Inputs Tab	Adjusted Concentration with Dilution Air (ppmv)
Pollutant Name		
Carbon monoxide	43	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	43	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77 °F
Density of auxiliary Fuel at 77 °F (ρ_{af}) =		0.0408 lb/ft^3
Heat Input of auxiliary fuel ($-\Delta h_{af}$) =		21,502 Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739 lb/ft^3 [actual = 0.0488]
Mean Heat Capacity of Air ($C_{p_{air}}$)	(for thermal gradient)	0.255 Btu/lb °F

Description	Equation	Estimated Value	Units	Value	Units
Sum of volume fraction of combustible components =	= $\sum x_i$ =	43 ppmv			
Lower Explosive Limit of waste gas (LEL_{wg})	= $[\sum(x_i/(LEL_i)) = LEL_i)]^{-1}$ =	125,000 ppmv			
	Where x_i is the volume fraction and LEL_i the lower explosive limit for each combustible component in the waste gas.				
% LEL_{wg}	= (Total Combustible Conc. In Mixture/LEL_{wg}) × 100 =	0.03 percent		* Note: Since the LEL of the waste gas stream is below 25%, no dilution air is needed.	
Dilution Factor	= (LEL_{wg} × 0.249)/(Σ x_i) =	Not Applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= [Total Adjusted Conc. With Dilution Air/LEL_{wg}] × 100 =	Not Applicable			
Inlet volumetric flow rate(Qact) at 77°F and 1 atm.	(From Data Inputs Tab) =	255,617 scfm			
Oxygen Content of gas stream	= 20 - ($\sum x_i$ × 100/10^6) = 0.209 =	20.00 percent			
Fan Power Consumption (FP)	= [(1.17 × 10^{-4}) × Q_{act} × ΔP]/e	1044.3 kW			
Q_{act}	= Q_{act} =	255,617 scfm			
Operating temperature of oxidizer (T_o)	(From Data Inputs Tab)	1,800 °F			
Temperature of waste gas at outlet to preheater (T_{wo})	= Heat Recovery × (T_o - T_{ai}) + T_{ai} =	1,368 °F			
Temperature of flue gas exiting the regenerative oxidizer (T_{fg})	= T_o - 0.95(T_o - T_{ai}) =	215 °F			
Heat Input of waste gas ($-\Delta H_{wg}$)	= $\sum(-\Delta h_i) \times x_i$				
	Where $(-\Delta h_i)$ is the heat of combustion and x_i the fraction of component "i" at 77 °F.	0.01 Btu/scf		0.2 Btu/lb	
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm.	(Calculated using Equation 2.45 in Appendix B)	0.70 scfm			
Auxiliary fuel Energy Input =		614 Btu/min			
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × ρ_{af} × Q_{af} × $C_{p_{air}}$ × (T_{af} - T_{ref}) ×	439,060 Btu/min			
Is the calculated auxiliary fuel sufficient to stabilize combustion? auxiliary fuel energy input > 5% of Total Energy Input, then the auxiliary fuel is sufficient.)	(Note: If the	Yes		Note: Additional auxiliary fuel equivalent to 5% of total energy input is required to stabilize combustion.	
Auxiliary Fuel Flow (Q_{af}) (adjusted for fuel required for combustion stabilization) at 77°F and 1 atm. =		500 scfm			
Total Volumetric Throughput (Q_{tot}) at 77 °F and 1 atm.	= Q_r = Q_{wg} + Q_a + Q_{af} + Q_{ai} + Q_{ar} =	256,118 scfm			

Capital Recovery Factor:

Description	Equation	Estimated Value
Capital Recovery Factor (CRF) =	= $[i \times (1+i)^n] \div [(1+i)^n - 1]$ =	0.0944
	Where n = Equipment Life and i = Interest Rate	

Cost Estimate

Capital Cost

Total Purchased equipment costs (in 2022 dollars)

Incinerator + auxiliary equipment[a] (A) =		
Equipment Cost (EC) for Regenerative Oxidizer	=(2.884 × 130,000 × (13.98 × Qtot)) × (2022 CEPCI/2016 CEPCI) =	$5,664,224 in 2022 dollars
Instrumentation[b] =	0.10 × A =	$566,422
Sales taxes =	0.03 × A =	$169,927
Freight =	0.05 × A =	$283,211
	Total Purchased equipment costs (B) =	$6,683,784 in 2022 dollars

Footnotes:
a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2022 dollars)

Foundations and Supports =	0.08 × B =	$534,703
Handling and Erection =	0.14 × B =	$935,730
Electrical =	0.04 × B =	$267,351
Piping =	0.02 × B =	$133,676
Insulation for Ductwork =	0.01 × B =	$66,838
Painting =	0.01 × B =	$66,838
Site Preparation (SP) =		$0
Buildings (Bldg) =		$0
	Total Direct Installation Costs =	$2,005,135
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$8,688,920 in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)

Engineering =	0.10 × B =	$668,378
Construction And Field expenses =	0.05 × B =	$334,189
Contractor fees =	0.10 × B =	$668,378
Start-up =	0.02 × B =	$133,676
Performance test =	0.01 × B =	$66,838
	Total Indirect Costs (IC) =	$1,871,460
Contingency Cost (C) =	0.1(IC+DC)=	$1,056,038
Total Capital Investment =	DC + IC + C =	$11,616,417 in 2022 dollars

Direct Annual Cost

Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$779,049
Annual Fuel Costs for Natural Gas	= $Cost_{ng}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$2,262,287
Operating Labor	Operator = 0 Shifts/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569
	Supervisor = 15% of Operator	$2,185
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,092
	Materials = 100% of maintenance labor	$15,092
Direct Annual Cost (DC) =		$3,088,293 in 2022 dollars

Indirect Annual Cost

	= (60% of sum of operating, supervision, maintenance labor and maintenance materials)	
Overhead		$28,858
Administrative Charges	= 2% of TCI	$232,328
Property Taxes	= 1% of TCI	$116,164
Insurance	= 1% of TCI	$116,164
Capital Recovery	= CRF[TCI, 0.08(cat. Cost)]	$1,096,388
Indirect Annual Cost (IC) =		$1,589,903 in 2022 dollars
Total Annual Cost =	DC + IC =	$4,677,202 in 2022 dollars

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$4,677,202 per year in 2022 dollars
CO Destroyed =	890.4 tons/year
Cost Effectiveness =	$74,553 per ton of pollutants removed in 2022 dollars

Data Inputs

Select the type of oxidizer [redacted]

Enter the following information for your emission source

Composition of Inlet Gas Stream				
Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Carbon monoxide	43	125,000	323	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the proposed oxidizer

Number of operating hours/year	8,760 hours/year	
Inlet volumetric flow rate(Q_{std}) at 77°F and 1 atm	255,617 scfm	
Inlet volumetric flow rate(Q_{act}) (actual conditions)	282,389 acfm	
Pressure drop (ΔP)	23 inches of water*	* 23 inches of water is the default pressure drop for thermal oxidizers, 19 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known
Motor/Fan Efficiency (c)	80 percent*	* 80% is a default fan efficiency. User should enter actual value, if known.
Inlet Waste Gas Temperature (T_{in})	126.8 °F	
Operating Temperature (T_o)	900 °F	* Note: Default value for Thermal Oxidizer is 1,400°F for catalytic oxidizers, the actual value if known. TO for catalytic oxidizers is typically between 600 and 900°F
Destruction and Removal Efficiency (DRE)	90 percent	
Estimated Equipment Life	20 Years*	* 20 years is the typical equipment life. User should enter actual value if known.
Catalyst Data:		
Estimated catalyst life (y)	4 years	* 4 years is default value. User should enter actual value if known
Catalyst Unit Cost (CC)	0 $/ft³	
Space velocity for catalyst (Θ)	30,000 /hour	* 30,000 per hour is a default value. User should enter actual value if known

Percent Energy Recovery (HR) = [redacted]

Enter the Cost Data

Desired dollar-year	2022		
CEPCI* for 2022	797.6	Enter the CEPCI value for 2022	390.6 1999 CEPCI
Annual Interest Rate (i)	7 Percent		
Electricity ($Cost_{elect}$)	0.085 $/kWh		
Natural Gas Fuel Cost ($Cost_{fuel}$)	0.00866 $/scf		
Operator Labor Rate	526.61 per hour		* 526.61 per hour is a default labor rate. User should enter actual value, if known
Maintenance Labor rate	527.40 per hour		* 527.40 per hour is a default labor rate. User should enter actual value, if known
Contingency Factor (CF)	15.0 Percent		* 15 percent is a default value for construction contingencies. User may enter values between 5 and 15 percent

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable

R004807

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the Data Inputs tab. These values were used to generate the costs shown on the Cost Summary Tab.

Component of Inlet Gas Stream	Concentration in Inlet Stream Before Startup Upset Factor Applied (ppmv)	Adjusted Concentration (ppmv) to Account for Upset
Carbon monoxide	43	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	43	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0 °F
Density of auxiliary fuel at 77 °F (δ_{af}) =		0.0408 lb_m/ft^3
Heat Input of auxiliary fuel (ΔH_{af}) =		21,502 Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739 lb_m/ft^3 (@STP = 0.0868)
Mean Heat Capacity of Air ($C_{p,air}$) =	(@ constant pressure)	0 Btu/lb-°F

Parameter	Equation	Calculated Value	Units	Value	Limit
Sum of volume fraction of combustible components =	= $\Sigma[x_i]$ =	43	ppmv		
Lower Explosive Limit of waste gas (LEL_{wg})	= $\Sigma[(x_i / [(\Sigma x_i) / LEL_i])]^{-1}$ =	325,000	ppmv		
	Where x_i is the volume fraction and LEL_i the lower explosive limit for each combustible component in the waste gas				
% LEL_{wg}	= (Total Combustible Conc. in Mixture/LEL_{wg}) x 100 =	0.01	percent	* Where %LEL_{wg} is less than 25% of the waste gas stream it must be diluted to 25% of %LEL or less.	
Dilution Factor	= (LEL_{wg} x 0.25)/(Σx_i) =	Not applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= (Total Adjusted Conc. With Dilut on Air/LEL_{wg}) x 100 =	Not Applicable			
Inlet volumetric flow rate(Q_{act}) at 77°F and 1 atm.	(From Data Input Tab) =	250,617	scfm		
Oxygen Content of gas stream	= 150 - (Σx_i x 150/10^6) = 0.298 =	20.88	percent		
Fan Power Consumption (FP)	= (1.17 x 10^{-5}) x Q_{act} x $\Delta P/\eta$	3265.5	kW		
Q_{act}	= Q_{act} =	250,617	scfm		
Operating temperature of ox dizer (T_1)	(From Data Inputs Tab)	900	°F		
Temperature of waste gas at outlet of preheater (T_{wg})	= Heat Recovery = (T_1 - T_2) / T_1 =	333	°F		
Temperature of flue gas exiting the oxidizer (T_2)	= T_1 - (T_1 - T_{wg}) =	333	°F		
Heat Input of waste gas (ΔH_{wg})	= Σ (ΔH_i) = Where (ΔH_i) = the heat of combustion and x_i the fraction of component "i" at 77 °F	0.01	Btu/scf	0.3	Btu/lb
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm	(Calculated using Equation 2.21 in Chapter 2 of the Cost Manual)	2,526.23	scfm		
Auxiliary fuel Energy Input =		2,316,233	Btu/min		
Minimum Energy required for combustion stabilization =	= 55% x Total Energy Input = 0.55 x ρ_{af} x Q_{af} x $C_{p,air}$ x (T_2 - T_{ref}) =	194,683	Btu/min		
Is the calculated auxiliary fuel sufficient to stabilize combustion?	(Note: If the auxiliary fuel energy input > 55% of Total Energy Input, then the auxiliary fuel is sufficient.)	Yes			
Auxiliary fuel flow (Q_{af}) at 77°F and 1 atm. =		2,526	scfm		
Total Volumetric Throughput (Q_{act}) at 77 °F and 1 atm.	= Q_{act} + Q_{af} + Q_{ca} + Q_{st} + Q_{dil} + Q_{ia} =	258,144	scfm		
Calculation of Catalyst Volume and Estimated Temperature of Waste Gas Entering the Catalyst Bed					
Volumetric Flow Rate at 68 °F and 1 atm (Q_s)	= Q_{act} x (528/537 °F + 460)] =	249,491	scfm		
Catalyst Volume (Vol_{cat})	= Q_s/GV	498.98	ft^3		
Estimated inlet temperature to the catalyst bed (T_1) =	(Calculated using Equation 2.32 in Chapter 2 of the Cost Manual)	898	°F		

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	= $i(1+i)^n/[(1+i)^n - 1]$ =	0.0944
	Where n = Equipment Life and i= Interest Rate	

Cost Estimate

Direct Costs

Total Purchased equipment costs (in 2022 dollars)

Incinerator + Auxiliary equipment[a] (A) = Equipment Costs (EC) for a Fixed Bed Catalytic Oxidizer	= (1.235 × Qact^(0.5575)) × (2022 CEPCI/1599 CEPCI) =	$2,580,726 in 2022 dollars
Instrumentation[b] =	0.10 × A =	$258,073
Sales taxes =	0.03 × A =	$77,422
Freight =	0.05 × A =	$129,036
	Total Purchased equipment costs (B) =	$3,045,257 in 2022 dollars

Footnotes:
a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2022 dollars)

Foundations and Supports =	0.08 × B =	$243,621
Handling and Erection =	0.14 × B =	$426,336
Electrical =	0.04 × B =	$121,810
Piping =	0.02 × B =	$60,905
Insulation for Ductwork =	0.01 × B =	$30,453
Painting =	0.01 × B =	$30,453
Site Preparation (SP) =		$0
Buildings (Bldg) =		$0
	Total Direct Installation Costs =	$913,577
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$3,958,834 in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)

Engineering =	0.10 × B =	$304,526
Construction and field expenses =	0.05 × B =	$152,263
Contractor fees =	0.10 × B =	$304,526
Start-up =	0.02 × B =	$60,905
Performance test =	0.01 × B =	$30,453
	Total Indirect Costs (IC) =	$852,672
Contingency Cost (C) =	CF(IC+DC)=	$481,351
Total Capital Investment	= DC + IC =	$5,292,857 in 2022 dollars

Direct Annual Costs

Catalyst Replacement Cost	= 1.08 × CC × Vol_{cat} × FWF Where CC is the $/ft³ cost for the replacement catalyst; Vol_{cat} is the volume of catalyst required based on the waste gas flow rate (Q_s) and the catalyst space velocity (SV), and FWF is the future worth factor.	$0
Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$943,847
Annual Fuel Costs for Natural Gas	= $Cost_{NG}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$13,418,886
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$16,569
	Supervisor = 15% of Operator	$2,485
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002
	Materials = 100% of maintenance labor	$15,002
Direct Annual Cost (DC)		$14,410,791 in 2022 dollars

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$28,054
Administrative Charges	= 2% of TCI	$105,858
Property Taxes	= 1% of TCI	$52,927
Insurance	= 1% of TCI	$52,927
Capital Recovery	= CRF(TCI-1.08(cat. Cost))	$499,589
Indirect Annual Costs (IC) =		$739,356 in 2022 dollars
Total Annual Cost =	DC + IC =	$15,150,146 in 2022 dollars

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$13,148,209 per year in 2022 dollars
CO Destroyed =	190.6 tons/year
Cost Effectiveness =	$69,049 per ton of pollutants removed in 2022 dollars

Pritchett, Jacob A.

From: Carter, Sally
Sent: Monday, October 7, 2019 4:15 PM
To: LaDonna Driver
Cc: Romaine, Chris; Patel, Minesh
Subject: New Time Proposed: (External) Conference call- USS & IEPA

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

Robertson, Laurie L.

From:	David Keen <keen@rtpenv.com>
Sent:	Monday, October 10, 2022 10:46 AM
To:	Ray, Sarah
Cc:	Colin Campbell; Gurinder (Gary) Saini; David Keen
Subject:	[External] US Steel Granite City Modeling
Attachments:	Granite City Model Report (10-10-22).pdf; Granite City SIL CO.zip; Granite City NAAQS CO.zip
Follow Up Flag:	Follow up
Flag Status:	Flagged

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
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CARBON MONOXIDE AIR DISPERSION MODELING FOR A PREVENTION OF SIGNIFICANT DETERIORATION AND CONSTRUCTION PERMIT REVISION FOR UNITED STATES STEEL GRANITE CITY WORKS



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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the United States Steel Corporation, Granite City Works ("US Steel") iron and steel making facility in Granite City, Illinois. The analysis has been conducted by RTP Environmental Associates, Inc. ("RTP Environmental") on behalf of US Steel.

The analysis evaluated the emissions of the criteria pollutant carbon monoxide ("CO") as regulated under the applicable provisions of the Prevention of Significant Deterioration ("PSD") regulations of 40 CFR § 52.21, incorporated by reference in the federally approved Illinois State Implementation Plan at 40 CFR § 52.738(b).[1] The criteria pollutant analysis was conducted to ensure that the proposed revisions to the CO emission limitations in the Prevention of Significant Deterioration ("PSD") and Construction Permit (Permit Number 95010001) ("1996 Construction Permit") do not cause or contribute to violation of a National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR § 52.21(l), the analysis conforms with the modeling procedures outlined in the Guideline on Air Quality Models[1] promulgated by United States Environmental Protection Agency ("USEPA") (the "Guideline" or "Appendix W"). It also conforms to the Illinois Environmental Protection Agency's (IEPA) Prevention of Significant Deterioration Modeling Guidance[2], the modeling protocol submitted to the IEPA on February 3, 2020, and associated USEPA modeling policy and guidance.

[1] All citations to the PSD regulations herein are to the currently applicable provisions of 40 CFR § 52.21. The analysis also is designed to satisfy the parallel requirements of the currently pending Illinois PSD rule, 35 Ill. Adm. Code Part 204.

2.0 PROJECT DESCRIPTION

The 1996 Construction Permit authorized National Steel to increase iron and steel production limitations for the blast furnaces and basic oxygen furnace ("BOF") shop at the existing integrated iron and steel manufacturing facility in Granite City, in Madison County, Illinois. US Steel purchased the assets of National Steel in 2003, including Granite City Works. US Steel is proposing revisions to the 1996 Construction Permit that involve increases in the CO emission limitations that were established per the PSD requirements. Therefore, the proposed increases in the CO rates were evaluated for PSD requirements including compliance with the NAAQS for CO. No physical changes are proposed in conjunction with the requested revisions to the 1996 Construction Permit.

3.0 FACILITY AND SITE DESCRIPTION

The US Steel Granite City Works produces high-quality hot-rolled, cold-rolled and coated sheet steel products to customers in the construction, container, piping and tubing, service center, and automotive industries. Granite City Works has an annual raw steelmaking capability of 3.58 million net tons.

The facility occupies approximately 400 acres and is located approximately 12 miles east of Lambert, St. Louis International Airport. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 749,000m East and 4,287,000m North (NAD83, Zone 15). Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

The US Steel facility is classified under the regulations governing PSD and Title V as a major source. The area of Madison County where US Steel facility is located is classified as attainment or unclassifiable for all regulated pollutants except ozone. St. Louis is classified as marginal nonattainment for the 2015 8-hour ozone standard.

Figure 1. General Location of the US Steel Granite City Works

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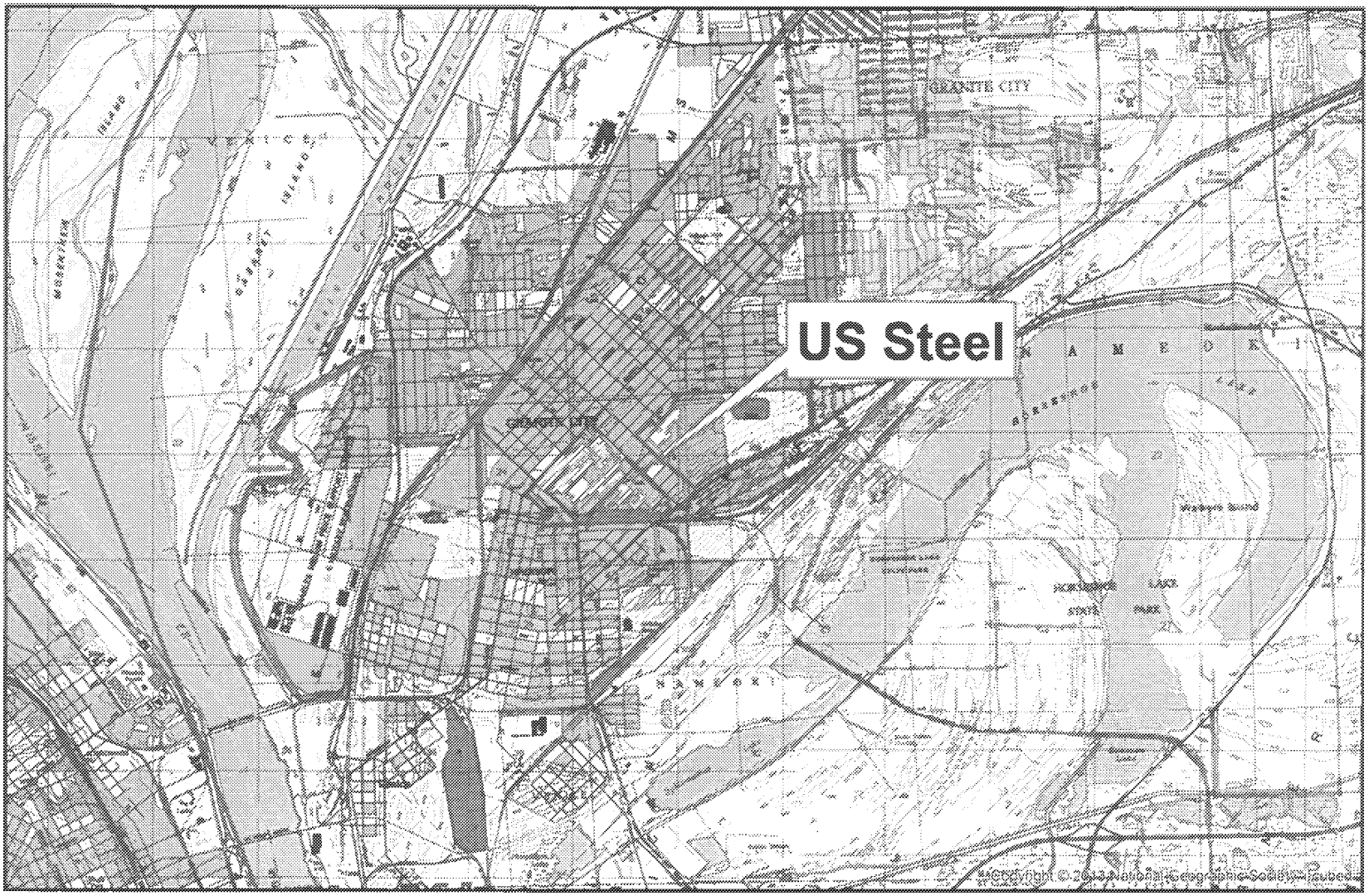


Figure 2. Specific Location of US Steel Granite City Works

4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 22112) was used to conduct the dispersion modeling analysis. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the required default model for calculating ambient concentrations near the US Steel facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the USEPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W was not warranted.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. These coefficients were used by the Illinois Environmental

Protection Agency ("IEPA") in its evaluation of the facility as part of the 1-hr sulfur dioxide ("SO2") Data Requirements Rule ("DRR").

4.3 Source Data

The modeling input data and modeled CO emission rates can be found in Appendix A of this report.

Source Characterization

The majority of modeled source input parameters were obtained from the IEPA's model conducted for the Data Requirements Rule ("DRR").

Point Sources

Most emission sources at the site vent to stacks with a well defined opening. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well defined opening. These sources were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were provided by the IEPA and were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

Flares

The facility uses blast furnace gas flares to combust excess process gas. Emissions that occur only during periods of malfunction are not required to be modeled per 40 CFR Part 51 Appendix W. Non-malfunction emissions were modeled using the procedures outlined in the AERSCREEN Manual[3]. The effective stack height (H, in meters) was computed by the IEPA as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare stack in caloriesper second:

$$H_{equivalent} = H_{actual} + 4.56x10^{-3} \times Q^{0.478}$$

The effective flare stack diameter (d, in meters) was computed as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88x10^{-4} \times (Q \times 0.45)^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec is assumed.

All source locations were based upon a NAD83, UTM Zone 15 projection.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for any stacks n excess of 65m. Procedures used are in accordance with those described in the USEPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[4]. GEP formula stack height, as defined in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from a facility plot plan. The structure locations and heights were obtained from the IEPA and were input to the USEPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The structures included in the GEP analysis are shown as the green blocks in Figure 3. All stacks and structures that are located near a stack were included in the BPIP runs.

Figure 3. Structures Included in the US Steel GEP Analysis

4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 40 CFR § 52.21(m), as discussed in Section 5.0herein.

Pursuant to 40 CFR § 52.21(i)(5), requirements for ambient monitoring data may be waived by the permitting authority if projected increases in ambient concentrations due to the project are less than the Significant Monitoring Concentrations. However, in light of the decision of the D.C. Circuit Court of Appeals *Sierra Club v. EPA*,[5] US Steel has elected not to request such a waiver at this time.

The USEPA Monitoring Guidelines[6], other USEPA interpretive guidance, and USEPA administrative decisions clarify that representative, existing air quality monitoring data may be used to fulfill the PSD pre-construction monitoring requirements and establish background concentrations needed for assessing NAAQS compliance, in lieu of monitoring data. USEPA's Monitoring Guidelines suggest specific criteria to determine representativeness of off-site data: *quality of the data, currentness of the data, and monitor location*.

There are many existing ambient CO monitors within 100 miles in the facility (Figure 4). Existing monitoring data have been evaluated in relation to the criteria provided in USEPA's Ambient Monitoring Guidelines as being representative of the US Steel site.

We have used recently available, quality assured data (2016-2018) from the AQS monitor in East St. Louis, IL (AQS Site # 17-163-0010). 2018 is the latest year of complete, available data. The 4th quarter of 2019 is incomplete and data are not



Figure 4. Ambient Air Quality Monitors in the Vicinity of the US Steel Facility

available for 2020-2021. This monitor best represents background concentrations near the facility as it is the closest monitor with current CO data and is in the vicinity of the site and therefore representative of conditions as the site. The background data are presented in Table 1.

Table 1. Proposed Background Concentrations 2016-2018

Pollutant	Averaging Time	Design Value (ppb)[µg/m³]	Basis	AQS Site No.
CO	1-hour	(2,200) [2,515]	Maximum	17-163-0010 St. Louis
	8-hour	(1,440) [1,646]		

The existing monitoring data satisfy the criteria provided in USEPA's Ambient Monitoring Guidelines[7] as being representative of the site.

Monitor Location

Of the monitors available, the East St. Louis monitor represents background concentrations as it is the closest monitor with data for the pollutants of concern that is not also significantly influenced by the localized source impacts.

Data Quality

The monitor data were collected and quality assured by the IEPA.

Currentness of Data

The data were collected during 2016-2018, which represents the recently available, quality assured data available for use in assessing compliance.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 14,100 receptors were used in the AERMOD significant impacts analysis. The receptor grid consisted of three cartesian grids and receptors located at 50m intervals along the facility fence line.

The first cartesian grid extended to approximately 3.0km from the facility in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region were 250m. A third grid extended to 15km with a spacing of 500m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 2.

Table 2. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Facility (m)
100	3,000
250	5,000
500	15,000

The US Steel facility is located in southern Illinois. Terrain within 10km of the site is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS one arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 15 projection. The near-field receptor grid is presented in Figure 5.

4.6 Meteorological Data

The 2016-2020, 5-year sequential hourly surface meteorological data from the National Weather Service (NWS) at St. Louis Lambert Field (WBAN No. 13994) and upper air data from the NWS station in Lincoln, IL (WBAN No. 04833) were used in the analysis. These data were processed into a "model-ready" format using AERMET version 21112.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption.

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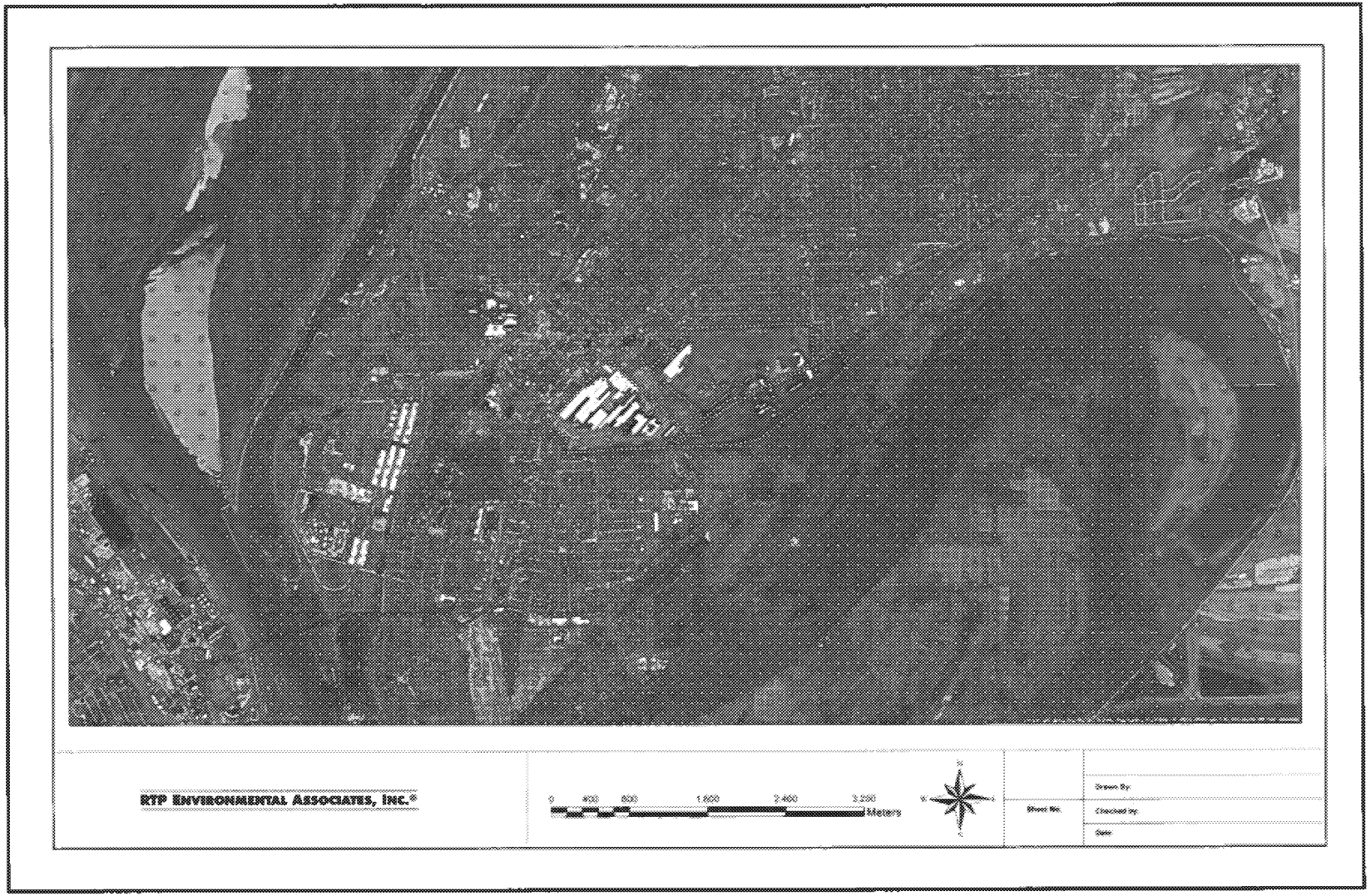


Figure 5. US Steel Facility Near-field Receptor Grid

The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. Estimates of the surface characteristics were made by the IEPA using USEPA's AERSURFACE program (Version 13016) and provided to RTP Environmental. A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. RTP employed the "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed.

The use of NWS meteorological data for dispersion modeling can often lead to a high incidence of calms and variable wind conditions if the data are collected by Automated Surface Observing Stations ("ASOS"), as are in use at most NWS stations since the mid-1990's. A calm wind is defined as a wind speed less than 3 knots and is assigned a value of 0 knots. In addition, variable wind observations may include wind speeds up to 6 knots, but the wind direction is reported as missing, if the wind direction varies more than 60 degrees during the 2-minute averaging period for the observation. The AERMOD model currently cannot simulate dispersion under calm or missing wind conditions. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations were used to calculate hourly average wind speed and directions, which were used to supplement the standard archive of hourly observed winds processed in AERMET. The USEPA AERMINUTE program (Version 15272) was used for these calculations. A wind rose of the 5-year meteorological dataset is provided in Figure 6.

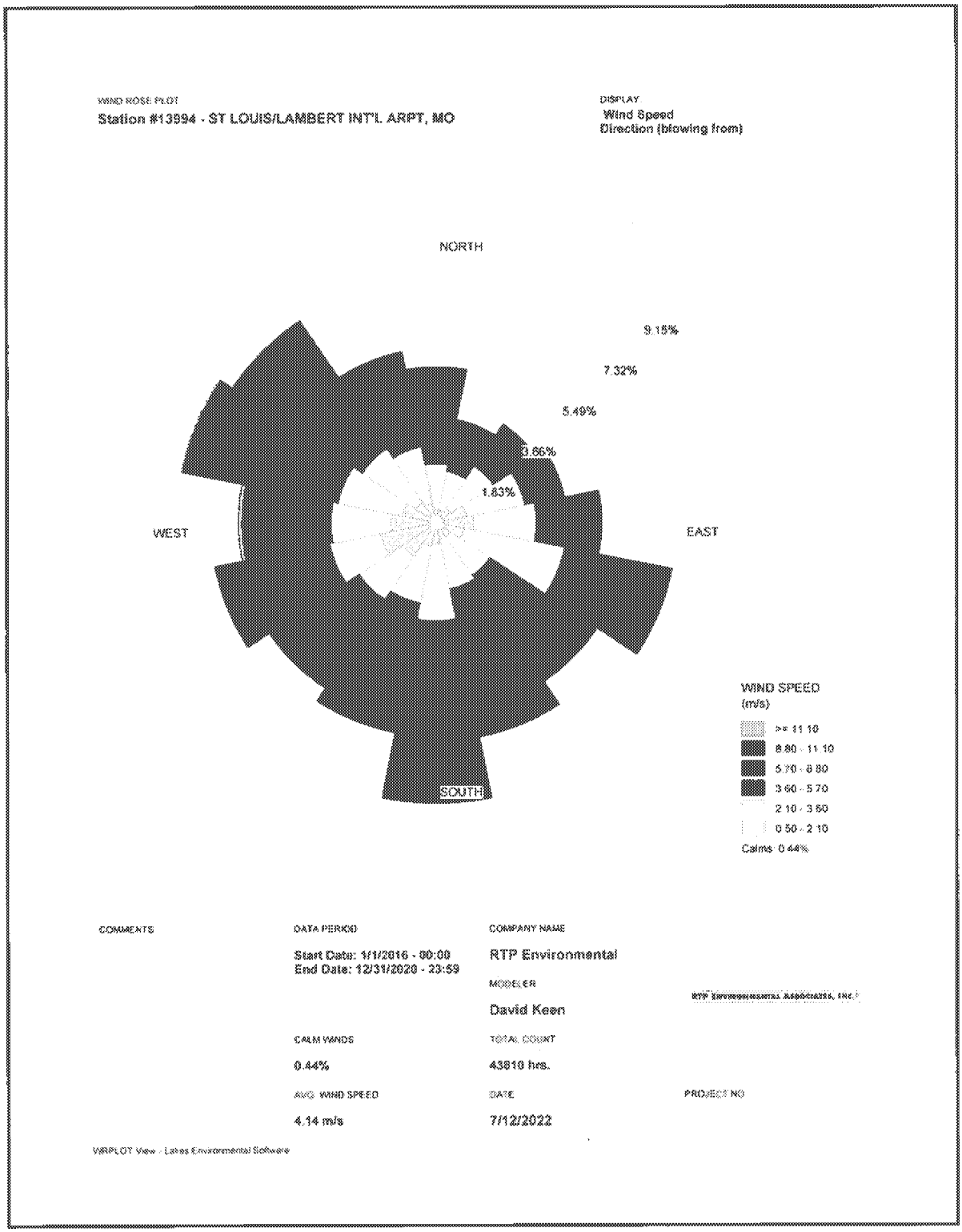


Figure 6. Lambert Field Windrose 2014-2018.

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

USS Steel is proposing changes to the CO emission limitations in the 1996 Construction Permit that were established per the PSD requirements. Therefore, as requested by Illinois EPA, dispersion modeling of CO emissions have been evaluated and compared to the NAAQS.

5.2 Significant Impact Analysis

The air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase NAAQS analysis. In the significant impact analysis, the calculated maximum impacts due to the project were determined for CO.[b] These impacts determined the net change in air quality resulting from the proposed revision to modification permitted under the 1996 Construction Permit. Five years of meteorological data were used in the significant impact analysis. Maximum modeled CO concentrations were compared to the significance levels. The PSD Class II Significant Impact Levels for CO are listed in Table 3.

Table 3. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels ($\mu g/m^3$)
CO	1-hour	2,000
	8-hour	500

[b] For some of the affected emissions units, in place of project related emissions increases, we conservatively used the potential to emit of CO.

5.3 NAAQS Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the CO NAAQS was conducted. In the NAAQS analysis, impacts from the US Steel facility were added to concentrations calculated from other nearby sources, plus a regional background concentration. The resultant total concentrations were compared to the NAAQS to assess compliance. The receptors modeled in the NAAQS analyses were limited to those showing a significant CO impact. Five years of meteorological data were again used in this analysis.

Nearby Source Inventory

Off-site sources were included in the NAAQS analysis. A 50km radius was used to define the screening area. A list of sources that are located within the screening area has been obtained from the IEPA as well as the Missouri Department of Natural Resources ("MDNR"). Section 8.3.3.b of Appendix W to 40 CFR Part 51 states that the number of nearby sources to be explicitly modeled is expected to be few, except in unusual situations. Appendix W further states that the sources to be included will usually be located within the first 10 to 20km from the source under consideration. In addition, it states that identification of nearby sources calls for the exercise of professional judgment by the appropriate reviewing authority. Further, USEPA's Guidance for PM2.5 Permit Modeling reiterates the Appendix W emphasis on a 10km screening radius for determining which nearby sources to include in the cumulative modeling analysis.

We conservatively included all sources provided by the IEPA and MDNR that are located within 50km of the US Steel facility. Total facility, potential emissions (i.e., all sources at a facility) were used in the NAAQS evaluation.

NAAQS Compliance Assessment

Ambient background concentrations (as discussed in more detail in Section 4.4) were then added to assess NAAQS compliance. The modeled and monitored values shown in Table 4 were used for this assessment.

Table 4. Monitored and Modeled Values Used to Assess NAAQS Compliance

Pollutant	Averaging Time	Monitored Value	Modeled Value
CO	1-hour & 8-hour	Maximum over 3 years	Highest, second high over 5 years

The NAAQS are shown in Table 5.

Table 5. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards ($\mu g/m^3$)	
		Primary	Secondary
CO	1-hour	40,000	--
	8-hour	10,000	--

6.0 RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are included on the enclosed CD.

6.1 Significant Impact Analysis Results

The project results in CO impacts in excess of the 8-hour Significant Impact Level shown in Table 3. The significant impact analysis results are presented in Table 6. Based upon the results of the significant impacts analysis, a cumulative, NAAQS analysis was conducted.

6.2 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the CO NAAQS. The project resulted in insignificant 1-hr CO impacts, as a result the 1-hr average was not included in the NAAQS assessment. All sources located within 50km of the US Steel facility were modeled in conjunction with the US Steel facility in assessing compliance. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the CO short term standards was based upon the maximum of the highest-second-highest values from the five-year meteorological dataset.

The results of the NAAQS analysis are presented in Table 7. As can be seen, the model demonstrates compliance.

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Table 6. Significant Impact Analysis Results

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
CO	1-hr	1,157	2,000	N/A	NA
	8-hr	692	500	575	2.2

N/A – Not applicable, impacts calculated to be insignificant.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Comment
CO	8-hour	2,045	1,646	3,691	10,000	Compliant

ATTACHMENT A
MODELING INPUT DATA

R004836

US Steel Granite City Point Source Model Input (NAD83, Zone 15)
Last Update (10-5-22)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
132833	DEFAULT	Blast Furnace A Stoves	749816.02	4286809.08	416.83	217.0	500.0	49.66	7.0	1604.52	1604.52
132838	DEFAULT	Blast Furnace B Stoves	749665.50	4286719.93	417.16	225.0	500.0	51.05	9.8	1837.76	1837.76
132837	DEFAULT	Blast Furnace Gas Flare #1	749777.33	4286841.02	418.23	221.8	1831.7	65.62	15.4	6280.99	6280.99
240479	DEFAULT	Blast Furnace Gas Flare #2	749865.93	4286920.23	416.24	221.8	1831.7	65.62	15.4	6280.99	0.00
132836	DEFAULT	Casthouse Baghouse	749616.61	4286732.18	417.75	63.0	150.0	63.88	11.0	63.77	21.68
132927	DEFAULT	Blast Furnace A and B Iron Spout Baghouse	749831.35	4286818.73	415.98	43.0	123.0	43.04	7.8	6.43	2.19
238459	DEFAULT	Cogeneration Boiler BFG-fired some NG-firing	749776.38	4287073.85	415.19	137.0	400.1	62.11	6.0	203.08	0.00
132867	DEFAULT	Boiler 11	749865.15	4286883.84	416.24	149.9	335.0	29.82	8.0	90.48	90.48
132872	DEFAULT	Boiler 12	749881.40	4286887.85	416.50	150.0	335.0	26.74	8.0	90.48	90.48
BOF	DEFAULT	BOF ESP	748415.00	4286681.00	416.57	125.0	400.0	50.00	15.0	4121.79	1274.01
BOF2ND	DEFAULT	BOF Secondary Baghouse	748625.57	4286763.99	413.00	160.0	275.0	38.55	17.0	19.69	19.69
132842	DEFAULT	Slab Reheat Furnace #1	747729.70	4286762.02	417.52	56.8	650.1	44.88	8.0	26.52	0.00
172532	DEFAULT	Slab Reheat Furnace #2	747715.25	4286747.05	416.47	56.8	650.1	44.88	8.0	26.52	0.00
172512	DEFAULT	Slab Reheat Furnace #3	747700.79	4286730.53	415.88	56.8	650.1	44.68	8.0	26.52	0.00
172514	DEFAULT	Slab Reheat Furnace #4	747700.27	4286714.00	416.08	146.0	736.1	26.94	13.7	40.76	0.00
132849	DEFAULT	Galvanizing line #8 - fume scrubber	748883.00	4287195.00	416.57	80.0	80.0	41.66	3.0	0.00	0.00
229337	DEFAULT	Galvanizing line #8 - space heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229338	DEFAULT	Galvanizing line #8 - drying oven and storage area heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229339	DEFAULT	Galvanizing line #8 - miscellaneous heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229601	DEFAULT	Emergency Generator (3500 HP)	749641.00	4286863.00	416.17	37.0	442.0	32.80	1.9	0.00	0.00
GTEWY1	DEFAULT	Gateway Energy & Coke Co., LLC - Coking (New Main Stack)	749279.00	4286984.00	415.78	199.9	293.1	48.249	13.0	2.62E+01	0.00
GTEWY2	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 2 of 6	749549.00	4287055.00	418.18	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY3	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 3 of 6	749433.00	4286972.00	418.93	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY4	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 4 of 6	749357.00	4286918.00	418.64	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY5	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 5 of 6	749278.00	4286861.00	418.44	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY6	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 6 of 6	749202.00	4286808.00	418.60	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY7	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 1 of 6	749624.00	4287108.00	418.50	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY8	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 1	749199.00	4286809.00	418.60	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY9	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 1 of 6	749620.00	4287113.00	418.11	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY10	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 2	749274.00	4286862.00	418.31	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY11	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 3	749353.00	4286919.00	418.67	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY12	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 4	749429.00	4286973.00	419.00	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY13	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 5	749545.00	4287055.00	418.27	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY14	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 6	749620.00	4287109.00	418.34	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY15	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 2 of 6	749545.00	4287060.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY16	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 3 of 6	749429.00	4286977.00	416.93	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY17	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 4 of 6	749352.00	4286923.00	418.57	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY18	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 5 of 6	749274.00	4286868.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY19	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 6 of 6	749198.00	4286813.00	418.77	20.0	400.0	69.602	5.0	1.32E+00	0.00

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US Steel Granite City Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
26070	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748457.20	4286596.40	413.88	169.0	21.6	78.6	1.373	1.373
26080	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748466.60	4286606.00	413.98	169.0	21.6	78.6	1.373	1.373
26090	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748475.40	4286616.10	413.88	169.0	21.6	78.6	1.373	1.373
26100	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748483.60	4286624.10	413.85	169.0	21.6	78.6	1.029	1.029
26110	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748495.20	4286635.90	414.01	169.0	21.6	78.6	1.029	0.000
26120	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748504.10	4286646.00	414.37	169.0	21.6	78.6	1.029	0.000
26130	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748513.90	4286656.70	414.63	169.0	21.6	78.6	1.029	0.000
26570	Galv Line 8	748368.26	4287046.91	420.41	101.7	12.3	48.5	0.254	0.000
26580	Galv Line 8	748374.01	4287041.49	420.11	101.7	12.3	48.5	0.254	0.000
26590	Galv Line 8	748379.56	4287036.28	419.82	101.7	12.3	48.5	0.254	0.000
26600	Galv Line 8	748420.52	4286997.79	419.55	38.0	15.1	38.0	0.254	0.000
26610	Galv Line 8	748428.00	4286990.81	419.95	38.0	15.1	38.0	0.254	0.000
26620	Galv Line 8	748436.60	4286982.91	419.85	38.0	15.1	38.0	0.254	0.000
26630	Galv Line 8	748444.54	4286975.49	419.62	38.0	15.1	38.0	0.254	0.000
26640	Galv Line 8	748451.78	4286968.87	418.50	38.0	15.1	38.0	0.254	0.000
26650	Galv Line 8	748324.79	4287118.60	421.65	38.0	15.6	17.7	0.254	0.000
26660	Galv Line 8	748331.95	4287112.00	421.52	38.0	15.6	17.7	0.254	0.000
26670	Galv Line 8	748340.34	4287104.30	421.39	38.0	15.6	17.7	0.254	0.000
26680	Galv Line 8	748347.69	4287097.51	421.29	38.0	15.6	17.7	0.254	0.000
26690	Galv Line 8	748354.48	4287091.31	421.16	38.0	15.6	17.7	0.254	0.000
26700	Galv Line 8	748362.29	4287084.18	420.87	38.0	15.6	17.7	0.254	0.000
26710	Galv Line 8	748370.46	4287076.71	420.51	38.0	15.6	17.7	0.254	0.000
26720	Galv Line 8	748378.04	4287069.70	420.14	38.0	15.6	17.7	0.254	0.000
26730	Galv Line 8	748385.51	4287062.91	419.52	38.0	15.6	17.7	0.254	0.000
0126A_1	Slag Pit Volume 1	749691.91	4286762.44	418.70	53.0	29.0	17.7	0.000	0.000
0126A_2	Slag Pit Volume 2	749708.01	4286772.50	421.33	53.0	29.0	17.7	0.000	0.000
0126A_3	Slag Pit Volume 3	749724.24	4286782.31	420.44	53.0	29.0	17.7	0.000	0.000
0126A_4	Slag Pit Volume 4	749740.84	4286791.62	419.00	53.0	29.0	17.7	0.000	0.000
0126A_5	Slag Pit Volume 5	749757.20	4286801.31	418.86	53.0	29.0	17.7	0.000	0.000

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (3-hour)
IL1331772	DEFAULT	Starr Memorial Pet Crematory - Crematory	749244.00	4324486.00	641.44	16.0	800.0	27.585	1.0	2.70E+00	0.00E+00	0.00E+00
IL1331841	DEFAULT	Alton Steel Inc. - Electric arc furnaces	747753.00	4307932.00	433.07	100.0	150.1	31.029	24.2	2.25E+02	7.07E+01	7.07E+01
IL1331845	DEFAULT	Alton Steel Inc. - 14 inch rolling mill reheat furnace	747645.00	4307692.00	432.64	106.0	200.0	2.394	16.0	2.40E+01	0.00E+00	0.00E+00
IL1331945	DEFAULT	Alton Memorial Hospital - 3 Boilers	746364.00	4309470.00	521.36	88.0	389.9	34.108	3.0	0.00E+00	1.28E+01	1.28E+01
IL1332052	DEFAULT	Olin Winchester, LLC - Package Boiler (B-4)	750887.00	4308614.00	435.63	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL1332062	DEFAULT	Olin Winchester, LLC - Package Boiler (B-9)	750891.00	4308619.00	435.89	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL1332063	DEFAULT	Olin Winchester, LLC - Package Boiler (B-2)	750892.00	4308613.00	435.53	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL1332064	DEFAULT	Olin Winchester, LLC - Package Boiler (B-1)	750888.00	4308609.00	435.30	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL1332065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-5)	750883.00	4308610.00	435.27	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL1332148	DEFAULT	Amsted Rail Co , Inc. - Electric Arc Furnace #1 (EF-1)	747122.00	4287625.00	425.26	55.0	250.1	54.087	6.2	3.84E+01	4.07E+00	4.07E+00
IL1332149	DEFAULT	Amsted Rail Co , Inc. - Electric Arc Furnace #2 (EF-2)	747147.00	4287625.00	425.20	44.0	250.1	42.448	7.0	3.84E+01	4.07E+00	4.07E+00
IL1332193	DEFAULT	Velocity Services, LLC. - North American Boiler	748928.00	4286192.00	416.21	27.0	450.1	24.305	2.3	2.36E+00	0.00E+00	0.00E+00
IL1332194	DEFAULT	Velocity Services, LLC. - Cleaver Brooks boiler	748928.00	4286192.00	416.21	29.0	440.0	39.590	2.0	2.36E+00	0.00E+00	0.00E+00
IL1332225	DEFAULT	Gateway Regional Medical Center - Boiler #3	748587.00	4287948.00	426.65	48.0	600.0	41.131	4.5	1.53E+00	1.29E+01	1.29E+01
IL1332226	DEFAULT	Gateway Regional Medical Center - Boilers #1 and 2	748592.00	4287952.00	425.95	48.0	600.0	38.966	4.5	3.07E+00	2.57E+01	2.57E+01
IL1332247	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #1	747505.00	4287550.00	424.64	75.0	375.0	30.078	2.5	1.30E-01	0.00E+00	0.00E+00
IL1332248	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #2	747505.00	4287550.00	424.64	25.0	375.0	65.010	2.5	2.40E-01	1.19E+00	1.19E+00
IL1332324	DEFAULT	Precast Metals - Afterburner AB1 and AB2	748469.00	4285535.00	434.97	34.0	1000.0	64.518	4.0	3.23E-00	0.00E+00	0.00E+00
IL1332424	DEFAULT	Highland Electric Light Plant - Engine IC-5	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	2.07E+01	0.00E+00	0.00E+00
IL1332425	DEFAULT	Highland Electric Light Plant - Engine IC-7	788126.93	4293320.17	534.65	57.0	736.2	6.265	11.4	2.51E+01	0.00E+00	0.00E+00
IL1332496	DEFAULT	ConocoPhillips Co. - Catalytic reformer #1 (STK12-4)	754869.00	4302525.00	442.56	348.9	600.0	56.830	15.0	6.28E+01	9.53E+01	9.53E+01
IL1332510	DEFAULT	ConocoPhillips Co. - Distilling unit; HTR-DU1-F301 (STK5-2)	754327.00	4303077.00	444.69	385.0	319.0	21.978	8.0	1.21E+01	0.00E+00	0.00E+00
IL1332511	DEFAULT	ConocoPhillips Co. - Distilling unit; HTR-DU1-F302 (STK5-1)	754326.00	4303100.00	444.69	150.0	150.0	11.677	8.5	1.57E+01	5.29E+00	5.29E+00
IL1332512	DEFAULT	ConocoPhillips Co. - Steam methane reformer SMR Heater (HTR-SMR - STK12-6)	754873.00	4302750.00	443.04	399.9	749.9	36.638	12.0	4.75E+01	6.82E+01	6.82E+01
IL1332516	DEFAULT	ConocoPhillips Co. - Rectified absorption unit; Reboiler heater (HTR-RAU-DEBUT - STK5-5)	754470.00	4302943.00	444.96	75.0	650.0	34.440	5.0	7.14E+00	0.00E+00	0.00E+00
IL1332517	DEFAULT	ConocoPhillips Co. - Rectified absorption system to RFG	754240.00	4303144.00	443.47	150.0	710.0	26.338	6.0	0.00E+00	1.20E+02	1.20E+02
IL1332518	DEFAULT	ConocoPhillips Co. - Cracked absorption unit (HTR-CAU-ROSTILL - STK5-4)	754468.00	4302963.00	445.81	85.0	800.0	22.573	7.2	6.72E+00	0.00E+00	0.00E+00
IL1332526	DEFAULT	ConocoPhillips Co. - CCU-1 Startup heater B-1	754240.00	4303144.00	443.47	212.0	500.1	86.853	4.5	0.00E+00	3.55E+01	3.55E+01
IL1332535	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #2 (STK6-3)	754868.00	4302895.00	443.27	199.9	175.0	49.954	11.0	4.72E+01	2.17E+03	2.17E+03
IL1332551	DEFAULT	ConocoPhillips Co. - Alkylation unit; HTR-ALKY-HM2 (STK6-6)	754930.00	4303043.00	442.59	150.0	475.1	12.398	6.7	4.92E+00	0.00E+00	0.00E+00
IL1332556	DEFAULT	ConocoPhillips Co. - Utility boiler #15 (STK12-15)	754859.00	4302776.00	443.84	132.0	425.0	43.165	7.0	2.65E+01	1.62E+01	1.62E+01
IL1332557	DEFAULT	ConocoPhillips Co. - Utility boiler #16 (STK12-16)	754875.00	4302778.00	443.21	132.0	425.0	43.165	7.0	2.78E+01	1.41E+01	1.41E+01
IL1332558	DEFAULT	ConocoPhillips Co - Utility boiler 17 (STK12-17)	754902.00	4302784.00	442.91	156.0	317.0	57.218	10.0	3.66E+01	1.82E+01	1.82E+01
IL1332559	DEFAULT	ConocoPhillips Co. - Utility boiler 18 (STK6-9)	754939.00	4302809.00	442.52	100.0	325.0	14.465	6.2	3.00E+01	6.61E+00	6.61E+00
IL1332561	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #1; Charge heater (HTR-HDU-1 - STK13-1)	755217.00	4302589.00	442.16	150.0	790.1	32.144	5.8	5.60E+00	0.00E+00	0.00E+00
IL1332564	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #2; Charge heater (HTR-HDU-2 - STK12-14)	755022.00	4302530.00	442.95	150.0	900.1	31.422	5.8	4.90E+00	0.00E+00	0.00E+00
IL1332565	DEFAULT	ConocoPhillips Co - Cat reformer #3; Stabilizer reboiler (HTR-CR3-H2 - STK12-9)	755014.00	4302580.00	442.62	150.0	950.1	7.019	7.8	4.75E+00	0.00E+00	0.00E+00
IL1332567	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3; Charge heater (HTR-CR3 -H4)	755019.00	4302571.00	442.65	150.0	800.0	28.766	7.8	1.75E+01	8.04E+00	8.04E+00
IL1332568	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3; First interreactor heater (HTR-CR3-H5)	755019.00	4302548.00	442.78	150.0	749.9	25.929	7.8	2.11E+01	6.93E+00	6.93E+00
IL1332569	DEFAULT	ConocoPhillips Co. - Cat reformer #3, Second interreactor heater (HTR-CR3-H6 - STK12-12)	755019.00	4302559.00	442.72	150.0	749.9	14.606	7.8	5.95E+00	0.00E+00	0.00E+00
IL1332594	DEFAULT	ConocoPhillips Co. - Sulfuric acid tank	755114.00	4302829.00	441.93	40.0	185.0	26.273	2.0	1.78E+00	2.35E+00	2.35E+00
IL1332598	DEFAULT	ConocoPhillips Co. - CCU-2 Startup heater B-1	754240.00	4303144.00	443.47	16.0	599.1	32.864	3.2	4.40E-01	0.00E+00	0.00E+00
IL1332699	DEFAULT	Airgas USA, LLC - Liquified carbon dioxide plant	756314.00	4302589.00	435.93	30.0	70.1	79.575	6.2	4.10E-01	0.00E+00	0.00E+00
IL1332701	DEFAULT	Kinder Morgan Liquids Terminals, LLC - New Truck loading rack	752998.00	4303578.00	435.63	20.0	70.1	0.262	2.2	4.87E+00	0.00E+00	0.00E+00
IL1332739	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 1 of 2)	750915.00	4308964.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL1332772	DEFAULT	Elias Kallal & Schaaf Funeral Home & Crematory - Crematorium	742098.00	4312210.00	627.20	30.0	1400.1	18.368	1.7	3.00E+00	0.00E+00	0.00E+00
IL1332781	DEFAULT	Christ Bros Products, LLC - Baghouse	754160.00	4283743.00	418.46	32.0	240.0	83.706	3.9	5.56E-01	2.48E+01	2.48E+01
IL1332828	DEFAULT	Enable Mississippi River Transmission, LLC - Engine SN-02	783556.00	4285536.00	492.29	30.0	1000.0	9.414	1.6	1.36E+01	0.00E+00	0.00E+00
IL1333625	DEFAULT	Waterloo City Light Plant - Engine #1	748326.00	4246769.00	640.45	29.0	749.9	13.579	7.3	4.00E+01	1.35E+00	1.35E+00
IL1333627	DEFAULT	Waterloo City Light Plant - Engine #9	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.6	1.50E+01	3.60E+00	3.60E+00
IL1333628	DEFAULT	Waterloo City Light Plant - Engine #10	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.6	1.50E+01	3.60E+00	3.60E+00
IL1336883	DEFAULT	Lakeview Memorial Gardens - Crematory	761896.00	4273894.00	579.89	16.0	895.0	26.666	1.6	8.40E+00	0.00E+00	0.00E+00
IL1336912	DEFAULT	Breckenridge of IL - Natural gas combustion	756461.00	4277782.00	423.82	38.0	341.6	35.781	7.7	3.94E+00	0.00E+00	0.00E+00
IL1336914	DEFAULT	Touchette Regional Hospital - 2 Boilers	751899.00	4273014.00	415.94	39.0	800.0	6.560	3.7	2.25E+00	0.00E+00	0.00E+00
IL1336918	DEFAULT	Upchurch Ready Mix Concrete Company - Boiler	749959.00	4276616.00	418.44	30.0	376.1	29.684	3.7	0.00E+00	7.00E-01	3.00E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL136098	DEFAULT	Safety Kleen Systems, Inc. - Pipe still (heat exchanger)	749786.00	4276425.00	420.28	15.0	170.0	0.295	1.0	0.00E+00	1.38E+00	1.38E+00
IL136125	DEFAULT	Milam Recycling and Disposal Facility - Open flare	750434.00	4282812.00	420.54	42.0	1800.1	10.070	1.0	1.83E+01	6.00E+00	6.00E+00
IL136129	DEFAULT	Village of Freeburg - Engine #6	769352.00	4257578.00	509.42	24.0	748.9	24.239	1.8	3.93E+00	0.00E+00	0.00E+00
IL136130	DEFAULT	Village of Freeburg - Engine #4	769352.00	4257578.00	509.42	25.0	550.0	87.871	1.3	9.60E+00	0.00E+00	0.00E+00
IL136131	DEFAULT	Village of Freeburg - Engine #7	769352.00	4257578.00	509.42	22.0	900.1	18.926	2.7	4.50E+01	4.43E+00	4.43E+00
IL136169	DEFAULT	Darling Ingredients, Inc. - Continuous rendering process	747472.00	4281438.00	414.93	44.0	74.9	84.854	4.0	6.67E+00	1.43E+00	1.43E+00
IL136187	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	772959.00	4275690.00	514.30	33.0	325.0	47.134	4.5	6.49E+01	2.90E+01	2.90E+01
IL136486	DEFAULT	Cerro Flow Products, LLC. - Piercing Mill Furnace #2	746228.00	4275272.00	407.32	25.0	299.9	38.901	2.0	8.65E-01	0.00E+00	0.00E+00
IL136547	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	747162.00	4269805.00	448.72	36.0	315.1	86.592	3.5	1.34E+01	5.91E+00	5.91E+00
IL142809	DEFAULT	Magnesium Elektron North America - Combustion units	746452.00	4285724.00	415.49	60.0	450.1	30.537	2.0	1.02E+01	4.44E+00	4.44E+00
IL143317	DEFAULT	Waterloo City Light Plant - Engine #11	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL143319	DEFAULT	Waterloo City Light Plant - Engine #7	748326.00	4246769.00	640.45	33.0	749.9	84.854	2.0	3.41E+01	0.00E+00	0.00E+00
IL143320	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246769.00	640.45	27.0	680.1	84.230	2.3	1.87E+01	1.36E+00	1.36E+00
IL145809	DEFAULT	ConocoPhillips Co. - Crude heaters (STK5-3)	754415.00	4303016.00	445.93	311.9	530.0	87.970	14.0	7.81E+01	1.98E+01	1.98E+01
IL145820	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #1 (STK3-1)	752928.00	4303077.00	428.41	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145826	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-1	754240.00	4303144.00	443.47	15.0	117.1	20.369	1.5	7.10E-01	1.74E+00	1.74E+00
IL145838	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #2 (STK3-2)	752929.00	4303071.00	428.38	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145850	DEFAULT	ConocoPhillips Co. - Flare for major effluent treatment project	754240.00	4303144.00	443.47	30.0	78.0	14.006	9.2	4.51E+00	0.00E+00	0.00E+00
IL147845	DEFAULT	Mayco Mfg, LLC - Britt kettles combustion stack	747189.00	4286970.00	421.78	34.0	250.1	2.362	1.1	2.00E-01	0.00E+00	0.00E+00
IL147846	DEFAULT	Mayco Mfg, LLC - Mixed metals A-II dross baghouse discharge stack	747189.00	4286970.00	421.78	30.0	95.1	52.611	5.0	5.77E-01	0.00E+00	0.00E+00
IL148354	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #1 (STK6-2)	754864.00	4302895.00	442.88	199.9	175.0	49.954	11.0	2.32E+01	3.84E+01	3.84E+01
IL149873	DEFAULT	City of Alton - Incinerator	749456.00	4310990.00	446.33	25.0	1400.1	53.038	1.0	1.40E+00	0.00E+00	0.00E+00
IL149908	DEFAULT	Charles E. Mahoney - Drum mix asphalt plant	749517.00	4309892.00	443.14	25.0	295.1	66.289	4.0	5.74E+01	2.56E+01	2.56E+01
IL154190	DEFAULT	Milam Recycling and Disposal Facility - Engine #1	750544.00	4282853.00	411.88	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154191	DEFAULT	Milam Recycling and Disposal Facility - Engine #2	750538.00	4282852.00	412.01	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154192	DEFAULT	Milam Recycling and Disposal Facility - Engine #3	750548.00	4282855.00	411.81	26.0	820.0	86.231	0.8	7.14E+00	1.84E+00	1.84E+00
IL155302	DEFAULT	Alton Steel Inc. - Ladle Furnace	747753.00	4307832.00	433.07	74.0	275.1	87.215	3.0	2.24E+01	1.12E+01	1.12E+01
IL155304	DEFAULT	Precoat Metals - Boiler B1	749469.00	4292538.00	424.97	74.0	700.1	20.730	1.6	8.80E-01	0.00E+00	0.00E+00
IL155305	DEFAULT	Granite City Pickling & Warehousing - Boiler	746973.00	4286890.00	422.41	50.0	331.1	15.449	2.7	7.06E-01	0.00E+00	0.00E+00
IL155307	DEFAULT	Kraft Heinz Co. - Boiler B	748105.00	4289580.00	423.56	40.0	380.0	58.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL155437	DEFAULT	Southwestern Illinois Correctional Center - 2 Boilers	753202.00	4278290.00	421.46	32.0	450.1	15.285	1.5	7.06E-01	0.00E+00	0.00E+00
IL155441	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	772959.00	4275690.00	514.30	33.0	341.0	18.368	3.2	0.00E+00	2.80E+00	2.80E+00
IL156624	DEFAULT	US Air Force/Scott Air Force Base - Boilers and Heaters	774337.00	4270862.00	440.32	30.0	331.1	23.288	2.2	4.81E+00	0.00E+00	0.00E+00
IL156970	DEFAULT	Olin Winchester, LLC - Package Boiler (B-6)	750906.00	4308625.00	436.06	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL159940	DEFAULT	Afton Chemical Corp. - 258 Sulfonation Stack	746513.00	4276305.00	407.05	158.0	70.1	41.820	1.0	0.00E+00	5.59E+00	5.59E+00
IL159942	DEFAULT	Afton Chemical Corp. - Unit 266: Flare 36-0011/36-0610	746653.00	4276356.00	410.10	100.0	700.1	59.368	0.7	8.55E+00	4.90E+01	4.90E+01
IL159965	DEFAULT	Afton Chemical Corp. - Flare 36-0219	746513.00	4276305.00	407.05	146.0	1600.0	42.837	0.4	3.84E+00	2.74E+01	2.74E+01
IL160741	DEFAULT	Brady McCasland, Inc. - Compaction plant	748518.00	4276987.00	413.75	17.0	1521.1	65.469	1.8	5.20E-01	0.00E+00	0.00E+00
IL160742	DEFAULT	Darling Ingredients, Inc. - Kewanee boiler	747472.00	4281438.00	414.93	35.0	450.1	54.448	2.6	1.96E+00	1.51E+01	1.51E+01
IL160799	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-2	754240.00	4303144.00	443.47	48.0	117.1	20.369	1.5	0.00E+00	1.74E+00	1.74E+00
IL160898	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0110	746653.00	4276489.00	405.22	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL165320	DEFAULT	BFI Waste Systems of North America, Inc. - Flare	758882.00	4264336.00	574.97	35.0	1600.1	23.485	0.8	6.80E+00	0.00E+00	0.00E+00
IL166479	DEFAULT	Union Electric Co. - Turbine CT02A	745573.00	4283620.00	420.60	30.0	850.0	18.860	11.4	7.73E+01	2.73E+01	2.73E+01
IL166491	DEFAULT	Enable Mississippi River Transmission, LLC - Turbine SN-03	782556.00	4285336.00	492.29	30.0	749.9	86.854	2.5	9.56E+00	0.00E+00	0.00E+00
IL167781	DEFAULT	Amsted Rail Co., Inc. - Pouring and casting (PR/CST-1)	747025.00	4287611.00	424.80	101.0	251.0	34.768	9.7	0.00E+00	6.70E-01	6.70E-01
IL167787	DEFAULT	Amsted Rail Co., Inc. - Ladle Preheater (LDP-1)	747039.00	4287611.00	424.93	82.0	505.0	31.488	6.1	6.50E+00	2.20E-01	2.20E-01
IL167858	DEFAULT	ConocoPhillips Co. - Scot unit	754240.00	4303144.00	443.47	16.0	115.1	15.580	9.0	0.00E+00	1.72E+02	1.72E+02
IL169226	DEFAULT	Messer, LLC - 2 Boilers	752309.00	4301220.00	434.42	15.0	800.0	0.925	1.4	2.52E+00	0.00E+00	0.00E+00
IL172707	DEFAULT	St. Anthony's Hospital - Boiler #4	745097.00	4310364.00	584.58	64.0	400.0	58.614	2.3	0.00E+00	6.02E+00	6.02E+00
IL179611	DEFAULT	Highland Electric Light Plant - Engine IC-1	788126.93	4293320.17	534.65	12.0	656.0	86.920	1.2	1.44E+01	0.00E+00	0.00E+00
IL179671	DEFAULT	Village of Freeburg - Engine #1	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179672	DEFAULT	Village of Freeburg - Engine #2	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179673	DEFAULT	Village of Freeburg - Engine #3a	769352.00	4257578.00	509.42	25.0	500.1	55.170	1.0	5.92E+00	0.00E+00	0.00E+00
IL181173	DEFAULT	ConocoPhillips Co. - Loading rack	752292.00	4299987.00	429.92	40.0	1800.1	87.510	2.0	1.53E+00	0.00E+00	0.00E+00
IL183733	DEFAULT	Veolia ES Technical Solutions, LLC - Hazardous waste incinerator #4 (rotary kiln)	745532.00	4275942.00	414.76	57.0	650.9	32.570	2.8	3.17E+00	1.16E+01	1.16E+01

R004840

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL189069	DEFAULT	US Air Force/Scott Air Force Base - Diesel generators	774337.00	4270862.00	440.52	37.0	402.0	29.389	1.3	5.83E+01	0.00E+00	0.00E+00
IL190090	DEFAULT	Contract Services, LLC - 3 Boilers	746767.00	4275755.00	417.81	40.0	310.0	50.381	4.2	8.55E+00	5.14E+00	5.14E+00
IL192953	DEFAULT	Midwest Metal Coatings, LLC - Chemical coater/infrared oven (CC/ IRO)	748283.00	4290395.00	423.88	34.0	110.0	18.926	3.0	2.90E-01	0.00E+00	0.00E+00
IL192954	DEFAULT	Midwest Metal Coatings, LLC - Afterburner	748283.00	4290395.00	423.88	34.0	900.1	23.780	5.0	3.29E-01	0.00E+00	0.00E+00
IL192967	DEFAULT	Midwest Metal Coatings, LLC - Boiler (B1)	748283.00	4290395.00	423.88	34.0	400.0	67.338	1.5	2.17E+00	0.00E+00	0.00E+00
IL193552	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	778762.00	4276345.00	439.34	35.0	297.1	62.254	3.8	2.95E+01	1.32E+01	1.32E+01
IL203652	DEFAULT	Empire Comfort Systems - Stack	763529.00	4286192.00	477.26	25.0	800.0	14.334	1.0	2.69E+00	0.00E+00	0.00E+00
IL204833	DEFAULT	Milam Recycling and Disposal Facility - 3 Passive solar flares	760550.00	4282537.00	594.06	30.0	1800.1	57.138	0.7	4.23E+00	4.38E+00	4.38E+00
IL207740	DEFAULT	Chemtrade Solutions, LLC - Scrubber C007	753339.00	4281367.00	422.21	30.0	70.1	0.384	0.3	0.00E+00	2.00E-01	2.00E-01
IL208343	DEFAULT	Center Point Terminal Co. - Asphalt and polymer modified blend tank (T-9)	746362.00	4289240.00	436.44	33.0	385.1	0.951	1.5	1.00E-01	0.00E+00	0.00E+00
IL209238	DEFAULT	Concrete Supply, LLC - Natural gas combustion	757768.00	4302270.00	444.69	20.0	341.0	25.781	2.7	9.69E-01	0.00E+00	0.00E+00
IL209433	DEFAULT	Alton Water Treatment Facility - Stack	742583.00	4309460.00	488.99	22.0	400.0	85.083	0.7	0.00E+00	5.50E-01	5.50E-01
IL211274	DEFAULT	Kienstra-Illinois, LLC - Natural gas combustion	764550.00	4296982.00	576.06	30.0	341.0	25.781	2.7	7.68E-01	0.00E+00	0.00E+00
IL211772	DEFAULT	Center Point Terminal Co. - Incinerator/waste heat boiler	746363.00	4289240.00	436.44	18.0	650.0	7.870	2.0	1.33E-01	1.05E+00	1.05E+00
IL212692	DEFAULT	Chain of Rocks Recycling & Disposal - Open flare	746945.00	4293274.00	431.59	20.0	1400.1	47.265	0.7	6.97E+00	1.06E+00	1.06E+00
IL212981	DEFAULT	Koch Fertilizer, LLC - Ammonia heater	750008.00	4305816.00	428.15	25.0	750.1	42.443	1.0	2.43E+00	5.30E-01	5.30E-01
IL213573	DEFAULT	Illinois Department of Transportation - R and K model 367-1 incinerator	752106.00	4302182.00	623.78	15.0	736.1	30.865	2.8	2.88E+00	0.00E+00	0.00E+00
IL213834	DEFAULT	Darling Ingredients, Inc. - Johnson boiler	747472.00	4281438.00	414.05	33.0	450.1	46.987	2.8	3.96E+00	1.51E+01	1.51E+01
IL213854	DEFAULT	Solvay Fluorides, LLC - Boiler	750245.00	4276135.00	419.72	30.0	361.0	7.314	2.8	3.44E+00	0.00E+00	0.00E+00
IL215715	DEFAULT	Madison County Sand, LLC - Drum mix asphalt plant	758921.00	4289026.00	422.01	32.0	245.0	64.452	4.1	3.63E+01	5.00E-01	5.00E-01
IL217756	DEFAULT	Phillips 66 Pipeline, LLC - Truck loading racks	744935.00	4274152.00	407.25	20.0	70.1	10.594	2.0	1.10E+01	0.00E+00	0.00E+00
IL218530	DEFAULT	ConocoPhillips Co. - North property ground flare (FLRS-2)	764486.00	4303322.00	446.06	195.0	1500.1	2.394	3.0	1.41E+01	0.00E+00	0.00E+00
IL218537	DEFAULT	Custom Steel Processing - Scrubber	746335.00	4286043.00	416.99	55.0	70.1	49.036	4.2	0.00E+00	1.00E-01	1.00E-01
IL218539	DEFAULT	Custom Steel Processing - Sulfuric acid storage tank	746335.00	4286043.00	416.99	35.0	127.0	0.000	2.4	0.00E+00	1.00E-01	1.00E-01
IL218569	DEFAULT	Contract Services, LLC - Boiler #4	746767.00	4275755.00	417.81	40.0	310.0	49.036	3.7	1.30E+01	1.64E+00	1.64E+00
IL218687	DEFAULT	ConocoPhillips Co. - Gas plant sour water stripper	754280.00	4303144.00	643.47	15.0	328.9	11.382	2.9	1.08E+00	0.00E+00	0.00E+00
IL218995	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silos and truck loadout	772959.00	4275690.00	514.30	32.0	86.1	84.854	1.5	1.26E+00	0.00E+00	0.00E+00
IL219420	DEFAULT	Crown Textile Services - Boiler	744287.00	4259382.00	466.40	24.0	450.1	35.227	1.7	1.03E+00	0.00E+00	0.00E+00
IL220266	DEFAULT	American Colloid Co. - Sand drying	746862.00	4287239.00	419.93	72.0	491.1	28.766	3.3	1.29E+00	0.00E+00	0.00E+00
IL220267	DEFAULT	American Colloid Co. - Space Heaters	746862.00	4287239.00	419.93	55.0	198.1	21.484	1.4	2.30E-01	0.00E+00	0.00E+00
IL220618	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	757560.00	4299801.00	441.63	33.0	290.0	68.322	4.3	7.61E+01	3.40E+01	3.40E+01
IL220649	DEFAULT	ConocoPhillips Co. - Alkylation unit flare (FLR6-3)	755035.00	4303051.00	442.55	199.9	1800.1	2.034	2.5	1.85E+01	0.00E+00	0.00E+00
IL222033	DEFAULT	Waterloo City Light Plant - Dual fuel-fired Turbine GT1	748328.00	4246769.00	640.45	39.0	612.1	41.599	6.8	1.77E+01	0.00E+00	0.00E+00
IL222134	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silo loading	757560.00	4299801.00	441.63	26.0	173.0	4.066	1.7	7.00E-01	0.00E+00	0.00E+00
IL222135	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	757560.00	4299801.00	441.63	35.0	351.0	26.896	3.7	0.00E+00	2.80E+00	2.80E+00
IL222988	DEFAULT	Apex Oil Co., Inc. - Thermal oxidizers	752471.00	4302567.00	431.07	18.0	820.0	43.985	2.3	2.98E+00	0.00E+00	0.00E+00
IL223796	DEFAULT	Union Electric Co. - Turbine CT03	745735.00	4282930.00	420.96	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223797	DEFAULT	Union Electric Co - Turbine CT04	745776.00	4282947.00	421.16	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223798	DEFAULT	Union Electric Co. - Turbine CT05	745538.00	4283620.00	420.99	38.0	603.1	74.948	3.4	6.90E-01	9.00E-01	9.00E-01
IL224167	DEFAULT	Intervision (LAWE - Emergency generator	757765.00	4276109.00	482.38	29.0	830.1	51.468	1.3	1.10E+01	4.60E+00	0.00E+00
IL224416	DEFAULT	Belleville Landfill, Inc. - Flare	760402.00	4264040.00	571.88	35.0	1600.1	8.059	0.8	1.22E+01	0.00E+00	0.00E+00
IL224592	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	755685.00	4299823.00	431.10	32.0	251.0	58.928	4.1	3.09E+01	1.38E+01	1.38E+01
IL224594	DEFAULT	Christ Bros Products, LLC - Asphalt tank heaters and boilers	755701.00	4299841.00	427.46	16.0	416.0	42.443	1.0	1.18E+00	2.50E+00	2.50E+00
IL224838	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-01	750099.00	4285426.00	410.47	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224839	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-02	750044.00	4285416.00	410.24	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224840	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-03	750049.00	4285406.00	410.37	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224841	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-04	750054.00	4285397.00	410.30	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224901	DEFAULT	Premcor Refining Group, Inc. - Thermal oxidizer	752775.00	4302454.00	429.95	20.0	342.1	49.462	0.8	7.40E-01	0.00E+00	0.00E+00
IL225166	DEFAULT	Metro Crematory - Crematory	754120.00	4290785.00	417.29	18.0	756.1	84.854	1.0	1.50E+00	0.00E+00	0.00E+00
IL225832	DEFAULT	ConocoPhillips Co. - Startup/malfunction/breakdown	754240.00	4303144.00	643.47	103.0	623.9	21.681	4.6	2.66E+01	1.91E+02	1.91E+02
IL225843	DEFAULT	City of O'Fallon - 600 kW (591 HP) Diesel generator	774612.00	4277280.00	434.42	13.0	500.1	86.592	0.7	3.37E+00	0.00E+00	0.00E+00
IL225844	DEFAULT	City of O'Fallon - 900 kW (1 322 HP) Diesel generator	774612.00	4277280.00	434.42	17.0	500.1	86.592	0.7	7.55E+00	0.00E+00	0.00E+00
IL225960	DEFAULT	Waterloo City Light Plant - Engine #4	748328.00	4246768.00	640.45	37.0	690.2	87.904	2.5	3.32E+01	0.00E+00	0.00E+00
IL226013	DEFAULT	Milam Recycling and Disposal Facility - 325 HP Tub grinder	760550.00	4282537.00	594.06	7.0	827.0	74.080	0.3	2.30E+00	8.00E-01	8.00E-01
IL226014	DEFAULT	Milam Recycling and Disposal Facility - Enclosed flare	760476.00	4282525.00	419.62	55.0	1400.1	0.656	12.0	2.40E+01	6.08E+00	6.08E+00

R004841

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL226015	DEFAULT	Milam Recycling and Disposal Facility - 750 HP Tub grinder	750550.00	4282537.00	594.06	8.0	627.0	70.881	0.7	5.10E+00	1.90E+00	1.90E+00
IL226184	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - 1F Mix muller (MM-3) Low profile turbine (LF-1) and induction form sta	750075.00	4306259.00	432.32	41.0	209.9	36.080	2.1	2.60E+00	0.00E+00	0.00E+00
IL226204	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #4 (SA-4)	750150.00	4308388.00	433.10	90.0	350.0	41.426	1.6	9.33E+01	0.00E+00	0.00E+00
IL226256	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip Anneal #3 (SA-3)	750439.00	4308328.00	433.83	100.0	350.0	62.745	3.3	9.83E+01	0.00E+00	0.00E+00
IL226257	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - #7 Strip Anneal (SA-7)	750222.00	4308335.00	433.20	99.0	850.0	38.671	3.5	1.18E+02	0.00E+00	0.00E+00
IL226352	DEFAULT	Olin Winchester, LLC - Hammermill 1 2 and 3 (HM-1 HM-2 and HM-3)	750495.00	4308287.00	434.42	21.0	160.1	19.647	1.8	8.03E+00	0.00E+00	0.00E+00
IL226612	DEFAULT	Solutia Inc. - Santoflex process: Thermal oxidizer 2770934	746325.00	4275822.00	405.12	112.0	865.0	16.794	12.6	1.50E+01	0.00E+00	0.00E+00
IL226783	DEFAULT	Schildknecht Funeral Home, Inc. - Crematory	769033.00	4275796.00	549.57	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL227030	DEFAULT	ConocoPhillips Co. - #4 Crude unit heater H-24 (STK9-5)	753051.00	4302413.00	423.83	179.9	550.0	26.207	8.5	2.27E+01	0.00E+00	0.00E+00
IL227032	DEFAULT	ConocoPhillips Co. - Hydrogen plant #1 flare (FLR12-2)	755194.00	4302793.00	443.67	130.0	1800.1	7.970	1.7	1.61E+01	0.00E+00	0.00E+00
IL227034	DEFAULT	ConocoPhillips Co. - Sulfur operation	754240.00	4303144.00	443.47	156.0	590.1	37.753	3.4	0.00E+00	3.00E+01	3.00E+01
IL227035	DEFAULT	ConocoPhillips Co. - Process heater HP-1 (STK12-6)	755194.00	4302793.00	443.67	127.0	360.3	27.093	7.5	6.97E+00	0.00E+00	0.00E+00
IL227038	DEFAULT	ConocoPhillips Co. - SZU Charge heater H-3	755219.00	4302667.00	442.29	150.0	567.1	25.518	5.0	5.75E+00	0.00E+00	0.00E+00
IL227333	DEFAULT	Waterloo City Light Plant - Engine SG5	750635.00	4249410.00	628.97	8.0	924.0	61.172	0.7	1.40E+00	0.00E+00	0.00E+00
IL227400	DEFAULT	Collinsville Wastewater Treatment Plant - Emergency diesel generator (2922 HP/2180 kW)	758289.00	4283982.00	419.36	36.0	692.0	67.371	2.0	1.72E+01	1.70E+00	0.00E+00
IL227432	DEFAULT	Totall Metal Recycling, Inc. - Safety certification unit	748030.00	4288120.00	422.74	6.0	587.0	8.069	1.2	1.60E-01	6.00E+00	0.00E+00
IL227590	DEFAULT	Illinois Electric Works - 3 Burn off ovens	747872.00	4288124.00	423.20	46.0	250.1	41.230	2.4	1.17E+00	6.90E-02	6.90E-02
IL227679	DEFAULT	Union Electric Co. - Diesel generator	745516.00	4283326.00	430.38	26.0	490.0	60.811	1.4	1.30E+00	1.60E-01	1.60E-01
IL228119	DEFAULT	St. Clair Crematory - Human crematory	773291.00	4275644.00	507.28	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL228260	DEFAULT	Center Ethanol Co. - West boiler	745888.00	4275662.00	412.66	75.0	428.1	63.460	3.0	3.23E+00	0.00E+00	0.00E+00
IL228262	DEFAULT	Center Ethanol Co. - East boiler	745888.00	4275662.00	412.66	75.0	428.1	45.428	3.0	3.23E+00	0.00E+00	0.00E+00
IL228263	DEFAULT	Center Ethanol Co. - RTO	745888.00	4275662.00	412.66	50.0	310.0	70.684	5.5	6.35E+00	0.00E+00	0.00E+00
IL228294	DEFAULT	ConocoPhillips Co. - Distilling west refinery flare (FLR10-1)	753647.00	4302546.00	430.31	197.0	1800.1	6.626	3.0	2.51E+01	0.00E+00	0.00E+00
IL228295	DEFAULT	ConocoPhillips Co. - SZU Regenerator vent	755209.00	4302720.00	442.32	44.0	135.1	32.343	2.0	1.78E+00	2.35E+00	2.35E+00
IL229921	DEFAULT	Christ Bros Products, LLC - 8 Heaters and boilers	754360.00	4283243.00	419.46	37.0	400.0	20.664	1.8	1.16E+00	2.80E+00	2.80E+00
IL229922	DEFAULT	Christ Bros Products, LLC - Silo filling	754360.00	4283243.00	419.46	25.0	74.0	0.262	0.4	5.10E-03	0.00E+00	0.00E+00
IL229923	DEFAULT	Christ Bros Products, LLC - Truck loading	754360.00	4283243.00	419.46	29.0	135.1	48.052	2.0	5.80E-03	0.00E+00	0.00E+00
IL230300	DEFAULT	Afton Chemical Corp. - Flare 36-0090	746478.00	4276293.00	407.26	45.0	1600.1	0.656	8.0	2.20E+00	0.00E+00	0.00E+00
IL230350	DEFAULT	Village of Freeburg - Engine #10	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL230355	DEFAULT	Asphalt Sales & Products Inc. - Truck loadout	757560.00	4289901.00	441.63	28.0	135.1	43.198	1.9	7.90E-03	0.00E+00	0.00E+00
IL231259	DEFAULT	Village of Freeburg - Engine #11	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231260	DEFAULT	Village of Freeburg - Engine #12	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231291	DEFAULT	Kurrus Funeral Home - 2 Crematories	759066.00	4271234.00	547.11	18.0	787.0	13.186	1.1	2.70E+00	0.00E+00	0.00E+00
IL232739	DEFAULT	ConocoPhillips Co. - Benzene extraction unit #3 (STK6-4)	754923.00	4302930.00	442.59	185.0	470.0	36.138	9.7	1.22E+01	0.00E+00	0.00E+00
IL232785	DEFAULT	Roxana Landfill, Inc. - Enclosed flare	759153.00	4301368.00	619.62	35.0	1600.1	20.008	12.0	2.31E+01	1.76E+00	1.76E+00
IL233294	DEFAULT	Gateway Terminals, LLC. - Marine vapor combustion unit (MVCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	1.68E+01	0.00E+00	0.00E+00
IL233295	DEFAULT	Gateway Terminals, LLC. - Truck/Rail vapor destruction unit (TRCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	8.39E+00	0.00E+00	0.00E+00
IL235261	DEFAULT	Gulfstream Aerospace Services Corp. - Make-up air unit 39-3	747629.00	4278560.00	410.10	42.0	577.0	29.356	2.5	1.63E+00	0.00E+00	0.00E+00
IL235939	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #5 (SA-5)	750151.00	4308373.00	430.91	90.0	450.1	54.087	1.4	1.07E+02	0.00E+00	0.00E+00
IL235946	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #6 (SA-6)	750207.00	4308390.00	431.82	110.0	580.0	62.779	1.3	1.07E+02	0.00E+00	0.00E+00
IL236260	DEFAULT	Bunge-SF Grain, LLC. - Grain Dryer	746158.00	4281045.00	437.55	96.0	105.0	87.904	8.2	5.06E+00	1.71E+01	1.71E+01
IL236359	DEFAULT	City of Belleville - 2 Emergency generators (1500 kW each)	763544.00	4265595.00	474.70	28.0	627.0	73.767	1.2	2.57E+01	1.84E+00	0.00E+00
IL236927	DEFAULT	Kraft Heinz Co. - Boiler C	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236928	DEFAULT	Kraft Heinz Co. - Boiler D	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236929	DEFAULT	Kraft Heinz Co. - Boiler E	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236930	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 1 of 2)	750920.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL237099	DEFAULT	Union Electric Co. - Turbine CT02B	745573.00	4283613.00	419.69	30.0	850.0	18.860	11.4	7.74E+01	2.73E+01	2.73E+01
IL237182	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	1.32E+01	0.00E+00	0.00E+00
IL237183	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	2.67E+01	0.00E+00	0.00E+00
IL237340	DEFAULT	Charles E. Mahoney - Asphalt silo filling	749517.00	4309892.00	443.14	25.0	74.0	0.262	0.4	5.30E-03	0.00E+00	0.00E+00
IL237341	DEFAULT	Charles E. Mahoney - Truck loadout	749517.00	4309892.00	443.14	27.0	136.0	42.050	1.9	6.00E-01	0.00E+00	0.00E+00
IL237362	DEFAULT	Charles E. Mahoney - Asphalt heaters and boilers	749517.00	4309892.00	443.14	30.0	350.0	69.995	1.0	1.18E+00	2.80E+00	2.80E+00
IL237659	DEFAULT	Green Plains Madison, LLC - Boiler #1	745256.00	4285477.00	414.14	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL237660	DEFAULT	Green Plains Madison, LLC - Fire Pump back-up Engine (460 HP)	745191.00	4285409.00	413.85	13.0	627.0	86.231	0.8	4.30E-01	9.40E-01	0.00E+00
IL237661	DEFAULT	Green Plains Madison, LLC - Electrical system backup Engine (1495 HP)	745144.00	4285537.00	415.88	28.0	627.0	73.767	1.2	3.54E+00	1.21E+01	0.00E+00

R004842

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL237679	DEFAULT	Green Plains Madison, LLC - Indirect dryer #1	745191.00	4285468.00	415.12	71.0	387.1	12.136	4.6	7.97E+00	4.10E-01	4.10E-01
IL237866	DEFAULT	Amsted Rail Co., Inc. - Curing oven	746913.00	4287625.00	419.23	39.0	258.0	27.978	1.9	2.52E-01	0.00E+00	0.00E+00
IL237899	DEFAULT	Center Ethanol Co. - Emergency generator	745888.00	4275662.00	412.66	28.0	627.0	73.767	1.2	3.30E+00	0.00E+00	0.00E+00
IL237903	DEFAULT	Center Ethanol Co. - Ethanol loadout Rack	745888.00	4275662.00	412.66	19.0	99.1	7.806	0.7	8.86E-01	0.00E+00	0.00E+00
IL238189	DEFAULT	Solutia Inc. - An in-situ soil vapor extraction system	746326.00	4275822.00	405.12	15.0	70.1	73.406	0.2	4.00E-01	0.00E+00	0.00E+00
IL238839	DEFAULT	Waterloo City Light Plant - Turbine Generator (GT2)	748326.00	4246769.00	640.45	39.0	965.9	87.937	4.8	1.78E+01	0.00E+00	0.00E+00
IL238942	DEFAULT	ConocoPhillips Co. - Rental Boiler #3	754240.00	4303144.00	443.47	20.0	550.0	46.412	4.0	1.65E+00	0.00E+00	0.00E+00
IL239395	DEFAULT	Amsted Rail Co., Inc. - Sand dryer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	1.24E+00	0.00E+00	0.00E+00
IL239396	DEFAULT	Amsted Rail Co., Inc. - Thermal sand reclaimer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	3.70E-01	0.00E+00	0.00E+00
IL239899	DEFAULT	Shell Oil Products US - RTO	753758.00	4303650.00	442.59	19.0	200.0	33.948	2.5	0.00E+00	8.47E-01	8.47E-01
IL240053	DEFAULT	Westwood Lands, Inc. - Process heater DFH-1	748864.00	4285684.00	412.99	39.0	284.1	23.157	2.0	8.30E-01	0.00E+00	0.00E+00
IL240359	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0210	746660.00	4276488.00	406.74	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL240360	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0310	746674.00	4276485.00	407.25	45.0	350.0	17.318	7.0	4.91E+00	0.00E+00	0.00E+00
IL241300	DEFAULT	ConocoPhillips Co. - VOC Flare (West - FLR4-1)	753428.00	4303073.00	428.81	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241301	DEFAULT	ConocoPhillips Co. - VOC Flare (East - FLR4-2)	753441.00	4303073.00	428.77	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241302	DEFAULT	ConocoPhillips Co. - Coker north flare (FLR1-3)	754947.00	4303684.00	444.23	139.0	911.0	26.535	5.4	0.00E+00	3.08E+01	3.08E+01
IL241303	DEFAULT	ConocoPhillips Co. - VF-5 Heater (H350H4 - STK1-1)	754937.00	4303459.00	444.98	150.0	650.0	26.765	12.0	0.00E+00	1.35E+01	1.35E+01
IL241304	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H2 - STK1-2)	754953.00	4303305.00	444.85	150.0	500.1	22.304	10.0	0.00E+00	7.37E+00	7.37E+00
IL241305	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H1 - STK1-3)	754986.00	4303306.00	444.82	150.0	500.1	22.304	10.0	0.00E+00	7.38E+00	7.38E+00
IL241312	DEFAULT	ConocoPhillips Co. - Heater HP-2 (STK7-1)	755263.00	4302920.00	443.86	118.0	400.0	45.002	10.8	0.00E+00	2.87E+01	2.87E+01
IL241405	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #1	756504.00	4295421.00	425.00	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL241449	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #2	756494.00	4295736.00	424.74	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL242126	DEFAULT	Center Point Terminals Co. - Tank Heater	746359.00	4289027.00	411.84	49.0	331.1	32.144	2.5	1.03E+00	0.00E+00	0.00E+00
IL245579	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #3	756198.00	4295409.00	424.97	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245580	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #4	756182.00	4295721.00	424.77	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245839	DEFAULT	Milam Recycling and Disposal Facility - Landfill gas conversion plant	750666.00	4282895.00	413.09	55.0	70.1	0.000	4.5	3.80E+00	9.00E-01	9.00E-01
IL246759	DEFAULT	Stookey Township WWTP - 2000 kW Emergency generator	756253.00	4268975.00	518.86	28.9	627.0	73.767	1.2	1.54E+01	0.00E+00	0.00E+00
IL246761	DEFAULT	Omega Partners Hartford, LLC - Truck Rail Marine racks loadout and VCUs	752232.00	4300866.00	430.74	33.0	69.5	0.328	0.3	6.60E+00	0.00E+00	0.00E+00
IL246762	DEFAULT	Omega Partners Hartford, LLC - Boiler 1 and 2	752273.00	4300698.00	430.18	58.0	436.0	27.650	3.4	3.83E+00	0.00E+00	0.00E+00
IL248060	DEFAULT	Kraft Heinz Co. - Boiler F	748105.00	4289580.00	423.56	26.0	380.0	34.407	2.0	1.44E+00	0.00E+00	0.00E+00
IL248262	DEFAULT	Olin Winchester, LLC - New Rotary retort process (RDR-2)	750495.00	4308287.00	434.42	16.0	119.9	26.634	1.7	9.62E+00	0.00E+00	0.00E+00
IL248799	DEFAULT	Gateway Terminals, LLC. - 600 HP Boiler	744607.00	4275093.00	422.70	26.0	440.0	39.557	2.2	2.11E+00	0.00E+00	0.00E+00
IL249480	DEFAULT	Highland Electric Light Plant - Engine IC-2	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.44E+01	0.00E+00	0.00E+00
IL249481	DEFAULT	Highland Electric Light Plant - Engine IC-3	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.25E+01	0.00E+00	0.00E+00
IL249482	DEFAULT	Highland Electric Light Plant - Engine IC-9	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249483	DEFAULT	Highland Electric Light Plant - Engine IC-10	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249499	DEFAULT	Roxana Landfill, Inc. - Zink ultra-Low emissions (Zule) Flare	759153.00	4301368.00	619.62	60.0	1800.1	46.838	13.0	1.25E+01	1.55E+01	1.55E+01
IL250343	DEFAULT	Mayco Mfg. LLC - Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.74E+00	0.00E+00	0.00E+00
IL250892	DEFAULT	ConocoPhillips Co. - Lift station pump (21628)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.90E-01	4.90E-01
IL250893	DEFAULT	ConocoPhillips Co. - Lift station pump (21629)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.30E+00	4.60E-01	4.60E-01
IL250894	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #1	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250895	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #2	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250896	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #3	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL250897	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #4	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250898	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #5	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250899	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #6	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL251099	DEFAULT	Amsted Rail Co., Inc. - Annealing Furnace 18	747071.00	4287670.00	426.02	39.0	284.1	23.157	2.0	1.12E+00	1.60E-01	1.00E-01
IL251286	DEFAULT	Premcor Refining Group, Inc. - Vapor Combustion Unit	752775.00	4302414.00	429.95	53.0	289.0	24.830	2.9	1.00E+01	0.00E+00	0.00E+00
IL251735	DEFAULT	ConocoPhillips Co. - Diesel engine (605 HP)	754240.00	4303144.00	443.47	15.0	69.5	0.328	0.3	3.50E+00	0.00E+00	0.00E+00
IL251754	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #1	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL253107	DEFAULT	Allnex USA, Inc. - Natural gas combustion	749698.00	4276478.00	418.37	58.0	436.0	27.650	3.4	3.26E+00	0.00E+00	0.00E+00
IL253166	DEFAULT	Cerro Flow Products, LLC. - Generators	746228.00	4275272.00	407.32	26.0	490.0	60.811	1.4	9.23E-01	1.82E-01	1.82E-01
IL253167	DEFAULT	City of Belleville - Emergency diesel generator (1500 kW)	762469.00	4266351.00	468.70	26.0	490.0	60.811	1.4	1.16E+01	0.00E+00	0.00E+00
IL253300	DEFAULT	Phillips 66 Pipeline, LLC - Engines (insignificant activities)	744935.00	4274152.00	407.25	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253361	DEFAULT	Amsted Rail Co., Inc. - Sand regeneration process (combustion)	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	3.80E-01	3.80E-01	2.80E-01

R004843

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL253367	DEFAULT	Green Plains Madison, LLC - Boiler #2	745258.00	4285486.00	414.27	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253368	DEFAULT	Green Plains Madison, LLC - Boiler #3	745260.00	4285491.00	414.24	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253369	DEFAULT	Green Plains Madison, LLC - Boiler #4	745262.00	4285500.00	414.21	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253370	DEFAULT	Green Plains Madison, LLC - Indirect dryer #2	745164.00	4285430.00	414.60	82.0	387.1	8.430	5.5	7.97E+00	4.10E-01	4.10E-01
IL253386	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Engines (insignificant activities)	750423.00	4308352.00	434.28	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253738	DEFAULT	Milam Recycling and Disposal Facility - 2000 scfm Utility Flare	750550.00	4282537.00	594.06	36.0	852.0	18.565	4.6	1.83E+01	7.32E+00	7.32E+00
IL253769	DEFAULT	Veolia ES Technical Solutions, LLC - 2 Emergency generators	745532.00	4275942.00	414.76	26.0	490.0	60.811	1.4	7.41E-01	0.00E+00	0.00E+00
IL254175	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #2	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254176	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #3	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254177	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #4	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254178	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #5	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254179	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #6	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254699	DEFAULT	HSHS St. Elizabeth's Hospital - 2 Emergency generators	767237.00	4275111.00	541.01	28.0	627.0	73.767	1.2	1.93E+01	0.00E+00	0.00E+00
IL255341	DEFAULT	Roxana Landfill, Inc. - New open flare	759353.00	4301368.00	619.62	45.0	1800.1	61.434	1.3	3.77E+01	8.17E+00	8.17E+00
IL255527	DEFAULT	Magnesium Elektron North America - Natural gas combustion	746452.00	4285724.00	415.49	39.0	284.1	23.157	2.0	4.20E-01	0.00E+00	0.00E+00
IL255741	DEFAULT	ConocoPhillips Co. - Utility Boiler #19 (BLR-19)	754755.00	4302798.00	442.16	132.0	364.1	46.281	7.0	0.00E+00	1.54E+01	1.54E+01
IL255816	DEFAULT	Mayco Mfg, LLC - Expansion: Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.94E+00	0.00E+00	0.00E+00
IL255953	DEFAULT	Moore Recycling Concrete & Asphalt, LLC. - Drum mix asphalt plant	762178.00	4246660.00	463.19	35.0	251.0	56.908	4.0	1.32E+01	0.00E+00	0.00E+00
IL256624	DEFAULT	PBT Acquisition, LLC - ASR Dryer	748704.00	4280830.00	418.77	32.0	305.0	19.483	1.5	2.53E+00	0.00E+00	0.00E+00
IL257535	DEFAULT	Marathon Ashland Pipe Line, LLC - Marine vapor combustion unit	751239.00	4302663.00	402.85	51.0	810.1	27.749	7.4	2.71E+01	0.00E+00	0.00E+00
SJEFF1	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	410.0	370.0	54.081	19.0		1.44E+02	1.44E+02
SJEFF2	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	325.0	210.0	59.173	6.6		2.04E-02	2.04E-02
SJEFF3	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	10.0	1100.0	23.333	0.5		3.32E-01	0.00E+00
SJEFF15	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	52.0	260.0	10.666	2.0		5.09E-03	5.09E-03
SJEFF16	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	2.29E-01
SJEFF17	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.40E-03	2.40E-03
SJEFF18	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	0.00E+00
SJEFF19	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.80E-03	1.80E-03
SJEFF20	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.20E-03	1.20E-03
SJEFF21	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		5.40E-04	5.40E-04
SJEFF22	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.80E-04	4.80E-04
SJEFF23	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.20E-04	4.20E-04
SJEFF24	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		3.00E-04	3.00E-04
SJEFF25	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	15.0	1049.0	349.734	0.2		4.80E-04	0.00E+00
SJEFF26	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	20.7		1.73E+03	1.73E+03
SJEFF27	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	29.0		2.50E+03	2.50E+03
SJEFF28	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	30.0	985.0	105.633	1.3		8.52E-06	0.00E+00
SJEFF29	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	240.0	600.0	32.999	7.0		3.54E-03	3.54E-03
SJEFF59	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF60	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF61	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	4.20E-02	3.00E-04	3.00E-04
SJEFF62	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.000	1.7	1.11E-02	7.98E-05	7.98E-05
SJEFF63	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	27.0	1800.0	10.046	1.5	2.86E-02	1.63E-01	1.63E-01
SJEFF65	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.45E-02	4.34E-04	4.34E-04
SJEFF66	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.40E-02	4.20E-04	4.20E-04
SJEFF67	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	8.35E-02	5.97E-04	5.97E-04
SJEFF68	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	3.54E-01	2.53E-03	2.53E-03
SJEFF69	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	-459.7	0.003	2.0	2.51E-01	1.79E-03	1.79E-03
SJEFF70	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF71	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF72	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	3.32E-01	1.02E-01	0.00E+00
SJEFF73	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF74	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF82	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	7.38E-02	3.77E+00	3.77E+00
SJEFF83	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	1.96E-01	6.37E+00	6.37E+00

R004844

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SJEFF86	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	20.0	0.0	0.000	0.5	1.29E-03	9.00E-04	9.00E-04
SJEFF92	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	10.0	1100.0	23.333	0.5		2.17E+00	0.00E+00
SJEFF99	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241715.78	485.56	2.5	370.0	46.499	2.0	5.60E-03	4.25E-02	4.25E-02
SJEFF100	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241715.78	485.56	2.5	370.0	46.499	2.0	1.60E-03	1.14E-03	1.14E-03
SJEFF125	DEFAULT	FRED WEBER, INC. ANTONIA	720102.78	4248877.71	670.57	20.0	250.0	49.249	5.0		5.88E-02	5.88E-02
SJEFF128	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.33E-01	2.33E-01
SJEFF129	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.92E-02	1.92E-02
SJEFF130	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		9.62E-03	9.62E-03
SJEFF131	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		3.50E-01	3.50E-01
SJEFF132	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.95E-01	2.95E-01
SJEFF133	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1347.0	16.316	1.0		1.54E-02	1.54E-02
SJEFF134	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		6.01E-03	6.01E-03
SJEFF135	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.44E-02	1.44E-02
SJEFF136	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1500.0	18.734	2.0		7.60E-02	7.60E-02
SJEFF137	DEFAULT	JEFFERSON COUNTY CREMATION SERVICES LC PEVELY	728536.07	4239554.88	583.23	10.0	1100.0	23.333	0.5		9.39E-02	9.39E-02
SJEFF138	DEFAULT	SIMPSON CONSTRUCTION MATERIALS PAULINA HILLS SITE	726459.50	4259186.04	426.64	12.0	925.0	42.441	0.5		1.29E-01	1.29E-01
SJEFF144	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	52.0	247.0	0.853	3.7	3.03E+00	1.21E+00	1.21E+00
SJEFF145	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	5.36E-02	3.07E-01	3.07E-01
SJEFF146	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	3.61E-03	9.62E-02	9.62E-02
SSTC1	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	138.7	46.759	23.6		2.32E+02	2.32E+02
SSTC2	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	138.6	46.844	23.6		2.89E+02	2.89E+02
SSTC3	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	217.0	325.0	50.000	4.5		5.90E-04	5.90E-04
SSTC4	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	25.0	1100.0	23.333	1.0		1.42E+00	0.00E+00
SSTC9	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	50.0	1000.0	0.351	2.3		2.23E-04	2.23E-04
SSTC10	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	50.0	1000.0	0.351	2.3		1.70E-03	1.70E-03
SSTC11	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	50.0	1000.0	0.351	2.3		2.23E-04	2.23E-04
SSTC12	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	50.0	1000.0	0.351	2.3		1.70E-03	1.70E-03
SSTC13	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	50.0	1000.0	0.351	2.3		2.23E-04	2.23E-04
SSTC14	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	50.0	1000.0	0.351	2.3		1.70E-03	1.70E-03
SSTC15	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	14.0	1068.0	40.515	0.4		3.53E-03	0.00E+00
SSTC16	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.06E+00	0.00E+00
SSTC17	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		7.06E+00	0.00E+00
SSTC18	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718498.57	4295433.59	515.16	14.0	1063.0	56.722	0.4		3.66E-03	2.38E-04
SSTC28	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC29	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		7.21E+02	7.21E+02
SSTC30	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC31	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	53.0	520.0	55.999	1.8		1.33E-01	1.33E-01
SSTC45	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.60	533.89	66.0	200.0	0.003	3.0		2.31E+00	2.31E+00
SSTC46	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.60	533.89	66.0	200.0	0.003	3.0		2.66E-02	2.66E-02
SSTC47	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.60	533.89	10.0	1100.0	23.333	0.5		1.52E+00	0.00E+00
SSTC48	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.60	533.89	66.0	200.0	0.003	3.0		1.50E-03	1.50E-03
SSTC57	DEFAULT	BLASTCO INC	690213.84	4297755.23	543.44	20.0	0.0	0.000	0.5		3.96E-04	3.96E-04
SSTC63	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	65.0	16.499	1.5		4.20E-03	4.20E-03
SSTC64	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	17.0	450.0	77.631	1.3		4.69E-03	4.69E-03
SSTC65	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	0.0	0.000	0.5		4.10E-03	4.10E-03
SSTC66	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		1.56E-03	1.56E-03
SSTC67	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		8.40E-04	8.40E-04
SSTC68	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	450.0	39.416	1.5		1.44E-03	1.44E-03
SSTC69	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	400.0	29.708	1.0		1.74E-03	1.74E-03
SSTC70	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	450.0	24.803	1.2		4.68E-03	4.68E-03
SSTC71	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	475.0	1.667	0.5		0.00E+00	0.00E+00
SSTC72	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	450.0	27.500	2.3		0.00E+00	0.00E+00
SSTC73	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	10.0	1100.0	23.333	0.5		3.97E+00	0.00E+00
SSTC87	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	30.0	0.0	0.000	0.5	2.10E-02	6.31E-04	6.31E-04
SSTC88	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	70.0	0.0	0.000	0.5	3.14E-02	1.73E-04	1.73E-04

R004845

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTC89	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	1.20E+00	3.65E-01	3.65E-01
SSTC98	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC99	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC100	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC101	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC102	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC103	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC104	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC105	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC106	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC107	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTL1	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.28E-02	2.28E-02
SSTL2	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.20E-02	2.20E-01
SSTL3	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	345.0	135.400	14.0		2.97E+02	2.97E+02
SSTL4	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	374.0	123.284	16.0		4.69E+02	4.69E+02
SSTL5	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	40.0	642.0	38.100	1.0		5.46E-03	5.46E-03
SSTL6	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL7	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.96E+00	1.96E+00
SSTL8	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL9	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		2.01E-02	2.01E-02
SSTL10	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL11	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.10E-02	1.10E-02
SSTL14	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	9.84E-01	1.42E+00	1.42E+00
SSTL15	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	1.06E-02	7.55E-05	7.55E-05
SSTL16	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	10.0	1100.0	23.333	0.5	5.03E+00	1.53E+00	0.00E+00
SSTL17	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	2.91E+00	4.19E+00	4.19E+00
SSTL18	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	9.59E-02	6.85E-04	6.85E-04
SSTL19	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.95E-05	2.95E-05
SSTL20	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.24E-02	2.24E-02
SSTL21	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		1.06E+00	0.00E+00
SSTL22	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		5.74E-04	0.00E+00
SSTL23	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.57E+01	2.57E+01
SSTL24	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		6.69E-03	6.69E-03
SSTL25	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.66E-02	2.66E-02
SSTL26	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	110.0	70.0	0.003	2.7		1.39E-02	1.39E-02
SSTL27	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.11E+01	1.11E+01
SSTL28	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.95E-02	1.95E-02
SSTL29	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		3.08E-05	3.08E-05
SSTL30	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		2.36E-02	2.36E-02
SSTL31	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.34E-01	0.00E+00
SSTL32	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-03	0.00E+00
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		3.77E+00	0.00E+00
SSTL37	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	0.00E+00	0.00E+00	0.00E+00
SSTL38	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	2.24E+00	1.60E-02	1.60E-02
SSTL39	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	0.00E+00	0.00E+00	0.00E+00
SSTL40	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	6.04E-01	4.31E-03	4.31E-03
SSTL41	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.39E+01	2.34E-03	0.00E+00
SSTL42	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	2.12E+01	5.78E-02	0.00E+00
SSTL43	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.59E+01	4.87E+00	0.00E+00
SSTL44	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.33E-02	2.37E+01	2.37E+01
SSTL45	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.02E-02	4.11E+01	4.11E+01
SSTL46	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	1.05E-01	1.48E+01	1.48E+01
SSTL47	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	2.86E-01	2.62E+01	2.62E+01
SSTL48	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7		2.04E-03	2.04E-03
SSTL66	DEFAULT	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	20.0	230.5	31.309	5.1		3.27E-01	3.27E-01

R004846

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL78	DEFAULT	FRED WEBER, INC. ANTIRE	711291.07	4264567.49	448.49	30.0	250.0	58.950	4.0		1.27E+00	1.27E+00
SSTL76	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	45.0	400.0	44.167	2.5	6.58E+00	8.24E+00	8.24E+00
SSTL77	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	45.0	400.0	44.167	2.5	1.38E+00	9.87E-03	9.87E-03
SSTL78	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	38.0	400.0	25.968	2.0	3.62E+00	4.47E+00	4.47E+00
SSTL79	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	38.0	400.0	25.968	2.0	1.06E+00	7.57E-03	7.57E-03
SSTL80	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	50.0	461.0	14.616	3.0	2.95E+00	4.36E+00	4.36E+00
SSTL81	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	50.0	461.0	14.616	3.0	7.02E-01	5.01E-03	5.01E-03
SSTL82	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	1.0	300.0	12.733	0.1	1.66E+00	1.19E-02	1.19E-02
SSTL83	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.31	545.54	15.0	955.0	19.800	0.7	2.52E+01	4.49E-02	0.00E+00
SSTL84	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	7.0	960.0	113.182	0.8	2.59E+01	7.63E+00	0.00E+00
SSTL85	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	30.0	965.0	31.234	5.0	2.03E-01	1.04E-02	1.04E-02
SSTL86	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	17.0	72.0	29.862	2.8		5.58E-03	5.58E-03
SSTL88	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	28.0	1400.0	25.466	1.0		1.01E+00	1.01E+00
SSTL89	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.3	1400.0	21.568	12.0		7.77E-01	7.77E-01
SSTL90	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.0	1400.0	21.568	12.0		6.35E-01	6.35E-01
SSTL92	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1700.0	61.381	1.1		1.96E-02	1.96E-02
SSTL93	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		6.98E-02	6.98E-02
SSTL94	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1250.0	50.226	1.3		1.70E+01	1.70E+01
SSTL95	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		5.43E+01	5.43E+01
SSTL96	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	35.0	1200.0	53.051	1.0		1.22E-01	1.22E-01
SSTL97	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.08E-03	1.08E-03
SSTL98	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.67E-03	1.67E-03
SSTL100	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		9.06E+00	9.06E+00
SSTL101	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		7.14E-03	7.14E-03
SSTL102	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	130.0	1009.0	53.156	1.0		2.56E+00	0.00E+00
SSTL106	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.832	3.0		6.63E-02	6.63E-02
SSTL107	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.15E-02	1.15E-02
SSTL108	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	12.0	900.0	38.100	1.2		8.33E+00	0.00E+00
SSTL109	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.37E-03	1.37E-03
SSTL111	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.53	508.83	45.0	425.0	1.667	2.0	3.02E+00	4.35E+00	4.35E+00
SSTL112	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.53	508.83	45.0	425.0	1.667	2.0	4.17E-01	2.99E-03	2.99E-03
SSTL113	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.53	508.83	45.0	425.0	1.667	2.0	4.40E-03	6.49E-03	6.49E-03
SSTL114	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.53	508.83	45.0	425.0	1.667	2.0	6.81E-01	4.86E-03	4.86E-03
SSTL115	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.53	508.83	10.0	1100.0	25.333	0.5	1.02E+02	3.11E+01	0.00E+00
SSTL116	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	1.45E-01	6.26E-03	6.26E-03
SSTL117	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	9.17E-01	6.55E-03	6.55E-03
SSTL118	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	15.0	-459.7	0.003	1.0	3.28E+01	3.00E-01	0.00E+00
SSTL120	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.35	4286068.83	618.60	15.0	65.0	7.165	2.2		5.20E-03	5.20E-03
SSTL121	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.35	4286068.83	618.60	16.0	75.0	28.963	1.1		8.96E-03	8.96E-03
SSTL122	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.35	4286068.83	618.60	29.0	600.0	14.167	2.5		6.83E-01	4.83E-01
SSTL123	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.35	4286068.83	618.60	30.0	365.0	12.001	1.2		4.48E-01	4.48E-01
SSTL124	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.35	4286068.83	618.60	29.0	360.0	25.499	0.7		1.63E-01	1.63E-01
SSTL126	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.35	4286068.83	618.60	20.0	0.0	0.000	0.5		1.23E-02	1.23E-02
SSTL127	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718699.54	4269850.38	422.90	30.0	650.0	31.995	1.3		3.60E-03	3.60E-03
SSTL128	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718699.54	4269850.38	422.90	30.0	650.0	31.995	1.3		1.79E+01	1.79E+01
SSTL129	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718699.54	4269850.38	422.90	26.0	650.0	33.264	2.0		2.26E-03	2.26E-03
SSTL130	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718699.54	4269850.38	422.90	26.0	650.0	33.264	2.0		1.44E+01	1.44E+01
SSTL131	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718699.54	4269850.38	422.90	54.0	1800.0	17.218	2.3		1.21E-03	1.21E-03
SSTL132	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718699.54	4269850.38	422.90	30.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL133	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718699.54	4269850.38	422.90	30.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL141	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	723489.70	4265428.04	633.14	75.0	495.0	4.668	2.5		3.40E+00	3.40E+00
SSTL142	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	723489.70	4265428.04	633.14	25.0	495.0	4.668	2.5		8.76E-04	8.76E-04
SSTL143	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	723489.70	4265428.04	633.14	30.0	450.0	0.803	1.5		5.59E-04	5.59E-04
SSTL148	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	723489.70	4265428.04	633.14	10.0	1100.0	23.333	0.5		4.66E-02	0.00E+00
SSTL147	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718833.79	4290583.38	444.32	75.0	550.0	1.181	0.7	9.19E-01	5.00E-01	5.00E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTL148	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	1.58E+00	5.47E-03	5.47E-03
SSTL149	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	4.42E-01	2.28E-01	2.28E-01
SSTL150	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	9.14E-02	4.81E-03	4.81E-03
SSTL151	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	16.0	77.0	4.774	2.0	2.46E+00	4.74E-01	4.74E-01
SSTL152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	42.0	300.0	38.494	4.2	2.49E+01	5.49E+00	5.49E+00
SSTL153	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	3.84E-03	1.20E-04	1.20E-04
SSTL154	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	4.60E-02	1.44E-03	1.44E-03
SSTL162	DEFAULT	MACLAN INDUSTRIES	742056.49	4291436.76	495.44	14.0	190.0	0.003	0.2		2.29E-01	2.29E-01
SSTL165	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	22.0	871.0	24.016	0.8		1.02E-01	1.02E-01
SSTL166	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	10.0	871.0	24.016	0.8		2.38E-01	2.38E-01
SSTL169	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	1.79E-01	1.28E-03	1.28E-03
SSTL170	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	25.0	-459.7	0.003	0.8	2.33E+01	3.69E-03	3.69E-03
SSTL171	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	18.0	-459.7	0.003	4.0	1.61E+00	6.69E-02	6.69E-02
SSTL172	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	35.0	-459.7	0.003	2.0	1.20E-02	8.60E-05	8.60E-05
SSTL173	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	16.0	-459.7	0.003	0.5	9.34E-01	2.85E-01	2.85E-01
SSTL174	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL175	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL196	DEFAULT	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	7.7	25.0	11.782	0.9	3.02E+00	1.28E-01	1.28E-01
SSTL199	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		1.59E-01	1.59E-01
SSTL200	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		7.25E-01	7.25E-01
SSTL209	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0		9.51E+00	9.51E+00
SSTL214	DEFAULT	THE HARPER COMPANY	731184.93	4292013.86	588.39	10.0	1100.0	23.333	0.5		2.75E-01	0.00E+00
SCITY1	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	330.0	21.217	10.0		2.38E-02	2.38E-02
SCITY2	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	100.0	350.0	47.149	3.0		5.80E-02	5.80E-02
SCITY3	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.67E+01	1.67E+01
SCITY4	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.78E-02	1.78E-02
SCITY5	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.53E+01	2.53E+01
SCITY6	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	125.0	350.0	18.468	10.0		2.15E-02	2.15E-02
SCITY7	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	135.0	950.0	19.367	3.5		1.75E+01	1.75E+01
SCITY8	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	20.0	50.0	70.000	3.0		1.69E+00	1.69E+00
SCITY9	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	1.33E+00	9.51E-03	9.51E-03
SCITY10	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	2.13E+00	1.52E-02	1.52E-02
SCITY11	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	2.53E+00	1.81E-02	1.81E-02
SCITY12	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	3.20E-01	2.29E-03	2.29E-03
SCITY13	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	12.0	200.0	0.335	1.0	3.77E+00	1.15E+00	0.00E+00
SCITY14	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.55E-02	1.07E-03	1.07E-03
SCITY15	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.07E-02	9.22E-04	9.22E-04
SCITY16	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	69.751	1.7	3.07E-02	9.22E-04	9.22E-04
SCITY17	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	16.0	77.0	24.600	0.2		1.41E-03	1.41E-03
SCITY18	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	3.0	800.0	0.335	0.5	1.63E-01	4.96E-02	0.00E+00
SCITY22	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	0.0	0.000	0.5	5.72E-03	1.72E-04	1.72E-04
SCITY23	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	6.00E-02	1.83E-02	0.00E+00
SCITY24	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	2.11E+00	6.44E-01	0.00E+00
SCITY25	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	8.32E-03	4.79E-03	0.00E+00
SCITY26	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	1.73E-02	5.29E-03	0.00E+00
SCITY27	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	42.0	77.0	3.734	0.2	4.35E-02	1.33E-02	0.00E+00
SCITY28	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	200.0	0.335	1.0	1.98E-01	6.04E-02	0.00E+00
SCITY29	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	3.0	800.0	0.335	0.5	1.07E-01	3.27E-02	0.00E+00
SCITY30	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.09E-04	3.32E-05	0.00E+00
SCITY31	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	22.0	212.0	1.296	1.0	5.28E-01	1.61E-01	0.00E+00
SCITY32	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	90.0	77.0	33.215	2.2	1.09E-04	3.32E-05	0.00E+00
SCITY33	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	3.69E-02	1.12E-02	0.00E+00
SCITY34	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.98E-01	6.04E-02	0.00E+00
SCITY48	DEFAULT	ASHLEY ENERGY LLC	745321.36	4280225.01	423.00	111.0	300.0	72.900	4.0		2.58E-01	2.58E-01
SCITY49	DEFAULT	ASHLEY ENERGY LLC	745321.36	4280225.01	423.00	111.0	300.0	72.900	4.0		2.42E-02	2.42E-02

R004848

Off-Site Point Source Modal Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY50	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.20E+00	1.20E+00
SCITY51	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.51E-01	1.51E-01
SCITY52	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY53	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		6.91E-02	6.91E-02
SCITY54	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY55	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		7.87E-03	7.87E-03
SCITY56	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	30.0	975.0	237.684	6.8		3.10E-02	0.00E+00
SCITY57	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.103	4.0		2.59E+01	2.59E+01
SCITY58	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.103	4.0		5.09E+00	5.09E+00
SCITY59	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.103	4.0		3.48E-02	3.48E-02
SCITY60	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	3.97E-01	3.97E-01
SCITY61	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	5.32E-01	5.32E-02
SCITY62	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY63	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	2.36E-02	2.36E-02
SCITY64	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	2.29E-02	2.29E-02
SCITY66	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	20.0	0.0	0.000	0.5	4.42E+01	1.33E+00	1.33E+00
SCITY67	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	4.19E+00	4.64E+00	4.64E+00
SCITY68	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	6.11E-01	5.15E-03	5.15E-03
SCITY69	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.04E+00	4.49E+00	4.49E+00
SCITY70	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	1.14E+00	8.17E-03	8.17E-03
SCITY71	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	2.98E-03	4.70E-07	0.00E+00
SCITY72	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	7.05E+00	2.15E+00	0.00E+00
SCITY83	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		1.14E-04	1.14E-04
SCITY84	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		4.07E-03	4.07E-03
SCITY85	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.40E-03	8.40E-03
SCITY86	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	90.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY87	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	90.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY88	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY89	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY90	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	10.0	1100.0	23.333	0.5		7.47E+00	0.00E+00
SCITY110	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	32.0	120.0	15.453	2.0		2.09E-02	2.09E-02
SCITY111	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	481.0	200.0	9.432	3.0		5.70E-03	5.70E-03
SCITY112	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	50.0	400.0	15.922	4.0		6.81E+01	6.81E+01
SCITY113	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	50.0	400.0	15.922	4.0		3.75E-02	3.75E-02
SCITY114	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	45.0	122.0	351.818	2.0		1.14E-02	1.14E-02
SCITY115	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	80.0	171.0	69.682	2.0		5.14E-03	5.14E-03
SCITY116	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	78.0	176.0	88.454	1.7		1.43E-03	1.43E-03
SCITY117	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	10.0	1100.0	23.333	0.5		1.91E-03	1.91E-03
SCITY121	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		9.43E+01	9.43E+01
SCITY122	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		5.31E-02	5.31E-02
SCITY123	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		6.41E+00	6.41E+00
SCITY124	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		7.35E-03	7.35E-03
SCITY125	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		1.86E-02	1.86E-02
SCITY126	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		5.89E-04	5.89E-04
SCITY127	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	30.0	140.0	0.125	2.0		1.44E-03	1.44E-03
SCITY128	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	15.4	752.2	32.451	1.0		7.85E-03	0.00E+00
SCITY129	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	34.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY132	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	34.0	1700.0	6.816	3.3		1.72E-02	1.72E-02
SCITY133	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	34.0	1700.0	36.601	2.0		3.72E-03	3.72E-03
SCITY136	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	34.0	1800.0	8.301	3.7		8.58E-03	8.58E-03
SCITY137	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	42.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY140	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY141	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740803.39	4271318.74	425.36	34.0	200.0	39.649	2.8		5.16E-03	5.16E-03

R004849

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY143	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY144	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY145	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY146	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY147	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	25.0	300.0	14.865	2.0		1.14E-02	1.14E-02
SCITY148	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	20.0	0.0	0.000	0.5		3.30E-03	3.30E-03
SCITY149	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	37.0	600.0	38.983	1.2		1.98E-03	1.98E-03
SCITY156	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY157	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.20E-02	1.20E-02
SCITY158	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY159	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	14.0	490.0	60.200	0.5		7.80E-01	0.00E+00
SCITY160	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	12.6	200.0	205.400	0.5		7.80E-01	0.00E+00
SCITY162	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	2.69E+00	1.16E-01	1.16E-01
SCITY163	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	6.20E+00	4.43E-02	4.43E-02
SCITY164	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.20E+00	9.30E-03	0.00E+00
SCITY165	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.18E+00	9.20E-03	0.00E+00
SCITY166	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.77E+00	8.30E-03	0.00E+00
SCITY167	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.12E+00	9.10E-03	0.00E+00
SCITY168	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.01E+00	1.23E+00	0.00E+00
SCITY169	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.15E+00	1.80E-02	0.00E+00
SCITY170	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.90E+00	1.08E-02	0.00E+00
SCITY171	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.52E+00	1.88E-02	0.00E+00
SCITY172	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	4.73E+00	2.04E-01	2.04E-01
SCITY173	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	1.09E+01	7.76E-02	7.76E-02
SCITY174	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	2.50E+00	1.08E-01	1.08E-01
SCITY175	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	6.01E+00	4.29E-02	4.29E-02
SCITY176	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	6.24E+00	1.38E-02	0.00E+00
SCITY177	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	5.17E+00	1.14E-02	0.00E+00
SCITY178	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	9.14E+00	2.02E-02	0.00E+00
SCITY179	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.31E+00	9.84E-01	0.00E+00
SCITY180	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.98E+00	8.40E-03	0.00E+00
SCITY181	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	3.53E-03	3.53E-03
SCITY183	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	2.41E-03	2.41E-03
SCITY185	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.24E-02	5.89E-04	5.89E-04
SCITY187	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.36E-01	1.69E-03	1.69E-03
SCITY189	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	1.37E+00	4.86E-01	0.00E+00
SCITY190	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.35E-02	2.31E-03	2.31E-03
SCITY191	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.00E-01	3.57E-03	3.57E-03
SCITY192	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.69E+01	6.78E-02	0.00E+00
SCITY193	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.48E+00	1.56E-02	0.00E+00
SCITY194	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.09E+01	4.41E-02	0.00E+00
SCITY227	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.32	4278652.89	459.06	20.0	250.0	18.068	1.0		2.54E-03	2.54E-03
SCITY228	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.32	4278652.89	459.06	20.0	150.0	22.218	1.0		1.20E+00	1.20E+00
SCITY229	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.32	4278652.89	459.06	25.0	0.0	0.000	1.0		2.19E-04	2.19E-04
SCITY242	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	250.0	71.667	1.7		2.39E-03	2.39E-03
SCITY243	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	400.0	19.833	1.5		4.37E-03	4.37E-03
SCITY244	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		1.37E-04	1.37E-04
SCITY245	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	55.0	750.0	11.168	4.2		8.16E-03	8.16E-03
SCITY246	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	43.0	500.0	7.467	2.5		7.33E-05	7.33E-05
SCITY247	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		3.46E-04	3.46E-04
SCITY248	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	36.0	375.0	1.716	2.0		2.48E-03	2.48E-03
SCITY266	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	24.0	1139.0	15.515	1.7		1.10E-02	1.10E-02
SCITY267	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	28.0	1800.0	35.584	2.0		6.76E-01	6.76E-01
SCITY275	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		2.33E+01	2.33E+01
SCITY276	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		4.99E-03	4.99E-03

R004850

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY277	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	70.5	800.0	0.003	0.5	7.11E-01	1.75E-05	0.00E+00
SCITY278	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	70.5	250.0	0.003	1.3	3.65E-01	1.28E-04	1.28E-04
SCITY279	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.3	6.87E-01	4.91E-03	4.91E-03
SCITY280	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.3	3.65E-02	1.28E-05	1.28E-05
SCITY281	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.3	6.89E-01	4.92E-03	4.92E-03
SCITY282	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	72.0	250.0	0.003	1.0	1.27E-01	5.27E-03	5.27E-03
SCITY283	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	1.0	2.73E-01	1.95E-03	1.95E-03
SCITY284	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.5	250.0	0.003	2.0	6.10E-01	2.56E-04	2.56E-04
SCITY285	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.5	250.0	0.003	2.0	1.38E+00	9.84E-03	9.84E-03
SCITY286	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	8.65E-01	1.53E-05	0.00E+00
SCITY287	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	70.5	800.0	0.003	1.5	7.79E+00	1.38E-04	0.00E+00
SCITY288	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	70.5	800.0	0.003	1.5	7.79E+00	1.38E-04	0.00E+00
SCITY289	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		2.26E-03	2.26E-03
SCITY290	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		2.91E+01	2.91E+01
SCITY291	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	78.0	400.0	50.535	2.0		1.63E-03	1.63E-03
SCITY292	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		1.28E+01	1.28E+01
SCITY293	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		3.47E+00	3.47E+00
SCITY295	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E-01	6.17E+01
SCITY296	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	220.0	350.0	14.856	5.0	1.81E+00	1.29E-02	1.29E-02
SCITY297	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	220.0	350.0	14.856	5.0	8.93E-01	2.57E+01	2.57E+01
SCITY298	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	270.0	350.0	14.856	5.0	6.02E+00	4.73E-02	4.73E-02
SCITY299	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	220.0	350.0	14.856	5.0	1.39E+00	5.45E+01	5.45E+01
SCITY300	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	220.0	350.0	14.856	5.0	7.02E+00	5.66E-02	5.66E-02
SCITY301	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY302	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	270.0	350.0	14.856	5.0	1.04E+00	7.40E-03	7.40E-03
SCITY303	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	80.0	1100.0	23.333	0.5	9.62E+00	5.13E+00	0.00E+00
SCITY304	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278680.20	527.85	80.0	1100.0	23.333	0.5	5.51E+00	6.09E+00	0.00E+00
SCITY315	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	80.0	1100.0	23.333	0.5	6.50E+00	1.98E-04	0.00E+00
SCITY316	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY317	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	80.0	1100.0	23.333	0.5	9.62E-01	3.00E-01	3.00E-01
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	6.00E-04	6.00E-04
SCITY320	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	1.26E-02	3.70E-04	3.70E-04
SCITY321	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	8.99E-01	3.68E-02	3.68E-02
SCITY322	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	4.60E-01	3.28E-03	3.28E-03
SCITY323	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	1.40E-02	2.08E-05	0.00E+00
SCITY324	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	7.00E-04	1.54E-06	0.00E+00
SCITY325	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	5.78E-03	1.23E-05	0.00E+00
SCITY326	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.71E-02	3.76E-03	3.76E-03
SCITY327	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.30E-01	5.93E-03	5.93E-03
SCITY328	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	7.46E-01	3.22E-02	3.22E-02
SCITY329	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	9.04E-01	6.46E-03	6.46E-03
SCITY330	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	1607.0	51.693	0.7	4.66E-01	1.03E-03	0.00E+00
SCITY331	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	1100.0	23.333	0.5	4.06E+00	1.24E+00	0.00E+00
SCITY332	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	1100.0	23.333	0.5	2.02E-01	1.44E-03	1.44E-03
SCITY333	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	5.0	1157.0	35.000	0.3	8.24E+00	2.52E+00	0.00E+00
SCITY334	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	5.0	1076.0	151.667	0.3	2.54E+00	7.81E-01	0.00E+00
SCITY335	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	8.9	815.0	37.835	0.8	6.13E-01	1.35E-03	0.00E+00
SCITY344	DEFAULT	PAULO PRODUCTS COMPANY	736699.70	4278776.67	501.12	32.0	200.0	2.933	1.2		5.04E-03	5.04E-03
SCITY353	DEFAULT	CHRISTY REFRACTORIES CO L.L.C.	738223.37	4278219.85	483.66	1.0	325.0	0.000	1.0		9.60E-02	9.60E-02
SCITY355	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	431.0	79.216	2.0		9.54E-01	9.54E-01
SCITY356	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	455.0	79.216	2.0		9.54E-01	9.54E-01
SCITY357	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	428.0	79.216	2.0		9.54E-01	9.54E-01
SCITY358	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY359	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01

R004851

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY360	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY361	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		1.09E-03	1.09E-03
SCITY362	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		4.92E-03	4.92E-03
SCITY363	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY364	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY365	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		1.19E+00	1.19E+00
SCITY366	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		5.13E+00	5.13E+00
SCITY367	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY368	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY380	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	25.0	450.0	20.000	2.5		2.46E-03	2.46E-03
SCITY381	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	12.0	150.0	8.333	1.0		1.63E-01	1.63E-01
SCITY394	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5		2.06E+00	0.00E+00
SCITY395	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		9.53E-03	9.53E-03
SCITY396	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	30.0	0.0	0.000	0.5		1.71E-03	1.71E-03
SCITY401	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		9.30E-05	9.30E-05
SCITY402	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		4.97E-03	4.97E-03
SCITY403	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		5.07E-05	5.07E-05
SCITY404	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		2.48E-03	2.48E-03
SCITY405	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	10.0	1100.0	23.333	0.5		1.83E-02	0.00E+00
SCITY406	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.55E+00	2.55E+00
SCITY407	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.87E-02	2.87E-02
CJEFF34	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	36.6	77.0	20.600	1.8	2.68E-02		
CJEFF35	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	350.0	40.000	2.0	2.90E-01		
CJEFF36	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	2.07E-01		
CJEFF37	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	20.0	0.0	0.000	0.5	9.13E-03		
CJEFF43	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	56.0	370.0	33.333	2.5	1.01E-01		
CJEFF44	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	8.06E-01		
CJEFF45	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	312.999	2.5	9.97E-02		
CJEFF46	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	20.600	2.5	2.58E-01		
CSTLC55	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.68E-02		
CSTLC56	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.27E+00		
CSTLC57	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	1.66E-02		
CSTLC58	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	3.85E-01		
CSTLC59	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	20.0	250.0	2.083	1.0	7.72E-02		
CSTLC60	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	3.28E+00		
CSTLC61	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	1.29E-01		
CSTLC62	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	9.99E-05		
CSTLC63	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	19.6	425.0	7.047	1.7	6.01E-01		
CSTLC64	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	24.0	170.0	105.951	2.0	3.24E+00		
CSTLC152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	43.0	-459.7	3.225	1.0	1.38E-01		
CSTLC155	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	37.0	230.0	51.250	4.2	2.57E+01		
CSTLC156	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	12.0	355.0	0.804	1.3	4.03E-01		
CSTLC157	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	31.0	230.0	80.499	4.2	3.93E+01		
CSTLC158	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	20.0	300.0	16.667	1.1	2.29E-01		
CSTLC207	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0	1.61E+02		
CCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	100.0	350.0	29.984	1.3	3.08E-02		
CCITY203	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0	3.56E-01		
CCITY204	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0	3.68E+02		
CCITY344	DEFAULT	GP RECYCLING, LLC	743830.86	4284034.28	422.18	20.0	0.0	0.000	0.5	1.72E-02		
CCITY368	DEFAULT	GP RECYCLING, LLC	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5	6.73E+00		
CCITY369	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	1.33E+00		
CCITY370	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	5.69E-02		

R004852

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF64	MERCY HOSPITAL JEFFERSON	728185.03	4230846.83	425.75	16.4	3.8	15.3	1.28E-02	9.13E-05	9.13E-05
SJEFF84	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	4.68E-03	4.68E-03
SJEFF85	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	7.06E-03	7.06E-03
SJEFF87	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	16.4	3.8	15.3	2.29E-01	1.44E-03	1.44E-03
SJEFF88	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	3.91E-03	3.91E-03
SJEFF89	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.47E-03	1.47E-03
SJEFF90	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		2.29E-01	2.29E-01
SJEFF91	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		6.88E-03	6.88E-03
SJEFF93	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.38E-03	1.38E-03
SJEFF101	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	4.81E-01	2.40E-02	2.40E-02
SJEFF102	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	6.41E-01	1.42E-02	1.42E-02
SJEFF103	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	5.24E-01	6.09E-03	6.09E-03
SJEFF104	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	1.51E-01	3.75E-03	3.75E-03
SJEFF105	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		3.08E-03	3.08E-03
SJEFF106	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.14E-03	1.14E-03
SJEFF107	AERO METAL FINISHING	718099.61	4263747.23	613.55	8.2	2.3	7.6		2.43E-01	2.43E-01
SJEFF126	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	8.2	2.3	7.6		3.08E+00	3.08E+00
SSTC56	BLASTCO INC	690213.84	4297755.23	943.44	8.2	2.3	7.6		1.47E-01	1.47E-01
SSTL67	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		5.88E-04	5.88E-04
SSTL68	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		1.02E+00	1.02E+00
SSTL125	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	8.2	2.3	7.6		7.18E-03	7.18E-03
SSTL197	FRED WEBER, INC. FT. BELLE	733499.97	4302900.13	443.27	8.2	2.3	7.6		1.80E-01	1.80E-01
SCITY19	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	8.24E-02	2.47E-02	2.47E-02
SCITY20	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	4.44E-03	7.73E-01	7.73E-01
SCITY23	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	2.59E+00	7.94E-01	7.94E-01
SCITY44	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		6.22E-04	6.22E-04
SCITY45	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		2.76E-02	2.76E-02
SCITY118	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		7.50E-05	7.50E-05
SCITY119	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		4.00E-01	4.00E-01
SCITY120	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		2.61E-01	2.61E-01
SCITY130	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY131	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY134	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY135	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY138	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY139	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY182	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY184	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	6.59E-02	4.71E-04	4.71E-04
SCITY186	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY188	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	4.95E-02	3.53E-04	3.53E-04
SCITY195	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	8.2	2.3	7.6	8.40E-02	6.00E-04	6.00E-04
SCITY241	PQ CORPORATION -THE	739053.43	4285317.19	495.80	8.2	2.3	7.6		2.66E-02	2.66E-02
SCITY340	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		3.60E-04	3.60E-04
SCITY341	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.13E-03	1.13E-03
SCITY342	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-03	1.20E-03
SCITY343	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-02	1.20E-02
CJEFF33	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.49E-01		
CJEFF38	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.71E-03		
CJEFF39	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.22E-03		

R004853

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr)		
								CO	SOx	SO2 (1-hour)
CJEFF40	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.01E-01		
CJEFF41	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.10E-03		
CJEFF42	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.18E-04		
CJEFF47	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.55E-02		
CJEFF48	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.56E-06		
CJEFF49	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.09E-04		
CJEFF50	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.48E-04		
CJEFF51	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	5.28E-02		
CJEFF52	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.46E-03		
CJEFF53	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.53E-01		
CJEFF54	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.56E-02		
CJEFF55	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.16E-01		
CJEFF56	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.45E-03		
CJEFF57	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.42E-01		
CJEFF58	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.74E-03		
CJEFF59	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.92E-01		
CJEFF60	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.36E-02		
CSTLC92	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	8.2	2.3	7.6	2.25E-01		
CSTLC151	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	13.5	1.4	0.7	1.58E-01		
CSTLC195	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	13.5	1.4	0.7	5.97E-01		
CCITY343	GP RECYCLING, LLC	743830.86	4284034.28	422.18	8.2	2.3	7.6	5.57E-02		

ATTACHMENT B
MODEL SUMMARY OUTPUT

R004855

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	1357.328	746400	4286400	128.82	132.25		0	19020109	STL_LCN15	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	1084.348	750800	4288100	127.44	127.44		0	16121910	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	1036.463	745200	4287400	129.9	134.11		0	18112209	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	997.1573	746700	4287100	126.89	126.89		0	20010610	STL_LCN2C	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	982.0781	748434.9	4287033	127.16	127.16		0	17051502	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	691.6775	748481.6	4286378	126.67	126.67		0	19041908	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	669.3078	748481.6	4286378	126.67	126.67		0	18111224	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	651.0973	750472	4287091	125.7	125.7		0	17090816	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	645.9934	748434.9	4287033	127.16	127.16		0	16110108	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	618.4866	748434.9	4287033	127.16	127.16		0	20041108	STL_LCN2C	13	1	14098

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1357.3	2,000	68%
CO	8-HR	ALL	1ST	691.7	500	138%

10-5-22 US Steel CO NAAQS Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag		Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City NAAQS_2016_CO.SUM	CO	8-HR	ALL	2ND	1856.677	748434.9	4287033	127.16	127.16		0	16032208	STL_LCN16	584	1	205
AERMOD 22112	Granite City NAAQS_2017_CO.SUM	CO	8-HR	ALL	2ND	1941.224	748434.9	4287033	127.16	127.16		0	17121624	STL_LCN17	584	1	205
AERMOD 22112	Granite City NAAQS_2018_CO.SUM	CO	8-HR	ALL	2ND	1726.885	748470.1	4287000	126.94	126.94		0	18092424	STL_LCN18	584	1	205
AERMOD 22112	Granite City NAAQS_2019_CO.SUM	CO	8-HR	ALL	2ND	2045.17	748434.9	4287033	127.16	127.16		0	19130908	STL_LCN19	584	1	205
AERMOD 22112	Granite City NAAQS_2020_CO.SUM	CO	8-HR	ALL	2ND	1966.717	748434.9	4287033	127.16	127.16		0	20092408	STL_LCN2C	584	1	205

10-5-22 US Steel CO NAAQS Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	% Standard
CO	8-HR	ALL	2ND	2045.2	1646	3691.2	10,000	37%

Background data from East St. Louis monitor (AQS No. 85-510-079), high second high value from 2016-2018.

REFERENCES

1. Guidelines on Air Quality Models, (Revised). Appendix W of 40 CFR Part 51, 82 FR 5182, January 17, 2017.

2 . Prevention of Significant Deterioration, The Art and Science of PSD Air Quality Analysis, The Modeling Perspective, Illinois Environmental Protection Agency, Modeling Unit, February 27, 2014..

3. AERSCREEN User's Guide. EPA-454/B-15-005, July 2015.

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. *Sierra Club v. EPA*, No. 10-1413, 2013 WL 216018 (Jan. 22, 2013).

6. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

7. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

Kras, Kim

From: Patel, Minesh
Sent: Tuesday, October 11, 2022 4:28 PM
To: Schnepp, Jason
Subject: FW: Updated Construction Permit Revision Application for USS Granite City Works
Attachments: GCW expansion - Updated Application (2).pdf

Fyi. I have also posted this in new application folder.

From: Colin Campbell <campbell@rtpenv.com>
Sent: Thursday, October 6, 2022 3:45 PM
To: Patel, Minesh <Minesh.Patel@Illinois.gov>
Cc: Gurinder (Gary) Saini <saini@rtpenv.com>; Christopher Hardin - U.S. Steel (CWHardin@uss.com) <cwhardin@uss.com>
Subject: [External] Updated Construction Permit Revision Application for USS Granite City Works

Minesh,

An updated copy of the application for revision of PSD/construction permit no. 95010001 for USS Granite City Works was shipped to your attention, via FedEx, for delivery tomorrow (Oct. 7, 2022). The package includes the final application and appendices; we will get in touch with Sarah Ray and will transmit the dispersion modeling files electronically.

Attached is the electronic version of the revised application package.

Please let me know if you have any questions.

Thank you
Colin Campbell

Pritchett, Jacob A.

From: Patel, Minesh
Sent: Tuesday, October 11, 2022 9:24 AM
To: Carter, Sally
Cc: Romaine, Chris
Subject: FW: Updated Construction Permit Revision Application for USS Granite City Works
Attachments: GCW expansion - Updated Application (2).pdf

Fyi.

From: Colin Campbell <campbell@rtpenv.com>
Sent: Thursday, October 6, 2022 3:45 PM
To: Patel, Minesh <Minesh.Patel@Illinois.gov>
Cc: Gurinder (Gary) Saini <saini@rtpenv.com>; Christopher Hardin - U.S. Steel (CWHardin@uss.com) <cwhardin@uss.com>
Subject: [External] Updated Construction Permit Revision Application for USS Granite City Works

Minesh,

An updated copy of the application for revision of PSD/construction permit no. 95010001 for USS Granite City Works was shipped to your attention, via FedEx, for delivery tomorrow (Oct. 7, 2022). The package includes the final application and appendices; we will get in touch with Sarah Ray and will transmit the dispersion modeling files electronically.

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Colin Campbell

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Granite City Works
United States Steel
20th & State Street
Granite City, IL 62040
(618) 451-3456

October 3, 2022

Bill Marr
Manager, Permit Section
Bureau of Air
Illinois Environmental Protection Agency
1021 North Grand Avenue
PO Box 19276
Springfield, IL 62794

RE: United States Steel Corporation - Granite City Works
Facility I.D. No. 119813AAI
Construction Permit No. 95010001

Dear Mr. Marr:

In March of 2020, United States Steel Corporation - Granite City Works ("U. S. Steel") submitted an application to revise Construction Permit No. 95010001. U. S. Steel and Illinois EPA have been in discussions regarding this application. U. S. Steel has updated the permit application to reflect those discussions. Due to the nature of revisions throughout the application, the Illinois EPA should refer to this application revision for permit processing.

U. S. Steel appreciates Illinois EPA's attention to this matter. If you should have any questions about this, please contact Chris Hardin at cwhardin@uss.com, or (412) 433-5904.

Sincerely,

Michael Patton
General Manager
Granite City Works

Application for Revisions to the Construction Permit / Prevention of Significant Deterioration (PSD) Approval for The 1996 Expansion of the Granite City Works Permit Number 95010001

U. S. Steel

Submitted to:

Division of Air Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, Illinois 62794

Prepared by:

RTP Environmental Associates, Inc.
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Submitted by:

U. S. Steel Corporation
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20th and State Streets
Granite City, Illinois 62040

February 2020
Revised October 2022

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APPENDICES

Appendix A	Application Forms (Copies of Previously Submitted Versions)
Appendix B	Emissions Calculations (Including Calculations from the 1995 Application)
Appendix C	Air Quality Modeling Report
Appendix D1	Copy of the Current Construction Permit No. 95010001 Issued in 2012
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1. Introduction

United States Steel Corporation Granite City ("USS Granite City") owns and operates an integrated iron and steel manufacturing facility in Granite City, Madison County, Illinois ("Granite City Works," ID # 119813AAI). The prior owner of this facility was National Steel Corporation. U.S. Steel acquired the assets of the National Steel Granite City facility on May 20, 2003. On January 25, 1996, prior to U.S. Steel acquiring these assets of National Steel Corporation, the Illinois Environmental Protection Agency ("Illinois EPA") issued Construction Permit No. 95010001, which also serves as a Prevention of Significant Deterioration ("PSD") approval, to National Steel Corporation. Construction Permit No. 95010001 authorized increases in the allowable production rate of iron and steel at the Granite City facility (the "1996 Project" or "Project"). This permit has been revised several times. The most recent revision was made on December 17, 2012, when the permit was revised to accommodate a proposed improvement to the air pollution control systems serving the Basic Oxygen Furnace ("BOF") Shop Operations at the facility, *i.e.*, the addition of a fabric filter baghouse and associated capture system to improve control of particulate matter emissions from charging and tapping the BOFs.[1]

Requirements of Construction Permit No. 95010001 are also incorporated in the Clean Air Act Permit Program ("CAAPP") (Permit Number 96030056 or "CAAPP Permit") for the facility that was issued on March 4, 2013. USS Granite City timely appealed some of the terms of the CAAPP Permit.[2]

This application requests several revisions to Construction Permit No. 95010001 to address correction of emission data for several emissions units involved in the 1996 Project. Most significantly, this application requests that the Illinois EPA revise certain permit conditions relating to emissions of carbon monoxide ("CO") and arising under the PSD permitting regulations at 35 Illinois Administrative Code ("IAC") Part 204.[3] The application includes updated control technology analyses and impact analyses in support of those requested revisions.

In 1996, at the time of Construction Permit No. 95010001 was initially issued, the Granite City area was designated nonattainment for ozone and particulate matter with aerodynamic diameter of 10 micrometer or less ("PM_{10}") national ambient air quality standards ("NAAQS"). The area was designated attainment or unclassifiable for all other regulated New Source Review ("NSR") pollutants. The permit included limitations on emissions sufficient to ensure that the Project did not trigger applicability of the Illinois Nonattainment New Source Review ("NNSR") program codified at 35 IAC Part 203 for oxides of nitrogen ("NOx") and volatile organic matter ("VOM") (both as precursors for ozone) and PM_{10} and did not trigger PSD permitting requirements for

---

[1] The improvements to the BOF Shop were authorized under Construction Permit No. 11050006, issued by Illinois EPA on August 31, 2011.

[2] CAAPP Permit Appeal IPCB No. 2013-053, pending before the Illinois Pollution Control Board ("Board").

[3] The 1996 Construction Permit is a PSD permit with respect to increases in emissions of two pollutants – CO and sulfur dioxide ("SO_2"). The PSD permit was issued pursuant to the federal PSD regulation at 40 CFR § 52.21, which Illinois EPA was then implementing under a delegation of authority from U.S. EPA. The federal PSD rule is no longer applicable, as the Illinois PSD regulation was approved by U.S. EPA in 2021 as a part of the Illinois State Implementation Plan ("SIP"), and the authority to administer and enforce federal PSD permits was fully transferred to Illinois EPA. See, 86 Fed. Reg. 50459 at 50464 (Sept. 9, 2021). This permit application does not request any changes relating to the PSD approval for SO_2 emissions from the Project.

particulate matter ("PM"), nitrogen dioxide ("NO_2"), or lead. Certain emission limits in Construction Permit No. 95010001 that were considered by Illinois EPA in making NNSR and PSD non-applicability determinations for the 1996 Project are the subject of revisions requested by USS Granite City in this application. The revisions requested by USS Granite City in this application are designed to ensure the continued non-applicability of the NNSR program for ozone precursors and PM_{10}, and the continued non-applicability of the PSD program for emissions of PM and NO_2, to the Project.[4] The application includes revised Project emission increase calculations, updated net emissions increase analyses, and discussion of compliance requirements in support of those non-applicability determinations.

The requested changes will resolve the issues raised in the CAAPP permit appeal filed by USS Granite City.

USS Granite City also requests that Illinois EPA process the revisions to Construction Permit No. 95010001 in accordance with the integrated processing procedures and issue the revised permit utilizing procedures and compliance requirements that are substantially equivalent to those utilized for issuance of a CAAPP permit, including a public notice period for the revised permit. See 35 IAC 270.302(e). USS Granite City understands that the CAAPP permit would be modified by means of the administrative amendment process to address the revisions that have been made to the applicable requirements in Construction Permit No. 95010001.[5]

No physical changes are proposed in conjunction with the requested revisions to Construction Permit No. 95010001.

1.1 Description of Facility

The Granite City Works is an integrated steel mill employing raw material handling, processing, and preparation; iron production; steel production; steel finishing; and boilers and other ancillary operations. In 1996, at the time of the Project, National Steel Corporation, owner of the Granite City Works produced metallurgical coke in a by-product coke plant. The by-product coke plant was among the assets acquired by USS Granite City in 2003 and continued to operate until 2015 at which time it was permanently idled. Coke is now obtained from the heat recovery coke batteries located adjacent to the steel mill, which are owned and operated by Gateway Energy and Coke Company, and from other sources.

1.2 Application Organization

This application contains the following analyses and supporting information for requested updates and revisions of Construction Permit No. 95010001.

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[4] Madison County is currently designated attainment for all criteria pollutants except ozone. For the 2015 ozone standard, the County is designated marginal nonattainment. Alton Township in Madison County is designated nonattainment for SO_2. However, USS Granite City is outside the Alton Township.

[5] A similar process was followed for the issuance of Construction Permit No. 11050006, for the emission reduction project serving the BOF Shop Operations, in 2011.

- Section 2 presents an overview of the requested permit revisions.
- Section 31 presents a discussion of permit conditions used to restrict potential to emit ("PTE") and the consideration of such conditions in determining applicability of the PSD and NNSR programs.
- Section 4 presents a discussion of proposed changes pertaining to carbon monoxide (CO) emissions. The demonstrations and analyses required under the PSD regulations in conjunction with these proposed changes are addressed in Sections 8, 9, and 10.
- Section 5 provides details of requested changes to permit terms for PM and PM_{10} emissions and updated emissions increase analyses.
- Section 6 addresses requested changes to permit terms for NOx emissions and updated emissions increase analysis.
- Section 7 addresses requested changes to permit terms relating to the VOM emissions and updated emissions increase analysis.
- Section 8 contains a best available control technology (BACT) demonstration for CO for the emissions units for which BACT is required.
- Section 9 summarizes the source impacts analyses, including air dispersion modeling, for CO.
- Section 10 provides analyses of additional impacts, including impacts of the Project's CO emissions on soils, vegetation, and visibility.
- Section 11 summarizes pertinent regulatory applicability and changes thereto.

2. Overview of Requested Permit Revisions

2.1 Background on Construction Permit No. 95010001

National Steel Corporation submitted an application on January 3, 1995 for a construction permit for a proposed increase in production at the Granite City Works ("1995 Application"). Illinois EPA issued Construction Permit and PSD Approval No. 95010001 on January 25, 1996. The permit authorized National Steel Corporation to increase throughput and fuel use at the Granite City Works as follows:

(a) The limits on production of hot metal (*i.e.*, iron) from the two blast furnaces were increased to 9,849 net tons per day, calendar month average, and 3,165,000 net tons per calendar year. [Permit Conditions 2(a) and (b).]

(b) The limits on production of liquid steel from the two BOFs were increased to 11,000 net tons per day, calendar month average, and 3,580,000 net tons per calendar year. [Permit Conditions 6(a) and (b).]

(c) The limits on use of blast furnace gas ("BFG") at the units in which BFG was burned (*i.e.*, boilers #1 through #12, blast furnace stoves, BFG flare #1, and ladle drying preheaters) were increased to 30,800 million cubic feet (MMcf) per calendar month and 185,030 MMcf per calendar year. [Permit Condition 21(b).]

(d) Construction Permit No. 95010001 also includes limits on use of natural gas at the project-affected units in which natural gas could be burned (*i.e.*, boilers #1 through #12, blast furnace stoves, BFG flare #1, and ladle drying preheaters.[6,7] The limits in the original Construction Permit No. 95010001 issued in 1996 were 190 MMcf per calendar month and 1,145 MMcf per calendar year. [Permit Condition 21(a).] These limits did not represent increases, as the same limits had previously been in effect in Construction Permit No. 95090167. As most recently revised in 2012, the natural gas consumption limits in Construction Permit No. 95010001 are 225 MMcf per calendar month and 1,346 MMcf per calendar year. [Permit Condition 21(a).]

These increases in permitted production and fuel usage resulted in increases in emissions from the various project-affected emissions units. The net emissions increase analysis for the Project as summarized in Construction Permit No. 95010001 are presented in Table 2-1 below.

For PM, PM_{10}, NOx, and VOM, the net emissions increases, including contemporaneous changes, were below the applicable significant emission rates for these pollutants. For lead, the

---

[6] Construction Permit No. 95010001 also includes limits on use of fuel oil in the units in which fuel oil could be burned. Fuel oil is no longer burned at Granite City Works. With this application, USS Granite City is requesting that Construction Permit No. 95010001 be revised to remove all permit conditions relating to the use of fuel oil in the project-affected combustion units.

[7] Construction Permit No. 95010001 did not address the use of coke oven gas or the emissions resulting from burning that gas as fuel in boilers #1 through #12 and in the blast furnace stoves. (Coke oven gas is a by-product fuel produced in by-product coke oven batteries.)

project emissions increase was below the significant emission rate. Finally, for SO_2 and CO, the project resulted in net emissions increases that were greater than the significant emission rates. As the 1996 Project was a major modification for SO_2 and CO, the PSD review requirements for these pollutants were addressed by National Steel Corporation in the 1995 Application and by Illinois EPA in Construction Permit No. 95010001.

Table 2-1. Summary of Net Emissions Increase Analysis for the Project

	Emissions (tons/year)						
	PM	PM_{10}	NO_x	SO_2	CO	VOM	Lead
Project Emissions Increases	-52.0	51.6	238.8	476.0	5,685.0	59.3	0.54
Contemporaneous Decreases	-58.0	-58.0	-226.5	-0.38	-23.31	-32.8	n/a
Contemporaneous Increases	20.3	20.7	26.0	0.25	11.8	1.6	n/a
Net Emissions Increases	**-89.2**	**14.3**	**38.3**	**475.9**	**5,673**	**28.1**	**0.54**
Significant Emission Rate	25.0	15.0	40.0	40.0	100.0	40.0	0.6

2.2 General Description of Requested Permit Revisions

This application proposes five categories of changes as described in Sections 2.2.1 through 2.2.5 below. USS Granite City is requesting neither authorization for changes to emissions units nor increases in the limits on hot metal production rate and liquid steel production rate. This permit application also does not request any changes to the SO_2 and lead emission limits established in Construction Permit No. 95010001, so SO_2 and lead emissions will not be discussed further.

2.2.1 Requested Changes Relating to CO Emissions

The Project was a major modification for CO and was subject to PSD review for this regulated NSR pollutant. USS Granite City is requesting revisions to Construction Permit No. 95010001 associated with the PSD review and approval. These changes are briefly summarized below and are discussed in detail in Section 4 of this permit application.

The primary changes requested by USS Granite City relating to CO emissions are (1) requested increases in the permitted emissions from burning of BFG and natural gas and (2) provisions to address CO emissions from the blast furnace casthouse. The emission limits established in Construction Permit No. 95010001 were based upon information in the 1995 Application submitted by National Steel Corporation, which in turn was based on published emission factors and other literature information. However, actual emissions testing data generated since the original PSD application was submitted and updated literature information indicate that corrections to the emission factors and corresponding limits are necessary and appropriate. Because these revisions are not necessitated by or associated with any changes to emissions units subsequent to the Project, these changes would be revisions to the original PSD permit based upon better emissions information; accordingly, updates to the substantive PSD reviews presented in the 1995 Application are provided in Sections 8, 9 and 10 herein. In addition, revisions are requested with respect to certain other permit terms to clarify compliance demonstration requirements and to improve operational flexibility .

2.2.2 Cleanup of Labeling & Organization of Individual Units (Independent of Emissions)

USS Granite City is requesting changes to the names of certain emissions units and control devices in Construction Permit No. 95010001 to reflect more accurately their functions within the process. In addition, USS Granite City is requesting changes to the groupings of emissions units. The requested organizational changes with respect to material handling operations are generally consistent with the approach that Illinois EPA used when issuing the CAAPP permit for the facility, to address material handling operations separately from the iron- and steelmaking operations and continuous casting operations as discussed in Section 5.3 of this permit application. Other organizational changes are requested in order to ensure the BOF Shop Operations grouping is consistent with federal emission standards for those operations as discussed in Section 11.1.2 herein.

2.2.3 Requested Changes Relating to PM, PM_{10}, NO_X, and VOM Emissions from Project-Affected Emissions Units

Construction Permit No. 95010001 includes a number of emission limitations and other permit conditions that are not explicitly required by any regulation. These emission limitations and permit conditions were included in the permit in order to restrict the PTE of certain operations at the Granite City Works and thereby memorialize non-applicability determinations under the PSD and NNSR permitting programs with respect to net emissions increases of PM, PM_{10}, NO_X, and VOM resulting from the Project. USS Granite City is requesting that certain permit conditions addressing individual emissions units or points, including both limits on annual emissions and provisions addressing emission factors, be removed or revised.

In this regard, the annual emission limitations for the various processes and activities at the Granite City facility listed in Table 5 of Construction Permit No. 95010001, referred to herein as "emissions caps," can address the PTE and serve to limit the net emissions increases of PM, PM_{10}, NO_X, and VOM to less than the corresponding significant emission rates under the PSD and NNSR permitting programs. The support for these revisions is provided in Section 1 of this permit application. USS Granite City anticipates that these revisions will enable settlement of the permit appeals currently before the Board because they involve provisions of the permit addressing emission factors.

For PM and PM_{10}, USS Granite City is requesting minor revisions to the emissions caps both to accommodate the revised grouping of material handling operations as discussed in Section 2.2.2 above and to reflect updated emissions information. The specific requested changes to permit terms relating to PM and PM_{10} emissions, accompanied by demonstrations that the net emissions increase for these pollutants remain below the corresponding significant emission rates, are discussed in Section 5 herein.

For NO_X and VOM, USS Granite City is requesting increases in permitted emissions from the BOF Shop Operations based upon updated emissions information and not related to any post-1996 changes at the source. The specific requested changes to permit terms relating to NO_X and VOM emissions, respectively, accompanied by demonstrations that the net emissions increase for these pollutants remain below the corresponding significant emission rates, are discussed in Sections 6 and 7 herein.

USS Granite City is also requesting revision/elimination of gaseous fuel usage limits for project-affected combustion units. In 2015, USS Granite City shut down its by-product coke oven batteries. This eliminated the ability to use coke oven gas ("COG") as a fuel at the mill. In addition, ten of the twelve boilers that existed at the mill at the time of the Project in 1996 have been retired. These actions have greatly reduced the emissions from fuel combustion in project-affected emissions units and obviate the need to preserve limits to restrict PTE of the remaining units.

2.2.4 New Net Emissions Increase Calculations Pursuant to "Source Obligation" Provisions of PSD and NNSR Rules

The emissions caps for PM, PM_{10}, NO_X, and VOM in Construction Permit No. 95010001 and certain other permit terms, and the resultant restrictions on PTE, appear to have been deemed by Illinois EPA to be necessary to prevent the Project from being a major modification.[8] Because the requested revisions to Construction Permit No. 95010001 include increases in certain emissions caps and other changes to permit terms that could allow increases in emissions of these four pollutants, the following "source obligation" provisions of the PSD and NNSR regulations are pertinent to this permit application:

> At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in, or expiration of, any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of this Part shall apply as though construction had not yet commenced on the source or modification. 35 IAC 203.210(b).

> At such time that a particular source or modification becomes a major stationary source or major modification solely by virtue of a relaxation in any enforceable limitation, established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of Sections 204.810, 204.820, 204.830, 204.840, 204.850, 204.1100, 204.1110, 204.1120, 204.1130, 204.1140, 204.1200, and 204.1400 shall apply to the source or modification as though construction had not yet commenced on the source or modification. 35 IAC 204.850.

In Sections 5 through 7 of this permit application and in Appendix B of this permit application, USS Granite City presents updated net emissions increase calculations for PM, PM_{10}, NO_X, and VOM. Unlike the calculations in the 1995 Application submitted by National Steel Corporation, these calculations address all emissions from fuel burning units affected by the Project, including emissions from the burning of COG. (See Sections 5.2.2.15, 6.2.2.1, and 7.2.2.1.) These updated calculations demonstrate that the changes to permit terms requested by USS Granite City will not

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[8] USS Granite City does not agree with this interpretation. The definitions of "major modification" and related provisions in the PSD and NNSR rules in effect in 1996 were based on increases in actual emissions, except in the narrow circumstances where the emissions unit at issue had not begun normal operations at the time of the project. *See, e.g.*, 56 *Fed. Reg.* 27630 (June 14, 1991). Nonetheless, for purposes of this permit application, USS Granite City has demonstrated that the Project, as it would be addressed by the revised construction permit that is requested herein, is not a major modification even under use of what Illinois EPA and U.S. EPA refer to as the "actual-to-potential" test.

trigger after-the-fact PSD or NNSR permitting for emissions of PM, PM_{10}, NOx, or VOM under the "source obligation" provisions because the Project will not become a major modification for these pollutants by virtue of those changes to permit terms.

2.2.5 Requested Removal of Requirements for Roads at the Former South Plant at the Granite City Works

Construction Permit No. 95010001 includes requirements for control of fugitive dust emissions from roads at Granite City Works. These requirements extend to certain road segments at the site of what was formerly the South Plant of Granite City Works during the period when the mill was owned and operated by National Steel Corporation. Specifically, Permit Condition 26a requires periodic application of chemical dust suppressant to road segments B and C and Permit Condition 27a requires periodic sweeping and flushing of road segment A.[9] Because the South Plant property, including these road segments, is not under the control of USS Granite City, or any person under common control with USS Granite City, pollutant-emitting activities at these properties are not a part of the Granite City Works stationary source.[10] Accordingly, requirements relating to these road segments should not be included in the revised construction permit issued to USS Granite City. USS Granite City requests that Attachment B of the construction permit be revised to omit the diagram for the South Plant and that Permit Conditions 26a and 27b be revised so that they no longer address road segments A, B, and C.

[9] Attachment B of the permit shows that these road segments are at the site of what was formerly the South Plant.
[10] The South Plant property, which comprises three parcels, was not among the assets acquired by U.S. Steel in 2003 or at any time thereafter. Based on information from the Madison County Chief Assessment Office (https://gis.co.madison.il.us/madco/viewer/index.html, last accessed June 24, 2022), the parcels at issue are currently owned by Cara Metals Illinois LLC and R W T Holdings LLC.

3. Discussion of Permit Conditions Used to Restrict PTE

As noted in Section 2.2 above, USS Granite City is proposing to retain, with no changes, the currently effective limits on hot metal production rate and liquid steel production rate in Construction Permit No. 95010001. As discussed in greater detail in Sections 5 through 7 of this permit application, USS Granite City also is proposing that the revised construction permit continue to include annual emissions caps, with certain revisions to reflect updated emissions information, and that the Illinois EPA include appropriate testing, operational monitoring, and recordkeeping requirements in the revised permit to ensure that the emission caps would be legally and practicable enforceable. Collectively, under the following provisions in the pertinent definitions in the PSD and NNSR rules, these proposed limitations and permit terms will restrict the PTE of the affected emissions units:

> Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design only if the limitation or the effect it would have on emissions is federally enforceable. 35 IAC 203.128.
>
> Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable or legally and practicably enforceable by a state or local air pollution control agency. 35 IAC 204.560.

Under the provisions above, what is required for restricting PTE is that the limits be enforceable as a practical matter.[1] Practical enforceability is a matter of technical judgment of the permitting authority – Illinois EPA – but there is a substantial body of policy and precedent regarding preferred forms for emissions caps that are enforceable as a practical matter. These policies can be summarized as follows:

- If not used to restrict emissions over a period shorter than one year, emissions caps should be expressed in terms of tons per year on a 12-month rolling sum basis or on a more frequent basis.
- If the emissions cap will cover multiple activities or emissions units, the permit should require at least monthly emissions calculation and recordkeeping.

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[1] *See, e.g.*, Administrative Order, *In the Matter of Orange Recycling and Ethanol Production Facility, Pencor-Masada Oxynol, LLC*, Petition No.: II-2000-07, C.T. Whitman, U.S. EPA Administrator, May 2, 2001, upholding use of annual emission caps with a rolling cumulative total methodology and rejecting petitioners' "concern that the permit appears to rely on after-the-fact monitoring, rather than engineering practices, test data, or vendor guarantees" to establish restrictions on PTE. U.S. EPA based its findings on the fact that "[i]f the source has no room to operate under the PTE limiting emissions cap, it must cease operation or face a violation" and that "all PTE limits rely on after the fact monitoring of some kind."

- The permit should prescribe methods of calculating actual emissions for each unit and each pollutant and should prescribe how monitoring and recordkeeping of relevant parameters will be used in those calculations.
- Where the permit prescribes an emission factor to be used in conjunction with operational data in demonstrating compliance, the permitting authority should describe the basis for its determination that the emission factor is representative.
- Where the permit requires development and use of a site-specific emission factor to be used in conjunction with operational data in demonstrating compliance, the permit should prescribe the method by which the emission factor will be developed, such as through performance testing with a specified frequency.

Two recent and significant examples of these policies are U.S. EPA's final agency actions in issuing the permits for construction of a drilling operation in the Beaufort Sea off the North Coast of Alaska in March 2012 and installation of new stationary reciprocating internal combustion engines at an existing power plant in Arizona in December 2018.[12,13] The Alaska permit, issued by U.S. EPA Region 10, includes annual emissions caps for NO_X and CO, with compliance determined on a 365-day rolling sum basis, and annual emissions caps for SO_2 and greenhouse gases, with compliance determined on a 12-month rolling sum basis. The Arizona permit, issued by the Pima County Department of Environmental Quality pursuant to a delegation of authority from U.S. EPA, includes an annual NO_X emissions cap with compliance determined on a 12-month rolling sum basis. Copies of the Alaska and Arizona documents referred here are provided in Appendix E.

Each of these permits includes some emissions units for which the emission factor used to quantify that unit's contribution to the emissions cap over a particular time period is directly prescribed in the permit and also some emissions units for which the permit prescribes the method by which the emission factor will be developed. In each instance where the emission factor is directly prescribed in the permit, this approach was used because the permitting authority determined the emission factor to be sufficiently representative of actual emissions, provided that required monitoring of operating parameters shows the process and control device to be operating within ranges or conditions established during the permitting process. (For example, in the Alaska permit, the NO_X and CO emission factors for periods when the control devices are operating assume control efficiencies of 90 percent and 80 percent, respectively; in the Arizona permit, the NO_X emission factor for engine startup events, during which the air pollution control equipment does not operate, is based on the estimate provided by the engine manufacturer.) In each instance where emission factors are developed through site-specific testing subsequent to permit issuance, the permit carefully prescribes the testing conditions that will be followed, the frequency of that testing, and the calculations to be used to derive the emission factor.

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[12] *In re: Shell Offshore, Inc., OCS Permit No. R10 OCS030000*, OCS Appeal Nos. 11-05, 11-06 & 11-07. Mar. 30, 2012. Docket available on the U.S. EPA internet web site at https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/f24b9734e6894b9385257958006dad34!OpenDocument (last accessed May 9, 2022).

[13] *In re: Tucson Electric Power, PSD Permit No. 1052*, PSD Appeal No. 18-02. Dec. 3, 2018. Docket available on the U.S. EPA internet web site at https://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/64a784010e968b9b852583050073ebe5!OpenDocument (last accessed May 9, 2022).

The approach proposed by USS Granite City with respect to the PM, PM_{10}, NO_X, and VOM emissions caps to be used in any revised Construction Permit No. 95010001, including the proposed revisions to certain emissions limitations, compliance demonstration requirements, and other permit conditions as discussed in detail in Sections 5 through 7 of this permit application, is consistent with this policy and precedent and will improve the enforceability of the PTE limitations in Construction Permit No. 95010001. In particular, USS Granite City emphasizes that removal or revision of certain permit conditions addressing individual emissions units or points, including both limits on annual emissions and provisions addressing emission factors, will not result in impairment of the enforceability of the PTE limitations.

4. Changes to Provisions for CO Emissions

This section of the permit application describes the changes to Construction Permit No. 95010001 requested by USS Granite City pertaining to CO emissions from fuel burning emissions units and from the blast furnace casthouse. These requested changes are not based upon any post-1996 Project changes but are based on updated information regarding CO emissions.

Construction Permit No. 95010001 also set a CO emissions limitation for the BOF electrostatic precipitator ("ESP") Stack. No changes are being proposed to this CO emission limitation in Table 2 of the permit.

The Project was permitted in 1996 as a major modification for CO and was subjected to PSD review by Illinois EPA; with the proposed changes, the project continues to be subject to PSD review with respect to CO emissions.

4.1 Process Background and Project

4.1.1 Blast Furnace Casthouse

The blast furnaces produce molten iron from iron ore pellets through a reduction reaction with metallurgical coke. In this reaction, carbon monoxide (CO) is formed along with hydrogen and other gases as a byproduct. The tapping of the blast furnaces, which takes place within a structure known as the casthouse, results in emissions of CO. These emissions are a consequence of the relatively small amount of BFG that leaves the furnaces with the molten metal and slag during the tapping process.

The Project involved increases in the production rate for the blast furnaces as outlined in subsection 2.1. The Project is also presumed by USS Granite City to have resulted in increases in CO emissions from the casthouse.

4.1.2 Fuel Combustion

Most of the gas that is formed in the blast furnace rises to the top of the furnace. At the top of the blast furnace, the BFG generated in the furnace is collected and routed to a BFG pretreatment system. BFG has a relatively low heating value (80-110 Btu/scf) and is preferentially used as fuel in the stoves that heat the blast air for the blast furnace. Each blast furnace at the Granite City Works has a set of three stoves. BFG is also used as a fuel in the boilers used to produce steam for use at the Granite City Works, including steam to power the turboblowers that supply blast air to the blast furnaces. Any excess BFG is flared.

The configuration of the Granite City Works in 1996, at the time of the Project, as it relates to fuel combustion in the Project-affected units differed considerably from the current configuration. In 1996, the mill had twelve boilers, all of which used BFG as fuel. Only two of these boilers – Boiler 11 and Boiler 12 – remain in existence. One flare, now known as BFG

flare #1, was used for flaring of excess BFG.[14] In 1996, the boilers used BFG, COG, natural gas, and fuel oil; currently, Boiler 11 and Boiler 12 use only BFG and natural gas. In 1996, the stoves used COG as supplemental fuel; currently, they use natural gas as supplemental fuel.

The 1996 Project involved increases in BFG generation and usage as outlined in subsection 2.1. The CO net emissions increase from the 1996 Project was significant and the project was subject to PSD review for CO emissions. The BACT-affected fuel burning emissions units identified and addressed in the 1995 Application were the blast furnace stoves, the ladle drying preheaters, and miscellaneous ancillary natural gas burning units in the BOF shop and at the continuous casters. In the 1995 Application, on page 1-3, National Steel Corporation stated that the boilers were not undergoing any changes as part of the project. Pursuant to 40 CFR § 52.21(j)(3) and 35 IAC 204.1100(c), because these emissions units were not changed as part of the project, they are not subject to BACT requirements.

4.2 Provisions of the Construction Permit Relating to CO Emissions from Fuel Combustion

Table 4 of Construction Permit No. 95010001 contains CO emission factors and emission limitations for the fuel burning emissions units affected by the Project. Table 4-1 below presents information from Table 4 of the permit pertaining to the CO emissions limitations from 'certain fuel burning emissions units,' *i.e.*, Boilers #1 through #12, Blast Furnace Flare 1, Blast Furnace Stoves, ladle drying preheaters, and continuous casters.[15] Copies of the original and current versions of the construction permit are provided in Appendices D1 and D2 of this permit application.

Table 4-1. Table 4 of Construction Permit – CO Emissions

Fuel Used for Boilers, Stoves, Flare, Ladle Drying Preheaters, and Ancillary Natural Gas Burning Units[16]	CO Emission Factor	Maximum CO Emissions (tons/year)	
		Original (1996) Permit	Current (2012) Permit
Natural Gas	40 lb/MMcf	22.90	26.92
Blast Furnace Gas	13.7 lb/MMcf	1,267.46	1,267.46
Fuel Oil[17]	5.0 lb/10^3 gal	0.91	0.91

[14] Granite City Works currently includes a second BFG flare, known as BFG flare #2, and a cogeneration boiler used to produce electricity and process steam. Construction of the boiler and flare was authorized under Construction Permit No. 06070023 issued in January 2008.

[15] The Construction Permit omits the ancillary fuel burning units at the continuous caster under Table 4. However, emissions from fuel combustion at these units are appropriately accounted for in the natural gas combustion rates.

[16] As discussed in Section 2.2.3 of this permit application, although the boilers and stoves burned COG, Construction Permit No. 95010001 did not include any terms relating to combustion of this byproduct fuel. As it pertains to CO emissions, this omission is now moot because the shutdown of the by-product coke oven batteries in 2015 eliminated the ability to use COG as a fuel. The current and future CO emissions from burning of COG in Project-affected combustion units are zero and are not addressed further in this permit application.

[17] As indicated in footnote 6, fuel oil is no longer used as fuel at Granite City Works.

4.3 Updated CO Emissions Information for Fuel Combustion

For natural gas combustion, the CO emission factor included in Construction Permit No. 95010001 was from Chapter 1.4 AP-42 as updated in August 1982. The U.S. EPA revised Chapter 1.4 of AP-42 in July 1998 and updated the CO emission factor for natural gas combustion to 84 lb per million cubic feet. For natural gas combustion in Boiler 11, Boiler 12, blast furnace stoves, ladle drying preheaters, and ancillary fuel burning units at the continuous casters, the updated CO emission factor has been used to calculate the CO emission rates in this permit application, including in the dispersion modeling analysis provided in Appendix C of this permit application.[18]

As previously explained, BFG is combusted as fuel in the boilers and blast furnace stoves at the site and excess BFG is flared. The CO emission factor for BFG burning in the 1995 Application and in Construction Permit No. 95010001 was from the U.S. EPA's AIRS 1990 database (WebFIRE). However, based on recent performance tests for boilers burning BFG, engineering evaluations of BFG burning in blast furnace stoves, and updates to AP-42 Section 13.5, this factor is not representative. Updated CO emission factors for BFG burning in the blast furnace stoves, Boiler 11, Boiler 12, and BFG flares are being proposed for purposes of this revision to the CO emission rates. The proposed CO emission rates are as follows:

- Based on the information regarding CO emission rates from another blast furnace stove, and engineering evaluations of BFG burning in the blast furnace stoves at Granite City Works, the CO emission factor for burning of BFG in the blast furnace stoves is 322 pounds per million cubic feet.[19]
- Based on CO stack testing performed at Boiler 11 and Boiler 12, the emission factor for burning of blast furnace gas in these boilers is 32.2 pounds per million cubic feet.[20]
- The CO emission factor for BFG flaring is calculated using a CO concentration of 24 percent in BFG and a destruction efficiency of 96 percent.[21, 22] This results in a CO emission factor of 698 pounds per million cubic feet.

Table 4-2 presents the updated maximum annual CO emissions from burning of fuel in the blast furnace stoves, Boiler 11, Boiler 12, Blast Furnace Flare 1, ladle drying preheaters, and ancillary

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[18] Boilers #1 through #10, which were Project-affected emissions units, have been permanently shut down. The current and future CO emissions from these boilers are zero and are not addressed further in this permit application.
[19] CO emission factor for AK Steel Dearborn / Severstal Dearborn Michigan permit for C Blast Furnace Stoves in the PTI 182-05C was specified as 328.9 lb/MMcf of BFG. See https://www.deq.state.mi.us/aps/downloads/permits/finpticon/2005/182-05C.pdf (accessed on August 17, 2022). In addition, USS Granite City evaluated CO emissions from the blast furnace stove stacks using non-reference method to compare against data from other furnaces. The Granite City Works blast furnace stoves stack configuration did not allow for application of a reference method for measuring CO emissions. Therefore, as part of an engineering evaluation, USS used a non-reference method to collect CO concentration in the stove stack exhaust.
[20] Boiler 11 tests were conducted in July 2011. Boiler 12 tests were conducted in May 2011.
[21] Data from the quarterly BFG component analyses for 2019 for USS Granite City shows CO concentration in BFG ranging from 20% to 22%.
[22] U.S. EPA's *Compilation of Air Pollutant Emission Factors, AP-42, Volume 1: Stationary Point and Area Sources*, Section 13.5, April 2015 ("Properly operated flares achieve at least 98 percent destruction efficiency in the flare plume").

fuel burning units at the continuous casters. Emissions calculations for CO from fuel combustion are provided in Appendix B of this permit application.

Table 4-2. Updated CO Emissions from Burning of Gaseous Fuels

Unit/Fuel	Future Throughput		Emission Factor		Emissions (TPY)
BFG in stoves	68,755	MMcf/year	321.83	lb/MMcf	11,064
BFG in boilers	76,327	MMcf/year	32.19	lb/MMcf	1,228
Natural gas in boilers	1,640	MMcf/year	84.0	lb/MMcf	69
BFG in BFG flare	39,947	MMcf/year	697.6	lb/MMcf	13,934
Natural gas in ladle preheaters	340	MMcf/year	84.0	lb/MMcf	14

4.4 Updated CO Emissions Information for Blast Furnace Casthouse

National Steel Corporation did not identify the blast furnace casthouse as a source of CO emissions in the 1995 Application, and Illinois EPA did not address those emissions in Construction Permit No. 95010001. Subsequent testing at Granite City Works and other integrated iron and steel mills indicates there are CO emissions from blast furnace casthouse operations. CO emissions measured during testing performed at the casthouse baghouse and the iron spout baghouse at Granite City Works in 2012 were 0.10 lb per ton of hot metal and 0.01 lb per ton of hot metal, respectively. As discussed in Section 8.2.3.7 of this permit application, USS Granite City is proposing a CO BACT emission limit of 70 lb/hr based on total emissions from these two baghouses. Assuming 95% capture efficiency for the capture system associated with the casthouse baghouse, as discussed in Section 5.2.2.3 of this permit application, the fugitive CO emissions from the casthouse roof monitor are 3.1 lb/hr. Total CO emissions from the blast furnace casthouse, including both baghouses and fugitive emissions, are 73.1 lb/hr and 320 tons per year ("TPY").

4.5 CO PSD Review Requirements

As previously explained, the 1996 Project was subject to PSD review for CO because the CO net emissions increase was greater than the significant emission rate of 100 tons per year. Sections 8 through 10 of this permit application address the requested changes to Construction Permit No. 95010001 relating to CO emissions under the PSD review requirements of 35 IAC 204.1100 through 204.1140, as applicable for the blast furnace casthouse and certain fuel burning emissions units.

5. Proposed Changes to Permit Terms for PM and PM_{10} Emissions Increases Analyses

This section describes the proposed changes to Construction Permit No. 95010001 requested by USS Granite City related to PM and PM_{10} emissions. It also provides a demonstration that, even with the requested revisions, the Project would still not be a major modification under the PSD program at 35 IAC Part 204 with respect to emissions of PM and under the NNSR program at 35 IAC Part 203 with respect to emissions of PM_{10}. The net emissions increase calculations for PM and PM_{10} from the 1995 Application submitted by National Steel Corporation are reproduced in Appendix B of this permit application.

5.1 Construction Permit No. 95010001 Applicability and Requirements

Table 5-1 summarizes the provisions from Construction Permit No. 95010001 pertaining to PM and PM_{10} emissions limitations from the project-affected emissions units. Copies of the relevant permits are provided in Appendices D1 and D2 of this application.

Table 5-1. Construction Permit Conditions Addressing PM and PM_{10}

Permit Condition	Requirements
5	Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.
18	Emissions from the BOF Shop operations shall not exceed the limits in attached Tables 2 and 5.
20	Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5
22	Emissions from the listed fuel combustion units shall not exceed the limits in Tables 4 and 5.

The annual PM and PM_{10} emissions caps listed in Table 5 of Construction Permit No. 95010001 are presented in Table 5-2 below. These annual PM and PM_{10} emissions caps cover all emissions units affected by the Project. These emissions units are grouped into four main processes or activities (as listed in Table 5-1). Each emissions cap is calculated as the sum of the unit-specific emissions limitations in Tables 1 through 3 and fuel specific limitations in Table 4 of the permit. Table 5 also includes limitations for PM and PM10 emissions from roadways and material handling activities at the facility.

Table 5-2. PM and PM_{10} Emissions Information from Table 5 of Construction Permit No. 95010001

Processes and Activities	Emissions Caps (tons/year)	
	PM	PM_{10}
Blast Furnace Operations	218	194
BOF Shop Operations	510	451
Continuous Casting Operations	71	71
Certain Fuel Combustion Units	273	273
Roadways	27	27
Material Handling	2	2
Total	1,101	1,018

The PM and PM_{10} emissions caps restricted the PTE of the project affected-emissions units. The project emissions increases for PM and PM_{10} were calculated by subtracting pre-project actual emissions (August 1992 to July 1994, 24-month period) from the PTE as restricted by the limitations in the permit. Table 6 of Construction Permit No. 95010001 summarized the net emissions increases from the project and summarized Illinois EPA's determination that the project was not a major modification with respect to PM or PM_{10} emissions. Because the net emissions increases for PM and PM_{10} were below the applicable significant emission rates, these pollutants were not subject to PSD or NNSR review.

5.2 Pre-Project Actual Emissions for 1996 Project

This section presents the pre-project actual emissions and USS Granite City's updates/revisions to some of the PM and PM_{10} emission factors and emission estimates. Corrections to the emissions factors are the result of updated information available regarding some of the operations affected by the project as discussed in Section 5.2.2 below.

5.2.1 Historical Throughput Rates

The PM and PM_{10} net emissions increase calculations presented in Table 6 of Construction Permit No. 95010001 were based on the calculations provided by National Steel Corporation in Tables 3-4, 3-5, and 3-7 of the 1995 Application. Those tables from the prior permit application are reproduced in Appendix B to this permit application.

The pre-project annual emissions were recalculated in this permit application using the same production and operating rates as the 1995 Application as shown in Table 5-3 below.

Table 5-3. Pre-Project Production and Operating Rates for PM and PM_{10}

Parameters	Units	1995 Application
Blast Furnace Production	Net tons of hot metal/year	2,059,557
Blast Furnace Charging	Charge Material tons/year	2,803,241
BOF Shop	Molten steel tons/year	2,413,406
Combined BFG Combustion	MMcf/year	121,039
Combined NG Combustion	MMcf/year	1,145
Combined Fuel Oil Combustion	Mgal/year	16

5.2.2 PM and PM_{10} Emission Factors Basis and Revisions

USS Granite City has reviewed the PM and PM_{10} emission factors used to calculate pre-project actual emissions from the project-affected emissions units based on stack testing and updated literature-based information. As a result of this review, emission factors for two operations were revised as described below. The updated pre-project actual emissions for PM and PM_{10} for the project are presented in Table 5-5 and Table 5-6 of this permit application, respectively; explanations are provided in the following paragraphs.

5.2.2.1 A&B Blast Furnace Charging Fugitive Emissions (PM_{10} Revised)

The Blast Furnace charging fugitive PM emissions were calculated using the emission factor of 0.0024 lb/ton from the U.S. EPA's AIRS 1990 database (WebFIRE). For PM_{10}, the 1995 Application assumed PM_{10} was the same as PM. However, based on particle size distribution data in AP-42 Table 12.5-2, which indicates 51% of PM is PM_{10}, the PM_{10} emission factor for this operation was lowered. The new PM_{10} emission factor is 0.0012 lb/ton.

5.2.2.2 A&B Blast Furnace Casthouse Stack (Baghouse) Emissions (No Change)

The pre-project actual emissions for the A and B Blast Furnaces Casthouse (baghouse) stack as presented by National Steel Corporation in the 1995 Application were calculated using the design outlet concentration of 0.010 grains per dry standard cubic foot in the baghouse exhaust gas and an exhaust gas flow factor of 49,000 dry standard cubic feet per ton of hot metal. PM_{10} was assumed to be same as PM. No changes are necessary for this emission factor.

5.2.2.3 A&B Blast Furnace Casthouse Roof Monitor Emissions (PM_{10} Revised)

The Blast Furnace Casthouse roof monitor actual emissions were calculated using the AP-42 Section 12.5 Table 12.5-1 PM emission factor of 0.6 lb per ton for the uncontrolled casthouse. A 95% capture efficiency, which has been recognized by U.S. EPA as representative for this source type,[23] was applied for the A&B Blast Furnace Casthouse capture systems. The PM emission factor for this operation was revised from 0.031 lb/ton to 0.030 lb/ton. Based on the particle size distribution in AP-42 Table 12.5-2, 51% of PM was assumed to be PM_{10}. The new PM_{10} emission factor is 0.0153 lb/ton vs 0.0155 lb/ton in the 1995 Application.

5.2.2.4 A&B Blast Furnace Iron Spout Baghouse Emissions (No Change)

The pre-project actual emissions for the A and B Blast Furnaces Iron Spout baghouse stack as presented by National Steel Corporation in the 1995 Application were based on an emission factor of 0.02548 lb per ton of hot metal. All PM was assumed to be PM_{10}. This emission factor appears to have been developed based on the results of stack testing conducted in 1992. No changes are necessary for this emission factor.

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[23] See, for example, "Technology Review for the Integrated Iron and Steel NESHAP," memorandum from D.L. Jones, U.S. EPA, *et al.*, to the Integrated Iron and Steel (II&S) Residual Risk and Technology Review (RTR) Project File, May 1, 2019. Available in the electronic docket at www.regulations.gov/document?D=EPA-HQ-OAR-2002-0083-0964.

5.2.2.5 Blast Furnace Slag Pits Emissions (No Change)

The pre-project actual emissions for the A and B Blast Furnaces slag pits as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.00417 lb per ton of hot metal. This emission factor is the sum of PM and PM_{10} emissions rate of 0.0026 lb per ton for slag quenching (derived from EPA assessment) for slag quenching and 0.00157 for slag transfers (using AP-42 Section 13.2.4 equation for aggregate handling). For purposes of emissions calculations, PM was assumed to be same as PM_{10}. No changes are necessary for this emission factor.

5.2.2.6 BOF ESP Stack (BOF 2 Vessels) Emissions (No Change)

The pre-project actual emissions for the BOF ESP stack as presented by National Steel Corporation in the 1995 Application were calculated using data from the stack tests conducted during 1989 to 1993 timeframe on the BOF ESP exhaust. PM and PM_{10} was assumed to be identical for this operation. No changes are necessary for this emission factor.

5.2.2.7 BOF Roof Monitor Emissions (No Change)

The BOF roof monitor actual emissions were calculated using the information from AP-42 Chapter 12.5 and AIRS database. For pre-change actual PM and PM_{10} emissions, National Steel used 90% capture efficiency during the charging and tapping steps and 99% capture efficiency during the refining step for the BOF operations. A detailed description of the baseline roof monitor PM and PM_{10} emission factors is provided in Appendix C of the 1995 Application. For the BOF operations, per particle size distribution in AP-42 Table 12.5-2, 67% of PM is PM_{10}. No changes are necessary for this emission factor.

5.2.2.8 Desulfurization Station & Transfer Pit Baghouse Stack Emissions (No Change)

The pre-project actual emissions for the Desulfurization Station and Transfer Pit Baghouse stack as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.03721 lb per ton of hot metal. No new information is available that would require any revisions to this emission factor.

5.2.2.9 Hot Metal Charging and Ladle Skimming Stack Emissions (No Change)

The pre-project actual emissions for the Hot Metal Charging and Ladle Skimming Baghouse stack as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.005 lb per ton of hot metal. No new information is available that would require any revisions to this emission factor.

5.2.2.10 Baghouse 2 for Argon Stirring and Ladle Metallurgy Emissions (No Change)

The pre-project actual emissions for Baghouse 2 for Argon Stirring and Ladle Metallurgy Facility (previously known as "Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)") as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.00715 lb per ton of steel. No new information is available that would require any revisions to this emission factor. It is now included with the BOF shop .

5.2.2.11 Caster Mold Process Emissions (No Change)

The pre-project actual emissions for the Caster Mold as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from the Illinois EPA 1991 EIS PM/PM_{10} report. No changes are necessary for this emission factor.

5.2.2.12 Continuous Caster Spray Chamber Emissions (No Change)

The pre-project actual emissions for the Continuous Caster Spray Chamber as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from a stack test in the 1980s. PM and PM_{10} emissions are assumed to be identical. No changes are necessary for this emission factor.

5.2.2.13 Slab Cut Off Casters Emissions (No Change)

The pre-project actual emissions for the Slab Cut Off Casters as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from the Illinois EPA 1991 EIS PM/PM_{10} report. No changes are necessary for this emission factor.

5.2.2.14 Slab Ripping Casters Emissions (No Change)

The pre-project actual emissions for the Slab Ripping Casters as presented by National Steel Corporation in the 1995 Application were calculated using the emission factor from the Illinois EPA 1991 EIS PM/PM_{10} report. No changes are necessary for this emission factor.

5.2.2.15 Fuel Burning Emissions Units Emissions (Revised)

The pre-project actual emission for various fuels used in certain fuel burning emissions units affected by the project were calculated using the emission factors presented in Table 5-4.

Table 5-4. PM and PM_{10} Emission Factors for Fuel Burning

Fuel	Emission Factor and Units	Basis
Blast Furnace Gas	2.9 lb/MMcf	AIRS 1990
Natural Gas	1.9 lb/MMcf *(revised)*	AP-42 Table 1.4-2 (Based on updated AP-42 information)
Coke Oven Gas (added)	16.56 lb/MMcf in stoves and 43.13 lb/MMcf in boilers *(both added)*	Stoves – Stack test (date unknown) Boilers – "A" battery stack test 1989
Fuel Oil (*Shown for historical purposes. USS Granite City no longer uses fuel oil.*)	9.72 lb/1000 gallon	AP-42 Page 1.3-2

In addition to the emission factors changes noted here, the emission calculations for each pollutant have been updated to reflect all emissions from boilers #1 through #12and from the blast furnace stoves, both pre-project and post-project. (The emission calculations performed by National Steel Corporation and included in the 1995 Application had improperly excluded the emissions from the boilers and stoves resulting from COG use; as a result, as noted in Section 2.1 of this permit application, Construction Permit No. 95010001 did not address the use of coke oven gas or the emissions resulting from burning that gas in the project-affected units.) For the pre-project emissions, the updated calculations include emissions from combustion of 2,584 MMcf of COG in these units during the baseline period; for the post-project emissions, the updated calculations reflect zero COG use.

5.2.2.16 Iron Pellet Screen Emissions (Revised)

The pre-project actual emissions for the Iron Pellet Screen were revised to be based on AP-42 Chapter 11.19.2 for crushed stone screening under Table 11.19.2-2. A control efficiency of 85% was applied for this operation.[24]

5.2.2.17 BOF Hopper Baghouse Emissions (No Change)

The pre-project actual emissions for the BOF Hopper baghouse stack were based on transfer point calculations using AP-42 Chapter 13.2.4 for aggregate handling. A control efficiency of 99.9% was applied for the baghouse used in this operation. No changes are necessary for this emission factor.[25]

5.2.2.18 Flux Conv and Transfer Points Baghouse Emissions (No Change)

The pre-project actual emissions for the Flux Conv and Transfer Points baghouse stack were based on transfer point calculations using AP-42 Chapter 13.2.4 for aggregate handling. A control efficiency of 99.3% was applied for the baghouse used in this operation. No changes are necessary for this emission factor.[26]

5.2.2.19 Baghouse 1 for Material Handling Emissions (No Change)

The pre-project actual emissions for the Baghouse 1 for Material Handling (previously known as "Deslagging Station and Material HS") as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor of 0.00355 lb/ton of hot metal. No new information is available that would require any revisions to this emission factor.[27]

5.2.2.20 Material Handling Emissions Changes (Revised)

The 1995 Application included emissions changes associated with the material handling and transfers for coke, pellets (other than screen), and limestone from the project under Table F-3. These emissions changes were accounted for in the contemporaneous emissions changes table for PM and PM_{10} along with the haul roads emissions changes. Construction Permit No. 95010001 accounted for the material handling emissions changes as "creditable contemporaneous actual emission decreases" in Table 6. With this application, the material handling and transfer operations for coke, pellets, and limestone are included in the project emissions calculations.

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[24] CAAPP Permit moved this operation to Material Handling and Processing.
[25] Same as above.
[26] Same as above.
[27] This unit is addressed twice in the CAAPP Permit. However, it is a single operation now included in Material Handling and Processing.

Table 5-5. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project PM Emission Factors for Affected Emissions Units

Emission Point[a]	Emission Factors[b]		Units	Basis	Baseline Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Fugitives	0.031	0.030	lb/ton of hot metal	No change	31.92	30.9
A & B Blast Furnace Charging	0.0024	0.0024	lb/ton of material	No change	3.36	3.4
A & B Blast Furnace Casthouse Baghouse	0.07026	0.07026	lb/ton of hot metal	No change	72.35	72.4
Blast Furnace Slag Pits	0.00417	0.00417	lb/ton of hot metal	No change	4.29	4.3
Iron Spout Baghouse	0.02548	0.02548	lb/ton of hot metal	No change	26.24	26.2
Blast Furnace Operations					***138.17***	***137.1***
BOF 2 Vessels	0.16	0.16	lb/ton of steel	No change	193.07	193.1
BOF Roof Monitor	0.428	0.428	lb/ton of steel	No change	516.72	516.7
Desulfurization Station [inside BOF shop] & Transfer Pit	0.03721	0.03721	lb/ton of hot metal	No change	38.32	38.3
Hot Metal Charging Ladle Slag Skimmer	0.00502	0.00502	lb/ton of hot metal	No change	5.17	5.2
Baghouse 2 for Argon Stirring and Ladle Metallurgy	0.00715	0.00715	lb/ton of steel	No change	8.63	8.6
BOF Shop Operations					***761.9***	***761.9***
Caster Mold – Casters #1 & #2	0.006	0.006	lb/ton of steel	No change	7.24	7.2
Continuous Casters #1 & #2 – Spray Chamber	0.00852	0.00852	lb/ton of steel	No change	10.28	10.3
Slab Cutoff Casters #1 & #2	0.0071	0.0071	lb/ton of steel	No change	8.57	8.6
Slab Ripping Casters #1 & #2	0.00722	0.00722	lb/ton of steel	No change	8.71	8.7
Continuous Casting Operations					***34.8***	***34.8***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	2.90	2.90	lb/MMcf	No change	175.51	175.5
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	5.10	1.90	lb/MMcf	Note [c]	2.92	1.1
Combined COG in stoves, B11 & B12		16.56 & 43.13	lb/MMcf	Added		50.8
Combined FO in stoves, boilers, ladle drying preheaters, and BFG flares	9.72	9.72	lb/Mgal	No change	0.08	0.1
Certain Fuel Burning Units					***178.51***	***227.4***
Material handling for Coke, Pellets, Limestone	Table F-3 of 1995 Application					17.2
Iron Pellet Screen[a]	0.00279	0.00375	lb/ton of material	Note [d]	3.91	5.3
BOF Hopper Baghouse[a]	0.00032	0.00032	lb/ton of steel	No change	0.39	0.4
Flux Conv. & Transfer Points Bin Flo-r - BOF[a]	0.0016	0.0016	lb/ton of steel	No change	1.93	1.9
Baghouse 1 for Material Handling	0.00355	0.00355	lb/ton of steel	No change	4.28	4.3
Material Handling Operations					***10.51***	***29.0***
Total					***1,123.90***	***1,190.3***

(a) Emission unit groupings have been revised slightly: The identified line items associated with material handling operations were grouped with the blast furnace operations or BOF shop in Construction Permit No. 95010001. Material handling for coke, pellets, limestone are now included in the project emissions. Baghouse 1 for Material Handling is also now grouped with material handling operations. In addition, the Baghouse 2 for Argon Stirring and Ladle Metallurgy is now grouped with BOF Shop operations.

(b) Except as noted in subsequent sections of this permit application, the same emission factors used to calculate pre-project actual emissions are also used to calculate post-project actual emissions. The BOF Roof Monitor is a notable exception, as the 1996 Project included measures to improve PM control efficiency.

(c) Updated AP-42 emission factor for natural gas combustion.

(d) Calculated using AP-42 emission factor for crushed stone, assuming 85% control efficiency.

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Table 5-6. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project PM_{10} Emission Factors for Affected Emissions Units

Emission Point[a]	Emission Factors[b]		Units	Basis	Baseline Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Fugitives	0.0155	0.0153	lb/ton of hot metal	Correction to calculation	15.96	15.8
A & B Blast Furnace Charging	0.0024	0.0012	lb/ton of materialIte [c]	3.36	1.7	
A & B Blast Furnace Casthouse Baghouse	0.07026	0.07026	lb/ton of hot metal	No change	72.35	72.4
Blast Furnace Slag Pits	0.00417	0.00417	lb/ton of hot metal	No change	4.29	4.3
Iron Spout Baghouse	0.02548	0.02548	lb/ton of hot metal	No change	26.24	26.2
Blast Furnace Operations					***122.21***	***120.3***
BOF 2 Vessels	0.16	0.16	lb/ton of steel	No change	193.07	193.1
BOF Roof Monitor	0.287	0.287	lb/ton of steel	No change	346.20	346.2
Desulfurization Station [inside BOF shop] & Transfer Pit	0.03721	0.03721	lb/ton of hot metal	No change	38.32	38.3
Hot Metal Charging Ladle Slag Skimmer	0.00502	0.00502	lb/ton of hot metal	No change	5.17	5.2
Baghouse 2 for Argon Stirring and Ladle Metallurgy	0.00715	0.00715	lb/ton of steel	No change	8.63	8.6
BOF Shop Operations					***591.39***	***591.4***
Cas-er Mold - Casters #1 & #2	0.006	0.006	lb/ton of steel	No change	7.24	7.2
Continuous Casters-#1 & #2 - Spray Chamber	0.00852	0.00852	lb/ton of steel	No change	10.28	10.3
Slab Cutoff Casters #1 & #2	0.0071	0.0071	lb/ton of steel	No change	8.57	8.6
Slab Ripping Casters #1 & #2	0.00722	0.00722	lb/ton of steel	No change	8.71	8.7
Continuous Casting Operations					***34.80***	***34.8***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	2.90	2.90	lb/MMcf	No change	175.51	175.5
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	5.10	1.90	lb/MMcf	Note [d]	2.92	1.1
Combined COG in stoves, B11 & B12		14.21 & 41.48	lb/MMcf	Added		48.5
Combined FO in stoves, boilers, ladle drying preheaters, and BFG flares	9.72	9.72	lb/Mgal	No change	0.08	0.1
Certain Fuel Burning Units					***178.51***	***225.2***
Material handling for Coke, Pellets, Limestone	Table F-3 of 1995 Application					17.2
Iron Pellet Screen [a]	0.00279	0.00131	lb/ton of materl	Note [c]	3.91	1.8
BOF Hopper Baghouse [a]	0.00032	0.00032	lb/ton of steel	No change	0.39	0.4
Flux Conv. & Transfer Point-Bin Floor - BOF [a]	0.0016	0.0016	lb/ton of steel	No change	1.93	1.9
Baghouse 1 for Material Handling	0.00355	0.00355	lb/ton of steel	No change	4.28	4.3
Material Handling Operations					***10.51***	***25.6***
Total					***937.42***	***997.3***

(a) Emission unit groupings have been revised slightly. The identified line items associated with material handling operations were grouped with the blast furnace operations or BOF shop in Construction Permit No. 95010001. Material handling for coke, pellets, limestone are now included in the project emissions. Baghouse 1 for Material Handling is also now grouped with material handling operations. In addition, the Baghouse 2 for Argon Stirring and Ladle Metallurgy is now grouped with BOF Shop operations.

(b) Except as noted in subsequent sections of this permit application, the same emission factors used to calculate pre-project actual emissions are also used to calculate post-project actual emissions. The BOF Roof Monitor is a notable exception, as the 1996 Project included measures to improve PM_{10} control efficiency.

(c) Applied PM to PM_{10} ratio from AP-42, Chapter 13.2.4.

(d) Updated AP-42 emission factor for natural gas combustion.

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(e) Calculated using AP-42 emission factor for crushed stone, assuming 85% control efficiency.

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5.3 Post-Project PM and PM_{10} Emissions Limitations

As noted in Sections 2.2.3 through 2.2.5 herein, and as discussed further below, for each pollutant, the project emissions increase and/or net emissions increase from the 1996 Project was calculated using the difference between the pre-project actual emissions (August 1992 to July 1994, 24-month period) and the post-project emissions cap for each major operational group of affected emissions units. The post-project emissions caps and emissions increases from the 1996 Project, respectively, were listed in Tables 5 and 6 of Construction Permit No. 95010001.

This Section 5.3 presents a discussion of the post-project PM and PM_{10} emissions caps and a summary of the updated emissions increase calculations for the 1996 Project, reflecting the proposed changes to the emissions caps. Section 5.4 of this permit application presents a summary of the updated net emissions increase calculations and Section 5.5 of this permit application presents certain permit terms proposed by USS Granite City for purposes of ensuring the emissions limitations are enforceable as a practical matter. As already discussed, USS Granite City is proposing that the revised permit no longer include limitations for the PM and PM_{10} emissions of individual emission points or emissions units.

The proposed emissions caps for the project-affected emissions units were developed by USS Granite City using the operating rates shown in Table 5-7. Other than the natural gas usage, which is proposed to increase, and the oil usage, which is proposed to be deleted entirely, these rates are unchanged from the operating rates in Construction Permit No. 95010001. USS Granite City shut down the by-product coke oven batteries in 2015. The shutdown of the Coke Plant eliminated coke oven gas as process fuel at the facility for use in the various fuel burning units. This resulted in increased use of natural gas for certain Project-affected fuel burning units. The emissions effects of the natural gas usage increase is also being addressed in this permit application.

Table 5-7. Projected Post-Project Operating Rates for PM and PM_{10}

Parameters	Units	Post Project Rates
Blast Furnace Production	Net tons of hot metal/year	3,165,000
BOF Shop	Molten steel tons/year	3,580,000
Combined BFG Combustion	MMcf/year	185,030
Combined NG Combustion	MMcf/year	1,980
Combined COG Combustion	n/a	0
Combined Oil Combustion	n/a	0

A comparison of the PM and PM_{10} emissions caps from Table 5 of Construction Permit No. 95010001 and the proposed revisions to these emissions caps is provided in Table 5-8. USS Granite City is proposing only minor changes to the emissions limitations as part of this permit application. (The changes are primarily attributable to the redistribution of the emission caps, including establishment of a separate emissions cap for certain material handling operations.)

The proposed revisions to the post-project PM and PM_{10} emissions caps reflect three categories of changes: corrections of certain emission factors used to calculate both pre-project and post-

project emissions, as shown in Table 5-5 and Table 5-6 herein; [28] changes to post-project operating rates as shown in Table 5-7; and changes to emissions unit groups for certain material handling and other operations, as discussed in footnote (a) of both Table 5-5 and Table 5-6 herein. A separate group for material handling builds upon the approach taken by Illinois EPA in the CAAPP permit for the USS Granite City facility.

Table 5-8. PM and PM_{10} Emissions Caps

Processes and Activities	Emissions Caps (TPY) from Table 5 of Construction Permit No. 95010001		Proposed Revised Emissions Caps (TPY)	
	PM	PM_{10}	PM	PM_{10}
Blast Furnace Operations	218	194	215	190
BOF Shop	510	451	525	462
Continuous Casting Operations	71	71	52	52
Certain Fuel Burning Units*	273	273	273	273
Roadways	27	27	27	27
Material Handling (coke, pellets (other than screen), limestone)	2	2	n/a	n/a
Material Handling Operations (New group accounts for emissions from material handling operations previously grouped under the BF and BOF Shop operations and material handling line shown above)	n/a	n/a	30	19
Total	1,101	1,018	30	19
* Emission rates for "certain fuel burning units" represent the potential to emit for these operations. No emissions caps are proposed for this category of affected units.				

Updated project emissions increase analyses for PM and PM_{10}, reflecting proposed revisions to the emissions increase calculations in Table 6 of Construction Permit No. 9501001, are provided in Table 5-9. This table incorporates the effects of the corrected pre-project emission factors and annual emissions as shown in Table 5-5 and Table 5-6 and the requested updates to the emissions caps as shown in Table 5-8. In addition, adjustments to the emissions caps reflect reorganization of material handling operations affected by the project under a separate operational group for Material Handling Operations (similar to the approach in the CAAPP Permit) and regrouping of some of the operations under the BOF Shop.

[28] In the 1995 Application, for post-project PM and PM_{10} emissions from the BOF roof monitor, National Steel proposed lower emission factors reflecting the implementation of measures to improve capture and control efficiency in the BOF. Illinois EPA agreed with this proposal, incorporated the lower emission factors into the 1996 Construction Permit, and recognized the PM and PM_{10} emission reductions in the netting analyses for these pollutants. No changes are proposed by USS Granite City to the post-project PM and PM_{10} emission factors for the BOF Shop roof monitor.

Table 5-9. PM and PM_{10} Project Emissions Increase Analyses

Processes and Activities	Pre-Project Actual Emissions (TPY)		Proposed Revised Emissions Caps (TPY)		Change (TPY)	
	PM	PM10	PM	PM10	PM	PM10
Blast Furnace Operations	137	120	215	190	78	70
BOF Shop	762	591	525	462	-237	-129
Continuous Casting Operations	35	35	52	52	17	17
Certain Fuel Burning Units	227	225	273	273	46	48
Material Handling Operations	29	26	30	19	1	-7
Total*					-95	-1

*Roadways were addressed as contemporaneous decreases in the 1995 Application. Table 5 of Construction Permit No. 95010001 includes the requisite emission limit for PM and PM10 emissions for the roadways. No changes are proposed to those emission limitations.

5.4 Changes to Net Emissions Increases for PM and PM_{10}

As part of the requested revisions to Construction Permit No. 95010001, USS Granite City is also proposing updates to the analyses for net emissions increases in emissions of PM and PM_{10} for the 1996 Project. Table 5-10 shows the updated net emissions increases calculations for PM and PM_{10} based on the updated project emissions increase calculations shown in Table 5-9.

In the 1995 Application, the calculations relating to contemporaneous decreases in actual emissions associated with fugitive dust controls for roadways and material handling were presented together. For increased clarity, those calculations are presented separately in this permit application and emissions changes for the material handling operations are now shown in the project emissions increase calculations in Table 5-9 herein. Further, in the 1995 Application and in Construction Permit No. 95010001, the calculations supporting those creditable and contemporaneous decreases in emissions of were performed using PM_{10} emissions data (see Attachment C of the permit). The estimated decreases in emissions of PM from fugitive dust controls for roadways were based on the highly conservative assumption that pre-project PM emissions from roadways were equal to pre-project PM_{10} emissions. (See Appendices E and F of the 1995 Application and see Tables 5 and 6 of the permit.) Information available now is not sufficient to develop revised calculations of fugitive pre-project PM emissions from roadways or to calculate what the PM emissions decrease would have been due to the implementation of fugitive dust controls, but it is known that both the pre-project actual PM emissions and the decrease in PM emissions would have been greater than the corresponding PM_{10} values shown in the 1995 Application and in the permit.[29] Because the Project clearly does not result in a significant net increase in PM emissions even with this conservative assumption, USS Granite City is conservatively retaining the estimated PM emissions decrease of 17.1 TPY (same as PM_{10}).

[29] Based on the most recent emission inventory for the Granite City Works, actual PM emissions from paved and unpaved roadways are approximately 3.6 times the PM_{10} emissions. This is generally consistent with U.S. EPA's AP-42 emission factor compilation: PM emissions from paved roads are 5.2 times PM_{10} emissions (see AP-42 Table 13.2.1-1) and PM emissions from unpaved industrial roads are 3.3 times PM_{10} emissions (see AP-42 Table 13.2.2-2).

Table 5-10. Updated Net Emissions Increases for PM and PM_{10} for the Project

		PM	PM10
Start of Contemporaneous Period		Jan 1991	Jan 1990
End of Contemporaneous Period		Jan 1996	Jan 1996
		Emissions (TPY)	
Project Emissions Increases (not including project decreases)		141.6	134.7
Significant Emission Rates		25	15
Whether Significant?		Yes	Yes
Project Emissions Changes (includes decreases at BOF shop operations)		-95	-1
Contemporaneous Emissions Increases	Date		
Remove Blast Furnace Slag Spout Hood	Jan-1990	n/a	4.9
#2 Caster Production	Dec-1990	n/a	11.7
Installation of #8 Galvanizing Line	Mar-1996	n/a	n/a
Contemporaneous Emissions Decreases			
Ingot Teeming Shutdown	Apr-1991	-22.4	-22.4
Blooming Mill Shutdown	Apr-1991	-3.4	-3.4
NESHAP Controls Coke By-product	Jul-1991	-	-
Batch Annealing Shutdown	Dec-1991	-0.2	-0.2
Roadways Fugitive Dust Controls	Nov-1991	-17.1	-17.1
Net Emissions Increases		**-138.4**	**-27.8**
Whether Significant?		No	No

The net emissions increases calculations also incorporate changes due to corrections to the contemporaneous period:

- The contemporaneous period for PM emissions from the project was established using the definition in 40 CFR § 52.21(b)(3)(ii). The start of the contemporaneous period was January 25, 1991, five years prior to the date on which construction of the project commenced. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered changes involving the removal of the blast furnace slag spout hood, startup of #2 caster, and the #8 Galvanizing Line to be contemporaneous. However, the removal of the blast furnace slag spout hood and the startup of the #2 caster occurred prior to the beginning of the contemporaneous period and the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period. Therefore, these changes were not contemporaneous for PM for the 1996 Project. USS Granite City has updated the netting analysis to reflect the fact that the PM emissions increase from installation of the #8 Galvanizing Line did not occur within the contemporaneous period.
- The contemporaneous period for PM_{10} emissions from the project was established using the definition in 35 IAC 203.208.[30] The start of the contemporaneous period was January 4, 1990, five years prior to the date of submittal of a timely and complete application on

[30] The USS Granite City facility was located in area that was designated as nonattainment for PM_{10} at the time of 1996 Construction Permit issuance.

January 3, 1995. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered the #8 Galvanizing Line to be contemporaneous. However, the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period and this project was not contemporaneous for PM_{10} for the 1996 Project. USS Granite City has updated the netting analysis to reflect the fact that the PM_{10} emissions increase from installation of the #8 Galvanizing Line did not occur within the contemporaneous period.

Net emissions increases for PM and PM_{10} remain below the applicable significant emission rates. Therefore, the 1996 Project remains a non-major modification under PSD and NNSR.

5.5 Requested Changes to Permit Terms Relating to PM and PM_{10} Emissions

As part of this application for revision to Construction Permit No. 95010001, USS Granite City is proposing the following revisions to the emission limitations and other permit terms relating to PM and PM_{10} emissions from the processes or activities affected by the 1996 Project.

5.5.1 Blast Furnace Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the blast furnace operations. The permit grouped the Iron Pellet Screen as part of the Blast Furnace Operations under Table 1. With this revision, USS Granite City is proposing to move the Iron Pellet Screen, previously listed under the Blast Furnace Operations, under a new Material Handling Operations Group discussed later in this Section.

5.5.1.1 Proposed PM and PM_{10} Emission Limitations for Blast Furnace Operations

USS Granite City proposes the following to replace Condition 5 in Construction Permit No. 95010001.

> *5.a Particulate matter emissions from the Blast Furnace Operations (A & B Blast Furnaces Casthouse Roof Monitor and Casthouse Baghouse stack, A & B Blast Furnace Charging, Iron Spout Baghouse, and Blast Furnace Slag Pits) shall not exceed 215 tons per year for PM and 190 tons per year for filterable PM10, each on a monthly rolling 12-month total.*

As the emission limitations would be in Condition 5.a itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations for specific emissions points and emissions units from Table 1 of Construction Permit No. 95010001 as they would be redundant.

5.5.1.2 Prescribed Emission Factors for Certain Blast Furnaces Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing the following prescribed emission factors for the

emissions points for which emissions testing is not feasible.[31] Each of these emission factors is the same as the corresponding emission factor used to calculate pre-project actual emissions as shown in Table 5-5 and Table 5-6.

(a) For Blast Furnace Casthouse Roof Monitor, use PM emission factor of 0.030 lb/ton and PM_{10} emission factor of 0.0153 lb/ton.
(b) For Blast Furnace charging, use PM emission factor of 0.0024 lb/ton and PM_{10} emission factor of 0.0012 lb/ton.
(c) For slag pits, use PM and PM_{10} emission factor of 0.00417 lb/ton.

USS Granite City recognizes that the annual emission limitations in the revised permit must now address a running total of 12-consecutive months of emissions, so that compliance with the annual limitations can be assessed 12 times per calendar year. Monthly emissions would be determined as the product of monthly throughout rate and applicable emission factor except if there are process upsets or malfunctions, that are accompanied by higher emissions. For such events, the additional emissions would be determined in accordance with the principles of credible evidence.

5.5.2 Basic Oxygen Furnace Shop Operations

This section of the permit application addresses the proposed changes to the requirements under Construction Permit No. 95010001 for the BOF Shop operations. The permit grouped the BOF Additive with BOF Hopper Baghouse and Flux Conveyor & Transfer Pits Bin Floor as part of the BOF Shop Operations under Table 2. With this revision, USS Granite City is proposing to address these units in a new group for Material Handling Operations. That group is discussed in Section 5.5.4 of this permit application. In addition, with this revision, USS Granite City is proposing to move the permit terms relating to the Baghouse 2 for Argon Stirring and Ladle Metallurgy (previously Argon Stirring and Material Handling Tripper (Ladle Metallurgy)) which was previously listed under the Continuous Casting Operations, in the BOF Shop Operations Group.

5.5.2.1 Proposed PM and PM_{10} Emission Limitations for BOF Shop Operations

USS Granite City proposes the following to replace Condition 18 in Construction Permit No. 95010001.

> *18.a Particulate matter emissions from the BOF Shop Operations (BOF ESP, BOF Baghouse, BOF Shop Roof Monitor, Desulf/ Soda Ash and Hot Metal Charging Baghouse, Slag Skimming Baghouse, and Baghouse 2 for Argon Stirring and Ladle Metallurgy shall not exceed 525 tons per year for PM and 462 tons per year for filterable PM_{10}, each on a monthly rolling 12-month total.*[32]

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[31] PM and PM_{10} emissions factors are appropriately determined from the results of emissions testing per 40 CFR 63 Subpart FFFFF to determine PM and PM_{10} emission rates for the Blast Furnace Casthouse baghouse and the Iron Spout baghouse.

[32] USS installed a capture system for the BOF vessels in the BOF Shop operations. This system captures emissions from charging and tapping of the BOF vessels and routes it to a baghouse. For compliance with the BOF Shop emission caps, emissions from the BOF ESP and baghouse exhausts are included here.

As the emission limitations would be in Condition 18.a itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations for specific emissions points and emissions units from Table 2 and Table 3 of Construction Permit No. 95010001 as it would be redundant.

5.5.2.2 Prescribed Emission Factors for Certain BOF Shop Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing prescribed emission factors for the BOF Shop Roof Monitor for which emissions testing is not feasible.[33] For BOF Shop Roof Monitor, use PM emission factor of 0.0296 lb/ton and filterable PM_{10} emission factor of 0.0198 lb/ton.

5.5.3 Continuous Casting Operations

This section addresses the proposed changes to the requirements of Construction Permit No. 95010001 for the Continuous Casting operations.

5.5.3.1 Proposed PM and PM_{10} Emission Limitations for Continuous Casting Operations

USS Granite City proposes the following to replace Condition 20 in Construction Permit No. 95010001.

> *20.a Particulate matter emissions from the Continuous Casting Operations Caster Mold, Continuous Caster Spray Chamber, Slab Cutoff, and Slab Ripping shall not exceed 52 tons per year for PM and 52 tons per year for filterable PM_{10}, each on a monthly rolling 12-month total.*

As the emission limitations would be in Condition 20.a itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations for specific emissions points and emissions units from Table 3 of Construction Permit No. 95010001 as they would be redundant.

5.5.3.2 Prescribed Emission Factors for Continuous Casting Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing the following prescribed emission factors for the emissions points for which emissions testing is not feasible.

(a) For Caster Mold, use PM/PM_{10} emission factor of 0.006 lb/ton.
(b) For Slab Cutoff, use PM/PM_{10} emission factor of 0.0071 lb/ton.
(c) For Slab Ripping, use PM/PM_{10} emission factor of 0.00722 lb/ton.

5.5.4 Material Handling Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the material handling operations associated with the Blast Furnace and BOF Shop operations. As previously noted, material handling equipment in the Blast Furnace Operations and the BOF

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[33] PM and PM_{10} emissions factors are appropriately determined from the results of emissions testing per 40 CFR 63 Subpart FFFFF to determine PM and PM_{10} emission rates for the BOF ESP and baghouse, Desulf/ Soda Ash and Hot Metal Charging Baghouse, Slag Skimming Baghouse, and Baghouse 2 for Argon Stirring and Ladle Metallurgy.

Shop Operations are now proposed to be included in this new section. This also includes emissions associated with material handling and transport of coke, pellets, and limestone. In addition, emissions from Baghouse 1 for Material Handling operation are also included in this section. In addition, USS identified a small silo used to store Mag-Lime at the BOF that used an integrated filter that exhausts inside the building. This emissions from this silo are also included in this group.[34]

5.5.4.1 Proposed PM and PM_{10} Emission Limitations for Material Handling Operations

USS Granite City proposes the following new Condition 42 in Construction Permit No. 95010001.

> *42. Particulate matter emissions from the Material Handling Operations shall not exceed 30 tons per year of PM and 19 tons per year of filterable PM_{10}, each on a monthly rolling 12-month total.*

As the emission limitations would be in Condition 42 itself, USS Granite City also requests the deletion of the PM and PM_{10} emission limitations from Table 1, Table 2, and Table 3 of Construction Permit No. 95010001 as they would be redundant.

5.5.4.2 Prescribed Emission Factors for Material Handling Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing the following prescribed emission factors for the emissions points for which emissions testing is not feasible.

(a) For Iron Pellet Screen fugitives, use PM/PM_{10} emission factor of 0.00131 lb/ton.
(b) For material handling and transfer operations for coke, pellets, and limestone, use AP-42 Chapter 13.2.4 to calculate applicable emission factors.
(c) For Mag-Lime silo with filter, use PM/PM10 emission rate of 0.009 lb/hour.

[34] PTE of the Mag-Lime silo is less than 0.1 TPY. Therefore, USS did not quantify any baseline for this operation and conservatively included this operation in the emission cap for the Maerial Handling Operations.

6. Proposed Changes to Permit Terms for NOx Emission Increase Analysis

This section describes the proposed changes to Construction Permit No. 95010001 being requested by USS Granite City related to NOx emissions. It also provides a demonstration that, even with the requested revisions, the Project would still not be a major modification under the PSD program at 35 IAC 204 with respect to emissions of NO_2 and under the NNSR program at 35 IAC Part 203 with respect to emissions of NOx. The emissions calculations for NOx from the 1995 Application submitted by National Steel Corporation are reproduced in Appendix B.

6.1 Construction Permit No. 95010001 Applicability and Requirements

Table 6-1 below summarizes the provisions from Construction Permit No. 95010001 pertaining to NOx emissions limitations from the project affected emissions units. Copies of the relevant permits are provided in Appendix D1 and D2 of this application.

Table 6-1. Construction Permit Conditions Addressing NOx

Permit Condition	Requirements
5	Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.
18	Emissions from the BOF Shop operations shall not exceed the limits in attached Tables 2 and 5.
20	Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5
22	Emissions from the listed fuel combustion units shall not exceed the limits in Tables 4 and 5.

The annual NOx emissions caps listed in Table 5 of Construction Permit No. 95010001 are presented in Table 6-2 below. These annual NOx emissions caps cover all emissions units affected by the Project. The emissions units are grouped in the four main processes or activities at the USS Granite City facility, each calculated as the sum of the unit-specific NOx emissions limitations in Tables 1 through 3 and fuel specific in Table 4 of the permit.

Table 6-2. NOx Emissions Information from Table 5 of Construction Permit No. 95010001

Processes and Activities	NOx Emissions Caps (tons/year)
Blast Furnace Operations	24
BOF Shop Operations	70
Continuous Casting Operations	90
Certain Fuel Combustion Units	674
Total	858

The NOx emissions caps restricted the PTE of the project-affected emissions units. The project emissions increase for NOx was calculated by subtracting pre-project actual emissions (August 1992 to July 1994, 24-month period) from the PTE as restricted by the limitations in the permit. Table 6 of Construction Permit No. 95010001 included the emissions increase from the project

and major modification applicability determinations for NOx. The NOx net emissions increase was below the applicable significant emission rates and as a result, NOx emissions were not subject to PSD or NNSR review.

6.2 Pre-Project Actual Emissions for 1996 Project

This section presents the updated pre-project actual emissions with proposed corrections to some of the NOx emission factors. Corrections to the NOx emissions factors are the result of more recent performance tests and updated information as discussed in 6.2.2.

6.2.1 Historical Throughput Rates

The NOx net emissions increase calculations presented in Table 6 of Construction Permit No. 95010001 were based on the calculations provided by National Steel Corporation in Table 3-2 of the 1995 Application. That table from the prior construction permit application is reproduced in Appendix B of this permit application.

The pre-project actual emissions were calculated using the same production and operating rates as the 1995 Application shown in Table 6-3.

Table 6-3. Pre-Project Production and Operating Rates for NOx

Parameters	Units	Pre-Project Rates
Blast Furnace Production	Net tons of hot metal/year	2,059,557
BOF Shop	Molten steel tons/year	2,413,406
Combined BFG Combustion	MMcf/year	121,039
Combined NG Combustion	MMcf/year	1,145
Combined Fuel Oil Combustion	Mgal/year	16

6.2.2 NOx Emission Factors Basis and Revisions

USS Granite City has corrected some of the NOx emission factors used to calculate pre-project actual emissions from the project-affected emissions units based on stack testing and updated literature-based information. USS Granite City has also validated the remaining emissions factors. The results are presented in Table 6-5; explanations are provided in the following paragraphs.

6.2.2.1 Fuel Burning Emissions Units Emissions (Revised)

The pre-project actual emissions for various fuels used in fuel burning emissions units affected by the project are calculated using the emission factors presented in Table 6-4.

Table 6-4. NOx Emission Factors for Fuel Burning

Fuel	Emission Factor and Units	Basis
Blast Furnace Gas[35]	5.28 lb/MMcf	February 1993 stack test
Natural Gas	306 lb/MMcf	November 1992 stack test
Coke Oven Gas (added)	80 lb/MMcf in stoves and 403.69 lb/MMcf in boilers *(both added)*	Stoves – Stack test (date unknown) Boilers – "A" battery stack test 1989
Fuel Oil (*Shown for historical purposes. USS Granite City no longer plans to use fuel oil.*)	55 lb/1000 gallon	AP-42 Page 1.3-2

Section 5.2.2.15 includes discussion of inclusion of emissions from the COG combustion for applicability calculations here including the fuel usage information for the affected units.

6.2.2.2 A&B Blast Furnace Casthouse Stack (Baghouse) Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnace Casthouse stack (baghouse), as presented by National Steel Corporation in the 1995 Application, were calculated using data from a stack test conducted in July 1993. Other than the test results, USS Granite City has no information regarding this stack test, which was conducted by National Steel. In March 2012, USS Granite City performed NOx stack tests at the Blast Furnace Casthouse stack. This test indicated a lower NOx emission factor for this operation than previously used (0.0144 lb/ton in the original analysis vs 0.0027 lb/ton based on the March 2012 stack test). In Table 6-5, both the original and updated NOx emission factors are shown for the Blast Furnace Casthouse stack.

6.2.2.3 A&B Blast Furnace Casthouse Roof Monitor Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnace Casthouse roof monitor, as presented by National Steel Corporation in the 1995 Application, were calculated using the emission factor as 0.00072 lb/ton. This value was developed using the July 1993 stack test result of 0.0144 lb/ton for the casthouse baghouse stack and an assumption of 95% capture efficiency as described in Section 5.2.2.3 herein. As discussed in Section 6.2.2.2 above, subsequent testing indicated a lower NOx emission factor for the stack emissions of 0.0027 lb/ton. Assuming a 95% capture efficiency for the casthouse baghouse collection system, the uncaptured portion (5% of NOx generated) is emitted through the roof monitors at the rate of 0.00014 lb/ton. In Table 6-5, both the original and updated NOx emission factors are shown for the Blast Furnace Casthouse roof monitor emissions.

6.2.2.4 A&B Blast Furnace Iron Spout Baghouse Emissions (Revised)

The 1995 Application and Construction Permit No. 95010001 did not identify any NOx emissions from the Blast Furnace Iron Spout Baghouse. However, a stack test conducted in March 2012 indicated a NOx emission factor of 0.0016 pound per ton of hot metal for this emission point. In Table 6-5, the revised analysis includes pre-project actual NOx emissions from the Blast Furnace Iron Spout Baghouse stack.

[35] BFG is a low Btu fuel that results in a cool flame during combustion. This results in relatively low NOx emission rate for this fuel for all types of applications.

6.2.2.5 BOF ESP Stack (BOF 2 Vessels) Emissions (Revised)

The pre-project actual emissions for the BOF ESP stack, as presented by National Steel Corporation in the 1995 Application, were calculated using data from the average of three runs from one stack test conducted in August 1993. As discussed below, the results of this 1993 stack test have been shown by subsequent data not to be representative of emissions from the BOF ESP stack. The 1996 Project involved increases in the production limits for the Granite City blast furnaces and BOF Shop operations. The project did not involve any physical changes or changes in the method of operation for the BOF Shop. The BOF Shop operations do not use any add-on NOx control devices. Thus, variability in NOx emissions for the BOF process are inherent to the process operation. Beginning in 2012, USS Granite City performed several NOx stack tests at the BOF ESP stack. This testing provided an updated NOx emission factor for the BOF ESP stack (0.0389 lb/ton in the original analysis vs 0.14 lb/ton based on the average of April 2012, July 2012, and November 2014 stack test results). In Table 6-5, both the original and updated NOx emission factors are shown for the BOF ESP stack.

6.2.2.6 BOF Baghouse - Secondary Emissions (New)

At the time of the 1995 Application, the BOF Shop did not include a baghouse to capture secondary emissions. Secondary emissions were released to the atmosphere through the BOF Shop roof monitor. No information was available at the time about the NOx emissions from the BOF Shop roof monitor. Since then, the BOF Shop includes a capture system for secondary emissions that are routed to a baghouse. NOx emission testing for the BOF Shop baghouse, completed in 2019-2020 timeframe, shows an average NOx rate of 0.0075 lb/ton for the BOF Shop Baghouse stack. USS Granite City added the BOF Shop secondary NOx emissions baseline based on the result of the stack test for the BOF Shop Baghouse stack.

6.2.2.7 Continuous Caster Mold Process Emissions (Revised)

The pre-project actual emissions for the Continuous Caster Mold – Caster #1 and Caster #2 process, as presented by National Steel Corporation in the 1995 Application listed NOx emissions from this operation. USS Granite City evaluated this analysis and determined that there is no NOx formation in this operation. Any NOx emissions from this operation are due to combustion of natural gas and are already accounted for under the gaseous fuel burning activities listed above. Therefore, in the revised analysis, NOx emissions are not included from this operation.

Table 6-5. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project NO_x Emission Factors for Affected Emissions Units

Emission Point	Emission Factors[a]		Units	Reason for Change	Pre-project Actual Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Stack (Baghouse)	0.0144	0.0027	lb/ton of hot metal	Revised based on 3/2012 stack test	14.83	2.78
A & B Blast Furnace Casthouse Roof Monitor	0.0007	0.0001	lb/ton of hot metal	3/2012 test assuming no NO_x control and 5% roof monitor fraction	0.74	0.15
Iron Spout Baghouse		0.0016	lb/ton of hot metal	Based on 3/2012 stack test		1.6
Blast Furnace Operations					***15.6***	***4.6***
BOF ESP Stack (2 Vessels)	0.0389	0.14	lb/ton of steel	Revised based on average of 2012-2014 stack tests	46.94	170.8
BOF Secondary Emissions (2 Vessels)		0.0075	lb/ton of steel	Based on 2019-20 stack test		9.1
BOF Shop Operations					***46.94***	***179.8***
Continuous Caster Mold - Casters #1 & #2	0.05	0.00	lb/ton of steel	All NO_x formed from natural gas combustion. No additional NO_x	60.34	0.00
Continuous Casting Operations					***60.34***	***0.00***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	5.28	5.28	lb/MMcf	No change	319.54	319.54
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	306.00	306.00	lb/MMcf	No change	175.19	175.19
Combined COG in stoves, B11 & B12		80 and 404	lb/MMcf	Added		461.18
Combined FO in stoves, B11 & B12, ladle drying preheaters, and BFG flares (*shown here for historical purposes*)	9.72	9.72	lb/Mgal	No change	0.44	0.44
Certain Fuel Burning Units					***495.17***	***956.4***
Total					***618.01***	***1,140.8***

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6.3 Post-Project NO_X Emissions Limitations

As described in subsection 5.3, the post-project emissions caps and emissions increases from the 1996 Project were, respectively, listed in Tables 5 and 6 of Construction Permit No. 95010001. Similar to PM and PM_{10}, this subsection 6.3 presents a discussion of the post-project NO_X emissions caps and summary of the updated emissions increase calculations for the 1995 Project, reflecting the proposed changes in the emissions caps.

The post-project emissions caps for the project affected emissions units are developed by USS Granite City using the operating rates shown in Table 6-6. Other than the natural gas usage, which is proposed to increase, and the oil usage, which is proposed to be eliminated, these rates are unchanged from the operating rates in the permit. As previously noted in Section 5.3, due to 2015 shutdown of the Coke Plant this application addresses increase in natural gas usage for the fuel burning units affected by the project and also addresses elimination of COG at the affected units.

Table 6-6. Projected Post-Project Operating Rates for NO_X

Parameters	Units	Post Project Rates
Blast Furnace Production	Net tons of hot metal/year	3,165,000
BOF Shop	Molten steel tons/year	3,580,000
Combined BFG Combustion	MMcf/year	185,030
Combined NG Combustion	MMcf/year	1,980
Combined COG Combustion	n/a	0
Combined Oil Combustion	n/a	0

A comparison of the NO_X emissions caps from Table 5 of Construction Permit No. 95010001 and the proposed revisions to these emissions caps is provided in Table 6-7. Detailed emissions calculations are provided in Appendix B. The proposed revisions to the post-project NOx emissions caps reflect changes to some of the emission factors presented in Table 6-5 and changes in post-project operating rates as shown in Table 6-6. USS Granite City also revised NOx emission factors for boilers to reflect the currently applicable emission limitations for boilers under 35 IAC 217.164(b).

Table 6-7. NO_X Emissions Caps

	NO_X Emission Caps (TPY) from Table 5 of Construction Permit No. 95010001	Proposed Revised NOx Emissions Caps (TPY)
Blast Furnace Operations	24	24.0
BOF Shop	70	400
Continuous Casting Operations	90	0.0
Certain Fuel Burning Units*	674	706
Total	858	1130
* Emission rates for "certain fuel burning units" represent the potential to emit for these operations. No emissions caps are proposed for this category of units.		

Updated project emissions increase analysis for NOx reflecting proposed revisions to the emissions increase calculations in Table 6 of Construction Permit No. 95010001, is provided in Table 6-8. This table incorporates the effects of the corrected pre-project emission factors as shown in Table 6-5 and the requested updates to the emission caps as shown in Table 6-7.

Table 6-8. NO_X Project Emissions Increase Analysis

	NO_X Pre-Project Actual Emissions (TPY)	Proposed Revised NO_X Emissions Caps (TPY)	NO_X Change (TPY)
Blast Furnace Operations	4.6	24.0	19.4
BOF Shop	179.8	400.0	220.2
Continuous Casting Operations	0.0	0.0	0.0
Certain Fuel Burning Units	956.3	706.0	-250.3
Total	1140.7	1130	-10.7

6.4 Changes to Net Emissions Increase Calculation for NO_X

In conjunction with the requested revisions to Construction Permit No. 95010001, USS Granite City is also updating the analysis for net increases in emissions of NOx for the 1996 Project.

Table 6-9 shows the updated net emissions increases calculations for NOx based on the updated project emissions increase calculations shown in Table 6-8. This table includes a correction to the contemporaneous period for NOx emissions from the project as established using the definition in 35 IAC 203.208.[36] The start of the contemporaneous period was January 4, 1990, five years prior to the date of submittal of a timely and complete application on January 3, 1995. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered the #8 Galvanizing Line to be contemporaneous. However, the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period and this project was not contemporaneous for the 1996 Project.

Net emissions increase for NOx remains below the applicable significant emission rate. Therefore, the 1996 Project remains a non-major modification under PSD and NNSR.

[36] Granite City Works is located in area that was designated as nonattainment for ozone at the time Construction Permit No. 95010001 was originally issued. Accordingly, the applicability provisions of the Illinois NNSR rule under 35 IAC 203 were addressed for the Project at that time.

Table 6-9. Updated Net Emissions Increases for NOx for the 1996 Project

		NOx
Start of Contemporaneous Period		Jan 1990
End of Contemporaneous Period		Jan 1996
Project Emissions Increases		239.6
Significant Emission Rates		40
Whether Significant?		Yes
Project Emissions Changes (includes decreases at the fuel combustion units)		-10.7
Contemporaneous Emissions Increases	Date	
Installation of #8 Galvanizing Line	Mar-1996	n/a
Contemporaneous Emissions Decreases		
Blooming Mill Shutdown	Apr-1991	-217.8
Batch Annealing Shutdown	Dec-1991	-8.7
Net Emissions Increase		**-237.3**
Whether Significant?		No

6.5 Requested Changes to Permit Terms Relating to NOx Emissions

As part of this application for revision to Construction Permit No. 95010001, USS Granite City is proposing the following revisions to the emission limitations and other permit terms relating to NOx emissions from the processes or activities affected by the 1996 Project.

6.5.1 Blast Furnace Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the blast furnace operations under Table 1.

6.5.1.1 Proposed NOx Emission Limitations for Blast Furnace Operations

USS Granite City proposes the following as Condition 5.b in Construction Permit No. 95010001.

> *5.b NOx emissions from the Blast Furnace Operations (A & B Blast Furnaces Casthouse Roof Monitor, Casthouse Baghouse stack, Iron Spout Baghouse stack) shall not exceed 24.0 tons per year on a monthly rolling 12-month total.*

As the NOx emission limitations are to be incorporated in Condition 5.b itself, USS Granite City also proposes the deletion of the NOx emission limitations for specific emissions points and emissions units from Table 1 of Construction Permit No. 95010001 as they would be redundant.

6.5.1.2 Prescribed Emission Factors for Blast Furnaces Operations

Prescribed emission factors consistent with the approach described in Section 3 are provided herein. USS Granite City is proposing a prescribed emissions calculation methodology for NOx emissions from the blast furnace casthouse roof monitor based on application of 95% capture efficiency to the NOx stack test result for the blast furnace casthouse baghouse.

6.5.2 Basic Oxygen Furnace Shop Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the BOF Shop operations under Table 2.

6.5.2.1 Proposed NO_X Emission Limitations for BOF Shop Operations

USS Granite City proposes the following as Condition 18.b in Construction Permit No. 95010001.

> *18.b NO_X emissions from the BOF ESP and BOF Baghouse stacks shall not exceed 400 tons per year on a monthly rolling 12-month total.*

As the NOx emission limitations are to be incorporated in Condition 18.b itself, USS Granite City also proposes the deletion of the NOx emission limitations for specific emissions points and emissions units in Table 2 of Construction Permit No. 95010001 as they would be redundant.

7. Proposed Changes to Permit Terms for VOM Emission Increase Analysis

This section describes the proposed changes to Construction Permit No. 95010001 requested by USS Granite City related to VOM emissions. It also provides a demonstration that, even with the requested revisions, the Project would still not be a major modification under the NNSR program at 35 IAC Part 203 with respect to emissions of VOM. The emissions calculations for VOM from the 1995 Application submitted by National Steel Corporation are reproduced in Appendix B.

7.1 Construction Permit No. 95010001 Applicability and Requirements

Table 7-1 below summarizes the provisions from Construction Permit No. 95010001 pertaining to VOM emissions limitations from the project-affected emissions units. Copies of the relevant permits are provided in Appendix D1 and D2 of this application.

Table 7-1. Construction Permit Conditions Addressing VOM

Permit Condition	Requirements
5	Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.
18	Emissions from the BOF Shop operations shall not exceed the limits in attached Tables 2 and 5.
22	Emissions from the listed fuel combustion units shall not exceed the limits in Tables 4 and 5.

The annual VOM emissions caps listed in Table 5 of Construction Permit No. 95010001 are presented in Table 7-2 below. These annual VOM emissions caps cover all emissions units affected by the Project. The emission units are grouped in the three main processes or activities at the USS Granite City facility, each calculated as the sum of the unit specific VOM emissions limitations in Tables 1 through 3 and the fuel specific limitations in Table 4 of the permit.

Table 7-2. VOM Emissions Information from Table 5 of Construction Permit No. 95010001

Processes and Activities	VOM Emissions Caps (tons/year)
Blast Furnace Operations	157
BOF Shop Operations	12
Certain Fuel Combustion Units	2
Total	171

The VOM emissions caps restricted the PTE of the project affected emissions units. The VOM project emissions increase was calculated by subtracting pre-project actual emissions (August 1992 to July 1994 24-month period) from the PTE as restricted by the 1996 Construction Permit limitations. Table 6 of Construction Permit No. 95010001 included the emissions increase from the project and major modification applicability determinations for VOM. VOM net emissions increases were below the applicable significant emission rates and as a result, VOM emissions were not subject to NNSR review.

7.2 Pre-Project Actual Emissions for 1996 Project

This section presents the updated pre-project actual emissions with proposed corrections to some of the VOM emission factors. Revisions to the emissions factors are the result of more recent performance tests and updated information as discussed in 7.2.2.

7.2.1 Historical Throughput Rates

The VOM net emissions increase calculations presented in Table 6 of Construction Permit No. 95010001 were based on the calculations provided by National Steel Corporation in Table 3-6 of the 1995 Application. That table from the prior construction permit application is reproduced in Appendix B to this permit application.

The pre-project annual emissions were calculated using the same production and operating rates as the 1995 Application shown in Table 7-3.

Table 7-3. Pre-Project Production and Operating Rates for VOM

Parameters	Units	Pre-Project Rates
Blast Furnace Production	Net tons of hot metal/year	2,059,557
BOF Shop	Molten steel tons/year	2,413,406
Combined BFG Combustion	MMcf/year	121,039
Combined NG Combustion	MMcf/year	1,145
Combined Fuel Oil Combustion	Mgal/year	16

7.2.2 VOM Emission Factors Basis and Revisions

USS Granite City has corrected some of the VOM emission factors used to calculate pre-project actual emissions from the project affected emissions units based on stack testing and updated literature-based information and has validated the remaining emissions factors. The results are presented in Table 7-5; explanations are provided in the following paragraphs.

7.2.2.1 Fuel Burning Emissions Units Emissions (Revised)

The pre-project actual emissions for various fuels used in fuel burning emissions units affected by the project are calculated using the emission factors presented in Table 7-4.

Table 7-4. VOM Emission Factors for Fuel Burning

Fuel	Emission Factors and Units	Basis
Blast Furnace Gas	0.24 lb/MMcf *(revised)*	Updated based on the CoGen Boiler Permit No. 06070023
Natural Gas	5.5 lb/MMcf *(revised)*	Based on AP-42 Chapter 1.4
Coke Oven Gas (added)	0.18 lb/MMcf in stoves 1.22 lb/MMcf in boilers (both added)	Stoves – literature based factor Boilers – AIRS 1990
Fuel Oil	0.28 lb/1000 gallon	AP-42 Page 1.3-2

Section 5.2.2.15 includes discussion of inclusion of emissions from the COG combustion for applicability calculations here including the fuel usage information for the affected units.

7.2.2.2 A&B Blast Furnace Casthouse Baghouse Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnaces Casthouse stack (baghouse) as presented by National Steel Corporation in the 1995 Application were calculated using data from a stack test conducted in July 1993. Other than the test results, USS Granite City has no information regarding this stack test, which was conducted by National Steel. In March 2012, USS Granite City performed VOM stack tests at the Blast Furnace Casthouse stack. This test indicated a lower VOM emission factor for this operation than previously used (0.09458 lb/ton in the original analysis vs 0.014 lb/ton based on the March 2012 stack test). In Table 7-5, both the original and updated VOM emission factors are shown for the Blast Furnace Casthouse stack.

7.2.2.3 A&B Blast Furnace Casthouse Roof Monitor Emissions (Revised)

The pre-project actual emissions for the A and B Blast Furnace Casthouse roof monitor, as presented by National Steel Corporation in the 1995 Application, were calculated using an emission factor of 0.0047 lb/ton. This value was developed using the July 1993 stack test result of 0.09548 lb/ton for the casthouse baghouse stack and an assumption of 95% capture efficiency described in Section 5.2.2.3 herein. As discussed in 7.2.2.2 above, subsequent testing indicated a lower VOM emission factor for the stack emissions of 0.014 lb/ton. Assuming a 95% capture efficiency for the casthouse baghouse collection system, the uncaptured portion (5% of VOM generated) is emitted through the roof monitors at the rate of 0.00073 lb/ton. In Table 7-5, both the original and updated VOM emission factors are shown for the Blast Furnace Casthouse roof monitor emissions.

7.2.2.4 A&B Blast Furnace Iron Spout Baghouse Emissions (Revised)

The 1995 Application Construction Permit No. 95010001 did not identify any VOM emissions from the Blast Furnace Iron Spout Baghouse. However, a stack test conducted in March 2012 indicated a VOM emission factor of 0.0037 pounds per ton of hot metal for this emission point. In Table 7-5, the revised analysis includes pre-project actual VOM emissions from the Blast Furnace Iron Spout Baghouse stack.

7.2.2.5 BOF ESP Stack (BOF 2 Vessels) Emission (Revised)

The pre-project actual emissions for the BOF ESP stack, as presented by National Steel Corporation in the 1995 Application, were calculated using data from the average of three runs from one stack test conducted in August 1993. As discussed below, the results of this 1993 stack test have been shown by subsequent data to be non-representative of the emissions from the BOF ESP stack. The 1996 Project involved increases in the production limits for the Granite City blast furnaces and BOF Shop operations. The project did not involve any physical changes or changes in the method of operation for the BOF Shop. The BOF Shop operation does not use any add-on VOM control devices. Thus, variability in VOM emissions for the BOF process is inherent to the process operation. Beginning in 2012, USS Granite City performed several VOM stack tests at the BOF ESP stack. This testing provided an updated VOM emission factor for the BOF ESP stack (0.006 lb/ton in the original analysis vs 0.019 lb/ton based on the average of April 2012, July 2012, and November 2014 stack test results). In Table 7-5, both the original and updated VOM emission factors are shown for the BOF ESP stack.

7.2.2.1 BOF Baghouse - Secondary Emissions (New)

At the time of the 1995 Application, the BOF Shop did not include a baghouse to capture secondary emissions. Secondary emissions were released to the atmosphere through the BOF

Shop roof monitor. No information was available at the time about the VOM emissions from the BOF Shop roof monitor. Since then, the BOF Shop includes a capture system for secondary emissions that are routed to a baghouse. VOM emission testing for the BOF Shop baghouse, completed in 2019-2020 timeframe, shows an average NOx rate of 0.0035 lb/ton for the BOF Shop Baghouse stack. USS Granite City added the BOF Shop secondary VOM emissions baseline based on the result of the stack test for the BOF Shop Baghouse stack.

7.2.2.2 Desulfurization Station & Transfer Pit Baghouse Emission Factor (Revised)

The pre-project VOM baseline emissions for the Desulfurization Station & Transfer Pit Baghouse stack as presented by National Steel Corporation in the 1995 Application were calculated using an emission factor from the U.S. EPA's AIRS 1990 database (WebFIRE). In May 2012, USS Granite City performed VOM stack tests at the Desulfurization Station & Transfer Pit Baghouse stack. This testing has provided an updated VOM emission factor for this emission point (0.0010 lb/ton in the original analysis vs 0.00019 lb/ton based on a May 2012 stack test). In Table 7-5, both the original and updated VOM emission factors are shown for the Desulfurization Station & Transfer Pit Baghouse stack.

7.2.2.3 Hot Metal Charging and Ladle Skimming Stack Emissions (New)

The 1995 Application and Construction Permit No. 95010001 did not quantify any VOM emissions from the Hot Metal Charging and Ladle Skimming baghouse exhaust. USS Granite City conducted a stack test in May 2012 and based on this stack test, included a VOM emission rate of 0.00015 lb/ton for this stack.

Table 7-5. Pre-project Actual Emissions and Summary of Proposed Changes to Pre-Project VOM Emission Factors for Affected Emissions Units

Emission Point	Emission Factors		Units	Basis	Baseline Emissions (TPY)	
	Original	Corrected			Original	Corrected
A & B Blast Furnace Casthouse Stack (Baghouse)	0.09458	0.014	lb/ton of hot metal	Revised based on 3/2012 stack test	97.40	14.3
A & B Blast Furnace Casthouse Roof Monitor	0.00469	0.00073	lb/ton of hot metal	3/2012 test assuming no VOM control and 5% roof monitor fraction	4.83	0.8
Iron Spout Baghouse	0.0000	0.0037	lb/ton of hot metal	Revised based on 3/2012 stack test	0.00	3.8
Blast Furnace Operations					***102.23***	***18.8***
BOF Stack (2 Vessels)	0.0060	0.0190	lb/ton of steel	Revised based on average of 2012-2014 stack tests	7.24	22.40
BOF Secondary Emissions (2 Vessels)		0.0035	lb/ton of steel	Based on 2019-20 stack test		4.2
Desulfurization Station [inside BOF shop] & Transfer Pit	0.00100	0.00019	lb/ton of hot metal	Revised based on 5/2012 stack test	1.03	0.2
Hot Metal Charging and Ladle Skimming		0.00015	lb/ton of hot metal	Based on 5/2012 stack test		0.2
BOF Shop Operations					***8.27***	***27.0***
Combined BFG in stoves, boilers, ladle drying preheaters, and BFG flares	0.0	0.24	lb/MMcf	Updated from Cogen Boiler permit	0	14.52
Combined NG in stoves, boilers, ladle drying preheaters, and BFG flares	2.8	5.5	lb/MMcf	1998 update to AP-42 Section 1.4	1.60	3.15
Combined COG in stoves, B11 & B12		0.18 and 1.22	lb/MMcf	Added		1.38
Combined FO in stoves, B11 & B12, ladle drying preheaters, and BFG flares	0.28	0.28	lb/Mgal	No change	0.00	0.00
Certain Fuel Burning Units					***1.61***	***19.1***
Total					***112.10***	***64.9***

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7.3 Post-Project VOM Emissions Limitations

As described in subsection 5.3, the post-project emissions caps and emissions increases from the 1996 Project were, respectively, listed in Tables 5 and 6 of Construction Permit No. 95010001. Similar to PM and PM_{10}, this subsection 6.3 presents a discussion of the post-project VOM emissions caps and summary of the updated emissions increase calculations for the 1995 Project, reflecting the proposed changes in the emissions caps.

The post-project emissions caps for the project affected emissions units are developed by USS Granite City using the operating rates parameters shown in Table 7-6. Other than the natural gas usage, which is proposed to increase, and the oil usage, which is proposed to be deleted entirely, these rates are unchanged from the operating rates in Construction Permit No. 95010001. As previously noted in Section 5.3, due to 2015 shutdown of the Coke Plant this application addresses increase in natural gas usage for the fuel burning units affected by the project and also addresses elimination of COG at the affected units.

Table 7-6. Projected Post-Project Operating Rates for VOM

Parameters	Units	Post Project Rates
Blast Furnace Production	Net tons of hot metal/year	3,165,000
BOF Shop	Molten steel tons/year	3,580,000
Combined BFG Combustion	MMcf/year	183,030
Combined NG Combustion	MMcf/year	1,980
Combined COG Combustion	n/a	0
Combined Oil Combustion	n/a	0

A comparison of the VOM emissions caps from Table 5 of Construction Permit No. 95010001 and the proposed revisions to these emissions caps is provided in Table 7-7. Detailed emissions calculations are provided in Appendix B. The proposed revisions to the post-project VOM emissions caps reflect changes to some of the emission factors presented in Table 7-5 and changes in post-project operating rates as shown in Table 7-6.

Table 7-7. VOM Emissions Caps

	VOM Emission Caps (TPY) from Table 5 of Construction Permit No. 95010001	Proposed Revised VOM Emissions Caps (TPY)
Blast Furnace Operations	157	45.0
BOF Shop	12	45.20
Certain Fuel Burning Units*	2	40
Total	171	130
* Emission rates for "certain fuel combustion units" represent the potential to emit for these operations. No emissions caps are proposed for this category of units.		

Updated project emissions increase analysis for VOM reflecting proposed revisions to the emissions increase calculations in Table of Construction Permit No. 95010001, is provided in

Table 7-8. This table incorporates the effects of the corrected pre-project emission factors as shown in Table 7-5 and the requested updates to the emission limitations as shown in Table 7-7.

Table 7-8. Revised VOM Project Emissions Increase Analyses

	VOM Pre-Project Emissions (TPY)	VOM Revised Emission Limitations (TPY)	VOM Change (TPY)
Blast Furnace Operations	18.8	45.0	26.2
BOF Shop	27.0	45.0	18.0
Certain Fuel Burning Units	19.1	40.0	20.9
Total	64.9	130	65.1

7.4 Changes to Net Emissions Increase Calculation for VOM

In conjunction with the requested revisions to Construction Permit No. 95010001, USS Granite City is also updating the analysis for net increases in emissions of VOM for the 1996 Project. Table 7-9 shows the updated net emissions increases calculations for VOM based on the updated project emissions increase calculations shown in Table 7-8. This table includes a correction to the contemporaneous period for VOM emissions from the project as established using the definition in 35 IAC 203.208.[37] The start of the contemporaneous period was January 4, 1990, five years prior to the date of submittal of a timely and complete application on January 3, 1995. The end of the contemporaneous period was January 25, 1996, the date on which the emissions increase from the project occurred. The original analysis considered the #8 Galvanizing Line to be contemporaneous. However, the startup of the #8 Galvanizing Line occurred after the end of the contemporaneous period and this project was not contemporaneous for the 1996 Project.

Table 7-9. Updated Net Emissions Increases for VOM for the 1996 Project

		VOM
Start of Contemporaneous Period		Jan 1990
End of Contemporaneous Period		Jan 1996
Project Emissions Increases		65.1
Significant Emission Rates		40
Whether Significant?		Yes
Contemporaneous Emissions Increases	Date	
Installation of #8 Galvanizing Line	Mar-1996	n/a
Contemporaneous Emissions Decreases		
Blooming Mill Shutdown	Apr-1991	-0.9
NESHAP Controls for Coke By-Product Operations	Jul-1991	-31.6
Batch Annealing Shutdown	Dec-1991	-0.3
Net Emissions Increase		**32.3**
Whether Significant?		No

[37] The USS Granite City facility was located in area that was designated as nonattainment for ozone at the time of 1996 Construction Permit issuance. Therefore, NNSR provisions under 35 IAC 203 applied for the project at the time.

Net emissions increase for VOM remains below the applicable significant emission rate. Therefore, the 1996 Project remains a non-major modification under NNSR.

7.5 Requested Changes to Permit Terms Relating to VOM Emissions

As part of this application for revision to Construction Permit No. 95010001, USS Granite City is proposing the following revisions to the emission limitations and other permit terms relating to VOM emissions from the processes or activities affected by the 1996 Project.

7.5.1 Blast Furnace Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the blast furnace operations under Table 1.

7.5.1.1 Proposed VOM Emission Limitations for Blast Furnace Operations

USS Granite City proposes to add the following as Condition 5.c in Construction Permit No. 95010001.

> *5.c VOM emissions from the Blast Furnace Operations (A & B Blast Furnaces Casthouse Roof Monitor, Casthouse Baghouse stack, Iron Spout Baghouse stack) shall not exceed 45.0 tons per year on a monthly rolling 12-month total.*

As the VOM emission limitations are to be incorporated in Condition 5.c itself, USS Granite City also proposes the deletion of the VOM emission limitations from for specific emissions points and emissions units Table 1 of Construction Permit No. 95010001 as they would be redundant.

7.5.1.2 Prescribed Emission Factors for Blast Furnaces Operations

Prescribed emission factors consistent with the approach described in Section 3 herein. USS Granite City is proposing a prescribed emissions calculation methodology for NO_X emissions from the casthouse roof monitor based on application of 95% capture efficiency to the NO_X stack test result for the blast furnace casthouse baghouse.

7.5.2 Basic Oxygen Furnace Shop Operations

This section addresses the proposed changes to the terms of Construction Permit No. 95010001 for the BOF Shop operations under Table 2.

7.5.2.1 Proposed VOM Emission Limitations for BOF Shop Operations

USS Granite City proposes to add the following as Condition 18.c in Construction Permit No. 95010001.

> *18.c VOM emissions from the BOF Shop Operation (BOF ESP and BOF Baghouse, Desulf/Soda Ash and Hot Metal Charging Baghouse, and Hot Metal Charging and Ladle Skimming baghouse) shall not exceed 45.0 tons per year based on a monthly rolling 12-month total.*

As the VOM emission limitations are to be incorporated in Condition 18.c itself, USS Granite City also proposes the deletion of the VOM emission limitations for specific emission points and emissions units in Table 2 of Construction Permit No. 95010001 as they would be redundant.

8. Best Available Control Technology for CO

In accordance with 35 IAC 204.1100(c), the BACT requirement under the PSD program generally applies for each regulated NSR pollutant for which the major modification resulted in a significant net emission increase at the source. This requirement specifically applies to each emission unit that, as part of the Project, will have a net emissions increase as a result of a physical change or change in the method of operation in the unit. As previously noted, the boilers at Granite City Works, including the existing Boiler 11 and Boiler 12, were not subject to BACT as the Project does not involve physical changes or changes in the method of operation of these units.

8.1 Historical BACT Evaluation

In the 1995 Application, National Steel Corporation provided a CO BACT analysis for the blast furnace stoves, the ladle drying preheaters, and the continuous casters. Use of CO add-on control technology (*i.e.*, direct combustion in a flare, thermal oxidation, and catalytic oxidation) were proposed to be rejected on the basis of a lack of technical feasibility. National Steel proposed that good combustion practices be determined to be BACT for CO emissions from these emissions units. The ladle drying preheaters and continuous casters use NG fuel, which is inherently lower emitting practice. No add-on controls were demonstrated for these operations. Therefore, the use of NG was determined to be BACT.

Illinois EPA released a "Project Summary for Proposed Issuance of a Construction Permit" in November 1995 along with a draft construction permit. This document included a section "Additional Requirements for Major Projects" that addressed BACT requirements for the 1996 Project. BACT for CO was determined to be use of 'work practice' standards. Specifically, Illinois EPA stated the following with respect to CO BACT.

> *The requirements of PSD include a demonstration that best available control technology (BACT) will be used for SO_2 and CO emissions at affected units, an analysis of air quality impacts, and an analysis of the impacts of the project on visibility, vegetations [sic], and soils. The Agency has determined that these requirements have been met.*
>
> *GCD [Granite City Division of National Steel] has shown that* ***work practices*** *used for SO_2 and CO constitute BACT as used by other steel mills for these pollutants. [emphasis added]*

During the original PSD permitting process for the Project in 1996, neither National Steel Corporation nor Illinois EPA evaluated BACT for CO emissions from the blast furnace casthouse. As discussed in Section 4.4 of this permit application, available information at the time did not recognize that such emissions occurred, but subsequent emissions testing indicates that the blast furnace casthouse is a source of CO emissions.

8.2 Updated BACT Evaluations

USS Granite City is providing updated CO BACT evaluations for the subject fuel burning emissions units (*i.e.*, blast furnace stoves, ladle drying preheaters, blast furnace flare No. 1, and miscellaneous ancillary natural gas burning units in the BOF shop and at the continuous casters) and for the blast furnace casthouse operations.

8.2.1 BACT General Approach

This section presents a proposed BACT analysis for the subject units for CO.

8.2.1.1 Best Available Control Technology Definition

The definition of BACT in the Clean Air Act [at 42 U.S.C. § 7479(3)] is as follows:

> *The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutants which will exceed the emissions allowed by any applicable standard established pursuant to section 7411 or 7412 of this title. Emissions from any source utilizing clean fuels, or any other means, to comply with this paragraph shall not be allowed to increase above levels that would have been required under this paragraph as it existed prior to November 15, 1990.*

The meaning of the term "emission limitation" used in the BACT definition is broad, as Congress expressed no preference for numeric limits rather than non-numeric requirements in the definition of this term in the Clean Air Act [at 42 U.S.C. § 7602(k)]:

> *The terms "emission limitation" and "emission standard" mean a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this chapter.*

The regulatory definition of BACT in the PSD rules is similar, although it allows for non-numeric requirements only in limited circumstances. In particular, 35 IAC 204.280 provides:

> *"Best Available Control Technology" means an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each regulated NSR pollutant that would be emitted from any proposed major stationary source or major modification that the Agency, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel*

combustion techniques for control of such pollutant. In no event shall application of BACT result in emissions of any pollutant that would exceed the emissions allowed by any applicable standard under 40 CFR 60, 61, 62 and 63 (incorporated by reference in Section 204.100). If the Agency determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of BACT. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means that achieve equivalent results.

8.2.1.2 Methodology for the BACT Analysis

In a memorandum dated December 1, 1987, the U.S. EPA stated its preference for a "top-down" analysis.[38] U.S. EPA outlined the BACT determination methodology following the top-down approach.[39] Accordingly, the BACT analyses presented in this application utilize the top-down approach. Under the "top-down" approach, progressively less stringent control technologies are analyzed until a level of control considered BACT is determined, based on the most effective control option that is determined to result in acceptable environmental, energy, and economic impacts. More specifically, the top-down BACT analysis methodology consists of five steps as follows:

1. Identify all "available" control options that might be utilized to reduce emissions of the subject pollutant for the type of unit subject to BACT.
2. Eliminate those available options that are technically infeasible to apply to the specific unit under consideration.
3. Rank the remaining feasible control options by control effectiveness.
4. Evaluate economic, energy and/or environmental impacts of each control option as applied to the subject units, rejecting those options for which the adverse impacts are inappropriate.
5. Based on the most effective control option not rejected in Step 4, select an emission limit or work practice standard as BACT, reflecting the level of control continuously achievable with the selected control option.

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[38] Memorandum from J.C. Potter to the Regional Administrators; U.S. EPA, Office of Air and Radiation; Washington, D.C.; December 1, 1987.

[39] See: *1990 New Source Review Workshop Manual, DRAFT*, at page B.2. (Environmental Appeals Board in *Prairie State Generating Station*, PSD Appeal No. 05-05, August 24, 2006, in footnote 2, noted that "[t]he NSR Manual has been used as a guidance document in conjunction with new source review workshops and training, and as a guide for state and federal permitting officials with respect to PSD requirements and policy. Although it is not a binding Agency regulation, the NSR Manual has been looked to by this Board as a statement of the Agency's thinking on certain PSD issues.")

8.2.1.3 Baseline Emission Rate

As used in the BACT analyses presented herein, the term "baseline emission rate" refers to the legal floor established in the definition of BACT, *i.e.*, applicable standards under 40 CFR parts 60, 61, 62 and 63.

8.2.1.4 Available Control Options

In the first step of the BACT analysis, all potentially "available" control strategies are identified for further consideration. In the context of the first step of a top-down BACT analysis, U.S. EPA's guidance describes "available" control strategies as:

> *Available control options are those air pollution control technologies or techniques with a practical potential for application to the emissions unit and the regulated pollutant under evaluation.*[40]

In the BACT analyses herein, the term "available" is used, consistent with the U.S. EPA guidance, to refer to any control strategy that is potentially applicable to the source type in question (*i.e.*, a technology or control option that has a practical potential for application to the source category in general). These may include fuel cleaning or treatment, inherently lower polluting processes, and end of pipe control devices. All identified control strategies that are not inconsistent with the fundamental purpose and basic design of the proposed facility are listed in this step.

The second step of the BACT analysis addresses source-specific or unit-specific factors that would prevent an otherwise available technology from being applied in the particular case. The criteria for "technical feasibility" are separate and distinct from the criteria used to determine whether a control option is considered to be "available" for purposes of BACT.

8.2.1.5 BACT Technical Feasibility Criteria

In the second step of a top-down BACT analysis, potentially available control strategies are evaluated for technical feasibility. A technically feasible control strategy is one that has been demonstrated to function efficiently on an emissions unit that is identical or similar to the emissions unit under review.[41] For the purposes of assessing technical feasibility of an add-on control technology, the determination of whether an emissions unit should be considered to be identical or similar is usually based on the physical and chemical characteristics of the gas stream to be controlled. An add-on control technology applicable to one emissions unit may not be technically feasible for application to an apparently similar unit depending on differences in physical and chemical gas stream characteristics, and rejection of a control option based on technical infeasibility for BACT purposes is appropriate if "it is uncertain the control device will work in the situation currently undergoing review."[42]

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[40] See: *1990 New Source Review Workshop Manual, DRAFT*, at page B.5.

[41] See, *Prevention of Significant Deterioration Workshop Manual*, EPA-450/2-80-081, October 1980, at pp. I-B-6 through I-B-7.

[42] See, *PSD and Title V Permitting Guidance for Greenhouse Gases*, EPA-457/B-11-001, March 2011, at p. 34.

For control strategies that are not demonstrated, the analysis of technical feasibility is somewhat more involved. Two key concepts are important in determining whether an undemonstrated technology is feasible: "availability[43]" and "applicability." A technology is considered "available" if it can be obtained by the applicant through commercial channels or is otherwise available within the common sense meaning of the term. An available technology is "applicable" if it can reasonably be installed and operated on the source type under consideration. A technology that is both available and applicable is technically feasible.

8.2.2 CO BACT Evaluation for Fuel Burning Units

This section presents the CO BACT analyses for the subject fuel burning emissions units. CO emissions from these units result primarily from incomplete combustion during the firing of BFG and natural gas. Therefore, the most direct approach for reducing these emissions is efficient combustion in the fuel burning emissions units, *i.e.*, appropriate combustion temperatures, adequate excess air, and good air/fuel mixing during combustion. Measures taken to reduce the formation of NOx during combustion can increase CO emissions. In particular lowering combustion temperatures through staged combustion to reduce NOx emissions can be counterproductive with regard to CO emissions. The existing boilers (Boiler 11 and Boiler 12) did not undergo any physical change or change in the method of operation as a result of the 1996 Project. Therefore, pursuant to 40 CFR § 52.21(j)(3Ind 35 IAC 204.1100(c), the boilers were not and are not subject to the BACT requirement for CO emissions.

8.2.2.1 Purpose and Design of Subject Fuel Burning Emissions Units

The fundamental purpose of the blast furnace stoves is to provide heat needs for the ironmaking process preferentially using the BFG fuel, as this fuel is produced as a byproduct at the facility. Any excess BFG unable to be used in the stoves and boilers at Granite City Works is flared through the BFG flares. Use of natural gas or other higher-Btu fuel in the blast furnace stoves as supplemental fuel, for purposes of flame stabilization, also is a necessary and inherent part of the design.

The fundamental purpose of the ladle drying preheaters and ancillary fuel burning units is to provide heat needs for the mill's processes using readily available gaseous fuels.

Alternative production processes that would be inconsistent with these fundamental objectives would impermissibly redefine the source and are not a part of the BACT analyses presented herein.

8.2.2.2 CO BACT Baseline

There are no federal emissions standards applicable to CO emissions from the fuel burning emission units.

[43] In Step 2 of a top-down BACT analysis, the term "availability" has a different meaning than the term "available" in Step 1. Control strategies that are not "available" in Step 1 are not considered in Step 2.

8.2.2.3 Step 1– Identify Available CO Control Options

Based on a review of recent BACT determinations in U.S. EPA's RBLC database and other literature, the control options (individually and in certain combinations) that are being used to limit CO emissions from emissions units burning gaseous fuels include:

- CO Oxidation Catalysts;
- Thermal Incineration;
- Work Practice Standards, including good combustion practices.

CO oxidation catalysts have previously been applied to natural gas fired boilers located in CO and/or ozone nonattainment areas but are primarily used on large combustion turbines. The oxidation catalyst is typically a precious metal catalyst (e.g., platinum) that has been applied over a metal or ceramic substrate. The catalyst lowers the activation energy for the oxidation of CO so that it is oxidized at lower flue gas temperature (range of 650 - 1,100 °F). The CO removal efficiency in natural gas-fired systems at which CO oxidation catalysts are used is typically greater than 90 percent.

Other technology used for the control of CO for other sources include thermal incineration. Incineration requires the exhaust gas containing CO to be heated up to a temperature sufficiently high enough (> 1,300 °F) to thermally destroy CO. Typical methods used include regenerative thermal oxidizers, recuperative incinerators, and direct flame incinerators. These devices are typically employed to control sources with high levels of CO and VOM requiring less supplemental fuel for reheating the exhaust gas. Additionally, the exhaust gas CO concentrations from these devices would be similar to that expected from a gaseous fuel combustion device with good combustion design and operation.

Good combustion practices, as the name implies, are based upon maintaining good fuel/air mixing, a proper fuel/air ratio, and adequate time at an appropriate combustion temperature. These practices are an inherent part of the routine operation of the units, as maintaining good combustion is essential for efficient use of fuel.

8.2.2.4 Step 2– Eliminate Technically Infeasible CO Control Options

Technical feasibility of the CO emissions controls identified in Step 1 for the subject gaseous fuel burning emissions units is addressed in this section.

Blast Furnace Stoves
There are no known applications of add-on CO controls to blast furnace stoves. These control options are not feasible for this application for several reasons as discussed below.

First, the temperature of the exhaust gases from the blast furnace stoves averages around 500 °F, which is below the operating range for CO oxidation catalyst. Second, the CO concentration in the stove exhaust is relatively low at less than 0.3%. As the lower explosive limit for CO is 12.5%, the exhaust from the blast furnace stoves will not have enough CO to combust in thermal incineration.[44] Third, there is significant variation, both in exhaust flow and temperature, due to

[44] See, *e.g.*, www.cdc.gov/niosh/idlh/630080.html (last accessed Sept. 23, 2022).

cycling of the individual stoves between blow and heat steps. Fourth, oxidation catalyst would create unacceptable back-pressure on the stoves. These factors make add-on CO emissions controls infeasible.

Use of good combustion practices for the stoves is a technically feasible control option.

Other Fuel Burning Emissions Units
The No. 1 Flare, ladle drying preheaters, and fuel burning units at the continuous casters do not have specific stacks but exhaust through building ventilation or an open flame. It is not feasible to enclose the ladle drying preheaters or the ancillary fuel burning units in the BOF shop and at the continuous casters as the vessels containing molten steel need to be moved using overhead cranes in the building. Therefore, use of post-combustion control devices, such as CO oxidation catalyst, are not technically feasible for these operations.

Use of good combustion practices for the listed fuel-burning units is a technically feasible control option.

8.2.2.5 Steps 3 & 4– Rank and Evaluate CO Control Options

No add-on control devices options are technically feasible for CO emissions from the fuel burning emissions units. The only remaining control option is to follow good combustion practices. No further evaluation of control options is necessary.

Emissions from the fuel burning emissions units using good combustion practices are as described in Section 4.3 of this permit application.

8.2.2.6 Step 5 – Establish CO BACT

USS Granite City is proposing work practice requirements rather than numeric limits as BACT. Numeric emission limitations are not proposed because direct measurement of emissions—*i.e.*, use of U.S. EPA reference test methods—is not feasible for any of the fuel burning emissions units subject to the BACT requirement for CO emissions. In particular, for the stack serving the blast furnace A stoves, there is no sampling port,[45] and for the stack serving the blast furnace B stoves, there is no sampling port satisfying the location criteria in U.S. EPA Reference Method 1.[46] Each stack is refractory lined and is believed to be approximately one hundred years old.

For the reasons presented above, numeric CO emission standards are not feasible for the blast furnace stoves. USS Granite City is proposing that Illinois EPA define and impose work practice requirements, *i.e.*, good combustion practices, as BACT for the subject fuel burning emissions units. For the blast furnace stoves, USS Granite City proposes the following specific practices.

- Conduct annual adjustment and tune-up to include, at a minimum, inspecting, adjusting, cleaning, or replacing instrumentation and operational control system components and

[45] For the one-time exhaust gas sampling event discussed in footnote 19 of this permit application, USS Granite City inserted a sampling probe into the stack through a pipe used to inject steam into the stack.
[46] Appendix A-1 to 40 CFR part 60.

inspecting the air-to-fuel ratio control system and adjusting as appropriate for proper operation.

- Inspect burners at least once per calendar quarter and make repairs as appropriate.
- Continuously monitor dome temperature and flue gas oxygen level for each stove during periods of fuel burning and adjust air-to-fuel ratio as necessary to maintain instantaneous temperature in the dome—the area at the top of the stove where hot gases from the combustion chamber are distributed into the regenerative checkers—of 2,300 °F ± 100 °F.

8.2.3 BACT Evaluation for Blast Furnace Casthouse

This section presents the CO BACT analysis for the blast furnace casthouse.

8.2.3.1 Purpose and Design of Subject Blast Furnace Casthouse

The fundamental purpose of the subject blast furnace casthouse is to facilitate transfer of molten iron produced in the process to the torpedo cars and separate slag produced in the process. This operation is inherent to production of molten iron in blast furnaces, and use of coke as reductant and fuel is inherent in the design and operation of the blast furnaces at Granite City Works. Any alternative production process that would be inconsistent with these fundamental objectives would impermissibly redefine the emissions unit and is not a part of the BACT analyses presented herein.

8.2.3.2 CO BACT Baseline

There are no federal emissions standards applicable to CO emissions from the blast furnace casthouse.

8.2.3.3 Step 1– Identify Available CO Control Options

Based on a review of BACT determinations in U.S. EPA's RBLC database and other literature, the control options that are potentially available to control CO emissions from the blast furnace casthouse are:

- Capture system and thermal Incineration and
- Capture system and catalytic Incineration

These control technologies have not been applied to a blast furnace casthouse; they are technologies developed and used to control CO emissions in exhaust streams that are substantially higher than those from blast furnace casthouses. As such, it is uncertain whether they are properly considered as available control options, but they are conservatively assumed to be available for purposes of this analysis.

8.2.3.4 Step 2– Eliminate Technically Infeasible CO Control Options

For purposes of this BACT analysis for CO emissions, both of the control options identified in Step 1—use of a capture system with either thermal incineration or catalytic incineration—are

conservatively assumed to be technically feasible for the blast furnace casthouse and will be carried on to Step 4 of the BACT analysis.

8.2.3.5 Step 3 – Rank CO Control Options

For purposes of this BACT analysis for CO emissions, both of the control options identified in Step 1—use of a capture system with either thermal incineration or catalytic incineration—are conservatively assumed to be capable of achieving 90 percent control of non-fugitive CO emissions from the blast furnace casthouse at Granite City Works.

8.2.3.6 Step 4 – Evaluate Impacts of CO Control Options

The casthouse is equipped with capture systems that were installed in the 1980's in conjunction with baghouses for control of PM emissions. The capture system associated with the casthouse baghouse is estimated to achieve 95% capture efficiency, as discussed in Section 5.2.2.3 of this permit application. It is therefore assumed for purposes of this analysis that there are no energy, environmental, or economic impacts with the portion of each control option involving use of a 95% efficient capture system.

A portion of the CO that is generated in the casthouse is not captured and routed through the baghouses but rather is emitted to atmosphere as fugitive emissions through the casthouse roof monitor. Neither of the identified and available CO control options will have any effect on these emissions, so they will not be discussed further in this analysis.

The mechanically exhausted gas streams from the blast furnace casthouse are characterized by low CO concentration: The CO concentrations in the exhaust gases from the casthouse baghouse and the iron spout baghouse are approximately 43 parts per million by volume ("ppmv") and 16 ppmv, respectively.

Both thermal incineration and catalytic incineration would require combustion of significant quantities of auxiliary fuel in order to raise the temperature of the blast furnace casthouse exhaust gas streams to the temperatures necessary for oxidation (and therefore requisite to achieve decreases in CO emissions). Based on U.S. EPA air pollution control device cost and design models, the outputs from which are shown in Appendix F to this permit application, the natural gas usage would be 38.1 MMBtu/hr for regenerative thermal oxidizers with 70 percent heat recovery or 191 MMBtu/hr for fixed-bed catalytic oxidizers with 50 percent heat recovery. Assuming 0.08 lb NOx per MMBtu heat input, the additional NOx emissions from this auxiliary fuel combustion would be 13 TPY from regenerative thermal oxidizers with 70 percent heat recovery or 67 TPY for fixed-bed catalytic oxidizers with 50 percent heat recovery. These are unacceptable, adverse energy and environmental impacts.[47]

Both control options also would impose significant economic cost. Regenerative thermal oxidizers with 70 percent heat recovery would require a capital cost of more than $15 million,

[47] The air quality impacts analysis presented in Appendix C of this permit application shows that the impact of the Project on ambient CO concentration is acceptable even in the absence of any add-on controls on the blast furnace casthouse. The beneficial environmental impacts of using add-on controls to reduce CO emissions would therefore be minimal.

total annualized cost of nearly $6 million, and cost effectiveness of nearly $29,000 per ton of CO emission reduction. Fixed-bed catalytic oxidizers with 50 percent heat recovery would require a capital cost of nearly $8 million, total annualized cost of nearly $16 million, and cost effectiveness of more than $76,000 per ton of CO emission reduction. These are excessive, adverse economic impacts.

Because the adverse impacts of the identified control options greatly outweigh the trivial environmental benefit that would result from installing controls to reduce CO emissions, these control options are not BACT.

8.2.3.7 Step 5 – Establish CO BACT

USS Granite City proposes a CO emission limit of 70 lb/hr, combined for the casthouse baghouse and iron spout baghouse, as BACT for the blast furnace casthouse. This proposed limit is as stringent as any identified limit for a blast furnace casthouse at any similar facility.[48]

[48] The only CO emission limit identified for a blast furnace casthouse is a limit of 56.25 lb/hr for the casthouse baghouse stack at the Dearborn (MI) Works, currently owned and operated by Cleveland Cliffs. This casthouse has a permitted iron production rate of 8,000 tons per calendar day. See https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Permits/AQD/PTI/applications-of-interest/PTI-182-05C-Severstal-Conditions-2014-05-12.pdf (last accessed Sept. 23, 2022).

9. CO Source Impact Analysis (Including Dispersion Modeling)

In accordance with 35 IAC 204.1110 through 204.1130, requirements to conduct ambient air impacts analysis apply to a major modification for pollutants which are subject to PSD review. In issuing Construction Permit 95010001, Illinois EPA addressed PSD requirements for CO as the project was a major modification for CO. The proposed changes to the CO emission factors for gaseous fuels used in fuel burning emissions units at the facility and the recognition of CO emissions from the blast furnace casthouse will result in increases in permitted CO emission rates. The air impacts analysis for the Project with these CO emission increases is provided in Appendix C of this application. This analysis includes all of the CO emitting operations at the USS Granite City facility (including certain units that were constructed since 1996 *e.g.*, Cogeneration Boiler) and offsite sources in the area (*e.g.*, Gateway Energy and Coke Company). Results of this analysis demonstrate that the CO emissions from the Project will not cause or contribute to an exceedance of the applicable NAAQS.

10. Additional Impacts Analyses for CO

An additional impacts analysis was performed consistent with the requirements of 35 IAC 204.1110 to determine potential air emissions impacts on soils, vegetation, visibility, and growth as part of this application. The 1996 Project was a major modification for CO as its increase was in excess of the PSD significant emission rates. This application includes increases in the permitted CO emission rates; therefore, CO emissions are considered in the additional impacts analyses.

10.1 Soils and Vegetation Surveys

The only pollutant included in this analysis of the potential impairment to soils is CO. The results of this analysis show that no material impairment will occur as a result of the proposed revisions.

10.1.1 Soil Survey

Over 66,000 acres surrounding the USS Granite City site were evaluated for the soils analysis using the U.S. Department of Agriculture ("USDA") Natural Resource Conservation Service Web Soil Survey application. The area evaluated encompasses parts of Madison and St. Clair Counties in Illinois and a portion of St. Louis County in Missouri.[49] As presented in Table 10-1, the primary soil type in this area is some variety of silt clay or sandy loam or silty clay loam. These soils account for over 70 percent of the total acreage in the study. The types of soil in significant quantities around the facility include Tice-Fluvents, Landes-Fluvents, Shaffton-Fluvents. The pH of these soils ranged from 5.0 to 7.0.

[49] Source of data: U.S. Department of Agriculture, Natural Resource Conservation Service, Custom Soil Resource Report. February 18, 2020.

Table 10-1. Major Soil Types in Study Area

Map Unit Name	Acres	Percent of Total	pH	Cation Exchange Capacity (CEC) (milliequivalents per 100 grams of soil)
Darwin silty clay, 0 to 2 percent slopes	7,542.3	16.39%	7.1	32
Landes very fine sandy loam, 2 to 5 percent slopes, occasionally flooded	3,870.60	8.41%	6.9	9.4
Beaucoup silty clay loam, 0 to 2 percent slopes	3,473.80	7.55%	7	20
Nameoki silty clay loam, 0 to 2 percent slopes, frequently flooded	2,731.80	5.94%	6.8	19.5
Orthents loamy	2,415.5	5.25%	6.5	10.5
Shaffton clay loam, 0 to 2 percent slopes, occasionally flooded	2,222.60	4.83%	5.8	20
Shaffton-Fluvents-Urban land complex, 0 to 2 percent slopes, occasionally flooded	1,684.30	3.66%	5.6	16.2
Fults silty clay, 0 to 2 percent slopes, occasionally flooded	1,585.80	3.45%	6.7	21.3
Worthen silt loam	1,496.9	3.25%	6.8	16.1
Rocher loam, 2 to 5 percent slopes, frequently flooded	1,460.50	3.17%	7.8	7.8
Landes-Fluvents-Urban land complex, 2 to 5 percent slopes, occasionally flooded	1,323.70	2.88%	6.9	9.4
Dupo silt loam, 0 to 2 percent slopes, occasionally flooded	1,314.1	2.86%	6.6	26.8
Nameoki-Fluvents-Urban land complex, 0 to 2 percent slopes, occasionally flooded	1,215.40	2.64%	6.7	20
Menfro silt loam	1,173.2	2.55%	6	16
Tice silty clay loam, 0 to 2 percent slopes, occasionally flooded	1,164.90	2.53%	6.8	19
Sylvan-Bold silt loams	1,108.3	2.41%	7.1	16
Fishpot-Urban land complex, 0 to 5 percent slopes, rarely flooded	944.1	2.05%	6.5	14.2
Dozaville silt loam, 0 to 2 percent slopes, occasionally flooded	930.6	2.02%	6.6	13.3
Other soil types	8,367.3	18.18%	5.6-8.0	5.8-31.6

The cation exchange capacity ("CEC") is the total amount of extractable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality or a pH of 7.0. Soils having a low CEC hold fewer cations and may require more frequent applications of fertilizer than soils having a high CEC. The ability to retain cations reduces the hazard of ground water pollution. The CEC of the types of soil in significant quantities in the study range from 8.0 to 31.0 milliequivalents per 100g soil.

The USDA considers a significant part of this land to be prime farmland. Additional land would be considered prime farmland if drained and/or protected from flooding. Further, the USDA soil survey rated all of the soil types listed in Table 10-1 as having somewhat or very limited use for recreational activities such as camping, paths and trails, picnic areas, and playgrounds. None of the total study area is identified as having unlimited recreational value.

10.1.2 Vegetation Survey

The natural vegetation located in these counties is primarily deciduous forest consisting of oaks, hickory, eastern white and red pine, ash, and cottonwood varieties.[50] According to a 2017 U.S. Department of Agriculture Forests of Illinois survey, approximately 21% of Madison County is forest land. [51]

Information provided in the 2012 USDA Census reports for Illinois was used to identify commercial vegetation in the study area.[52] The major crops are presented in Table 10-2. As shown, approximately 60 percent of the land included in the study area is used for harvested crops. Of this total, 26 percent is used for corn for grain and 29 percent is used for soybeans. Other crops, each harvested from less than 3 percent of the harvested area include forage, wheat for grain, and vegetables. Specific locations for the farms for these harvested crops are not provided in the Census reports.

Table 10-2. Land Use for Commercially Significant Crops

Vegetation	Area (Acres)
Corn	121,675
Wheat	16,331
Forage	7,145
Soybeans	137,628
Vegetables	2,331
Total Cropland	285,110
Total Land Area of Study	474,240

10.2 Pollutant Impacts on Soils, Vegetation, and Visibility

As explained in Section 9 and Appendix C of this permit application, ambient CO impacts from the Project and the proposed revisions to the CO limitations are below the primary CO NAAQS. CO, at ambient concentrations, is not known to cause any soils or vegetation impacts.[53] Elevated

[50] Forest Inventory and Analysis. Design and Analysis Toolkit for Inventory and Monitoring web application, Version November 30, 2018 10.0 c9ded9d. St. Paul, MN: U.S. Department of Agriculture, Forest Service, Northern Research Station. Available only on internet: https://www.fs.usda.gov/emc/rig/DATIM/index.shtml (last accessed August 17, 2022).

[51] Forests of Illinois 2017, https://www.fs.usda.gov/treesearch/pubs/55799 (last accessed on August 17, 2022).

[52] 2017 Census of Agriculture, Illinois State and County Data, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Illinois/cp17119.pdf (last accessed on August 17, 2022).

[53] Secondary NAAQS provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings [https://www.epa.gov/criteria-air-pollutants/naaqs-table (last accessed on August 17, 2022)]. The U.S. EPA revoked the secondary NAAQS for CO in 1985 noting that "[c]arbon monoxide is a normal constituent of the plant environment. Plants can both metabolize and produce CO. This may explain the fact that relatively high levels of CO are necessary before damage occurs to vegetation. The lowest level for which significant effects on vegetation have been reported is 100 ppm for 3 to 35 days. The effect observed in this study was an inhibition of nitrogen fixation in legumes. Since CO concentrations of this magnitude are rarely if

CO may produce some impacts such as epinasty, chlorosis, and abscission. However, plant injury occurs at concentration over 100 ppm which is well over the CO primary NAAQS.[54] As noted in Section 9 and Appendix C, CO impacts from the facility are well below the CO primary NAAQS. Therefore, no adverse soil and vegetation impacts are expected as a result of the requested permit revisions relating to CO emissions.

In addition, CO emissions do not contribute to formation of the particulate that causes visibility impairment.[55]

10.3 Associated Growth

As stated in the 1995 Application, "The infrastructure surrounding the mill is already established due to the existing industrial nature of the area. Therefore, it is not anticipated that there will be secondary air quality impacts due to the increase in production." As part of its decision to issue Construction Permit No. 95010001 in 1996, Illinois EPA accepted this statement as part of its determination that National Steel Corporation had satisfied all requirements for impact analyses under the PSD program.

Because no physical changes are proposed, there will be no further industrial, commercial, or residential growth in the area in conjunction with the requested revisions to Construction Permit No. 95010001.

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ever observed in the ambient air, it is very unlikely that any damage to vegetation will occur from CO air pollution. No other effects on welfare have been associated with CO exposures at or near ambient levels. Because no standards appear to be requisite to protect the public welfare from any known or anticipated adverse effects from ambient CO exposures, EPA is rescinding the existing secondary standards." 50 Fed. Reg. 37484, September 13, 1985.

[54] "The Effects of Air Pollutants on Vegetation and the Role of Vegetation in Reducing Atmospheric Pollution," Iuliana Florentina Gheorghe and Barbu Ion, September 26, 2011, https://www.intechopen.com/books/the-impact-of-air-pollution-on-health-economy-environment-and-agricultural-sources/the-effects-of-air-pollutants-on-vegetation-and-the-role-of-vegetation-in-reducing-atmospheric-pollu (last accessed on Sept. 23, 2022).

[55] https://www.epa.gov/visibility/basic-information-about-visibility (last accessed on Sept. 23, 2022).

11. Regulatory Applicability Review

USS Granite City reviewed the federal and Illinois air quality regulations to determine their applicability to the proposed revisions to Construction Permit No. 95010001. Federal regulations delegated to the Illinois EPA include New Source Performance Standards ("NSPS"), and National Emission Standards for Hazardous Air Pollutants ("NESHAP"). Illinois air quality regulations are found at Title 35 of the Illinois Administrative Code ("IAC") Subtitle B. Chapters I and II of 35 IAC Subtitle B contain rules administered by the Illinois EPA.

Requirements associated with federal and State air quality regulations found to be applicable to the requested revisions of Construction Permit No. 95010001 are presented in this section.

11.1 Federal Air Quality Regulations

Federal regulations delegated to the Illinois EPA were reviewed to determine their applicability to the requested revisions. USS Granite City's conclusions regarding applicability of these rules and the supporting rationale are presented below.

11.1.1 New Source Performance Standards (NSPS, 40 CFR Part 60)

The federal NSPS regulations are codified at 40 CFR Part 60. Illinois has been delegated the authority to administer the federal NSPS.

NSPS apply to new or modified "affected facilities" as defined in specific subparts of 40 CFR Part 60. None of the emissions units covered by Construction Permit No. 95010001 are affected facilities under any NSPS. The proposed changes to the permit do not trigger applicability of NSPS requirements.

11.1.2 National Emission Standards for Hazardous Air Pollutants (NESHAP, 40 CFR Parts 61 and 63)

The federal NESHAP regulations are codified at 40 CFR Part 61 and 40 CFR Part 63 (NESHAP for source categories also known as MACT standards). Illinois EPA has been delegated authority to administer the federal NESHAP programs.

The Part 61 NESHAPs apply to certain pollutants and/or area source types. None of the emissions units covered by Construction Permit No. 95010001 are affected facilities under any Part 61 NESHAPs. The proposed changes to the permit do not trigger applicability of Part 61 NESHAPs requirements.

The Part 63 NESHAPs apply to existing, new, or reconstructed affected sources at major sources of HAP emissions in accordance with applicability criteria specified in individual subparts. The following NESHAPs now apply to the extant units that were affected under the Project.

a) Boilers 11 and 12 at USS Granite City are parts of an existing affected source subject to 40 CFR Part 63 Subpart DDDDD.[56]
b) Blast furnaces A and B are each an existing affected source subject to 40 CFR Part 63 Subpart FFFFF.
c) The BOF shop is an existing affected source subject to 40 CFR Part 63 Subpart FFFFF. (The terminology used in Subpart FFFFF is "basic oxygen process furnace shop" or "BOPF shop.")

There will be no changes to the applicability of the Part 63 NESHAPs to the boilers or the blast furnaces in conjunction with the requested permit action. However, with this application, USS Granite City requests that Illinois EPA change the organization of Construction Permit No. 95010001 to be consistent with the affected source definition under Subpart FFFFF. Specifically, the emissions unit historically identified as "Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)" and grouped with the Continuous Casting Operations in the permit is part of the "BOPF shop ancillary operations" as that term is used in Subpart FFFFF; emissions from these BOPF shop ancillary operations are subject to the emission standards and compliance demonstration requirements for BOPF shops in Subpart FFFFF. Accordingly, for clarity and consistency with these federal rule provisions, USS Granite City requests that this operation be renamed as the "Baghouse 2 for Argon Stirring and Ladle Metallurgy Facility" and grouped with the BOF Shop operations. In addition, several material handling operations historically grouped with the Blast Furnace Operations and the BOF Shop in Construction Permit No. 95010001 are not parts of those affected sources under Subpart FFFFF. For similar reasons regarding clarity and consistency with federal rule provisions, USS Granite City is requesting that those emissions units be covered under a separate group for Material Handling Operations, as detailed in Sections 5.5.1, 5.5.2, and 5.5.4 of this permit application.

11.2 Illinois Air Quality Regulations

USS Granite City performed a review of 35 IAC Subtitle B regulations to determine the applicability of specific standards to the proposed revisions to Construction Permit No. 95010001. A summary of this review and associated regulatory applicability conclusions are documented below. Only those rules deemed potentially relevant to the proposed revisions request are addressed.

11.2.1 35 IAC Part 201.142 Construction Permit Required

The proposed revisions to Construction Permit No. 95010001 involve changes to an existing construction permit for the modifications of existing emissions sources. Therefore, a revised permit in accordance with 35 IAC 201.142 is required. This permit application, including the permit application forms contained in Appendix A, is intended to fulfill the requirements of 35 IAC 201.142.

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[56] Boilers 11 and 12 are in the "units designed to burn gas 1 fuels" subcategory under Subpart DDDDD because the only regulated fuel burned in these boilers is natural gas, which falls within the definition of this term in 40 CFR § 63.7575. Blast furnace gas is expressly excluded from the definition of the term "gaseous fuel" and does not fall within any other fuel categories. These boilers previously burned COG and fuel oil but no longer do, so those fuels do not affect applicability of Subpart DDDDD to the boilers.

11.2.2 Prevention of Significant Deterioration (35 IAC Part 204) and Major Stationary Sources Construction and Modification [in Nonattainment Areas] (35 IAC Part 203)

The Illinois PSD regulations are codified at 35 IAC Part 204 and are applicable in attainment and unclassifiable areas within the State. The PSD regulations apply to new major stationary sources and to major modifications at an existing major stationary source. Emissions increases of PM, NOx, SO_2, and CO were evaluated under this program.

In nonattainment areas, Illinois EPA implements the requirements under 35 IAC Part 203 (NNSR program), with respect to major stationary sources and major modifications at major stationary sources for criteria pollutants for which the area is designated nonattainment. The area where Granite City Works is located was nonattainment for ozone and PM_{10} at the time of the 1996 Project. Therefore, emissions of NOx, VOM, and PM_{10} were evaluated under the requirements of this program.

As explained in Section 2.2 of this permit application, the revisions currently being requested to Construction Permit No. 95010001 addressed two sets of changes:

(a) Changes to the emission limits for PM, PM_{10}, NO_X, and VOM, regulated NSR pollutants for which the 1996 Project was not subject to PSD or NNSR permitting requirements. (No changes are proposed to lead emissions.)
(b) Changes to the emissions rates for CO for some of the emissions units that were subject to PSD review. (The 1996 Project also was subject to PSD review for SO_2 emissions, but USS Granite City is not requesting changes to any emissions rates or permit terms relating to SO_2.)

As demonstrated in sections 5, 6, and 7, the net emissions increases for PM, PM_{10}, NO_X, and VOM remain below the applicable significant emissions rates for these pollutants after the proposed revisions to the emissions limitations. Therefore, USS Granite City is not proposing any change to the applicability of PSD or NNSR requirements in regard to PM, PM_{10}, NOx, and VOM.

For CO, the 1996 Project was subject to the PSD requirements. Therefore, the proposed changes to the emissions limitations for CO have been evaluated per the PSD requirements. Sections 8, 9 and 10 herein address the PSD review requirements for CO.

11.2.3 35 IAC Part 270 CAAPP Permits

The CAAPP requirements are contained in Section 39.5 of the Illinois Environmental Protection Act and in 35 IAC Part 270. The Granite City Works is a major source subject to CAAPP requirements. As noted in Section 1 herein, this application package addresses the 'integrated processing' procedures for the proposed revisions to Construction Permit No. 95010001 for incorporation in the CAAPP permit via an administrative amendment.

11.2.4 Other State Regulations

There will be no change to the applicability of the limitations and requirements of other emissions standards under the Illinois Administrative Code that have already been addressed in the CAAPP permit for the USS Granite City facility.

Appendix A – Application Forms (Copies of Previously Submitted Versions)

Illinois Environmental Protection Agency

Bureau of Air • 1021 North Grand Avenue East • P.O. Box 19506 • Springfield • Illinois • 62794-9506

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY

ID Number: _____ Permit #: _____

☐ Complete ☐ Incomplete Date Complete: _____

Check Number: _____ Account Name: _____

This form is to be used to supply fee information that must accompany all construction permit applications. This application must include payment in full to be deemed complete. Make check or money order payable to the Illinois Environmental Protection Agency, Division of Air Pollution Control - Permit Section at the above address. Do NOT send cash. Refer to instructions (197-INST) for assistance.

Source Information

1. Source Name: United States Steel Corporation - Granite City Works
2. Project Name: 1996 Construction Permit Revision
3. Source ID #: (if applicable) 1191813AAI
4. Contact Name: Krista Armentrout
5. Contact Phone #: (618) 451-3013

Fee Determination

6. The boxes below are automatically calculated.

Section 1 Subtotal $0.00 + Section 2, 3 or 4 Subtotal $23,000.00 = $23,000.00 Grand Total

Section 1: Status of Source/Purpose of Submittal

7. Your application will fall under only one of the following five categories described below. Check the box that applies. Proceed to applicable sections. For purposes of this form:

- **Major Source** is a source that is required to obtain a CAAPP permit.
- **Synthetic Minor Source** is a source that has taken limits on potential to emit in a permit to avoid CAAPP permit requirements (e.g.,FESOP).
- **Non-Major Source** is a source that is not a major or synthetic minor source.

☑ Existing source without status change or with status change from synthetic minor to major source or vice versa. Proceed to Section 2.

☐ Existing non-major source that will become synthetic minor to major source. Proceed to Section 4.

☐ New major or synthetic minor source. Proceed to Section 4.

☐ New non-major source. Proceed to Section 3.

☐ AGENCY ERROR. If this is a timely request to correct an issued permit that involves only an agency error and if the request is received within the deadline for a permit appeal to the Pollution Control Board. Skip Sections 2, 3 and 4. Proceed directly to Section 5.

$0.00 Section 1 Subtotal

This agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 ET SEQ. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Section 2: Special Case Filing Fee

8. **Filing Fee**. If the application only addresses one or more of the following, check the appropriate boxes, skip Sections 3 and 4 and proceed directly to Section 5. Otherwise, proceed to Section 3 or 4 as appropriate.

Addition or replacement of control devices on permitted units.

Pilot projects/trial burns by a permitted unit

Land remediation projects

Revisions related to methodology or timing for emission testing

Minor administrative-type change to a permit

Section 3: Fees for Current or Projected Non-Major Sources

9.	This application consists of a single new emission unit or no more than two modified emission units. ($500 fee)	9.
10.	This application consists of more than one new emission unit or more than two modified units. ($1,000 fee)	10.
11.	This application consists of a new source or emission unit subject to Section 39.2 of the Act (i.e., Local Siting Review); a commercial incinerator or a municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or an emission unit designated as a complex source by agency rulemaking. ($15,000 fee)	11.
12.	A public hearing is held (see instructions). ($10,000 fee)	12.
13.	Section 3 subtotal. (lines 9 through 12 - entered on page 1)	13. $0.00

Section 4: Fees for Current or Projected Major or Synthetic Minor Sources

Application contains modified emission units only	14. For the first modified emission unit, enter $2,000.	14. $2,000.00
	15. Number of additional modified emission units = 25 x $1,000.	15. $25,000.00
	16. Line 14 plus line 15, or $5,000, whichever is less.	16. $5,000.00
Application contains new and/or modified emission units	17. For the first new emission unit, enter $4,000.	
	18. Number of additional new and/or modified emission units = x $1,000.	18. $0.00
	19. Line 17 plus line 18, or $10,000, whichever is less.	19. $0.00
Application contains netting exercise	20. Number of individual pollutants that rely on a netting exercise or contemporaneous emissions decrease to avoid application of PSD or nonattainment area NSR = 4 x $3,000.	20. $12,000.00
Additional Supplemental Fees	21. If the new source or emission unit is subject to Section 39.2 of the Act (i.e. siting); a commercial incinerator or other municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or one or more other emission units designated as a complex source by Agency rulemaking, enter $25,000.	21.
	22. If the source is a new major source subject to PSD, enter $12,000.	22.
	23. If the project is a major modification subject to PSD, enter $6,000.	23. $6,000.00
	24. If this is a new major source subject to nonattainment area (NAA) NSR, enter $20,000.	24.
	25. If this is a major modification subject to NAA NSR, enter $12,000.	25.
	26. If the application involves a determination of MACT for a pollutant and the project is not subject to BACT or LAER for the related pollutant under PSD or NSR (e.g., VOM for organic HAP), enter $5,000 per unit for which a determination is requested or otherwise required. ____ x $5,000.	26. $0.00
	27. If a public hearing is held (see instructions), enter $10,000.	27.
28. Section 4 subtotal (line 16 and lines 19 through 28) to be entered on page1		28. $23,000.00

Section 5: Certification

NOTE: Applications without a signed certification will be deemed incomplete.

29. I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the information contained in this fee application form is true, accurate and complete.

by: _____ General Manager - Granite City Works

Signature — Title of Signatory

Michael Patton — 2/25/2020

Typed or Printed Name of Signatory — Date

Illinois Environmental Protection Agency
Division Of Air Pollution Control -- Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

Construction Permit Application for a Proposed Project at a CAAPP Source	For Illinois EPA use only
	ID No.:
	Appl. No.:
	Date Rec'd:
	Chk No./Amt:

This form is to be used to supply general information to obtain a construction permit for a proposed project involving a Clean Air Act Permit Program (CAAPP) source, including construction of a new CAAPP source. Detailed information about the project must also be included in a construction permit application, as addressed in the "General Instructions For Permit Applications," Form APC-201.

Proposed Project

1. Working Name of Proposed Project:
1996 Construction Permit Revision

2. Is the project occurring at a source that already has a permit from the Bureau of Air (BOA)?
☐ No ☒ Yes If Yes, provide BOA ID Number: 119813AAI

3. Does this application request a revision to an existing construction permit issued by the BOA?
☐ No ☒ Yes If Yes, provide Permit Number: 95010001

4. Brief Description of Proposed Project:
This application proposes revisions to certain emission limits and other requirements in the 1996 Construction Permit for the U.S. Steel Granite City facility.

Source Information

1. Source name:* United States Steel Corporation - Granite City Works

2. Source street address:* 1951 State Street

3. City: Granite City	4. County: Madison	5. Zip code:* 62040

ONLY COMPLETE THE FOLLOWING FOR A SOURCE WITHOUT AN ID NUMBER.

6. Is the source located within city limits? ☐ Yes ☐ No
If no, provide Township Name:

7. Description of source and product(s) produced:	8. Primary Classification Code of source: SIC: _____ or NAICS: _____
9. Latitude (DD:MM:SS.SSSS):	10. Longitude (DD:MM:SS.SSSS):

* Is information different than previous information? ☐ Yes ☐ No
If yes, then complete Form CAAPP 273 to apply for an Administrative Change to the CAAPP Permit for the source.

Identification of Permit Applicant

1. Who is the applicant? ☒ Owner ☐ Operator	2. All correspondence to: (check one) ☒ Source ☐ Owner ☐ Operator
3. Applicant's FEIN: 25-1897152	4. Attention name and/or title for written correspondence: Krista Armentrout - Environmental Manager

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Owner Information*		
1. Name: United States Steel Corporation		
2. Address: 600 Grant Street		
3. City: Pittsburgh	4. State: PA	5. Zip code: 15219

* Is this information idifferent than previous information? ☐ Yes ☐ No
If yes, then complete Form CAAPP 273 to apply for an Administrative Change to the CAAPP Permit for the source.

Operator Information (if different from owner)*		
1. Name		
2. Address:		
3. City:	4. State:	5. Zip code:

* Is this information different than previous information? ☐ Yes ☒ No
If yes, then complete Form CAAPP 273 to apply for an Administrative Change to the CAAPP Permit for the source.

Technical Contacts for Application	
1. Preferred technical contact: (check one) ☒ Applicant's contact ☐ Consultant	
2. Applicant's technical contact person for application: Christopher Hardin	
3. Contact person's telephone number(s) (412) 433-5904	4. Contact person's e-mail address: cwhardin@uss.com
5. Consultant for application: RTP Environmental Associates Inc. (Colin Campbell)	
6. Consultant's telephone number(s): (919) 845-1422, 20	7. Consultant's e-mail address: campbell@rtpenv.com

Other Addresses for the Permit Applicant	
ONLY COMPLETE THE FOLLOWING FOR A SOURCE WITHOUT AN ID NUMBER	
1. Address for billing Site Fees for the source: ☐ Source ☐ Other (provide below):	
2. Contact person for Site Fees:	3. Contact person's telephone number:
4. Address for Annual Emission Report for the source: ☐ Source ☐ Other (provide below):	
5. Contact person for Annual Emission Report:	6. Contact person's telephone number:

Review Of Contents of the Application	
NOTE: ANSWERING "NO" TO THESE ITEMS MAY RESULT IN THE APPLICATION BEING DEEMED INCOMPLETE	
1. Does the application include a narrative description of the proposed project?	☒ Yes ☐ No
2. Does the application clearly identify the emission units and air pollution control equipment that are part of the project?	☒ Yes ☐ No
3. Does the application include process flow diagram(s) for the project showing new and modified emission units and control equipment, along with associated existing equipment and their relationships?	☒ Yes ☐ No
4. Does the application include a general description of the source, a plot plan for the source and a site map for its location?	☐ Yes ☐ No ☒ N/A* * Material previously provided
5. Does the application include relevant technical information for the proposed project as requested on CAAPP application forms (or otherwise contain all relevant technical information)?	☒ Yes ☐ No
6. Does the application include relevant supporting data and information for the proposed project as provided on CAAPP forms?	☒ Yes ☐ No
7. Does the application identify and address all applicable emission standards for the proposed project, including: State emission standards (35 IAC Chapter I, Subtitle B); Federal New Source Performance Standards (40 CFR Part 60)?	☒ Yes ☐ No
8. Does the application address whether the project would be a major project for Prevention of Significant Deterioration, 40 CFR 52.21?	☒ Yes ☐ No ☐ N/A
9. Does the application address whether the project would be a major project for "Nonattainment New Source Review," 35 IAC Part 203?	☒ Yes ☐ No ☐ N/A
10. Does the application address whether the proposed project would potentially be subject to federal regulations for Hazardous Air Pollutants (40 CFR Part 63) and address any emissions standards for hazardous air pollutants that would be applicable?	☒ Yes ☐ No ☐ N/A* * Source not major ☐ Project not major ☐
11. Does the application include a summary of annual emission data for different pollutants for the proposed project (tons/year), including: 1) The requested permitted emissions for individual new, modified and affected existing units*, 2) The past actual emissions and change in emissions for individual modified units* and affected existing units*, and 3) Total emissions consequences of the proposed project? (* Or groups of related units)	☒ Yes ☐ No ☐ N/A * The project does not involve an increase in emissions from new or modified emission units.
12. Does the application include a summary of the current and requested potential emissions of the source (tons/year)?	☒ Yes ☐ No ☐ N/A* * Applicability of PSD, NA NSR or 40 CFR 63 to the project is not related to the source's emissions.
13. Does the application address the relationships and implications of the proposed project on the CAAPP Permit for the source?	☒ Yes ☐ No ☐ N/A* * CAAPP Permit not issued
14. If the application contains information that is considered a TRADE SECRET, has it been properly marked and claimed and all requirements to properly support the claim pursuant to 35 IAC Part 130 been met? Note: "Claimed" information will not be legally protected from disclosure to the public if it is not properly claimed or does not qualify as trade secret information.	☐ Yes ☐ No ☒ N/A* * No information in the application is claimed to be a TRADE SECRET
15. Are the correct number of copies of the application provided? (See Instructions for Permit Applications, Form 201)	☒ Yes ☐ No
16. Does the application include a completed "FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION," Form 197-FEE, a check in the amount indicated on this form, and any supporting material needed to explain how the fee was determined?	☒ Yes ☐ No

Signature Block

Authorized Signature:

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete and that I am a responsible official for the source, as defined by Section 39.5(1) of the Environmental Protection Act.

BY: AUTHORIZED SIGNATURE — General Manager - Granite City Works (TITLE OF SIGNATORY)

Michael Patton (TYPED OR PRINTED NAME OF SIGNATORY) — 02 25 2020 (DATE)

Appendix B – Emissions Calculations

Updated Emissions Calculations for the Construction Permit Revision Application

USS Granite City - 1996 Production Increase Project
Revised PM PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year tons of charge	0.03	lb/ton of hot metal	30.9			Minor correction to calculation (95.0% capture efficiency)
A & B Blast Furnace Charging	2,803,241	material/year	0.0024	lb/ton of material	3.4			No change
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.07026	lb/ton of hot metal	72.4			No change
Blast Furnace Slag Pits	2,059,557	tons of hot metal/year	0.00417	lb/ton of hot metal	4.3			No change
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.02548	lb/ton of hot metal	26.2			No change
Subtotal					137.1	215.0	77.9	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.16	lb/ton of steel	193.1			No change
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.428	lb/ton of steel	516.7			No change
BOF Hot Metal Transfer and Desulfurization Baghouse	2,059,557	tons of hot metal/year	0.03721	lb/ton of hot metal	38.3			No change
BOF Slag Skimming Baghouse	2,059,557	tons of hot metal/year	0.00502	lb/ton of hot metal	5.2			No change
Baghouse 2 for Argon Stirring Ladle Metallurgy	2,413,406	tons of molten steel/year	0.00715	lb/ton of steel	8.6			No change other than regrouping
Subtotal					761.9	525.0	-236.9	
Continuous Casting Operations								
Caster Mold - Casters #1 & #2	2,413,406	tons of molten steel/year	0.006	lb/ton of steel	7.2			No change
Continuous Casters #1 & #2 - Spray Chamber	2,413,406	tons of molten steel/year	0.00852	lb/ton of steel	10.3			No change
Slab Cutoff Casters #1 & #2	2,413,406	tons of molten steel/year	0.0071	lb/ton of steel	8.6			No change
Slab Ripping Casters #1 & #2	2,413,406	tons of molten steel/year	0.00722	lb/ton of steel	8.7			No change
Subtotal					34.8	52.0	17.2	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	2.90	lb/MMcf	65.2			No change
COG in stoves	374	MMcf/year	16.56	lb/MMcf	3.1			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	2.90	lb/MMcf	72.4			No change
COG in boilers	2,211	MMcf/year	43.13	lb/MMcf	47.7			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	9.72	lb/Mgal	0.1			No change
Natural gas in boilers	805	MMcf/year	1.9	lb/MMcf	0.8			Revised to use current AP-42 emission factor
BFG in BFG flare	26,132	MMcf/year	2.9	lb/MMcf	37.9			No change
Natural gas in ladle preheaters	340	MMcf/year	1.9	lb/MMcf	0.3			Revised to use current AP-42 emission factor
Subtotal					227.4	273.0	45.6	
Material Handling Operations at BF and BOF								
Material handling for Coke, Pellets, Limestone	Table F-3 of the 1995 Permit Application				17.2			This activity was previously listed only in the contemporaneous changes.
Iron Pellet Screen	2,803,241	tons of charge material/year	0.00375	lb/ton of material	5.3			USS representation of 85% control to crushed stone EF
BOF Hopper Baghouse	2,413,406	tons of molten steel/year	0.00032	lb/ton of steel	0.4			No change other than regrouping
BOF Bin Floor Baghouse	2,413,406	tons of molten steel/year	0.0016	lb/ton of steel	1.9			No change other than regrouping
Baghouse 1 for Material Handling	2,413,406	tons of molten steel/year	0.00355	lb/ton of steel	4.3			No change other than regrouping
Subtotal					29.0	30.0	1.0	

R004945

USS Granite City - 1996 Production Increase Project
Revised PM PSD Net Emissions Increase Analysis

Contemporaneous Changes		
Remove Blast Furnace Slag Spout Hood	0.0	Removed from analysis because not contemporaneous
#2 Caster Production	0.0	Removed from analysis because not contemporaneous
Installation of #8 Galvanizing Line	0.0	Removed from analysis because not contemporaneous
Ingot Teeming Shutdown	-22.4	No change
Blooming Mill Shutdown	-3.4	No change
Batch Annealing Shutdown	-0.2	No change
Haul Roads emissions controls	-17.1	Revised to reflect only the haul road emissions changes
Subtotal	-43.1	
Total	-138.4	

R004946

USS Granite City - 1996 Production Increase Project
Revised PM10 PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year tons of charge	0.0153	lb/ton of hot metal	15.8			Minor correction to calculation (95.0% capture efficiency)
A & B Blast Furnace Charging	2,803,241	material/year	0.0012	lb/ton of material	1.7			USS representation includes basis for EF
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.07026	lb/ton of hot metal	72.4			No change
Blast Furnace Slag Pits	2,059,557	tons of hot metal/year	0.00417	lb/ton of hot metal	4.3			No change
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.02548	lb/ton of hot metal	26.2			No change
Subtotal					120.3	190.0	69.7	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.16	lb/ton of steel	193.1			No change
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.287	lb/ton of steel	346.2			No change
BOF Hot Metal Transfer and Desulfurization Baghouse	2,059,557	tons of hot metal/year	0.03721	lb/ton of hot metal	38.3			No change
BOF Slag Skimming Baghouse	2,059,557	tons of hot metal/year	0.00502	lb/ton of hot metal	5.2			No change
Baghouse 2 for Argon Stirring Ladle Metallurgy	2,413,406	tons of molten steel/year	0.00715	lb/ton of steel	8.6			No change other than regrouping
Subtotal					591.4	462.0	-129.4	
Continuous Casting Operations								
Caster Mold - Casters #1 & #2	2,413,406	tons of molten steel/year	0.006	lb/ton of steel	7.2			No change
Continuous Casters #1 & #2 - Spray Chamber	2,413,406	tons of molten steel/year	0.00852	lb/ton of steel	10.3			No change
Slab Cutoff Casters #1 & #2	2,413,406	tons of molten steel/year	0.0071	lb/ton of steel	8.6			No change
Slab Ripping Casters #1 & #2	2,413,406	tons of molten steel/year	0.00722	lb/ton of steel	8.7			No change
Subtotal					34.8	52.0	17.2	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	2.90	lb/MMcf	65.2			No change
COG in stoves	374	MMcf/year	14.21	lb/MMcf	2.7			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	2.90	lb/MMcf	72.4			No change
COG in boilers	2,211	MMcf/year	41.48		45.8			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	9.72	lb/Mgal	0.1			No change
Natural gas in boilers	805	MMcf/year	1.9	lb/MMcf	0.8			Revised to use current AP-42 emission factor
BFG in BFG flare	26,132	MMcf/year	2.9	lb/MMcf	37.9			No change
Natural gas in ladle preheaters	340		1.9		0.3			Revised to use current AP-42 emission factor
Subtotal					225.2	273.0	47.8	
Material Handling Operations at BF and BOF								
Material handling for Coke, Pellets, Limestone	Table F-3 of the 1995 Permit Application	tons of charge			17.2			This activity was previously listed only in the contemporaneous changes.
Iron Pellet Screen	2,803,241	material/year	0.00131	lb/ton of material	1.8			USS representation of 85% control to crushed stone EF
BOF Hopper Baghouse	2,413,406	tons of molten steel/year	0.00032	lb/ton of steel	0.4			No change other than regrouping
BOF Bin Floor Baghouse	2,413,406	tons of molten steel/year	0.0016	lb/ton of steel	1.9			No change other than regrouping
Baghouse 1 for Material Handling	2,413,406	tons of molten steel/year	0.00355	lb/ton of steel	4.3			No change other than regrouping
Subtotal					25.6	19.0	-6.6	

R004947

USS Granite City - 1996 Production Increase Project
Revised PM10 PSD Net Emissions Increase Analysis

Contemporaneous Changes		
Remove Blast Furnace Slag Spout Hood	4.9	No change
#2 Caster Production	11.7	No change
Installation of #8 Galvanizing Line	0.0	Removed from analysis because not contemporaneous
Ingot Teeming Shutdown	-22.4	No change
Blooming Mill Shutdown	-3.4	No change
Batch Annealing Shutdown	-0.2	No change
Haul Roads emissions controls	-17.1	Revised to reflect only the road emissions changes
Subtotal	-26.5	
Total	-27.8	

R004948

USS Granite City - 1996 Production Increase Project
Revised NOx PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year	0.00014	lb/ton of hot metal	0.1			3/2012 test assuming no NOx control and 5% fugitive
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.0027	lb/ton of hot metal	2.8			3/2012 test
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.0016	lb/ton of hot metal	1.6			3/2012 test
Subtotal					4.6	24.0	19.4	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.14	lb/ton of steel	170.8			Average of 4/2012, 7/2012, 11/2014 test results
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.0075	lb/ton of steel	9.1			Average from 2019-20 test result
Subtotal					179.8	400.0	220.2	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	5.28	lb/MMcf	118.74			No change
COG in stoves	374	MMcf/year	80	lb/MMcf	14.95			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	5.28	lb/MMcf	131.82			No change
COG in boilers	2,211	MMcf/year	404	lb/MMcf	446.23			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	55	lb/Mgal	0.44			No change
Natural gas in boilers	805	MMcf/year	306	lb/MMcf	123.17			No change
BFG in BFG flare	26,132	MMcf/year	5.28	lb/MMcf	68.99			No change
Natural gas in ladle preheaters	340		306		52.02			Revised to use current AP-42 emission factor
Subtotal					956.3	706.0	-250.3	
Contemporaneous Changes								
Installation of #8 Galvanizing Line							0.0	Removed from analysis because not contemporaneous
Batch Annealing Shutdown							-8.7	Removed from analysis because not contemporaneous
Blooming Mill Shutdown							-217.8	No change
Subtotal							-226.5	
Total							-237.3	

R004949

USS Granite City - 1996 Production Increase Project
Revised VOM PSD Net Emissions Increase Analysis

Emission Point	Pre-Project Throughput	Units	Pre-Project Emission Factor	Units	Baseline Emissions (TPY)	Future Emissions (TPY)	Emissions Change (TPY)	Change from 1996 analysis?
Blast Furnace Operations								
A & B Blast Furnace Casthouse Fugitives	2,059,557	tons of hot metal/year	0.00073	lb/ton of hot metal	0.8			3/2012 test assuming no VOM control and 5% fugitive
A & B Blast Furnace Casthouse Baghouse	2,059,557	tons of hot metal/year	0.014	lb/ton of hot metal	14.3			3/2012 test
Iron Spout Baghouse	2,059,557	tons of hot metal/year	0.0037	lb/ton of hot metal	3.8			3/2012 test
Subtotal					18.8	45.0	26.2	
BOF Shop								
BOF 2 Vessels Primary Emissions	2,413,406	tons of molten steel/year	0.019	lb/ton of steel	22.4			Average of 4/2012, 7/2012, 11/2014 test results
BOF 2 Vessels Secondary Emissions	2,413,406	tons of molten steel/year	0.0035	lb/ton of steel	4.2			Average from 2019-20 test result
BOF Hot Metal Transfer and Desulfurization Baghouse	2,059,557	tons of hot metal/year	0.00019	lb/ton of hot metal	0.2			5/2012 test
BOF Slag Skimming Baghouse	2,059,557	tons of hot metal/year	0.00015	lb/ton of hot metal	0.2			5/2012 test
Subtotal					27.0	45.0	18.0	
Certain Fuel Burning Emissions Units								
BFG in stoves	44,977	MMcf/year	0.24	lb/MMcf	5.40			Updated from Cogen Permit
COG in stoves	374	MMcf/year	0.18	lb/MMcf	0.03			Added; omitted from 1996 analysis
BFG in boilers	49,930	MMcf/year	0.24	lb/MMcf	5.99			Updated from Cogen Permit
COG in boilers	2,211	MMcf/year	1.22	lb/MMcf	1.34			Added; omitted from 1996 analysis
Fuel oil in boilers	16	Mgal/year	0.28	lb/Mgal	0.00			No change
Natural gas in boilers	805	MMcf/year	5.5	lb/MMcf	2.21			1998 update to AP-42 Section 1.4
BFG in BFG flare	26,132	MMcf/year	0.24	lb/MMcf	3.14			Updated from Cogen Permit
Natural gas in ladle preheaters	340		5.5		0.94			1998 update to AP-42 Section 1.4
Subtotal					19.1	40.0	20.9	
Contemporaneous Changes								
Installation of #8 Galvanizing Line							0.0	Removed from analysis because not contemporaneous
NESHAP Controls Coke By-product							-31.6	No change
Batch Annealing Shutdown							-0.3	No change
Blooming Mill Shutdown							-0.9	No change
Subtotal							-32.8	
Total							32.3	

R004950

Emissions Calculations Included in the 1995 Construction Permit Application

TABLE 3-1
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - CO

Projected Emissions Based On: Blast Furnace @ 8,[illegible]1NTPD
BOF @ 9,808 NTPD

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	13.7	lb/MMcf	22,774	MMcf	156.00	Included in line 17	-	-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	13.7	lb/MMcf	22,203	MMcf	152.09	Included in line 17	-	-	-
3	0008	01	Blast Furnace Gas Flare - BFG	13.7	lb/MMcf	26,132	MMcf	179.00	Included in line 17	-	-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	13.7	lb/MMcf	37,501	MMcf	256.88	Included in line 17	-	-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	40	lb/MMcf	361	MMcf	7.22	Included in line 16	-	-	-
6	0044	01	Boiler #11 - BFG	13.7	lb/MMcf	5,323	MMcf	36.46	Included in line 17	-	-	-
7	0044	91	Boiler #11 - NG	40	lb/MMcf	226	MMcf	4.52	Included in line 16	-	-	-
8	0044	92	Boiler #11 - Fuel Oil	5.0	lb/Mgal	15.00	Mgal	0.04	Included in line 18	-	-	-
9	0048	01	Boiler #12 - BFG	13.7	lb/MMcf	7,106	MMcf	48.68	Included in line 17	-	-	-
10	0048	91	Boiler #12 - NG	40	lb/MMcf	218	MMcf	4.36	Included in line 16	-	-	-
11	0048	92	Boiler #12 - Fuel Oil	5.0	lb/Mgal	1.00	Mgal	0.00	Included in line 18	-	-	-
12	0033	01	BOF 2 Vessels	8.993	lb/ton proc.	2,413,406	ton proc.	10,851.88	3,580,000	ton proc.	16,097.47	5,245.59
13	0038	01	BOF Preheaters/Dryers - NG	40	lb/MMcf	283	MMcf	5.66	Included in line 16	-	-	-
14	0071 & 0119	01	Continuous Casters #1 & #2 - NG	40	lb/MMcf	57	MMcf	1.14	Included in line 16	-	-	-
15			Natural Gas	40	lb/MMcf	1,145	MMcf	inc. above	1,145	MMcf	22.90	-
16			Blast Furnace Gas	13.7	lb/MMcf	121,039	MMcf	inc. above	185,030	MMcf	1,267.46	-
17			Fuel Oil	5.0	lb/Mgal	16	Mgal	inc. above	365	Mgal	0.91	-
	TOTALS:							**11,703.94**			**17,388.74**	**5,684.80**
			Contemporaneous Changes									(11.51)
			Net Change									***5,673.29***

R004952

TABLE 3-2
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - NOx

Projected Emissions Based On: Blast Furnace @[illegible]71NTPD
BOF @ 9,808 NTPD

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy	
1	0004	01	"A" Blast Furnace Stoves - BFG	5.28	lb/MMcf	22,774	MMcf	60.12	Included in Line 20	-	-	-	
2	0009	01	"B" Blast Furnace Stoves - BFG	5.28	lb/MMcf	22,203	MMcf	58.62	Included in Line 20	-	-	-	
3	0008	01	Blast Furnace Gas Flare - BFG	5.28	lb/MMcf	26,132	MMcf	68.99	Included in Line 20	-	-	-	
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	5.28	lb/MMcf	37,501	MMcf	99.00	Included in Line 20	-	-	-	
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	306	lb/MMcf	361	MMcf	55.23	Included in Line 19	-	-	-	
6	0044	01	Boiler #11 - BFG	5.28	lb/MMcf	5,323	MMcf	14.05	Included in Line 20	-	-	-	
7	0044	91	Boiler #11 - NG	306	lb/MMcf	226	MMcf	34.58	Included in Line 19	-	-	-	
8	0044	92	Boiler #11 - Fuel Oil	55	lb/Mgal	15.00	Mgal	0.41	Included in Line 21	-	-	-	
9	0048	01	Boiler #12 - BFG	5.28	lb/MMcf	7,106	MMcf	18.76	Included in Line 20	-	-	-	
10	0048	91	Boiler #12 - NG	306	lb/MMcf	218	MMcf	33.35	Included in Line 19	-	-	-	
11	0048	92	Boiler #12 - Fuel Oil	55	lb/Mgal	1.00	Mgal	0.03	Included in Line 21	-	-	-	
12	0033	01	BOF 2 Vessels	0.0389	lb/ton proc.	2,413,406	tons proc.	46.94	3,580,000	ton proc.	69.63	X -	•22.69
13	0038	01	BOF Preheaters/Dryers - NG	306	lb/MMcf	283	MMcf	43.30	Included in Line 19	-	-	-	
14	0007 & 0012	01	"A" & "B" Blast Furnace - Casthouse	0.01440	lb/ton proc.	2,059,557	tons proc.	14.83	3,165,000	tons proc.	22.79	X -	7.96
15	0005 & 0010	01	"A" & "B" Blast Furnace - Uncaptured Roof Emiss.	0.00072	lb/ton proc.	2,059,557	tons proc.	0.74	3,165,000	tons proc.	1.14	-	0.4
16	0070 &0120	01	Caster Mold - Casters #1 & #2	0.05	lb/ton prod.	2,413,406	tons prod.	60.34	3,580,000	ton prod.	89.50	X -	29.16
17	0071 & 0119	01	Continuous Casters #1 & #2 - NG	306	lb/MMcf	57	MMcf	8.72	Included in Line 19	-	-	-	60.21
18			Natural Gas	306	lb/MMcf	1,145	MMcf	inc. above	1,145	MMcf	175.19	-	
19			Blast Furnace Gas	5.28	lb/MMcf	121,039	MMcf	inc. above	185,030	MMcf	488.48	+ 168.54	52.9%
20			Fuel Oil	55	lb/Mgal	16	Mgal	inc. above	365	Mgal	10.04	+ 9.59	
	TOTALS:							618.01			856.76	238.75	229.15
			Contemperaneous Changes									(200.54)	
			Net Change									*38.21*	

+15%

R004953

TABLE 3-3
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - SO2

Projected Emissions Based On: Blast Furnace @ 8,671NTPD
BOF @ 9,808 NTPD

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy	COMMENTS
1	0004	01	"A" Blast Furnace Stoves - BFG	6.65	lb/MMcf	22,774	MMcf	75.72	included in line 19	-	-	-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	6.65	lb/MMcf	22,203	MMcf	73.82	included in line 19	-	-	-	-
3	0008	01	Blast Furnace Gas Flare - BFG	6.65	lb/MMcf	26,132	MMcf	86.89	included in line 19	-	-	-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	6.65	lb/MMcf	37,501	MMcf	124.69	included in line 19	-	-	-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	0.6	lb/MMcf	361	MMcf	0.11	included in line 18	-	-	-	-
6	0044	01	Boiler #11 - BFG	6.65	lb/MMcf	5,323	MMcf	17.70	included in line 19	-	-	-	-
7	0044	91	Boiler #11 - NG	0.6	lb/MMcf	226	MMcf	0.07	included in line 18	-	-	-	-
8	0044	92	Boiler #11 - Fuel Oil	141.3	lb/Mgal	15.00	Mgal	1.06	included in line 20	-	-	-	-
9	0048	01	Boiler #12 - BFG	6.65	lb/MMcf	7,106	MMcf	23.63	included in line 19	-	-	-	-
10	0048	91	Boiler #12 - NG	0.6	lb/MMcf	218	MMcf	0.07	included in line 18	-	-	-	-
11	0048	92	Boiler #12 - Fuel Oil	141.3	lb/Mgal	1.00	Mgal	0.07	included in line 20	-	-	-	-
12	0038	01	BOF Preheaters/Dryers - NG	0.6	lb/MMcf	283	MMcf	0.08	included in line 18	-	-	-	-
13	0007 & 0012	01	"A & B" Blast Furnace - Casthouse	0.2006	lb/ton proc.	2,059,557	tons proc.	206.57	3,165,000	tons proc.	422.00	215.43	Est. Annual Max
14	0005 & 0010	01	"A & B" Blast Furnace - Uncap. roof	0.0104	lb/ton proc.	2,059,557	tons proc.	10.71	3,165,000	tons proc.	21.94	11.23	Est. Annual Max
15	—	—	Iron Spout Baghouse	0.0073	lb/ton proc.	2,059,557	tons proc.	7.52	3,165,000	tons proc.	13.89	6.37	Est. Annual Max
16	113	1	Blast Furnace Slag Pits	0.0100	lb/ton	2,059,557	tons proc.	10.30	3,165,000	tons proc.	15.83	5.53	
17	0071 & 0119	01	Continuous Casters #1 & #2 - NG	0.6	lb/MMcf	57	MMcf	0.02	included in line 18	-	-	-	
18			Natural Gas	0.6	lb/MMcf	1,145	MMcf	-	1,145	MMcf	0.34	0.00	
19			Blast Furnace Gas	6.65	lb/MMcf	121,039	MMcf	-	185,030	MMcf	615.22	212.77	
20			Fuel Oil	141.3	lb/Mgal	16	Mgal	-	385	Mgal	25.79	24.66	
	TOTALS:							**639.03**			**1,115.01**	**475.98**	
			Contemporaneous Changes									(0.13)	
			Net Change									***475.85***	

R004954

TABLE 3-4
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - PM-10

Projected Emissions Based On: Blast Furnace @ 3,071NTPD
BOF @ 9,808 NTPD

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
3	0008	01	Blast Furnace Gas Flare - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
6	0044	01	Boiler #11 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
7	0044	91	Boiler #11 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
8	0044	92	Boiler #11 - Fuel Oil	9.72	lb/Mgal	Included in line 40	Mgal	-	Included in line 40	-			-	-
9	0048	01	Boiler #12 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
10	0048	91	Boiler #12 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
11	0048	92	Boiler #12 - Fuel Oil	9.72	lb/Mgal	Included in line 48	Mgal	-	Included in line 48	-			-	-
12	0033	01	BOF 2 Vessels	0.16	lb/ton proc.	2,413,406	tons proc.	193.07	8,760	hours	60	lbs/hr	262.80	69.73
13	0038	01	BOF Preheaters/Dryers - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
14	0005 & 0010	01	"A" & "B" Blast Furnace - Uncap. Fugitives	0.0155	lb/ton proc.	2,059,557	tons proc.	15.96	3,165,000	tons proc.			24.53	8.57
15	0006 & 0011	01	"A" & "B" Blast Furnace - Charging	0.0024	lb/ton pellets charged	2,803,241	tons proc.	3.36	4,308,581	tons proc.			5.17	1.81
16	0007 & 0012	01	"A" & "B" Blast Furnace - Baghouse Stack	0.0703	lb/ton proc.	2,059,557	tons proc.	72.35	3,165,000	tons proc.			111.19	38.83
17	0034	01	BOF Roof Monitor	0.287	lb/ton proc.	2,413,406	tons proc.	346.20	3,580,000	tons proc.	0.066144		118.40	(227.81)
18	0037	01	Flux Conv. & Xfer Pts., Bin Floor - BOF	0.0016	lb/ton proc.	2,413,406	tons proc.	1.93	3,580,000	tons proc.			2.86	0.93
19	0040	01	Hot Metal Chging Ladle Slag Skimmer	0.0050	lb/ton proc.	2,059,557	tons proc.	5.17	3,165,000	tons proc.			7.94	2.77

R004955

TABLE 3-4
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - PM-10

Projected Emissions Based On: Blast Furnace @ 8,071NTPD
BOF @ 9,808 NTPD

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
20	0070 & 0120	01	Caster Mold - Casters #1 & #2	0.006	lb/ton prod.	2,413,406	tons prod.	7.24	3,580,000	ton prod.			10.74	3.50
21	0071 & 0119	01	Cont. Casters #1 & #2 - Spray Chamber	0.00852	lb/ton proc.	2,413,406	tons prod.	10.28	3,580,000	ton prod.			15.25	4.97
22	0071 & 0119	01	Continuous Casters #1 & #2 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
23	0072 & 0118	01	Slab Cutoff - Casters #1 & #2	0.0071	lb/ton proc.	2,413,406	tons prod.	8.57	3,580,000	ton prod.			12.71	4.14
	73	1	Slab Ripping - Casters #1 & #2	0.00722	lb/ton proc.	2,413,406	tons prod.	8.71	3,580,000	ton prod.			12.92	4.21
25	0103, 0104 & 0121	01	LMF Argon Stirring #1 & #2, Material Handling Tripper	0.00715	lb/ton proc.	2,413,406	tons prod.	8.63	3,580,000	ton prod.			12.80	4.17
26	0105 & 0106	01	Deslagging Station & Material HS	0.00355	lb/ton proc.	2,413,406	tons prod.	4.28	3,580,000	ton prod.			6.35	2.07
27			BOF Hopper Baghouse	0.00032	lb/ton proc.	2,413,406	tons proc.	0.39	3,580,000	tons proc.			0.57	0.18
28	0107 & 0035	01	Desulf. Station (inside BOF shop) & Xfer Pit	0.03721	lb/ton proc.	2,059,557	tons prod.	38.32	3,165,000	ton prod.			58.88	20.57
29	0113	01	Blast Furnace Slag Pits	0.00417	lb/ton proc.	2,059,557	tons slag	4.29	3,165,000	ton prod.			6.60	2.30
30	9003	01	Iron Pellet Screen	0.00279	lb/ton pellets charged	2,803,241	tons proc.	3.91	4,308,581	tons proc.			6.01	2.10
31		01	Iron Spout Baghouse	0.02548	lb/ton proc.	2,059,557	tons proc.	26.24	3,165,000	tons proc.			40.32	14.08
32			Road Fugitive Emissions	Included in Contemporaneous Changes. See Appendix F						-				0.00
33			Material Handling	Included in Contemporaneous Changes. See Appendix F						-				0.00
34			Unpaved Parking Lots					-		-			-	-
35			Paved Parking Lots					-		-			-	-
36			Natural Gas	5.1	lb/MMcf	1,145	MMcf	2.92	1,145	MMcf			2.92	0.00
37			Blast Furnace Gas	2.9	lb/MMcf	121,039	MMcf	175.51	185,030	MMcf			268.29	92.79
38			Fuel Oil	9.72	lb/Mgal	16	Mgal	0.08	365	Mgal			1.77	1.70
	TOTALS:							937.42					989.04	51.62
			Contemporaneous Changes											(37.31)
			Net Change											*14.31*

+145

Note: Actual Emissions = Base Year Throughput * Emission Factor / 2000

Projected Actual Emissions = Projected Throughput * Emission Factor / 2000
except -
BOF Vessels Projected Actual Emissions = 60 lb/hr * 8760 hrs
BOF Roof Monitor Projected Actual Emissions = Projected Emission Factor * Projected Throughput

R004956

TABLE 3-5
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - TSP

Projected Emissions Based On: Blast Furnace @ [illegible]71NTPD
BOF @ 9,808 NTPD

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
3	0008	01	Blast Furnace Gas Flare - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
6	0044	01	Boiler #11 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
7	0044	91	Boiler #11 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
8	0044	92	Boiler #11 - Fuel Oil	9.72	lb/Mgal	Included in line 40	Mgal	-	Included in line 40	-			-	-
9	0048	01	Boiler #12 - BFG	2.9	lb/MMcf	Included in line 39	MMcf	-	Included in line 39	-			-	-
10	0048	91	Boiler #12 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
11	0048	92	Boiler #12 - Fuel Oil	9.72	lb/Mgal	Included in line 48	Mgal	-	Included in line 48	-			-	-
12	0033	01	BOF 2 Vessels	0.16	lb/ton proc.	2,413,406	tons proc.	193.07	8,760	hours	60	lbs/hr	262.80	69.73
13	0038	01	BOF Preheaters/Dryers - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
14	0005 & 0010	01	"A" & "B" Blast Furnace - Uncap. Fugitives	0.031	lb/ton proc.	2,059,557	tons proc.	31.92	3,165,000	tons proc.			49.06	17.13
15	0006 & 0011	01	"A" & "B" Blast Furnace - Charging	0.0024	lb/ton pellets charged	2,803,241	tons proc.	3.36	4,308,581	tons proc.			5.17	1.81
16	0007 & 0012	01	"A" & "B" Blast Furnace - Baghouse Stack	0.0703	lb/ton proc.	2,059,557	tons proc.	72.35	3,165,000	tons proc.			111.19	38.83
17	0034	01	BOF Roof Monitor	0.428	lb/ton proc.	2,413,406	tons proc.	516.72	3,580,000	tons proc.	0.0987		176.71	(340.01)
18	0037	01	Flux Conv. & Xfer Pts., Bin Floor - BOF	0.0016	lb/ton proc.	2,413,406	tons proc.	1.93	3,580,000	tons proc.			2.86	0.93
19	0040	01	Hot Metal Chging Ladle Slag Skimmer	0.0050	lb/ton proc.	2,059,557	tons proc.	5.17	3,165,000	tons proc.			7.94	2.77

R004957

TABLE 3-5
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - TSP

Projected Emissions Based On: Blast Furnace @ 8,071NTPD
BOF @ 9,808 NTPD

Line #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED EMISSION FACTOR	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
20	0070 & 0120	01	Caster Mold - Casters #1 & #2	0.006	lb/ton prod.	2,413,406	tons prod.	7.24	3,580,000	ton prod.			10.74	3.50
21	0071 & 0119	01	Cont. Casters #1 & #2 - Spray Chamber	0.00852	lb/ton proc.	2,413,406	tons prod.	10.28	3,580,000	ton prod.			15.25	4.97
22	0071 & 0119	01	Continuous Casters #1 & #2 - NG	5.1	lb/MMcf	Included in line 38	MMcf	-	Included in line 38	-			-	-
23	0072 & 0118	01	Slab Cutoff - Casters #1 & #2	0.0071	lb/ton proc.	2,413,406	tons prod.	8.57	3,580,000	ton prod.			12.71	4.14
	73	1	Slab Ripping - Casters #1 & #2	0.00722	lb/ton proc.	2,413,406	tons prod.	8.71	3,580,000	ton prod.			12.92	4.21
25	0103, 0104 & 0121	01	Argon Stirring #1 & #2, Material Handling Tripper	0.00715	lb/ton proc.	2,413,406	tons prod.	8.63	3,580,000	ton prod.			12.80	4.17
26	0105 & 0106	01	Deslagging Station & Material HS	0.00355	lb/ton proc.	2,413,406	tons prod.	4.28	3,580,000	ton prod.			6.35	2.07
27			BOF Hopper Baghouse	0.00032	lb/ton proc.	2,413,406	tons proc.	0.39	3,580,000	tons proc.			0.57	0.18
28	0107 & 0035	01	Desulf. Station (inside BOF shop) & Xfer Pit	0.03721	lb/ton proc.	2,059,557	tons prod.	38.32	3,165,000	ton prod.			58.88	20.57
29	0113	01	Blast Furnace Slag Pits	0.00417	lb/ton proc.	2,059,557	tons slag	4.29	3,165,000	ton prod.			6.60	2.30
30	9003	01	Iron Pellet Screen	0.00279	lb/ton pellets charged	2,803,241	tons proc.	3.91	4,308,581	tons proc.			6.01	2.10
31		01	Iron Spout Baghouse	0.02548	lb/ton proc.	2,059,557	tons proc.	26.24	3,165,000	tons proc.			40.32	14.08
32			Road Fugitive Emissions	Included in Contemporaneous Changes. See Appendix F						-				0.00
33			Material Handling	Included in Contemporaneous Changes. See Appendix F						-				0.00
34			Unpaved Parking Lots					-		-			-	-
35			Paved Parking Lots					-		-			-	-
36			Natural Gas	5.1	lb/MMcf	1,145	MMcf	2.92	1,145	MMcf			2.92	0.00
37			Blast Furnace Gas	2.9	lb/MMcf	121,039	MMcf	175.51	185,030	MMcf			268.29	92.79
38			Fuel Oil	9.72	lb/Mgal	16	Mgal	0.08	365	Mgal			1.77	1.70
	TOTALS:							1,123.90					1,071.89	(52.01)
			Contemporaneous Changes											(37.16)
			Net Change											*(89.17)*

Note: Actual Emissions = Base Year Throughput * Emission Factor / 2000

Projected Actual Emissions = Projected Throughput * Emission Factor / 2000
except -
BOF Vessels Projected Actual Emissions = 60 lb/hr * 8760 hrs
BOF Roof Monitor Projected Actual Emissions = Projected Emission Factor * Projected Throughput

R004958

Projected Emissions Based On: Blast Furnace @8,[illegible]1 NTPD
BOF @ 9,808 NTPD

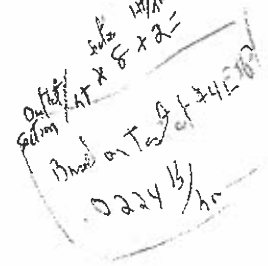
TABLE 3-6
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - VOM

LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION tpy	PROJECTED THRUPUT	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0004	01	"A" Blast Furnace Stoves - BFG	0.0	lb/MMcf	22,774	MMcf	0.00	included in line 18	-	-	-
2	0009	01	"B" Blast Furnace Stoves - BFG	0.0	lb/MMcf	22,203	MMcf	0.00	included in line 18	-	-	-
3	0008	01	Blast Furnace Gas Flare - BFG	0.0	lb/MMcf	26,132	MMcf	0.00	included in line 18	-	-	-
4	0041	01	Boiler House 1 (Blrs 1-10) - BFG	0.0	lb/MMcf	37,501	MMcf	0.00	included in line 18	-	-	-
5	0041	91	Boiler House 1 (Blrs 1-10) - NG	2.8	lb/MMcf	361	MMcf	0.51	included in line 17	-	-	-
6	0044	01	Boiler #11 - BFG	0.0	lb/MMcf	5,323	MMcf	0.00	included in line 18	-	-	-
7	0044	91	Boiler #11 - NG	1.4	lb/MMcf	226	MMcf	0.16	included in line 17	-	-	-
8	0044	92	Boiler #11 - Fuel Oil	0.28	lb/Mgal	15.00	Mgal	0.00	included in line 19	-	-	-
9	0048	01	Boiler #12 - BFG	0.0	lb/MMcf	7,106	MMcf	0.00	included in line 18	-	-	-
10	0048	91	Boiler #12 - NG	1.4	lb/MMcf	218	MMcf	0.15	included in line 17	-	-	-
11	0048	92	Boiler #12 - Fuel Oil	0.28	lb/Mgal	1.00	Mgal	0.00	included in line 19	-	-	-
12	0033	01	BOF Preheaters/Dryers - NG	2.8	lb/MMcf	283	MMcf	0.40	included in line 17	-	-	-
13	0007 & 0012	01	"A & B" Blast Furnace - Casthouse	0.0946	lb/ton proc.	2,059,557	tons proc.	97.40	3,165,000	tons proc.	149.68	-
14	0005 & 0010	01	"A & B" Blast Furnace - Uncap. roof	0.0047	lb/ton proc.	2,059,557	tons proc.	4.83	3,165,000	tons proc.	7.42	-
15	0033	01	2 BOF Vessels	0.0060	lb/ton proc.	2,413,406	tons proc.	7.24	3,580,000	tons proc.	10.74	-
16	0035	01	Transfer Pits	0.0010	lb/ton proc.	2,059,557	tons proc.	1.03	3,165,000	tons proc.	1.58	-
17	0071 & 0119	01	Continuous Casters #1 & #2 - NG	2.8	lb/MMcf	57	MMcf	0.08	included in line 17	-	-	-
18			Natural Gas	2.8	lb/MMcf	-	MMcf	-	1,145	MMcf	1.60	-
19			Blast Furnace Gas	0.0	lb/MMcf	-	MMcf	-	185,030	MMcf	0.00	-
20			Fuel Oil	0.28	lb/Mgal	-	Mgal	-	365	lb/Mgal	0.05	-
	TOTALS:							111.80			171.08	59.28
			Contemporaneous Changes									(31.23)
			Net Change									***28.05***

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Projected Emissions Based On: Blast Furnace @ 8,671NTPD
BOF @ 9,808 NTPD

TABLE 3-7
GRANITE CITY DIVISION of NATIONAL STEEL
NETTING ANALYSIS SUMMARY - Pb



LINE #	POINT	MODE	SOURCE DESCRIPTION	EMISSION FACTOR	UNITS	EMISSION RATE lb/hr	BASE YEAR THRUPUT	UNITS	ACTUAL EMISSION TPY	PROJECTED THRUPUT OR PRODUCTION RATIO	UNITS	PROJECTED ACTUAL EMISSIONS tpy	POTENTIAL EMISSIONS INCREASE tpy
1	0044	03	Boiler #11 - Fuel Oil	0.01600000	lb/Mgal	0.01600000	15.00	Mgal	0.0001	included in line 19	-	-	-
2	0048	03	Boiler #12 - Fuel Oil	0.01600000	lb/Mgal	0.01600000	1.00	Mgal	0.0000	included in line 19	-	-	-
3	0005	01	"A" Blast Furnace - Uncap. Fugitives	0.00039000	lb/hr	0.00039000	8760	hours	0.0017	1.537	tons proc.	0.00262550	-
4	0006	01	"A" Blast Furnace - Charging	0.00055000	lb/hr	0.00055000	8760	hours	0.0024	1.537	tons proc.	0.00370263	-
5	0007	01	"A" Blast Furnace - Baghouse Stack	0.00022000	lb/hr	0.00022000	8760	hours	0.0010	1.537	tons proc.	0.00148105	-
6	0010	01	"B" Blast Furnace - Uncap. Fugitives	0.00036700	lb/hr	0.00036700	8760	hours	0.0016	1.537	tons proc.	0.00247067	-
7	0011	01	"B" Blast Furnace - Charging	0.00053700	lb/hr	0.00053700	8360	hours	0.0024	1.537	tons proc.	0.00361512	-
8	0012	01	"B" Blast Furnace - Baghouse Stack	0.00021400	lb/hr	0.00021400	8360	hours	0.0009	1.537	tons proc.	0.00144066	-
9	0033	01	BOF 2 Vessels Stack	0.19337500	lb/hr	0.19337500	8760	hours	0.8470	1.483	tons prod.	1.25607505	0.3855
10	0034	01	BOF Roof Monitor	0.01290000	lb/hr	0.01290000	8760	hours	0.0565	1.483	tons prod.	0.08379247	-
11	0035	01	Hot Metal Reladling - Xfer Pit	0.00002320	lb/hr	0.00002320	8760	hours	0.0001	1.483	tons prod.	0.00015070	-
12	0037	01	Flux Conv. & Xfer Pts., Bin Floor - BOF	0.00000062	lb/hr	0.00000062	8760	hours	0.0000	1.483	tons prod.	0.00000405	-
13	0040	01	Hot Metal Chging Ladle Slag Skimmer	0.00002250	lb/hr	0.00002250	8760	hours	0.0001	1.483	tons prod.	0.00014616	-
14	0103	01	Argon Stirring #1 & #2	0.00020200	lb/hr	0.00020200	8760	hours	0.0009	1.483	tons prod.	0.00131210	-
15	0105	01	Deslagging Station	0.00240000	lb/hr	0.00240000	8760	hours	0.0105	1.483	tons prod.	0.01558930	-
16	0107	01	Desulf. Station (inside BOF shop)	0.01330000	lb/hr	0.01330000	8760	hours	0.0583	1.483	tons prod.	0.08639068	-
17	0120	01	Caster Mold - Casters	0.00113000	lb/hr	0.00113000	8760	hours	0.0049	1.483	tons prod.	0.00733996	-
18			Boilers -Waste Oil	0.33600000	lb/Mgals		-	-	-	365	Mgals	0.06132000	-
	TOTAL					0.26			0.988			1.527	0.639
			Contemporaneous Changes										0.000
			Net Change										*0.639*

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Contemporaneous Changes from the 1995 Application

APPENDIX E

The following table summarizes emissions changing projects that have been undertaken at Granite City Steel since 1990.

PROJECTS CHANGING EMISSIONS SINCE 1990 (TPY)

Project	Effective Date	TSP/PM_{10}	SO_2	NO_x	CO	VOM
Removal Blast Furnace Slag Sput Hood	January, 1990	+4.90				
# 2 Caster Production	December 1, 1990	+11.70				
Ingot Teeming Shutdown	April 1, 1991	-22.40				
Installation NESHAP Controls Coke By-Product	July, 1991					-31.6
Shutdown Blooming Mill	April 1, 1991	-3.38	-0.34	-217.82	-22.12	-0.92
Shutdown Batch Annealing	December, 1991	-0.18	-0.036	-8.72	-1.19	-0.31
Fugitive Dust Control Program (Roads and Material Handling)	November, 1991 to present	-32.00				
Installation of #8 Galvanizaing Line	Expected 1996	+4.20/+4.05	+.25	+26.0	+11.8	+1.6
Net Change		-37.16/-37.31	-0.126	-200.54	-11.51	-31.23

The following information presents how the emission change was calculated for each project.

REMOVAL OF BLAST FURNACE SLAG SPOUT HOOD - JANUARY, 1990

Based on May 8, 1989 submittal for modification of operating permit for "A" & "B" Blast Furnaces. +4.9 TPY

2 CASTER PRODUCTION - DECEMBER 1, 1990

Summary of Project Emission Changes (tons/yr)[1] (Assuming all steel produced is continuous cast.)

Argon Stirring and Baghouse	4.85
Tundish with Shrouds	--
Powder Addition	7.49
Slab Casting	2.01
Slab Cut-off	9.03
Slab Ripping with Baghouse	2.58
	26.0 tons/yr PM_{10}
Caster #1 Actual	14.3 tons/yr PM_{10}

Caster #2 PM_{10} emissions = 26.0 - 14.3 = 11.7 tons/yr

INGOT TEEMING SHUTDOWN - APRIL 1, 1991

670,000 tons / year X 0.067 lbs / ton = 22.4 tons / year PM_{10} reduction

[1] Reference - March 16, 1988 IEPA "Project Summary for Proposed Issuance of an Air Pollution Control Construction Permit for Continuous Caster".

SHUTDOWN BLOOMING MILL - APRIL 1, 1991

Coke oven gas consumed at Soaking Pits, 1,076,926 MMBtu in 1990.

The coke oven gas which was consumed at the Blooming Mill Soaking Pits (firing rate 408 MMBtu/hr/furnace) is to be used at the Hot Strip Slab Furnaces (1 - 3) (firing rate 321.8 MMBtu/hr/furnace) and #4 slab furnace (firing rate 495 MMBtu/hr).

The emission reductions for the displaced use of natural gas on the slab reheat furnaces is based on the AIRS 1990 emission factor for natural gas sources greater than 100 MMBtu/hr and the "ACT for NO_X Emissions from Iron and Steel Mills".

1990

Coke Oven Gas Soaking Pits - General < 10 MMBtu/hr

44,131 X 0.003 X 1/2000 = 0.066 tpy PM_{10} emission reduction

44,131 X 0.0006 X 1/2000 = 0.013 tpy SO_2 emission reduction

44,131 X 0.10 X 1/2000 = 2.21 tpy NO_X emission reduction

44,131 X 0.0053 X 1/2000 = 0.12 tpy VOC emission reduction

44,131 X 0.02 X 1/2000 = 0.44 tpy CO emission reduction

Natural Gas Blooming Mill < 10 MMBtu/hr

18,083 X 0.003 X 1/2000 = 0.027 tpy PM_{10} emission reduction

18,083 X 0.0006 X 1/2000 = 0.005 tpy SO_2 emission reduction

18,083 X 0.10 X 1/2000 = 0.90 tpy NO_X emission reduction

18,803 X 0.0053 X 1/2000 = 0.05 tpy VOC emission reduction

18,803 X 0.02 X 1/2000 = 0.18 tpy CO emission reduction

Coke Oven Gas Soaking Pits

1,076,926 X 0.005 X 1/2000 = 2.69 tpy PM_{10} emission reduction

1,076,926 X 0.0006 X 1/2000 = 0.32 tpy SO_2 emission reduction

1,076,926 X 0.399 X 1/2000 = 214.71 tpy NO_X emission reduction

1,076,926 X 0.0014 X 1/2000 = 0.75 tpy VOC emission reduction

1,076,926 X 0.04 X 1/2000 = 21.5 tpy CO emission reduction

EMISSION REDUCTION SUMMARY for SHUTDOWN of BLOOMING MILL (tons/year)

	PM_{10}	SO_2	NO_X	CO	VOC
Soaking Pit - General	0.66	0.013	2.21	0.44	0.12
Blooming Mill	0.027	0.005	0.90	0.18	0.05
Soaking Pits	2.69	0.32	214.71	21.5	0.75
Total	3.377	0.338	217.82	22.12	0.92

SHUTDOWN BATCH ANNEALING - DECEMBER, 1991

1990 Natural Gas Usage 118,612 MMBtu (< 10 MMBtu/hr)

118,612 X 0.003 X 1/2000 = 0.18 tpy PM_{10} emission reduction

118,612 X 0.0006 X 1/2000 = 0.036 tpy SO_2 emission reduction

118,612 X 0.147[2] X 1/2000 = 8.72 tpy NO_X emission reduction

118,612 X 0.0053 X 1/2000 = 0.31 tpy VOC emission reduction

118,612 X 0.02 X 1/2000 = 1.19 tpy CO emission reduction

[2] Based on the "ACT for NO_X Emissions from Iron and Steel Mills".

NO. 8 GALVANIZING LINE

Furnace

54.6 MMBtu/hr - natural gas fired

Pollutant	*Emission Factor/Source (lb/MMBtu)*	*Heat Input (MMBtu/hr)*	*Annual Emissions (tpy)*
NO_X	0.0378/Vendor Guarantee	54.6	9.04
TSP	0.003/AP-42	54.6	0.72
PM_{10}	0.003/AP-42	54.6	0.72
VOM	0.0028/AP-42	54.6	0.67
CO	0.035/AP-42	54.6	8.37
SO_2	0.0006/AP-42	54.6	0.14

Fume Scrubber

10,000 cfm

Pollutant	*Emission Factor (lb/hr)/Source*	*Annual Emissions (tpy)*
TSP	0.24/Vendor Guarantee	1.05
PM_{10}	0.24/ Vendor Guarantee	1.05

5 Space Heaters

3,440,000 Btu/hr per heater - natural gas fired
1,019 Btu/ft^3 (1993 emission inventory)
5 * 3,440,000 Btu/hr / (1,019 Btu/ft^3) = 16,879.3 ft^3/hr total natural gas consumption, 5 heaters

Pollutant	*Emission Factor(lb/MMft^3) AIRS-1-05-001-6*	*Heat Input (MMBtu/hr)*	*Annual Emissions (tpy)*
NO_X	100.0	16,879.3	7.39
TSP	3.0	16,879.3	0.22
PM_{10}	3.0	16,879.3	0.22
VOM	5.3	16,879.3	0.39
CO	20.0	16,879.3	1.48
SO_2	0.6	16,879.3	0.04

11 Galvanize Line Related Heaters

Heaters associated with the following galvanizing processes are to be installed as part of the No. 8 Galvanize Line Project:

Equipment	*Maximum Natural Gas Use (CFH)*
Entry Strip Dryer	2,078
Quench Strip Dryer	1,419
Chem. Treat Strip Dryer	1,370
Pre-clean Recirc. Tank	2,944
Electrolytic Recirc. Tank #1	2,748
Electrolytic Recirc. Tank #2	2,500
Hot Water Rinse Tank	883
Hot Water Make-up Tank	6,869
Chimical Treat Recirc. Tank	491
Chemical Treat Mix Tank	491
Roll Rig Preheaters	102
Total	21,895

Pollutant	*Emission Factor(lb/MMft^3) AIRS-1-05-001-6*	*Heat Input (MMBtu/hr)*	*Annual Emissions (tpy)*
NO_X	100.0	21,895	9.60
TSP	3.0	21,895	0.29
PM_{10}	3.0	21,895	0.29
VOM	5.3	21,895	0.51
CO	20.0	21,895	1.92
SO_2	0.6	21,895	0.06

Kettle Melting

32,000 tons product per month
0.1 tons Zn per ton product

32,000 tons product/month * 0.1 tons Zn/ton product * 0.1 lbs TSP/ton Zn * 12 months / 2000 lbs /ton = 1.92 tons TSP
1.92 tons TSP * 0.92 = 1.77 tons PM_{10}

Pollutant	*Emission Factor (lb/ton Zn)/Source*	*Annual Emissions (tpy)*
TSP	0.1/AP-42	1.92
PM_{10}	0.092/AP-42	1.77

TOTAL EMISSIONS ASSOCIATED WITH NO. 8 GALVANIZE LINE PROJECT

Pollutant	*Annual Emissions (tpy)*
NO_X	26.03
TSP	4.20
PM_{10}	4.05
VOM	1.56
CO	11.77
SO_2	0.25

INSTALLATION OF NESHAP CONTROLS AT COKE BY-PRODUCT PLANT

VOC Emissions Reduction at Coke By-Product Plant after Installation of NESHAPS Controls

It was reported, in Attachment 2 of the October 8, 1991 submittal of additional information in application for modification of Operating Permits for the Granite City Division Emission Reduction Plant Production Increase Project, that the installation of benzene emission controls (NESHAPS) at the Coke By-Product Recovery Plant would provide a reduction of 31.6 TPY VOC other than benzene. The following is a demonstration of the derivation of that VOC emission reduction.

All calculations are based on 1990 coke production of 577,473 tons.

Emission factors are taken from the publication EPA-450/3-83-016a, "Benzene Emissions from Coke By-Product Recovery Plants - Background Information for Proposed Standards." The NESHAPS emission factors contained in this publication are for benzene only. The emissions of other light oil (L.O.) constituents were calculated by taking the ratio of the mole fraction of each L.O. constituent (liquid) times the vapor pressure of that constituent to the mole fraction of benzene (liquid) times the vapor pressure of benzene, then multiplying that ration by the calculated benzene emissions. It is assumed that all emissions are vapors and that the vapors are in equilibrium with the liquid light oil.

Sample calculation:

For the direct water cooling tower, benzene emissions are calculated as follows:

$$(577{,}473 \text{ tons coke}) \times \frac{2000 \text{ lb.}}{\text{ton}} \times \frac{454 \text{g}}{\text{lb.}} \times \frac{1 \text{ Mg}}{10^6 \text{g}} = 524.346 \text{ Mg coke}$$

$$\frac{524.346 \text{ Mg coke}}{\text{yr.}} \times \frac{270 \text{g}}{\text{Mg}} \times \frac{1 \text{ lb.}}{454 \text{g}} = 311{,}836 \text{ lb./year}$$

where 270g/Mg = uncontrolled benzene emission factor from Table 3 - 7, attached.

From the Light Oil Constituents table, attached,

Benzene: $y(P^\circ) = .71(96) - 68.16$

where .71 = benzene mole fraction
and 96 = benzene vapor pressure

Similarly,

Toluene: $y(P^\circ) = .159(30) - 4.77$

Exhibit
Page two

Hence, the toluene emissions, with no controls, from the direct water cooling tower are

$$\frac{4.77}{68.16} \text{ (311,836 lb/yr.)} = 21{,}823 \text{ lb. toluene/year}$$

Toluene emissions after installation of NESHAPS controls with 100% efficiency are

21,823 lb. toluene (100 - 100) = 0 lb. toluene/yr.

Emission of benzene, toluene, xylene, ethylbenzene and styrene are calculated, as above, for the various emission sources at the By-Product Plant and presented in the table Emissions of Light Oil Constituents after Installation of NESHAPS Controls at the Coke Oven By-Products Plant, attached.

The non-benzene emissions controlled by the NESHAPS project are then calculated, for each light oil constituent considered, by subtracting the total emissions after controls were applied at all sources from the total emissions prior to application of controls at all sources. These calculations are presented in the table entitled Non-Benzene Emissions Controlled by NESHAPS Project, attached.

Non-Benzene Emissions Controlled by NESHAPS Project

	Total Uncontrolled Emissions		Total Uncontrolled Emissions after NESHAPS Controls Installed					
Toluene	59,584	-	997	=	58,587 lbs.	x $\frac{1T}{2000}$	=	29.3 tons/yr.
Xylene	2,871	-	48	=	2,823 lbs.	x $\frac{1T}{2000}$	=	1.4 tons/yr.
Ethylbenzene	959	-	10	=	949 lbs.	x $\frac{1T}{2000}$	=	0.5 tons/yr.
Styrene	868	-	9	=	859 lbs.	x $\frac{1T}{2000}$	=	0.4 tons/yr.
								31.6 tons/yr.

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Emissions of Light Oil Constituents after Installation of NESHAPS Controls at the By-Product Plant

By-Product Source	Uncontrolled Benzene Factor (g Mg)	NESHAPS Control	NESHAPS Control Effiency %	Benzene (lb./yr.) A*	Benzene (lb./yr.) B**	Toluene (lb./yr.) A	Toluene (lb./yr.) B	Xylene (lb./yr.) A	Xylene (lb./yr.) B	Ethylbenzene (lb./yr.) A	Ethylbenzene (lb./yr.) B	Styrene (lb./yr.) A	Styrene (lb./yr.) B
Direct Water Cooling Tower	270	Tar Spray Final Cooler	100	311,836	0	21,823	0	1,050	0	351	0	317	0
Light Oil Condenser Vent	89	Gas Blanket	98	102,790	2,056	7,193	144	346	7	116	2	105	2
Napthlene Seperator	87	Tar Spray	100	100,480	0	7,032	0	339	0	113	0	102	0
Napthalene Processing	20	Tar Spray	100	23,099	0	1,617	0	78	0	26	0	23	0
Tar-intercepting Sump	95	Gas Blanket	98	109,720	2,194	7,678	154	370	7	124	3	112	2
Tar Dewatering	21	Steam Blanket	98	24,254	485	1,697	34	82	2	27	1	25	1
Tar Decanter	77	Steam Blanket	98	88,931	1,779	6,224	125	300	6	100	2	90	2
Tar Storage	12	Steam Blanket	98	13,859	277	970	19	47	1	16	0	14	0
Light Oil Sump	15	Gas Blanket	98	17,324	347	1,212	24	58	1	20	0	18	0
Light Oil Storage	5.8	Gas Blanket	98	6,699	134	469	9	23	1	8	0	7	0
BTX Storage (ILO)	5.8	Gas Blanket	98	6,699	134	469	9	23	1	8	0	7	0
Leaks	14	Manual Detection	88	16,169	1,940	1,132	136	55	7	18	2	16	2
Flushing Liquor Circulation Tank	9	Steam Blanket	98	10,395	208	727	15	35	1	11	0	11	0
Excess Ammonia Liquor Tank	9	Steam Blanket	98	10,395	208	727	15	35	1	11	0	11	0
Wash Oil Decanter	3.8	Uncontrolled	0	4,389	4,389	307	307	15	15	5	0	5	0
Wash Oil Circulating Tank	3.8	Gas Blanket	98	4,389	88	307	6	15	0	5	0	5	0
				851,428	14,239	59,586	997	2,871	48	959	10	868	0

*Uncontrolled emissions

**Emissions after NESHAPS controls installed

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LIGHT OIL CONSTITUENTS

Chemical	Weight fraction (X)	MW	$\frac{X}{MW}$	Mole fraction (Y)	P° at 25°C
enzene	.5925	78.11	.0076	.710	96 mm Hg
oluene	.1598	92.13	.0017	.159	30
ylene (mixed)	.0336	106.16	.0003	.028	8.2
ylbenzene	.0100	106.16	.00009	.008	9.6
rene	.0136	104.14	.0001	.009	7.7
hthalene	.005	128.16	.00004	.004	<1
bon disulfide	.003	76.14	.00004	.004	366
marin	.0367	118.13	.00031	.029	100
lohexane	.0009	84.16	.00001	.001	98
lohexene	.0276	82.14	.00034	.032	100
lopentadiene	.0064	66.10	.00009	.008	600
lene	.0029	70.13	.00004	.004	654
tane	.0014	72.15	.00002	.002	533
ophene	.0024	84.13	.00003	.003	79
,5-trimethylbenzene	.0028	120.20	.00002	.002	7.0
,3-trimethylbenzene	.0130	120.20	.0001	.002	6.8

$\Sigma \frac{X}{MW} = .01071$

* Benzene, toluene, and xylene weight fractions were the average of two analysis OM of light oil samples: Environmetrics on March 1, 1991, and by Doug Stracke of Granite City Steel on March 24, 1985.

Average molecules weight of light oil = ΣyM = 84.47
Average vapor pressure of light oil = ΣyP = 89.67

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Benzene Emissions from Coke By-Product Recovery Plants - Background Information for Proposed Standards

Draft EIS

NESHAP

TABLE 3-7. UNCONTROLLED BENZENE EMISSION FACTORS FOR COKE BY-PRODUCT PLANTS

Source	Emission factor (g benzene/Mg coke)	Industry emissions (Mg/yr)[36]
Cooling tower		
Direct-water	270	6,340
Tar-bottom	70	1,090
Light-oil condenser vent	89	4,080
Naphthalene separation	87	2,040
Naphthalene processing	20	470
Tar-intercepting sump	95	5,360
Tar dewatering	21	1,090
Tar decanter	77	4,350
Tar storage	12	680
Light-oil sump	15	780
Light-oil storage	5.8	300
BTX storage	5.8	80
Benzene storage	5.8	80
Flushing-liquor circulation tank	9	510
Excess-ammonia liquor tank	9	510
Wash-oil decanter	3.8	180
Wash-oil circulation tank	3.8	180
Pump seals	a	600
Valves	a	400
Pressure-relief devices	a	270
Exhausters	a	30
Sample connections	a	50
Open-ended lines	a	20
Total (rounded)		29,000

[a] Emissions were estimated on the basis of number of potentially leaking units. Emission factors are listed in Table 3-6.

APPENDIX F

FUGITIVE PARTICULATE EMISSIONS

EMISSION CALCULATIONS

Fugitive particulate emissions from paved and unpaved roads were calculated based on information provided in "Granite City Area PM-10 Emission Inventory", MRI Final Report, 1988, and the 1991 PM_{10} SIP developed by the Illinois Environmental Protection Agency.

Based on information in these sources, fugitive particulate inventories were developed for three scenarios:

- Initial Uncontrolled Emissions - These are uncontrolled emission estimates taken from the 1988 MRI report.
- Projected Initial Uncontrolled Emissions - These emission estimates reflect uncontrolled emissions reported in the 1988 MRI document scaled up by a factor related to the requested production increase. That factor is derived by dividing the requested production level by the base period production level. The factor applied is dependent on the potential increase in activity on each specific road segment. A factor of one was used for those areas where activity is not a function of production level. A factor of 1.1 was used in those areas where some increase in activity may occur, but that increase is expected to be minor.
- Projected Controlled Emissions - These estimates start with the Projected Initial Uncontrolled Emissions and are then reduced to reflect the fugitive emission control program that will be in effect with the production increase.

EMISSION CONTROL PROGRAM

Table F-1 presents intitial uncontrolled, projected uncontrolled, and projected controlled emissions.

Projected controlled emissions reflect an extensive fugitive dust control program. As a part of this application, Granite City Steel is committing to a fugitive emission control program that adds to the commitments that were implemented earlier. The resulting control program is outlined below in **Table F-2.**

MATERIALS HANDLING

Uncontrolled and controlled emissions from materials handling activities that will be affected by the production increase were estimated using the same sources previously cited. These estimates are presented in **Table F-3**.

SUMMARY

Fugitive emissions ard credits are summarized on **Table F-4**.

TABLE F-1

Granite City Division of National Steel Company
Projected PM-10 Emissions - Roads

Area	Segment ***	Initial Uncontrolled Emissions * (TPY)	Production Increase Factor	Projected Initial Uncontrolled Emissions **	Control Efficiency for Projected Emissions (%) *	Projected Controlled Emissions ***
South Plant	A ****	26.09	1.00	26.09	95.00%	1.30
	B	9.91	1.00	9.91	98.00%	0.20
	C	7.46	1.00	7.46	98.00%	0.15
Steelworks	D****	45.72	1.48	67.80	98.00%	1.36
	K ****	6.23	1.48	9.24	98.00%	0.18
	M ****	7.39	1.48	10.96	98.00%	0.22
	E	8.79	1.00	8.79	98.00%	0.18
	F ****	148.15	1.48	219.71	98.84%	2.55
	G ****	3.96	1.48	5.87	96.24%	0.22
	H [2]	11.24	1.00	11.24	97.90%	0.24
	J	8.10	1.00	8.10	98.00%	0.16
	L	161.37	1.48	239.31	98.00%	4.79
	R ****	2.57	1.48	3.81	98.00%	0.08
BOF	O ****	37.61	1.48	55.78	98.00%	1.12
	N	27.75	1.48	41.15	98.00%	0.82
	P [2]	28.44	1.48	42.18	99.30%	0.30
Furnace	V [2]	65.65	1.10	72.22	99.50%	0.36
	W ****	6.59	1.10	7.25	96.54%	0.25
	X ****	238.15	1.54	366.04	97.52%	9.08
	Y	11.06	1.00	11.06	98.00%	0.22
	Z [1]	43.70	1.54	67.17	99.67%	0.22
North Plant	S ****	17.84	1.00	17.84	95.00%	0.89
	T ****	21.09	1.00	21.09	95.00%	1.05
Area	D-D [2]	41.87	1.54	64.35	98.98%	0.66
	E-E [2]	1.69	1.54	2.60	97.87%	0.06
	F-F	1.53	1.54	2.35	98.00%	0.05
	CS(1) ****	13.57	1.00	13.57	98.00%	0.27
	CS(2)	8.49	1.00	8.49	98.00%	0.17
	G-G	5.81	1.00	5.81	95.00%	0.29
	Total:	1,017.82		1,427.23		27.42

* Based on IEPA PM10 SIP
** Base case emissions times production increase factor
*** Unpaved roads paved as per proposed schedule.
**** Paved Road.
[1] Road 72% paved. The remaining 28% will be paved prior to the production increase.
[2] Road to be paved prior to production increase.

TABLE F-2
GRANITE CITY DIVISION of NATIONAL STEEL
FUGITIVE PARTICULATE EMISSION CONTROL PROGRAM for REQUESTED PRODUCTION INCREASE

AREA	SEGMENT	SURFACE	CONTROL
South Plant	A	Paved	Sweep or Flush once per month
	B	Unpaved	Spray three times per month
	C	Unpaved	Spray three times per month
Steelworks	D	Paved	Sweep or flush daily
	K	Paved	Sweep or flush daily
	M	Paved	Sweep or flush daily
	E	Unpaved	Spray three times per month
	F	Paved	Sweep or flush daily
	G	Paved	Sweep or flush daily
	H *	Paved	Sweep or flush once per month
	J	Paved	Sweep or flush daily
	L	Unpaved	Spray four times per month
	R	Paved	Sweep or flush daily
BOF	O	Paved	Sweep or flush daily
	N	Unpaved	Spray three times per month
	P *	Paved	Sweep or flush five days per week
Blast Furnace	V *	Paved	Sweep or flush five days per week
	W	Paved	Sweep or flush five days per week
	X	Paved	Sweep or flush five days per week
	Y	Unpaved	Spray three times per month
	Z *	Paved	Sweep or flush five days per week
North Plant	S	Paved	Sweep or flush every other day
	T	Paved	Sweep or flush every other day
Area	D-D *	Paved	Sweep or flush five days per week
	E-E *	Paved	Sweep or flush five days per week
	F-F	Unpaved	Spray three times per month
	CS(1)	Paved	Sweep or flush five days per week
	CS(2)	Unpaved	Spray three times per month
	G-G	Unpaved	Spray quarterly

* Sprayed four times per month as of production increase; paved by July 31, 1996.

TABLE F-3

Granite City Division of Nation Steel

Base Case PM10 Emissions and Contemporaneous Emissions Reductions - Materials Handling

Material			Control * Efficiency		Production Increase			Production Increase Related
	TPY (1)	TPY		TPY		TPY	TPY	TPY
Coke	7.45	7.45	90%	0.64	1.54	0.98	(6.47)	0.34
Coke Breeze	0.01	0.01	90%	0.00	1.54	0.00	(0.01)	0.00
Pellets	7.84	7.84	90%	0.67	1.54	1.03	(6.81)	0.36
Limestone	1.88	1.88	90%	0.16	1.54	0.25	(1.63)	0.09
	17.18	**17.18**		**1.47**		**2.26**	**(14.92)**	0.79

*** Based on IEPA PM10 SIP**

**** Reductions based Contemporaneous Controls**

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TABLE F-4
FUGITIVE EMISSION SUMMARY

Granite City Division of National Steel

IEPA Fugitive PM10 SIP Control Requirement for GCS			61.68	tons / year
PM10 Emissions from Roads	27.42	tons / year		
PM10 Emissions from Materials Handling	2.26	tons / year		
Total Fugitive PM10 Emissions After Production Increase			29.68	tons / year
Excess Fugitive PM10 Reduction (Credit)			32.00	tons / year

R004981

Appendix C – Air Quality Modeling Report

CARBON MONOXIDE AIR DISPERSION MODELING FOR A PREVENTION OF SIGNIFICANT DETERIORATION AND CONSTRUCTION PERMIT REVISION FOR UNITED STATES STEEL GRANITE CITY WORKS



Prepared for:
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Granite City Works
20th and State Streets
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October 2022

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the United States Steel Corporation, Granite City Works ("US Steel") iron and steel making facility in Granite City, Illinois. The analysis has been conducted by RTP Environmental Associates, Inc. ("RTP Environmental") on behalf of US Steel.

The analysis evaluated the emissions of the criteria pollutant carbon monoxide ("CO") as regulated under the applicable provisions of the Prevention of Significant Deterioration ("PSD") regulations of 40 CFR § 52.21, incorporated by reference in the federally approved Illinois State Implementation Plan at 40 CFR § 52.738(b).[1] The criteria pollutant analysis was conducted to ensure that the proposed revisions to the CO emission limitations in the Prevention of Significant Deterioration ("PSD") and Construction Permit (Permit Number 95010001) ("1996 Construction Permit") do not cause or contribute to violation of a National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR § 52.21(l), the analysis conforms with the modeling procedures outlined in the Guideline on Air Quality Models[1] promulgated by United States Environmental Protection Agency ("USEPA") (the "Guideline" or "Appendix W"). It also conforms to the Illinois Environmental Protection Agency's (IEPA) Prevention of Significant Deterioration Modeling Guidance[2], the modeling protocol submitted to the IEPA on February 3, 2020, and associated USEPA modeling policy and guidance.

[1] All citations to the PSD regulations herein are to the currently applicable provisions of 40 CFR § 52.21. The analysis also is designed to satisfy the parallel requirements of the currently pending Illinois PSD rule, 35 Ill. Adm. Code Part 204.

2.0 PROJECT DESCRIPTION

The 1996 Construction Permit authorized National Steel to increase iron and steel production limitations for the blast furnaces and basic oxygen furnace ("BOF") shop at the existing integrated iron and steel manufacturing facility in Granite City, in Madison County, Illinois. US Steel purchased the assets of National Steel in 2003, including Granite City Works. US Steel is proposing revisions to the 1996 Construction Permit that involve increases in the CO emission limitations that were established per the PSD requirements. Therefore, the proposed increases in the CO rates were evaluated for PSD requirements including compliance with the NAAQS for CO. No physical changes are proposed in conjunction with the requested revisions to the 1996 Construction Permit.

3.0 FACILITY AND SITE DESCRIPTION

The US Steel Granite City Works produces high-quality hot-rolled, cold-rolled and coated sheet steel products to customers in the construction, container, piping and tubing, service center, and automotive industries. Granite City Works has an annual raw steelmaking capability of 3.58 million net tons.

The facility occupies approximately 400 acres and is located approximately 12 miles east of Lambert, St. Louis International Airport. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 749,000m East and 4,287,000m North (NAD83, Zone 15). Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

The US Steel facility is classified under the regulations governing PSD and Title V as a major source. The area of Madison County where US Steel facility is located is classified as attainment or unclassifiable for all regulated pollutants except ozone. St. Louis is classified as marginal nonattainment for the 2015 8-hour ozone standard.

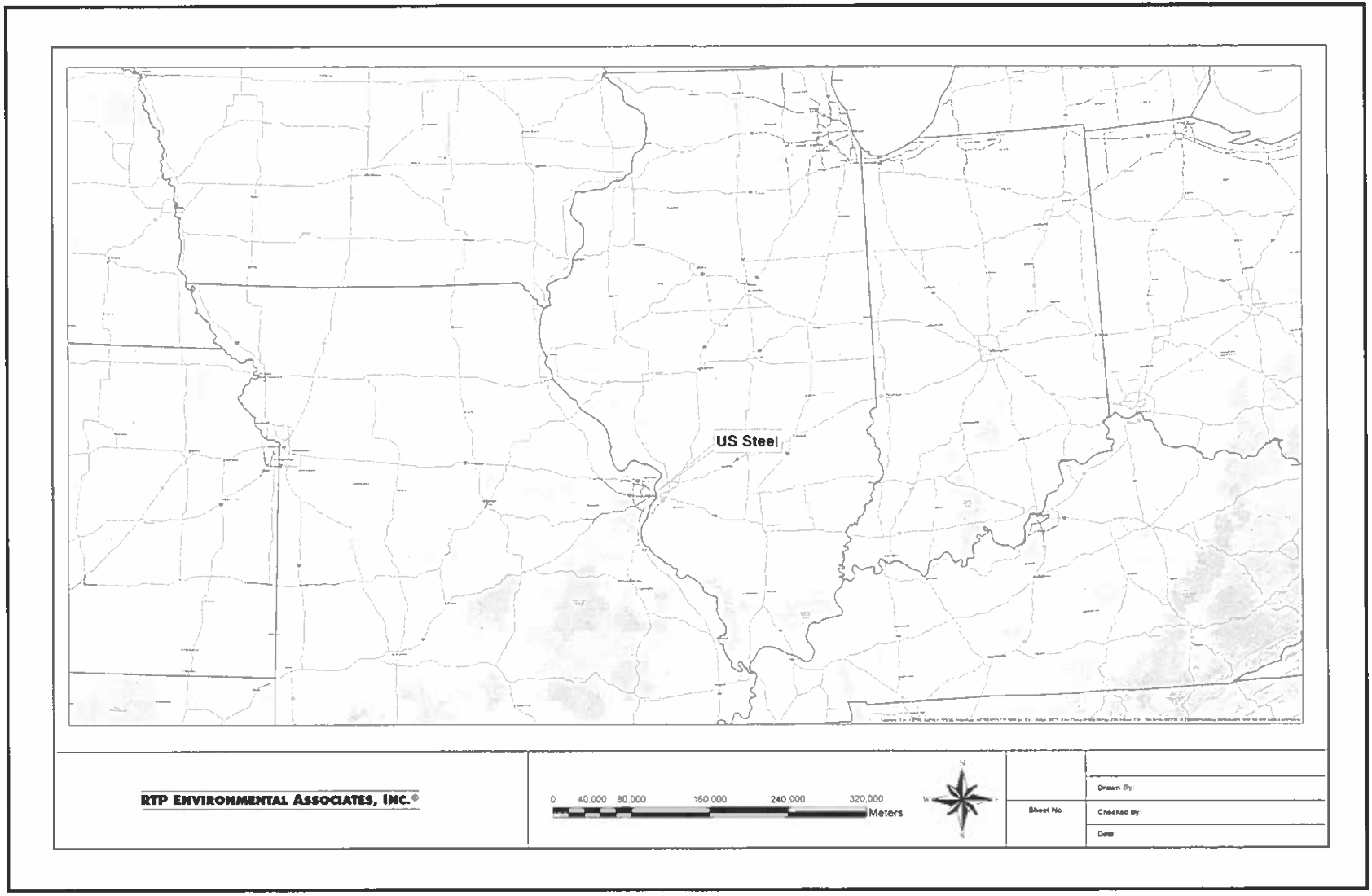


Figure 1. General Location of the US Steel Granite City Works

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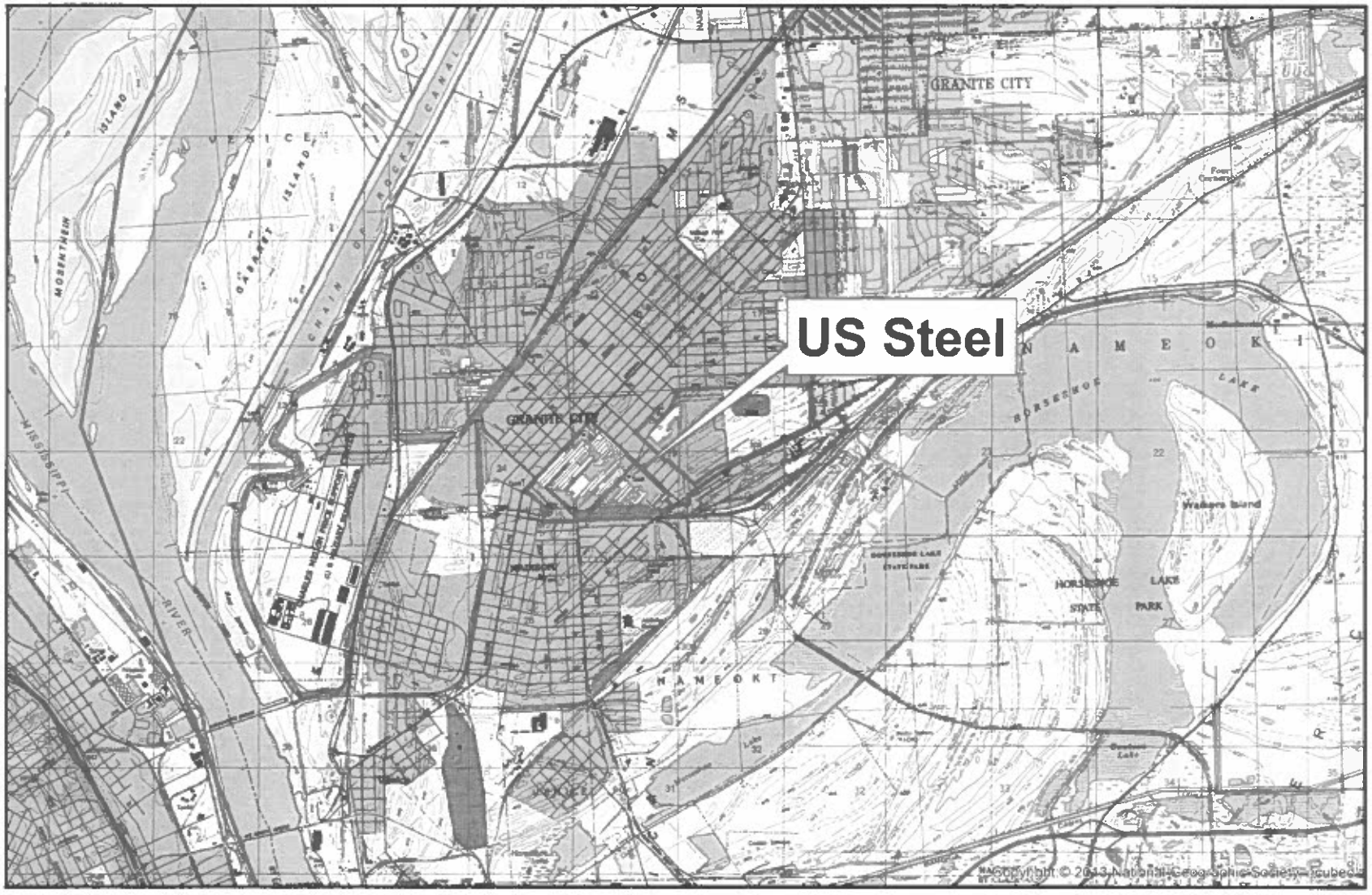


Figure 2. Specific Location of US Steel Granite City Works

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4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 22112) was used to conduct the dispersion modeling analysis. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the required default model for calculating ambient concentrations near the US Steel facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the USEPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W was not warranted.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. These coefficients were used by the Illinois Environmental

Protection Agency ("IEPA") in its evaluation of the facility as part of the 1-hr sulfur dioxide ("SO2") Data Requirements Rule ("DRR").

4.3 Source Data

The modeling input data and modeled CO emission rates can be found in Appendix A of this report.

Source Characterization

The majority of modeled source input parameters were obtained from the IEPA's model conducted for the Data Requirements Rule ("DRR").

Point Sources

Most emission sources at the site vent to stacks with a well defined opening. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well defined opening. These sources were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were provided by the IEPA and were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

Flares

The facility uses blast furnace gas flares to combust excess process gas. Emissions that occur only during periods of malfunction are not required to be modeled per 40 CFR Part 51 Appendix W. Non-malfunction emissions were modeled using the procedures outlined in the AERSCREEN Manual[3]. The effective stack height (H, in meters) was computed by the IEPA as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare stack in caloriesper second:

$$H_{equivalent} = H_{actual} + 4.56x10^{-3} \times Q^{0.478}$$

The effective flare stack diameter (d, in meters) was computed as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88x10^{-4} \times (Q \times 0.45)^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec is assumed.

All source locations were based upon a NAD83, UTM Zone 15 projection.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for any stacks n excess of 65m. Procedures used are in accordance with those described in the USEPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[4]. GEP formula stack height, as defined in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from a facility plot plan. The structure locations and heights were obtained from the IEPA and were input to the USEPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The structures included in the GEP analysis are shown as the green blocks in Figure 3. All stacks and structures that are located near a stack were included in the BPIP runs.

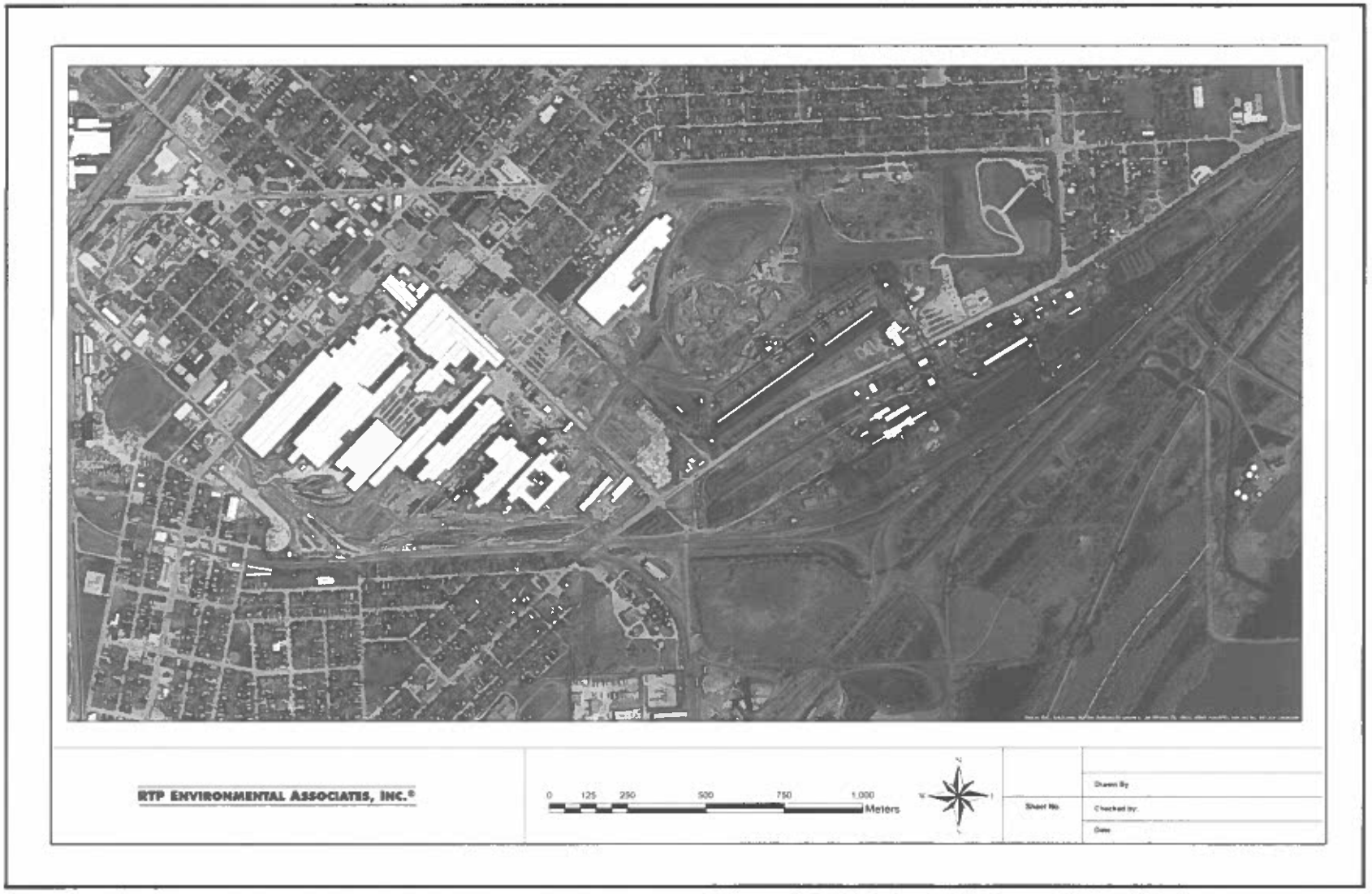


Figure 3. Structures Included in the US Steel GEP Analysis

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4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 40 CFR § 52.21(m), as discussed in Section 5.0herein.

Pursuant to 40 CFR § 52.21(i)(5), requirements for ambient monitoring data may be waived by the permitting authority if projected increases in ambient concentrations due to the project are less than the Significant Monitoring Concentrations. However, in light of the decision of the D.C. Circuit Court of Appeals *Sierra Club v. EPA*,[5] US Steel has elected not to request such a waiver at this time.

The USEPA Monitoring Guidelines[6], other USEPA interpretive guidance, and USEPA administrative decisions clarify that representative, existing air quality monitoring data may be used to fulfill the PSD pre-construction monitoring requirements and establish background concentrations needed for assessing NAAQS compliance, in lieu of monitoring data. USEPA's Monitoring Guidelines suggest specific criteria to determine representativeness of off-site data: *quality of the data, currentness of the data, and monitor location*.

There are many existing ambient CO monitors within 100 miles in the facility (Figure 4). Existing monitoring data have been evaluated in relation to the criteria provided in USEPA's Ambient Monitoring Guidelines as being representative of the US Steel site.

We have used recently available, quality assured data (2016-2018) from the AQS monitor in East St. Louis, IL (AQS Site # 17-163-0010). 2018 is the latest year of complete, available data. The 4th quarter of 2019 is incomplete and data are not



Figure 4. Ambient Air Quality Monitors in the Vicinity of the US Steel Facility

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available for 2020-2021. This monitor best represents background concentrations near the facility as it is the closest monitor with current CO data and is in the vicinity of the site and therefore representative of conditions as the site. The background data are presented in Table 1.

Table 1. Proposed Background Concentrations 2016-2018

Pollutant	Averaging Time	Design Value (ppb)[µg/m^3]	Basis	AQS Site No.
CO	1-hour	(2,200) [2,515]	Maximum	17-163-0010 St. Louis
	8-hour	(1,440) [1,646]		

The existing monitoring data satisfy the criteria provided in USEPA's Ambient Monitoring Guidelines[7] as being representative of the site.

Monitor Location

Of the monitors available, the East St. Louis monitor represents background concentrations as it is the closest monitor with data for the pollutants of concern that is not also significantly influenced by the localized source impacts.

Data Quality

The monitor data were collected and quality assured by the IEPA.

Currentness of Data

The data were collected during 2016-2018, which represents the recently available, quality assured data available for use in assessing compliance.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 14,100 receptors were used in the AERMOD significant impacts analysis. The receptor grid consisted of three cartesian grids and receptors located at 50m intervals along the facility fence line.

The first cartesian grid extended to approximately 3.0km from the facility in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region were 250m. A third grid extended to 15km with a spacing of 500m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 2.

Table 2. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Facility (m)
100	3,000
250	5,000
500	15,000

The US Steel facility is located in southern Illinois. Terrain within 10km of the site is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS one arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 15 projection. The near-field receptor grid is presented in Figure 5.

4.6 Meteorological Data

The 2016-2020, 5-year sequential hourly surface meteorological data from the National Weather Service (NWS) at St. Louis Lambert Field (WBAN No. 13994) and upper air data from the NWS station in Lincoln, IL (WBAN No. 04833) were used in the analysis. These data were processed into a "model-ready" format using AERMET version 21112.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption.

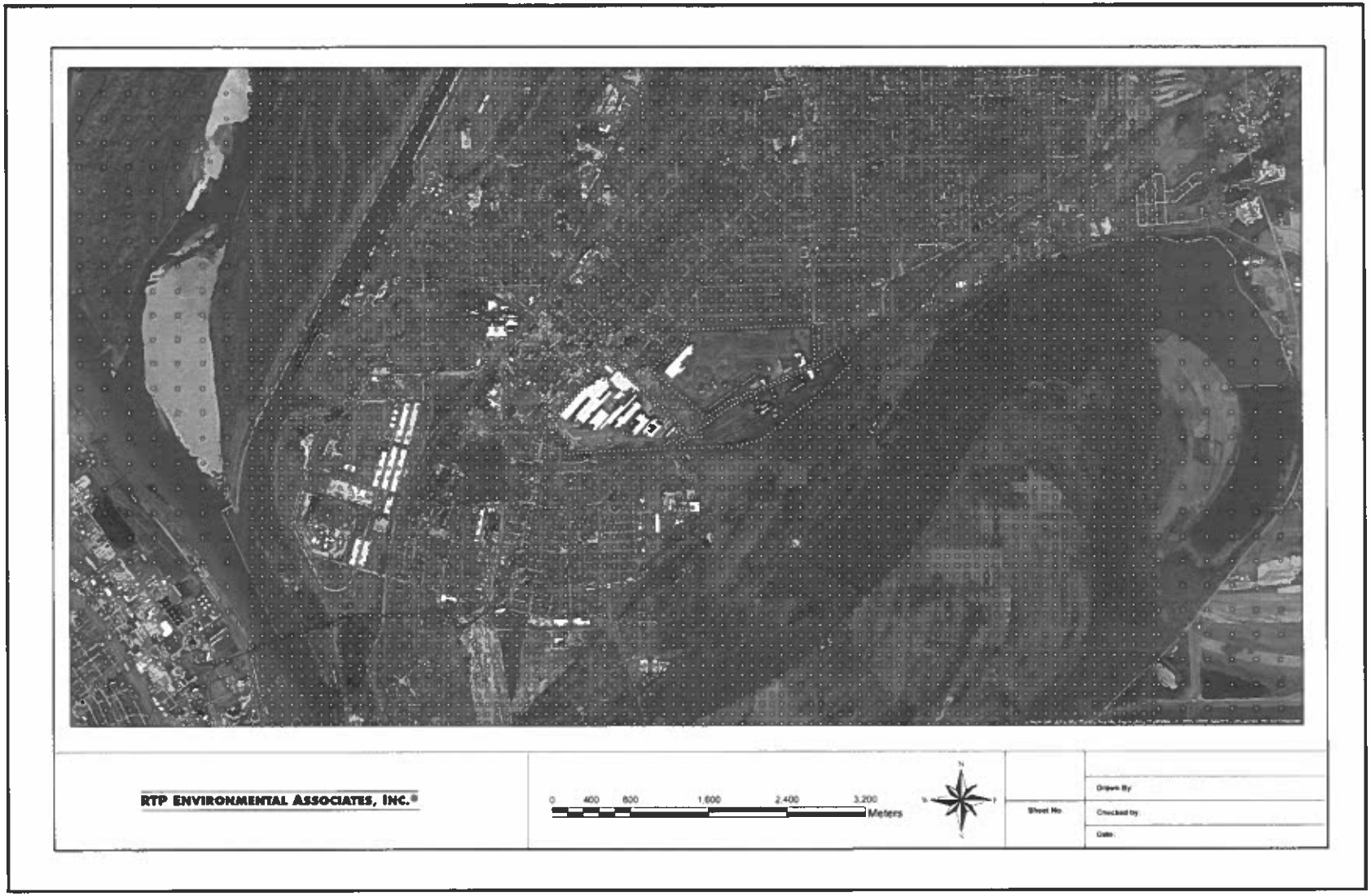


Figure 5. US Steel Facility Near-field Receptor Grid

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The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. Estimates of the surface characteristics were made by the IEPA using USEPA's AERSURFACE program (Version 13016) and provided to RTP Environmental. A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. RTP employed the "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed.

The use of NWS meteorological data for dispersion modeling can often lead to a high incidence of calms and variable wind conditions if the data are collected by Automated Surface Observing Stations ("ASOS"), as are in use at most NWS stations since the mid-1990's. A calm wind is defined as a wind speed less than 3 knots and is assigned a value of 0 knots. In addition, variable wind observations may include wind speeds up to 6 knots, but the wind direction is reported as missing, if the wind direction varies more than 60 degrees during the 2-minute averaging period for the observation. The AERMOD model currently cannot simulate dispersion under calm or missing wind conditions. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations were used to calculate hourly average wind speed and directions, which were used to supplement the standard archive of hourly observed winds processed in AERMET. The USEPA AERMINUTE program (Version 15272) was used for these calculations. A wind rose of the 5-year meteorological dataset is provided in Figure 6.

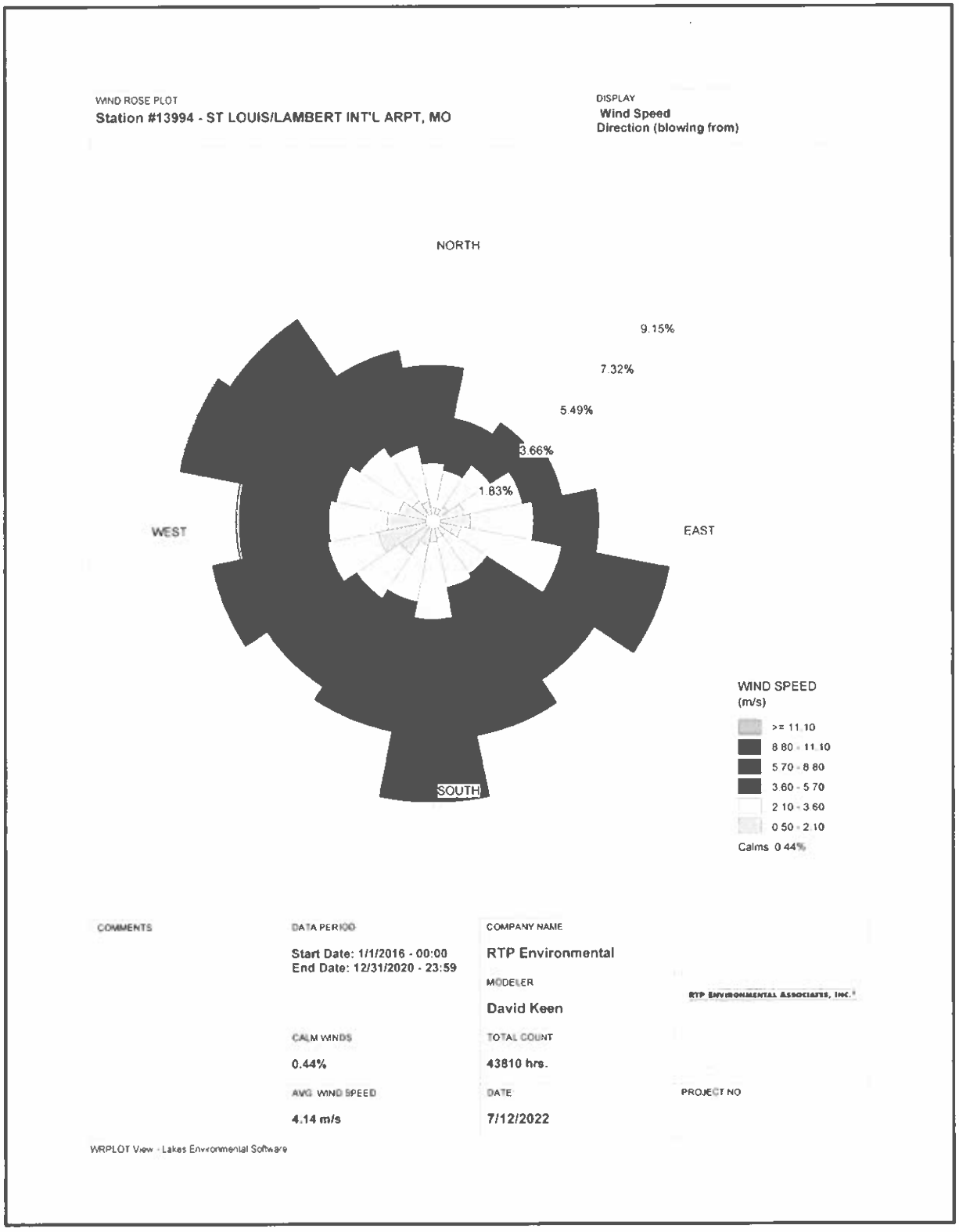


Figure 6. Lambert Field Windrose 2014-2018.

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

USS Steel is proposing changes to the CO emission limitations in the 1996 Construction Permit that were established per the PSD requirements. Therefore, as requested by Illinois EPA, dispersion modeling of CO emissions have been evaluated and compared to the NAAQS.

5.2 Significant Impact Analysis

The air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase NAAQS analysis. In the significant impact analysis, the calculated maximum impacts due to the project were determined for CO.[b] These impacts determined the net change in air quality resulting from the proposed revision to modification permitted under the 1996 Construction Permit. Five years of meteorological data were used in the significant impact analysis. Maximum modeled CO concentrations were compared to the significance levels. The PSD Class II Significant Impact Levels for CO are listed in Table 3.

Table 3. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels ($\mu g/m^3$)
CO	1-hour	2,000
	8-hour	500

[b] For some of the affected emissions units, in place of project related emissions increases, we conservatively used the potential to emit of CO.

5.3 NAAQS Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the CO NAAQS was conducted. In the NAAQS analysis, impacts from the US Steel facility were added to concentrations calculated from other nearby sources, plus a regional background concentration. The resultant total concentrations were compared to the NAAQS to assess compliance. The receptors modeled in the NAAQS analyses were limited to those showing a significant CO impact. Five years of meteorological data were again used in this analysis.

Nearby Source Inventory

Off-site sources were included in the NAAQS analysis. A 50km radius was used to define the screening area. A list of sources that are located within the screening area has been obtained from the IEPA as well as the Missouri Department of Natural Resources ("MDNR"). Section 8.3.3.b of Appendix W to 40 CFR Part 51 states that the number of nearby sources to be explicitly modeled is expected to be few, except in unusual situations. Appendix W further states that the sources to be included will usually be located within the first 10 to 20km from the source under consideration. In addition, it states that identification of nearby sources calls for the exercise of professional judgment by the appropriate reviewing authority. Further, USEPA's Guidance for PM2.5 Permit Modeling reiterates the Appendix W emphasis on a 10km screening radius for determining which nearby sources to include in the cumulative modeling analysis.

We conservatively included all sources provided by the IEPA and MDNR that are located within 50km of the US Steel facility. Total facility, potential emissions (i.e., all sources at a facility) were used in the NAAQS evaluation.

NAAQS Compliance Assessment

Ambient background concentrations (as discussed in more detail in Section 4.4) were then added to assess NAAQS compliance. The modeled and monitored values shown in Table 4 were used for this assessment.

Table 4. Monitored and Modeled Values Used to Assess NAAQS Compliance

Pollutant	Averaging Time	Monitored Value	Modeled Value
CO	1-hour & 8-hour	Maximum over 3 years	Highest, second high over 5 years

The NAAQS are shown in Table 5.

Table 5. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards ($\mu g/m^3$)	
		Primary	Secondary
CO	1-hour	40,000	--
	8-hour	10,000	--

6.0 RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are included on the enclosed CD.

6.1 Significant Impact Analysis Results

The project results in CO impacts in excess of the 8-hour Significant Impact Level shown in Table 3. The significant impact analysis results are presented in Table 6. Based upon the results of the significant impacts analysis, a cumulative, NAAQS analysis was conducted.

6.2 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the CO NAAQS. The project resulted in insignificant 1-hr CO impacts, as a result the 1-hr average was not included in the NAAQS assessment. All sources located within 50km of the US Steel facility were modeled in conjunction with the US Steel facility in assessing compliance. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the CO short term standards was based upon the maximum of the highest-second-highest values from the five-year meteorological dataset.

The results of the NAAQS analysis are presented in Table 7. As can be seen, the model demonstrates compliance.

Table 6. Significant Impact Analysis Results

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
CO	1-hr	1,157	2,000	N/A	NA
	8-hr	692	500	575	2.2

N/A – Not applicable, impacts calculated to be insignificant.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Comment
CO	8-hour	2,045	1,646	3,691	10,000	Compliant

R005005

ATTACHMENT A
MODELING INPUT DATA

US Steel Granite City Point Source Model Input (NAD83, Zone 15)
Last Update (10-5-22)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
132833	DEFAULT	Blast Furnace A Stoves	749816.02	4286809.08	416.83	217.0	500.0	49.66	7.0	1604.52	1604.52
132838	DEFAULT	Blast Furnace B Stoves	749665.50	4286719.93	417.16	225.0	500.0	51.05	9.8	1837.76	1837.76
132837	DEFAULT	Blast Furnace Gas Flare #1	749777.33	4286841.02	418.21	221.8	1831.7	65.62	15.4	6280.99	6280.99
240479	DEFAULT	Blast Furnace Gas Flare #2	749865.93	4286920.23	416.24	221.8	1831.7	65.62	15.4	6280.99	0.00
132836	DEFAULT	Casthouse Baghouse	749616.61	4286732.18	417.75	63.0	150.0	63.88	11.0	63.77	21.68
132927	DEFAULT	Blast Furnace A and B Iron Spout Baghouse	749831.35	4286818.73	415.98	43.0	123.0	43.04	7.8	6.43	2.19
238459	DEFAULT	Cogeneration Boiler BFG-fired some NG-firing	749776.38	4287073.85	415.19	137.0	400.1	62.11	6.0	203.08	0.00
132867	DEFAULT	Boiler 11	749865.15	4286883.84	416.24	149.9	335.0	29.82	8.0	90.48	90.48
132872	DEFAULT	Boiler 12	749881.40	4286887.85	416.50	150.0	335.0	26.74	8.0	90.48	90.48
BOF	DEFAULT	BOF ESP	748415.00	4286681.00	416.57	125.0	400.0	50.00	15.0	4121.79	1274.01
BOF2ND	DEFAULT	BOF Secondary Baghouse	748625.57	4286763.99	413.00	160.0	275.0	38.55	17.0	19.69	19.69
132842	DEFAULT	Slab Reheat Furnace #1	747729.70	4286762.02	417.52	56.8	650.1	44.88	8.0	26.52	0.00
172532	DEFAULT	Slab Reheat Furnace #2	747715.25	4286747.05	416.47	56.8	650.1	44.88	8.0	26.52	0.00
172512	DEFAULT	Slab Reheat Furnace #3	747700.79	4286730.53	415.88	56.8	650.1	44.88	8.0	26.52	0.00
172514	DEFAULT	Slab Reheat Furnace #4	747700.27	4286714.00	416.08	146.0	736.1	26.94	13.7	40.76	0.00
132849	DEFAULT	Galvanizing line #8 - fume scrubber	748883.00	4287195.00	416.57	80.0	80.0	41.66	3.0	0.00	0.00
229337	DEFAULT	Galvanizing line #8 - space heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229338	DEFAULT	Galvanizing line #8 - drying oven and storage area heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229339	DEFAULT	Galvanizing line #8 - miscellaneous heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229601	DEFAULT	Emergency Generator (3500 HP)	749641.00	4286863.00	416.17	37.0	442.0	32.80	1.9	0.00	0.00
GTEWY1	DEFAULT	Gateway Energy & Coke Co., LLC - Coking (New Main Stack)	749279.00	4286984.00	415.78	199.9	293.1	48.249	13.0	2.62E+01	0.00
GTEWY2	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 2 of 6	749549.00	4287055.00	418.18	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY3	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 3 of 6	749433.00	4286972.00	418.93	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY4	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 4 of 6	749357.00	4286918.00	418.64	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY5	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 5 of 6	749278.00	4286861.00	418.44	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY6	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 6 of 6	749202.00	4286808.00	418.60	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY7	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 1 of 6	749624.00	4287108.00	418.50	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY8	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 1	749199.00	4286809.00	418.60	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY9	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 1 of 6	749620.00	4287113.00	418.11	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY10	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 2	749274.00	4286862.00	418.31	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY11	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 3	749353.00	4286919.00	418.67	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY12	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 4	749429.00	4286973.00	419.00	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY13	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 5	749545.00	4287055.00	418.27	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY14	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 6	749620.00	4287109.00	418.34	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY15	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 2 of 6	749545.00	4287060.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY16	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 3 of 6	749429.00	4286977.00	418.93	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY17	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 4 of 6	749352.00	4286923.00	418.57	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY18	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 5 of 6	749274.00	4286866.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY19	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 6 of 6	749198.00	4286813.00	418.77	20.0	400.0	69.602	5.0	1.32E+00	0.00

US Steel Granite City Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
26070	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748457.20	4286596.40	413.88	169.0	21.6	78.6	1.373	1.373
26080	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748466.60	4286606.00	413.98	169.0	21.6	78.6	1.373	1.373
26090	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748475.40	4286616.10	413.88	169.0	21.6	78.6	1.373	1.373
26100	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748483.60	4286624.10	413.85	169.0	21.6	78.6	1.029	1.029
26110	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748495.20	4286635.90	414.01	169.0	21.6	78.6	1.029	0.000
26120	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748504.10	4286646.00	414.37	169.0	21.6	78.6	1.029	0.000
26130	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748513.90	4286656.70	414.63	169.0	21.6	78.6	1.029	0.000
26570	Galv Line 8	748368.26	4287046.91	420.41	101.7	12.3	48.5	0.254	0.000
26580	Galv Line 8	748374.01	4287041.49	420.11	101.7	12.3	48.5	0.254	0.000
26590	Galv Line 8	748379.56	4287036.28	419.82	101.7	12.3	48.5	0.254	0.000
26600	Galv Line 8	748420.52	4286997.79	419.55	38.0	15.1	38.0	0.254	0.000
26610	Galv Line 8	748428.00	4286990.81	419.95	38.0	15.1	38.0	0.254	0.000
26620	Galv Line 8	748436.60	4286982.91	419.85	38.0	15.1	38.0	0.254	0.000
26630	Galv Line 8	748444.54	4286975.49	419.62	38.0	15.1	38.0	0.254	0.000
26640	Galv Line 8	748451.78	4286968.87	418.50	38.0	15.1	38.0	0.254	0.000
26650	Galv Line 8	748324.79	4287118.60	421.65	38.0	15.6	17.7	0.254	0.000
26660	Galv Line 8	748331.95	4287112.00	421.52	38.0	15.6	17.7	0.254	0.000
26670	Galv Line 8	748340.34	4287104.30	421.39	38.0	15.6	17.7	0.254	0.000
26680	Galv Line 8	748347.69	4287097.51	421.29	38.0	15.6	17.7	0.254	0.000
26690	Galv Line 8	748354.48	4287091.31	421.16	38.0	15.6	17.7	0.254	0.000
26700	Galv Line 8	748362.29	4287084.18	420.87	38.0	15.6	17.7	0.254	0.000
26710	Galv Line 8	748370.46	4287076.71	420.51	38.0	15.6	17.7	0.254	0.000
26720	Galv Line 8	748378.04	4287069.70	420.14	38.0	15.6	17.7	0.254	0.000
26730	Galv Line 8	748385.51	4287062.91	419.52	38.0	15.6	17.7	0.254	0.000
0126A_1	Slag Pit Volume 1	749691.91	4286762.44	418.70	53.0	29.0	17.7	0.000	0.000
0126A_2	Slag Pit Volume 2	749708.01	4286772.50	421.33	53.0	29.0	17.7	0.000	0.000
0126A_3	Slag Pit Volume 3	749724.24	4286782.31	420.44	53.0	29.0	17.7	0.000	0.000
0126A_4	Slag Pit Volume 4	749740.84	4286791.62	419.00	53.0	29.0	17.7	0.000	0.000
0126A_5	Slag Pit Volume 5	749757.20	4286801.31	418.86	53.0	29.0	17.7	0.000	0.000

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL131772	DEFAULT	Star Memorial Pet Crematory - Crematory	749244.00	4324486.00	641.44	16.0	800.0	27.585	1.0	2.70E+00	0.00E+00	0.00E+00
IL131841	DEFAULT	Alton Steel Inc. - Electric arc furnaces	747753.00	4307832.00	433.07	100.0	250.1	31.029	24.2	2.25E+02	7.07E+01	7.07E+01
IL131845	DEFAULT	Alton Steel Inc. - 14 inch rolling mill reheat furnace	747645.00	4307692.00	432.64	106.0	200.0	2.394	16.0	2.40E+01	0.00E+00	0.00E+00
IL131945	DEFAULT	Alton Memorial Hospital - 3 Boilers	746364.00	4309470.00	521.36	89.0	389.9	24.108	3.0	0.00E+00	1.28E+01	1.28E+01
IL132052	DEFAULT	Olin Winchester, LLC - Package Boiler (B-4)	750887.00	4308614.00	435.63	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132062	DEFAULT	Olin Winchester, LLC - Package Boiler (B-3)	750891.00	4308619.00	435.89	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132063	DEFAULT	Olin Winchester, LLC - Package Boiler (B-2)	750892.00	4308613.00	435.53	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132064	DEFAULT	Olin Winchester, LLC - Package Boiler (B-1)	750888.00	4308609.00	435.30	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-5)	750883.00	4308610.00	435.27	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132148	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #1 (EF-1)	747122.00	4287625.00	425.26	55.0	250.1	54.087	6.2	3.84E+01	4.07E+00	4.07E+00
IL132149	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #2 (EF-2)	747147.00	4287625.00	425.20	44.0	250.1	42.443	7.0	3.84E+01	4.07E+00	4.07E+00
IL132193	DEFAULT	Velocity Services, LLC. - North American Boiler	748928.00	4286192.00	416.21	27.0	450.1	24.305	2.3	2.36E+00	0.00E+00	0.00E+00
IL132194	DEFAULT	Velocity Services, LLC. - Cleaver Brooks boiler	748928.00	4286192.00	416.21	29.0	440.0	39.590	2.0	2.36E+00	0.00E+00	0.00E+00
IL132225	DEFAULT	Gateway Regional Medical Center - Boiler #3	748587.00	4287448.00	426.05	48.0	600.0	41.131	4.5	1.53E+00	1.28E+01	1.28E+01
IL132226	DEFAULT	Gateway Regional Medical Center - Boilers #1 and 2	748592.00	4287452.00	425.95	48.0	600.0	38.966	4.5	3.07E+00	2.57E+01	2.57E+01
IL132247	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #1	747505.00	4287550.00	424.64	75.0	375.0	30.078	2.5	1.30E-01	0.00E+00	0.00E+00
IL132248	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #2	747505.00	4287550.00	424.64	25.0	375.0	65.010	2.5	2.40E-01	1.19E+00	1.19E+00
IL132324	DEFAULT	Precoat Metals - Afterburner AB1 and AB2	749469.00	4292538.00	424.97	34.0	1000.0	64.518	4.0	3.23E+00	0.00E+00	0.00E+00
IL132424	DEFAULT	Highland Electric Light Plant - Engine IC-5	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	2.07E+01	0.00E+00	0.00E+00
IL132425	DEFAULT	Highland Electric Light Plant - Engine IC-7	788126.93	4293320.17	534.65	57.0	734.1	6.265	11.4	2.51E+01	0.00E+00	0.00E+00
IL132496	DEFAULT	ConocoPhillips Co. - Catalytic reformer #1 (STK12-4)	754869.00	4302625.00	442.55	349.9	600.0	56.810	15.0	6.28E+01	9.53E+01	9.53E+01
IL132510	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-F301 (STK5-2)	754327.00	4303077.00	444.69	185.0	319.0	21.878	8.0	1.21E+01	0.00E+00	0.00E+00
IL132511	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-F302 (STK5-1)	754326.00	4303100.00	444.49	150.0	150.0	11.677	8.5	1.57E+01	5.29E+00	5.29E+00
IL132512	DEFAULT	ConocoPhillips Co. - Steam methane reformer: SMR Heater (HTR-SMR - STK12-8)	754873.00	4302750.00	443.04	199.9	749.9	36.638	12.0	4.75E+01	6.82E+01	6.82E+01
IL132516	DEFAULT	ConocoPhillips Co. - Rectified absorption unit: Reboiler heater (HTR-RAU-DEBUT - STK5-5)	754470.00	4302943.00	444.98	75.0	850.0	34.440	5.0	7.14E+00	0.00E+00	0.00E+00
IL132517	DEFAULT	ConocoPhillips Co. - Rectified absorption system to RFG	754240.00	4303144.00	443.47	150.0	710.0	26.338	6.0	0.00E+00	1.20E+02	1.20E+02
IL132519	DEFAULT	ConocoPhillips Co. - Cracked absorption unit (HTR-CAU-ROSTILL - STK5-4)	754468.00	4302963.00	445.41	85.0	800.0	22.173	7.2	6.72E+00	0.00E+00	0.00E+00
IL132526	DEFAULT	ConocoPhillips Co. - CCU-1 Startup heater B-1	754240.00	4303144.00	443.47	212.0	500.1	86.953	4.5	0.00E+00	3.55E+01	3.55E+01
IL132535	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #2 (STK6-3)	754848.00	4302895.00	443.27	199.9	175.0	49.954	11.0	4.72E+01	2.17E+03	2.17E+03
IL132551	DEFAULT	ConocoPhillips Co. - Alkylation unit: HTR-ALKY-HM2 (STK6-6)	754930.00	4303043.00	442.59	150.9	475.1	12.398	5.7	4.32E+00	0.00E+00	0.00E+00
IL132556	DEFAULT	ConocoPhillips Co. - Utility boiler #15 (STK12-15)	754859.00	4302776.00	443.44	132.0	425.0	43.165	7.0	2.65E+01	1.62E+01	1.62E+01
IL132557	DEFAULT	ConocoPhillips Co. - Utility boiler #16 (STK12-16)	754875.00	4302778.00	443.21	132.0	425.0	43.165	7.0	2.78E+01	1.41E+01	1.41E+01
IL132558	DEFAULT	ConocoPhillips Co. - Utility boiler 17 (STK12-17)	754902.00	4302784.00	442.91	150.0	317.0	52.218	10.0	3.60E+01	1.82E+01	1.82E+01
IL132559	DEFAULT	ConocoPhillips Co. - Utility boiler 18 (STK6-9)	754919.00	4302809.00	442.52	100.0	325.0	14.465	6.2	3.00E+01	6.61E+00	6.61E+00
IL132561	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #1: Charge heater (HTR-HDU-1 - STK13-1)	755217.00	4302588.00	442.16	150.0	790.1	32.144	5.0	5.60E+00	0.00E+00	0.00E+00
IL132564	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #2: Charge heater (HTR-HDU-2 - STK12-14)	755022.00	4302530.00	442.95	150.0	900.1	31.422	5.8	4.90E+00	0.00E+00	0.00E+00
IL132565	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Stabilizer reboiler (HTR-CR3-H2 - STK12-9)	755014.00	4302580.00	442.62	150.0	950.1	7.019	7.8	4.79E+00	0.00E+00	0.00E+00
IL132567	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: Charge heater (HTR-CR3 -H4)	755019.00	4302571.00	442.65	150.0	800.0	28.766	7.8	1.75E+01	8.04E+00	8.04E+00
IL132568	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: First interreactor heater (HTR-CR3-H5)	755019.00	4302548.00	442.78	150.0	749.9	26.929	7.8	2.11E+01	6.93E+00	6.93E+00
IL132569	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Second interreactor heater (HTR-CR3-H6 - STK12-12)	755019.00	4302559.00	442.72	150.0	749.9	14.006	7.8	5.55E+00	0.00E+00	0.00E+00
IL132594	DEFAULT	ConocoPhillips Co. - Sulfuric acid tank	755114.00	4302829.00	441.93	40.0	186.0	26.273	2.0	1.78E+00	2.35E+00	2.35E+00
IL132598	DEFAULT	ConocoPhillips Co. - CCU-2 Startup heater B-1	754240.00	4303144.00	443.47	16.0	509.1	32.964	3.2	4.40E-01	0.00E+00	0.00E+00
IL132599	DEFAULT	Airgas USA, LLC - Liquified carbon dioxide plant	756314.00	4302509.00	435.93	30.0	70.1	79.573	0.2	4.10E-01	0.00E+00	0.00E+00
IL132701	DEFAULT	Kinder Morgan Liquids Terminals, LLC - New Truck loading rack	752998.00	4303578.00	435.63	20.0	70.1	0.262	2.2	4.87E+00	0.00E+00	0.00E+00
IL132739	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 1 of 2)	750915.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL132777	DEFAULT	Elias Kallal & Schaaf Funeral Home & Crematory - Crematorium	742098.00	4312210.00	627.20	30.0	1400.1	18.368	1.7	3.00E+00	0.00E+00	0.00E+00
IL132781	DEFAULT	Christ Bros Products, LLC - Baghouse	754160.00	4283243.00	419.46	32.0	240.0	83.706	3.9	5.56E+01	2.48E+01	2.48E+01
IL132928	DEFAULT	Enable Mississippi River Transmission, LLC - Engine SN-02	782556.00	4285336.00	492.29	30.0	1000.0	9.414	2.6	1.36E+01	0.00E+00	0.00E+00
IL133625	DEFAULT	Waterloo City Light Plant - Engine #1	748326.00	4246769.00	640.45	29.0	749.9	13.579	2.3	4.00E+01	1.35E+00	1.35E+00
IL133627	DEFAULT	Waterloo City Light Plant - Engine #9	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL133628	DEFAULT	Waterloo City Light Plant - Engine #10	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL135983	DEFAULT	Lakeview Memorial Gardens - Crematory	762896.00	4273894.00	579.89	16.0	895.0	26.666	2.6	8.40E+00	0.00E+00	0.00E+00
IL136012	DEFAULT	Breckenridge of IL - Natural gas combustion	756461.00	4277782.00	423.82	38.0	341.0	25.781	2.7	3.94E+00	0.00E+00	0.00E+00
IL136014	DEFAULT	Touchette Regional Hospital - 2 Boilers	751890.00	4273014.00	415.94	39.0	800.0	6.560	3.7	2.26E+00	0.00E+00	0.00E+00
IL136018	DEFAULT	Upchurch Ready Mix Concrete Company - Boiler	749859.00	4276616.00	418.44	30.0	376.1	29.684	3.7	0.00E+00	3.00E-01	3.00E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL136098	DEFAULT	Safety Kleen Systems, Inc. - Pipe still (heat exchanger)	749786.00	4276425.00	420.28	15.0	170.0	0.295	1.0	0.00E+00	1.38E+00	1.38E+00
IL136125	DEFAULT	Milam Recycling and Disposal Facility - Open flare	750434.00	4282812.00	420.54	42.0	1800.1	10.070	1.0	1.83E+01	6.00E+00	6.00E+00
IL136129	DEFAULT	Village of Freeburg - Engine #6	769352.00	4257578.00	509.42	24.0	749.9	24.239	1.8	3.93E+00	0.00E+00	0.00E+00
IL136130	DEFAULT	Village of Freeburg - Engine #4	769352.00	4257578.00	509.42	25.0	550.0	87.871	1.3	9.60E+00	0.00E+00	0.00E+00
IL136131	DEFAULT	Village of Freeburg - Engine #7	769352.00	4257578.00	509.42	22.0	900.1	18.926	2.7	4.50E+01	4.43E+00	4.43E+00
IL136169	DEFAULT	Darling Ingredients, Inc. - Continuous rendering process	747472.00	4281438.00	414.93	44.0	74.9	84.854	4.0	6.67E+00	1.43E+00	1.43E+00
IL136187	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	772959.00	4275690.00	514.30	33.0	325.0	47.134	4.5	6.49E+01	2.90E+01	2.90E+01
IL136486	DEFAULT	Cerro Flow Products, LLC. - Piercing Mill Furnace #2	746228.00	4275272.00	407.32	25.0	299.9	38.901	2.0	8.65E-01	0.00E+00	0.00E+00
IL136547	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	747162.00	4269805.00	448.72	36.0	315.1	86.592	3.5	1.34E+01	5.91E+00	5.91E+00
IL142809	DEFAULT	Magnesium Elektron North America - Combustion units	746452.00	4285724.00	415.49	60.0	450.1	30.537	2.0	1.02E+01	4.44E+00	4.44E+00
IL143317	DEFAULT	Waterloo City Light Plant - Engine #11	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL143319	DEFAULT	Waterloo City Light Plant - Engine #7	748326.00	4246769.00	640.45	33.0	749.9	84.854	2.0	3.41E+01	0.00E+00	0.00E+00
IL143320	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246769.00	640.45	27.0	680.1	84.230	2.3	1.87E+01	1.36E+00	1.36E+00
IL145809	DEFAULT	ConocoPhillips Co. - Crude heaters (STK5-3)	754415.00	4303016.00	445.93	311.9	530.0	87.970	14.0	7.81E-01	1.98E+01	1.98E+01
IL145820	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #1 (STK3-1)	752928.00	4303077.00	428.41	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145826	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-1	754240.00	4303144.00	443.47	15.0	117.1	20.369	1.5	7.10E-01	1.74E+00	1.74E+00
IL145838	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #2 (STK3-2)	752929.00	4303071.00	428.38	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145850	DEFAULT	ConocoPhillips Co. - Flare for major effluent treatment project	754240.00	4303144.00	443.47	30.0	78.0	14.006	9.2	4.51E+00	0.00E+00	0.00E+00
IL147845	DEFAULT	Mayco Mfg, LLC - Britt kettles combustion stack	747189.00	4286970.00	421.78	34.0	250.1	2.362	1.1	2.00E-01	0.00E+00	0.00E+00
IL147846	DEFAULT	Mayco Mfg, LLC - Mixed metals A-II dross baghouse discharge stack	747189.00	4286970.00	421.78	30.0	95.1	52.611	5.0	5.77E-01	0.00E+00	0.00E+00
IL148354	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #1 (STK6-2)	754864.00	4302895.00	442.88	199.9	175.0	49.954	11.0	2.32E+01	3.84E+01	3.84E+01
IL149873	DEFAULT	City of Alton - Incinerator	749456.00	4310990.00	446.33	25.0	1400.1	53.038	1.0	1.40E+00	0.00E+00	0.00E+00
IL149908	DEFAULT	Charles E. Mahoney - Drum mix asphalt plant	749517.00	4309892.00	443.14	25.0	295.1	66.289	4.0	5.74E+01	2.56E+01	2.56E+01
IL154190	DEFAULT	Milam Recycling and Disposal Facility - Engine #1	750544.00	4282853.00	411.88	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154191	DEFAULT	Milam Recycling and Disposal Facility - Engine #2	750538.00	4282852.00	412.01	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154192	DEFAULT	Milam Recycling and Disposal Facility - Engine #3	750548.00	4282855.00	411.81	26.0	820.0	86.231	0.8	7.14E+00	1.84E+00	1.84E+00
IL155302	DEFAULT	Alton Steel Inc. - Ladle Furnace	747753.00	4307832.00	433.07	74.0	275.1	87.215	3.0	2.24E+01	1.12E+01	1.12E+01
IL155304	DEFAULT	Precoat Metals - Boiler B1	749469.00	4292538.00	424.97	24.0	700.1	20.730	1.6	8.80E-01	0.00E+00	0.00E+00
IL155305	DEFAULT	Granite City Pickling & Warehousing - Boiler	746973.00	4286890.00	422.41	50.0	331.1	15.449	2.7	7.06E-01	0.00E+00	0.00E+00
IL155307	DEFAULT	Kraft Heinz Co. - Boiler B	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL155437	DEFAULT	Southwestern Illinois Correctional Center - 2 Boilers	753202.00	4278290.00	421.46	32.0	450.1	15.285	1.5	7.06E-01	0.00E+00	0.00E+00
IL155441	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	772959.00	4275690.00	514.30	33.0	341.0	18.368	3.2	0.00E+00	2.80E+00	2.80E+00
IL156624	DEFAULT	US Air Force/Scott Air Force Base - Boilers and Heaters	774337.00	4270862.00	440.32	30.0	331.1	23.288	2.2	4.81E+00	0.00E+00	0.00E+00
IL156970	DEFAULT	Olin Winchester, LLC - Package Boiler (B-6)	750906.00	4308625.00	436.06	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL159940	DEFAULT	Afton Chemical Corp. - 258 Sulfonation Stack	746513.00	4276305.00	407.05	158.0	70.1	41.820	1.0	0.00E+00	5.59E+00	5.59E+00
IL159942	DEFAULT	Afton Chemical Corp. - Unit 266: Flare 36-0011/36-0610	746653.00	4276356.00	410.10	100.0	700.1	59.368	0.7	8.55E+00	4.90E+01	4.90E+01
IL159965	DEFAULT	Afton Chemical Corp. - Flare 36-0219	746513.00	4276305.00	407.05	146.0	1000.0	42.837	0.4	3.84E+00	2.74E+01	2.74E+01
IL160741	DEFAULT	Brady McCasland, Inc. - Compaction plant	748518.00	4276987.00	413.75	17.0	1521.1	65.469	1.8	5.20E-01	0.00E+00	0.00E+00
IL160742	DEFAULT	Darling Ingredients, Inc. - Kewanee boiler	747472.00	4281438.00	414.93	35.0	450.1	54.448	2.6	1.96E+00	1.51E+01	1.51E+01
IL160799	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-2	754240.00	4303144.00	443.47	48.0	117.1	20.369	1.5	0.00E+00	1.74E+00	1.74E+00
IL160898	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0110	746653.00	4276489.00	405.22	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL165120	DEFAULT	BFI Waste Systems of North America, Inc. - Flare	758882.00	4264336.00	574.97	35.0	1600.1	23.485	0.8	6.80E+00	0.00E+00	0.00E+00
IL166479	DEFAULT	Union Electric Co. - Turbine CT02A	745573.00	4283620.00	420.60	30.0	850.0	18.860	11.4	7.73E+01	2.73E+01	2.73E+01
IL166491	DEFAULT	Enable Mississippi River Transmission, LLC - Turbine SN-03	782556.00	4285336.00	492.29	30.0	749.9	86.854	2.5	9.56E+00	0.00E+00	0.00E+00
IL167781	DEFAULT	Amsted Rail Co., Inc. - Pouring and casting (PR/CST-1)	747025.00	4287611.00	424.80	101.0	251.0	34.768	9.7	0.00E+00	6.70E-01	6.70E-01
IL167787	DEFAULT	Amsted Rail Co., Inc. - Ladle Preheater (LDP-1)	747039.00	4287611.00	424.93	82.0	505.0	31.488	6.1	6.50E+00	2.20E-01	2.20E-01
IL167858	DEFAULT	ConocoPhillips Co. - Scot unit	754240.00	4303144.00	443.47	16.0	115.1	15.580	9.0	0.00E+00	1.72E+02	1.72E+02
IL169226	DEFAULT	Messer, LLC - 2 Boilers	752309.00	4301220.00	434.42	15.0	800.0	0.525	1.4	2.52E+00	0.00E+00	0.00E+00
IL172707	DEFAULT	St. Anthony's Hospital - Boiler #4	745097.00	4310364.00	584.58	64.0	400.0	58.614	2.3	0.00E+00	6.02E+00	6.02E+00
IL179611	DEFAULT	Highland Electric Light Plant - Engine IC-1	788126.93	4293320.17	534.65	12.0	656.0	86.920	1.2	1.44E+01	0.00E+00	0.00E+00
IL179671	DEFAULT	Village of Freeburg - Engine #1	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179672	DEFAULT	Village of Freeburg - Engine #2	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179673	DEFAULT	Village of Freeburg - Engine #3a	769352.00	4257578.00	509.42	25.0	500.1	55.170	1.0	5.92E+00	0.00E+00	0.00E+00
IL181173	DEFAULT	ConocoPhillips Co. - Loading rack	752292.00	4299987.00	429.92	40.0	1800.1	87.510	2.0	1.53E+00	0.00E+00	0.00E+00
IL183733	DEFAULT	Veolia ES Technical Solutions, LLC - Hazardous waste incinerator #4 (rotary kiln)	745532.00	4275942.00	414.76	57.0	650.9	32.570	2.8	3.17E+00	1.16E+01	1.16E+01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL189069	DEFAULT	US Air Force/Scott Air Force Base - Diesel generators	774337.00	4270862.00	440.32	37.0	402.0	29.389	1.3	5.83E+01	0.00E+00	0.00E+00
IL190090	DEFAULT	Contract Services, LLC - 3 Boilers	746767.00	4275755.00	417.81	40.0	310.0	50.381	4.2	8.53E+00	5.14E+00	5.14E+00
IL192953	DEFAULT	Midwest Metal Coatings, LLC - Chemical coater/infrared oven (CC/ IRO)	748281.00	4290395.00	423.88	34.0	110.0	18.926	3.0	2.90E-01	0.00E+00	0.00E+00
IL192964	DEFAULT	Midwest Metal Coatings, LLC - Afterburner	748281.00	4290395.00	423.88	34.0	900.1	23.780	5.0	3.28E-01	0.00E+00	0.00E+00
IL192967	DEFAULT	Midwest Metal Coatings, LLC - Boiler (B1)	748281.00	4290395.00	423.88	34.0	400.0	67.338	1.5	2.12E+00	0.00E+00	0.00E+00
IL198552	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	778702.00	4276345.00	439.34	35.0	297.1	62.254	3.8	2.95E+01	1.32E+01	1.32E+01
IL201652	DEFAULT	Empire Comfort Systems - Stack	763529.00	4266192.00	477.26	25.0	800.0	14.334	1.0	2.69E+00	0.00E+00	0.00E+00
IL204833	DEFAULT	Milam Recycling and Disposal Facility - 3 Passive solar flares	750550.00	4282537.00	594.06	20.0	1800.1	57.138	0.7	4.23E+00	4.38E+00	4.38E+00
IL207740	DEFAULT	Chemtrade Solutions, LLC - Scrubber C007	753339.00	4281367.00	422.21	30.0	70.1	0.394	0.3	0.00E+00	2.00E-01	2.00E-01
IL208343	DEFAULT	Center Point Terminal Co. - Asphalt and polymer modified blend tank (T-9)	746361.00	4289240.00	416.44	33.0	185.1	0.951	1.5	1.00E-01	0.00E+00	0.00E+00
IL209238	DEFAULT	Concrete Supply, LLC - Natural gas combustion	757768.00	4302270.00	444.69	20.0	341.0	25.781	2.7	9.69E-01	0.00E+00	0.00E+00
IL209433	DEFAULT	Alton Water Treatment Facility - Stack	742583.00	4309460.00	488.98	22.0	400.0	85.083	0.7	0.00E+00	5.50E-01	5.50E-01
IL211274	DEFAULT	Kienstra-Illinois, LLC - Natural gas combustion	764550.00	4296982.00	575.95	20.0	341.0	25.781	2.7	7.68E-01	0.00E+00	0.00E+00
IL211772	DEFAULT	Center Point Terminal Co. - Incinerator/waste heat boiler	746361.00	4289240.00	416.44	18.0	650.0	7.970	2.0	1.83E-01	1.05E+00	1.05E+00
IL212692	DEFAULT	Chain of Rocks Recycling & Disposal - Open flare	746945.00	4293274.00	431.59	20.0	1400.1	47.265	0.7	6.92E+00	1.06E+00	1.06E+00
IL212881	DEFAULT	Koch Fertilizer, LLC - Ammonia heater	750008.00	4305316.00	428.15	25.0	250.1	42.443	1.0	2.43E+00	5.30E-01	5.30E-01
IL213573	DEFAULT	Illinois Department of Transportation - R and K model 367-1 incinerator	732106.00	4332182.00	623.79	15.0	736.1	30.865	2.8	2.88E+00	0.00E+00	0.00E+00
IL213834	DEFAULT	Darling Ingredients, Inc. - Johnson boiler	747472.00	4281438.00	414.93	33.0	450.1	46.937	2.8	1.96E+00	1.51E+01	1.51E+01
IL213854	DEFAULT	Solvay Fluorides, LLC - Boiler	750245.00	4276115.00	419.72	30.0	361.0	7.314	2.8	1.44E+00	0.00E+00	0.00E+00
IL215315	DEFAULT	Madison County Sand, LLC - Drum mix asphalt plant	758921.00	4289026.00	422.01	32.0	245.0	64.452	4.1	1.63E+01	5.00E-01	5.00E-01
IL217756	DEFAULT	Phillips 66 Pipeline, LLC - Truck loading racks	744935.00	4274152.00	407.25	20.0	70.1	10.594	2.0	1.10E+01	0.00E+00	0.00E+00
IL218530	DEFAULT	ConocoPhillips Co. - North property ground flare (FLR1-2)	754486.00	4303322.00	445.08	195.0	1800.1	2.394	3.0	1.41E+01	0.00E+00	0.00E+00
IL218537	DEFAULT	Custom Steel Processing - Scrubber	746335.00	4286043.00	416.99	55.0	70.1	49.036	4.2	0.00E+00	1.00E-01	1.00E-01
IL218539	DEFAULT	Custom Steel Processing - Sulfuric acid storage tank	746335.00	4286043.00	416.99	35.0	127.0	0.000	2.4	0.00E+00	1.00E-01	1.00E-01
IL218569	DEFAULT	Contract Services, LLC - Boiler #4	746767.00	4275755.00	417.81	40.0	310.0	49.036	3.7	1.30E+01	1.64E+00	1.64E+00
IL218687	DEFAULT	ConocoPhillips Co. - Gas plant sour water stripper	754240.00	4303144.00	443.47	15.0	128.9	11.382	2.9	1.06E+00	0.00E+00	0.00E+00
IL218995	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silos and truck loadout	772959.00	4275690.00	514.30	32.0	86.1	84.854	1.5	1.26E+00	0.00E+00	0.00E+00
IL219420	DEFAULT	Crown Textile Services - Boiler	744287.00	4259382.00	466.40	24.0	450.1	35.227	1.7	1.03E+00	0.00E+00	0.00E+00
IL220266	DEFAULT	American Colloid Co. - Sand drying	746862.00	4287239.00	419.91	72.0	491.1	28.766	3.3	1.29E+00	0.00E+00	0.00E+00
IL220267	DEFAULT	American Colloid Co. - Space Heaters	746862.00	4287239.00	419.91	35.0	198.1	21.484	1.4	2.30E-01	0.00E+00	0.00E+00
IL220618	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	757560.00	4299901.00	441.63	32.0	280.0	68.322	4.3	7.61E+01	3.40E+01	3.40E+01
IL220849	DEFAULT	ConocoPhillips Co. - Alkylation unit flare (FLR6-1)	755035.00	4303081.00	442.55	199.9	1800.1	2.034	2.5	1.85E+01	0.00E+00	0.00E+00
IL222033	DEFAULT	Waterloo City Light Plant - Dual fuel-fired Turbine GT1	748326.00	4246769.00	640.45	39.0	612.1	41.590	4.8	1.77E+01	0.00E+00	0.00E+00
IL222134	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silo loading	757560.00	4299901.00	441.63	26.0	123.0	4.986	1.7	7.00E-01	0.00E+00	0.00E+00
IL222135	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	757560.00	4299901.00	441.63	35.0	361.0	26.896	3.7	0.00E+00	2.80E+00	2.80E+00
IL222988	DEFAULT	Apex Oil Co., Inc. - Thermal oxidizers	752471.00	4302667.00	431.07	18.0	820.0	43.985	2.3	2.98E+00	0.00E+00	0.00E+00
IL223796	DEFAULT	Union Electric Co. - Turbine CT03	745735.00	4282930.00	420.96	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223797	DEFAULT	Union Electric Co. - Turbine CT04	745776.00	4282947.00	421.16	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223798	DEFAULT	Union Electric Co. - Turbine CT05	745538.00	4283620.00	420.90	38.0	603.1	74.948	3.4	6.90E+01	9.00E-01	9.00E-01
IL224167	DEFAULT	Interurban ILAWC - Emergency generator	757265.00	4276109.00	482.38	29.0	880.1	51.463	1.3	1.10E+01	4.60E+00	0.00E+00
IL224416	DEFAULT	Belleville Landfill, Inc. - Flare	760402.00	4264040.00	571.88	35.0	1600.1	8.659	0.8	1.22E+01	0.00E+00	0.00E+00
IL224592	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	755685.00	4299823.00	431.10	32.0	251.0	53.628	4.1	3.09E+01	1.38E+01	1.38E+01
IL224594	DEFAULT	Christ Bros Products, LLC - Asphalt tank heaters and boilers	755701.00	4299841.00	427.46	10.0	416.0	42.443	1.0	1.18E+00	2.80E+00	2.80E+00
IL224838	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-01	750039.00	4285426.00	410.47	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224839	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-02	750044.00	4285416.00	410.24	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224840	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-03	750049.00	4285406.00	410.37	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224841	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-04	750054.00	4285397.00	410.30	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224901	DEFAULT	Premcor Refining Group, Inc. - Thermal oxidizer	752775.00	4302414.00	429.95	20.0	342.1	49.462	0.8	7.40E-01	0.00E+00	0.00E+00
IL225166	DEFAULT	Metro Crematory - Crematory	754120.00	4290785.00	417.29	18.0	736.1	84.854	1.0	1.50E+00	0.00E+00	0.00E+00
IL225832	DEFAULT	ConocoPhillips Co. - Startup/malfunction/breakdown	754240.00	4303144.00	443.47	103.0	623.9	21.681	4.6	2.86E+01	1.91E+02	1.91E+02
IL225843	DEFAULT	City of O'Fallon - 400 kW (591 HP) Diesel generator	774612.00	4277280.00	434.42	13.0	500.1	86.592	0.7	3.37E+00	0.00E+00	0.00E+00
IL225844	DEFAULT	City of O'Fallon - 900 kW (1 322 HP) Diesel generator	774612.00	4277280.00	434.42	17.0	500.1	86.592	0.7	7.55E+00	0.00E+00	0.00E+00
IL225960	DEFAULT	Waterloo City Light Plant - Engine #4	748326.00	4246769.00	640.45	37.0	680.1	87.904	2.5	3.32E+01	0.00E+00	0.00E+00
IL226013	DEFAULT	Milam Recycling and Disposal Facility - 325 HP Tub grinder	750550.00	4282537.00	594.06	7.0	627.0	74.030	0.3	2.20E+00	8.00E-01	8.00E-01
IL226014	DEFAULT	Milam Recycling and Disposal Facility - Enclosed flare	750476.00	4282825.00	419.62	55.0	1400.1	0.656	12.0	2.40E+01	6.08E+00	6.08E+00

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL226015	DEFAULT	Milam Recycling and Disposal Facility - 760 HP Tub grinder	750550.00	4282537.00	594.06	8.0	627.0	70.881	0.7	5.10E+00	1.90E+00	1.90E+00
IL226184	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - 1F Mix muller (MM-3) Low profile turbine (LF-1) and Induction form sta	750075.00	4306259.00	432.32	41.0	209.9	36.080	2.1	2.00E+00	0.00E+00	0.00E+00
IL226204	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #4 (SA-4)	750150.00	4308388.00	431.10	90.0	350.0	41.426	1.6	9.33E+01	0.00E+00	0.00E+00
IL226256	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip Anneal #3 (SA-3)	750439.00	4308328.00	433.83	100.0	350.0	62.746	1.3	9.83E+01	0.00E+00	0.00E+00
IL226257	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - #7 Strip Anneal (SA-7)	750222.00	4308335.00	433.20	89.0	850.0	38.671	1.5	1.18E+02	0.00E+00	0.00E+00
IL226352	DEFAULT	Olin Winchester, LLC - Hammermill 1 2 and 3 (HM-1 HM-2 and HM-3)	750495.00	4308287.00	434.42	21.0	160.1	19.647	1.8	8.03E+00	0.00E+00	0.00E+00
IL226612	DEFAULT	Solutia Inc. - Santoflex process: Thermal oxidizer 2770934	746325.00	4275822.00	405.12	112.0	865.0	16.794	12.6	1.50E+01	0.00E+00	0.00E+00
IL226783	DEFAULT	Schildknecht Funeral Home, Inc. - Crematory	769033.00	4275796.00	549.57	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL227030	DEFAULT	ConocoPhillips Co. - #4 Crude unit heater H-24 (STK9-5)	753051.00	4302413.00	428.81	179.9	550.0	26.207	8.5	2.27E+01	0.00E+00	0.00E+00
IL227032	DEFAULT	ConocoPhillips Co. - Hydrogen plant #1 flare (FLR12-2)	755194.00	4302793.00	443.67	130.0	1800.1	7.970	1.7	1.62E+01	0.00E+00	0.00E+00
IL227034	DEFAULT	ConocoPhillips Co. - Sulfur operation	754240.00	4303144.00	443.47	158.0	590.1	37.753	3.4	0.00E+00	3.00E+01	3.00E+01
IL227035	DEFAULT	ConocoPhillips Co. - Process heater HP-1 (STK12-6)	755194.00	4302793.00	443.67	127.0	360.1	27.093	7.5	6.97E+00	0.00E+00	0.00E+00
IL227038	DEFAULT	ConocoPhillips Co. - SZU Charge heater H-3	755219.00	4302667.00	442.29	150.0	567.1	25.518	5.0	5.75E+00	0.00E+00	0.00E+00
IL227333	DEFAULT	Waterloo City Light Plant - Engine SG5	750635.00	4249410.00	628.97	8.0	924.0	61.172	0.7	1.40E+00	0.00E+00	0.00E+00
IL227400	DEFAULT	Collinsville Wastewater Treatment Plant - Emergency diesel generator (2922 HP/2180 kW)	758289.00	4283982.00	419.36	36.0	692.0	67.371	2.0	1.72E+01	1.20E+00	0.00E+00
IL227432	DEFAULT	Totall Metal Recycling, Inc. - Safety certification unit	748030.00	4289120.00	422.74	6.0	587.0	8.069	1.2	1.00E-01	0.00E+00	0.00E+00
IL227590	DEFAULT	Illinois Electric Works - 3 Burn off ovens	747872.00	4288124.00	423.20	46.0	250.1	41.230	2.4	1.17E+00	6.90E-02	6.90E-02
IL227679	DEFAULT	Union Electric Co. - Diesel generator	745516.00	4283326.00	430.38	26.0	490.0	60.811	1.4	1.30E+00	1.60E-01	1.60E-01
IL228119	DEFAULT	St. Clair Crematory - Human crematory	773291.00	4275644.00	507.28	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL228260	DEFAULT	Center Ethanol Co. - West boiler	745888.00	4275662.00	412.66	75.0	428.1	43.460	3.0	3.23E+00	0.00E+00	0.00E+00
IL228262	DEFAULT	Center Ethanol Co. - East boiler	745888.00	4275662.00	412.66	75.0	428.1	45.428	3.0	3.23E+00	0.00E+00	0.00E+00
IL228263	DEFAULT	Center Ethanol Co. - RTO	745888.00	4275662.00	412.66	50.0	310.0	70.684	5.5	6.85E+00	0.00E+00	0.00E+00
IL228294	DEFAULT	ConocoPhillips Co. - Distilling west refinery flare (FLR10-1)	753647.00	4302546.00	430.31	197.0	1800.1	6.626	3.0	2.51E+01	0.00E+00	0.00E+00
IL228295	DEFAULT	ConocoPhillips Co. - SZU Regenerator vent	755209.00	4302720.00	442.32	44.0	135.1	32.341	2.0	1.78E+00	2.35E+00	2.35E+00
IL229921	DEFAULT	Christ Bros Products, LLC - 8 Heaters and boilers	754160.00	4283243.00	419.46	37.0	400.0	20.664	1.8	1.18E+00	2.80E+00	2.80E+00
IL229922	DEFAULT	Christ Bros Products, LLC - Silo filling	754160.00	4283243.00	419.46	25.0	74.0	0.262	0.4	5.10E-01	0.00E+00	0.00E+00
IL229923	DEFAULT	Christ Bros Products, LLC - Truck loading	754160.00	4283243.00	419.46	29.0	135.1	48.052	2.0	5.80E-01	0.00E+00	0.00E+00
IL230300	DEFAULT	Afton Chemical Corp. - Flare 36-0090	746478.00	4276293.00	407.28	45.0	1600.1	0.656	8.0	2.20E+00	0.00E+00	0.00E+00
IL230350	DEFAULT	Village of Freeburg - Engine #10	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL230355	DEFAULT	Asphalt Sales & Products Inc. - Truck loadout	757560.00	4299901.00	441.63	28.0	135.1	43.198	1.9	7.90E-01	0.00E+00	0.00E+00
IL231259	DEFAULT	Village of Freeburg - Engine #11	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231260	DEFAULT	Village of Freeburg - Engine #12	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231291	DEFAULT	Kurrus Funeral Home - 2 Crematories	759066.00	4271234.00	547.11	18.0	787.0	13.186	1.1	2.70E+00	0.00E+00	0.00E+00
IL232739	DEFAULT	ConocoPhillips Co. - Benzene extraction unit #3 (STK6-4)	754923.00	4302930.00	442.59	185.0	470.0	16.138	9.7	1.22E+01	0.00E+00	0.00E+00
IL232785	DEFAULT	Roxana Landfill, Inc. - Enclosed flare	759153.00	4301368.00	619.62	35.0	1600.1	20.008	12.0	2.31E+01	1.76E+00	1.76E+00
IL233294	DEFAULT	Gateway Terminals, LLC. - Marine vapor combustion unit (MVCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	1.69E+01	0.00E+00	0.00E+00
IL233295	DEFAULT	Gateway Terminals, LLC. - Truck/Rail vapor destruction unit (TRCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	8.39E+00	0.00E+00	0.00E+00
IL235261	DEFAULT	Gulfstream Aerospace Services Corp. - Make-up air unit 19-3	747629.00	4273560.00	410.10	42.0	577.0	29.356	2.5	1.63E+00	0.00E+00	0.00E+00
IL235939	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #5 (SA-5)	750151.00	4308373.00	430.91	90.0	450.1	54.087	1.4	1.07E+02	0.00E+00	0.00E+00
IL235940	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #6 (SA-6)	750207.00	4308390.00	431.82	110.0	580.0	62.779	1.3	1.07E+02	0.00E+00	0.00E+00
IL236260	DEFAULT	Bunge-SF Grain, LLC. - Grain Dryer	746158.00	4281045.00	417.55	96.0	105.0	87.904	8.2	5.06E+00	1.71E+01	1.71E+01
IL236359	DEFAULT	City of Belleville - 2 Emergency generators (1500 kW each)	763544.00	4265595.00	474.70	28.0	627.0	73.767	1.2	2.57E+01	1.84E+00	0.00E+00
IL236927	DEFAULT	Kraft Heinz Co. - Boiler C	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236928	DEFAULT	Kraft Heinz Co. - Boiler D	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236929	DEFAULT	Kraft Heinz Co. - Boiler E	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236930	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 2 of 2)	750920.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL237099	DEFAULT	Union Electric Co. - Turbine CT02B	745573.00	4283613.00	419.69	30.0	850.0	18.860	11.4	7.74E+01	2.73E+01	2.73E+01
IL237182	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	1.32E+01	0.00E+00	0.00E+00
IL237183	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	2.57E+01	0.00E+00	0.00E+00
IL237340	DEFAULT	Charles E. Mahoney - Asphalt silo filling	749517.00	4309892.00	443.14	25.0	74.0	0.262	0.4	5.30E-01	0.00E+00	0.00E+00
IL237341	DEFAULT	Charles E. Mahoney - Truck loadout	749517.00	4309892.00	443.14	27.0	136.0	42.050	1.9	6.00E-01	0.00E+00	0.00E+00
IL237362	DEFAULT	Charles E. Mahoney - Asphalt heaters and boilers	749517.00	4309892.00	443.14	10.0	350.0	69.995	1.0	1.18E+00	2.80E+00	2.80E+00
IL237659	DEFAULT	Green Plains Madison, LLC - Boiler #1	745256.00	4285477.00	414.14	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL237660	DEFAULT	Green Plains Madison, LLC - Fire Pump back-up Engine (460 HP)	745191.00	4285409.00	413.85	13.0	627.0	86.231	0.8	4.80E-01	9.40E-01	0.00E+00
IL237661	DEFAULT	Green Plains Madison, LLC - Electrical system backup Engine (1495 HP)	745144.00	4285537.00	415.88	28.0	627.0	73.767	1.2	3.54E+00	1.21E+01	0.00E+00

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL237679	DEFAULT	Green Plains Madison, LLC - Indirect dryer #1	745191.00	4285468.00	415.12	71.0	387.1	12.136	4.6	7.97E+00	4.10E-01	4.10E-01
IL237866	DEFAULT	Amsted Rail Co., Inc. - Curing oven	746913.00	4287625.00	419.23	39.0	258.0	27.978	1.9	2.52E-01	0.00E+00	0.00E+00
IL237899	DEFAULT	Center Ethanol Co. - Emergency generator	745888.00	4275662.00	412.66	28.0	627.0	73.767	1.2	3.30E+00	0.00E+00	0.00E+00
IL237903	DEFAULT	Center Ethanol Co. - Ethanol loadout Rack	745888.00	4275662.00	412.66	19.0	99.1	7.806	0.7	8.86E-01	0.00E+00	0.00E+00
IL238199	DEFAULT	Solutia Inc. - An in-situ soil vapor extraction system	746325.00	4275822.00	405.12	15.0	70.1	73.406	0.2	4.00E-01	0.00E+00	0.00E+00
IL238839	DEFAULT	Waterloo City Light Plant - Turbine Generator (GT2)	748326.00	4246769.00	640.45	39.0	965.9	87.937	4.8	1.78E+01	0.00E+00	0.00E+00
IL238942	DEFAULT	ConocoPhillips Co. - Rental Boiler #3	754240.00	4303144.00	443.47	20.0	550.0	46.412	4.0	1.65E+00	0.00E+00	0.00E+00
IL239395	DEFAULT	Amsted Rail Co., Inc. - Sand dryer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	1.24E+00	0.00E+00	0.00E+00
IL239396	DEFAULT	Amsted Rail Co., Inc. - Thermal sand reclaimer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	3.70E-01	0.00E+00	0.00E+00
IL239899	DEFAULT	Shell Oil Products US - RTO	753758.00	4303650.00	442.59	19.0	200.0	33.948	2.5	0.00E+00	8.47E-01	8.47E-01
IL240053	DEFAULT	Westwood Lands, Inc. - Process heater DFH-1	748864.00	4285684.00	412.99	39.0	284.1	23.157	2.0	8.30E-01	0.00E+00	0.00E+00
IL240359	DEFAULT	Afton Chemical Corp. - Boiler S00-15-0210	746660.00	4276488.00	405.74	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL240360	DEFAULT	Afton Chemical Corp. - Boiler S00-15-0310	746674.00	4276485.00	407.25	45.0	350.0	17.318	7.0	4.91E+00	0.00E+00	0.00E+00
IL241300	DEFAULT	ConocoPhillips Co. - VOC Flare (West - FLR4-1)	753428.00	4303073.00	428.81	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241301	DEFAULT	ConocoPhillips Co. - VOC Flare (East - FLR4-2)	753441.00	4303073.00	428.77	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
IL241302	DEFAULT	ConocoPhillips Co. - Coker north flare (FLR1-3)	754947.00	4303684.00	444.23	139.0	911.0	26.535	5.4	0.00E+00	3.08E+01	3.08E+01
IL241303	DEFAULT	ConocoPhillips Co. - VF-5 Heater (H350H4 - STK1-1)	754937.00	4303459.00	444.98	150.0	650.0	26.765	12.0	0.00E+00	1.35E+01	1.35E+01
IL241304	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H2 - STK1-2)	754953.00	4303305.00	444.85	150.0	500.1	22.304	10.0	0.00E+00	7.37E+00	7.37E+00
IL241305	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H1 - STK1-3)	754986.00	4303306.00	444.82	150.0	500.1	22.304	10.0	0.00E+00	7.38E+00	7.38E+00
IL241312	DEFAULT	ConocoPhillips Co. - Heater HP-2 (STK7-1)	755263.00	4302920.00	443.86	118.0	400.0	45.002	10.8	0.00E+00	2.87E+01	2.87E+01
IL241405	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #1	756504.00	4295421.00	425.00	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL241449	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #2	756494.00	4295735.00	424.74	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL242126	DEFAULT	Center Point Terminals Co. - Tank Heater	746359.00	4289027.00	411.84	49.0	331.1	32.144	2.5	1.03E+00	0.00E+00	0.00E+00
IL245579	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #3	756198.00	4295409.00	424.97	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245580	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #4	756182.00	4295721.00	424.77	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
IL245839	DEFAULT	Milam Recycling and Disposal Facility - Landfill gas conversion plant	750666.00	4282895.00	413.09	55.0	70.1	0.000	4.5	3.80E+00	9.00E-01	9.00E-01
IL246759	DEFAULT	Stookey Township WWTP - 2000 kW Emergency generator	756253.00	4269975.00	518.86	28.0	627.0	73.767	1.2	1.54E+01	0.00E+00	0.00E+00
IL246761	DEFAULT	Omega Partners Hartford, LLC - Truck Rail Marine racks loadout and VCUs	752232.00	4300866.00	430.74	33.0	69.5	0.328	0.3	6.60E+00	0.00E+00	0.00E+00
IL246762	DEFAULT	Omega Partners Hartford, LLC - Boiler 1 and 2	752273.00	4300698.00	430.18	58.0	436.0	27.650	3.4	3.83E+00	0.00E+00	0.00E+00
IL248060	DEFAULT	Kraft Heinz Co. - Boiler F	748105.00	4289580.00	423.56	26.0	380.0	34.407	2.0	1.44E+00	0.00E+00	0.00E+00
IL248262	DEFAULT	Olin Winchester, LLC - New Rotary retort process (RDR-2)	750495.00	4308287.00	434.42	16.0	119.9	26.634	1.7	9.62E+00	0.00E+00	0.00E+00
IL248799	DEFAULT	Gateway Terminals, LLC. - 600 HP Boiler	744607.00	4275093.00	422.70	26.0	440.0	39.557	2.2	2.11E+00	0.00E+00	0.00E+00
IL249480	DEFAULT	Highland Electric Light Plant - Engine IC-2	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.44E+01	0.00E+00	0.00E+00
IL249481	DEFAULT	Highland Electric Light Plant - Engine IC-3	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.25E+01	0.00E+00	0.00E+00
IL249482	DEFAULT	Highland Electric Light Plant - Engine IC-9	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249483	DEFAULT	Highland Electric Light Plant - Engine IC-10	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	1.50E+01	0.00E+00	0.00E+00
IL249499	DEFAULT	Roxana Landfill, Inc. - Zink ultra-Low emissions (Zule) Flare	759153.00	4301368.00	619.62	60.0	1800.1	46.838	13.0	1.25E+01	1.55E+01	1.55E+01
IL250343	DEFAULT	Mayco Mfg, LLC - Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.74E+00	0.00E+00	0.00E+00
IL250892	DEFAULT	ConocoPhillips Co. - Lift station pump (21028)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.90E-01	4.90E-01
IL250893	DEFAULT	ConocoPhillips Co. - Lift station pump (21029)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.30E+00	4.60E-01	4.60E-01
IL250894	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #1	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250895	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #2	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250896	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #3	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL250897	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #4	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250898	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #5	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
IL250899	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #6	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
IL251099	DEFAULT	Amsted Rail Co., Inc. - Annealing Furnace 18	747071.00	4287670.00	426.02	39.0	284.1	23.157	2.0	1.12E+00	1.00E-01	1.00E-01
IL251286	DEFAULT	Premcor Refining Group, Inc. - Vapor Combustion Unit	752775.00	4302414.00	429.95	53.0	289.0	24.830	2.9	1.00E+01	0.00E+00	0.00E+00
IL251735	DEFAULT	ConocoPhillips Co. - Diesel engine (605 HP)	754240.00	4303144.00	443.47	15.0	69.5	0.328	0.3	3.50E+00	0.00E+00	0.00E+00
IL251754	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #1	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL253107	DEFAULT	Allnex USA, Inc. - Natural gas combustion	749698.00	4276478.00	418.37	58.0	436.0	27.650	3.4	3.26E+00	0.00E+00	0.00E+00
IL253166	DEFAULT	Cerro Flow Products, LLC. - Generators	746228.00	4275272.00	407.32	26.0	490.0	60.811	1.4	9.23E-01	2.82E-01	2.82E-01
IL253167	DEFAULT	City of Belleville - Emergency diesel generator (1500 kW)	762469.00	4266351.00	468.70	26.0	490.0	60.811	1.4	1.16E+01	0.00E+00	0.00E+00
IL253300	DEFAULT	Phillips 66 Pipeline, LLC - Engines (insignificant activities)	744935.00	4274152.00	407.25	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253361	DEFAULT	Amsted Rail Co., Inc. - Sand regeneration process (combustion)	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	2.80E-01	2.80E-01	2.80E-01

R005013

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL253367	DEFAULT	Green Plains Madison, LLC - Boiler #2	745258.00	4285486.00	414.27	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253368	DEFAULT	Green Plains Madison, LLC - Boiler #3	745260.00	4285491.00	414.24	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253369	DEFAULT	Green Plains Madison, LLC - Boiler #4	745262.00	4285500.00	414.21	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253370	DEFAULT	Green Plains Madison, LLC - Indirect dryer #2	745164.00	4285430.00	414.60	81.0	387.1	8.430	5.5	7.97E+00	4.10E-01	4.10E-01
IL253386	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Engines (insignificant activities)	750423.00	4308352.00	434.28	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253738	DEFAULT	Milam Recycling and Disposal Facility - 2000 scfm Utility Flare	750550.00	4282537.00	594.06	36.0	852.0	18.565	4.6	1.83E+01	7.32E+00	7.32E+00
IL253769	DEFAULT	Veolia ES Technical Solutions, LLC - 2 Emergency generators	745532.00	4275942.00	414.76	26.0	490.0	60.811	1.4	7.41E-01	0.00E+00	0.00E+00
IL254175	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #2	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254176	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #3	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254177	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #4	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254178	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #5	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254179	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #6	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254699	DEFAULT	HSHS St. Elizabeth's Hospital - 2 Emergency generators	767237.00	4275111.00	541.01	28.0	627.0	73.767	1.2	1.93E+01	0.00E+00	0.00E+00
IL255341	DEFAULT	Roxana Landfill, Inc. - New open flare	759153.00	4301368.00	619.62	45.0	1800.1	61.434	1.3	3.77E+01	8.17E+00	8.17E+00
IL255527	DEFAULT	Magnesium Elektron North America - Natural gas combustion	746452.00	4285724.00	415.49	39.0	284.1	23.157	2.0	4.20E-01	0.00E+00	0.00E+00
IL255741	DEFAULT	ConocoPhillips Co. - Utility Boiler #19 (BLR-19)	754755.00	4302798.00	442.16	132.0	304.1	46.281	7.0	0.00E+00	1.54E+01	1.54E+01
IL255816	DEFAULT	Mayco Mfg, LLC - Expansion: Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.94E+00	0.00E+00	0.00E+00
IL255953	DEFAULT	Moore Recycling Concrete & Asphalt, LLC. - Drum mix asphalt plant	762178.00	4246660.00	463.19	35.0	251.0	56.908	4.0	1.32E+01	0.00E+00	0.00E+00
IL256624	DEFAULT	PBT Acquisition, LLC - ASR Dryer	748704.00	4280830.00	418.77	32.0	305.0	19.483	1.5	2.53E+00	0.00E+00	0.00E+00
IL257535	DEFAULT	Marathon Ashland Pipe Line, LLC - Marine vapor combustion unit	751239.00	4302663.00	402.85	51.0	810.1	27.749	7.4	2.71E+01	0.00E+00	0.00E+00
SJEFF1	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	410.0	370.0	54.081	19.0		1.44E+02	1.44E+02
SJEFF2	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	125.0	210.0	59.173	6.6		2.04E-02	2.04E-02
SJEFF3	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	10.0	1100.0	23.333	0.5		1.32E-01	0.00E+00
SJEFF15	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	52.0	260.0	10.666	2.0		5.09E-03	5.09E-03
SJEFF16	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	2.29E-01
SJEFF17	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.40E-03	2.40E-03
SJEFF18	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	0.00E+00
SJEFF19	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.80E-03	1.80E-03
SJEFF20	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.20E-03	1.20E-03
SJEFF21	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		5.40E-04	5.40E-04
SJEFF22	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.80E-04	4.80E-04
SJEFF23	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.20E-04	4.20E-04
SJEFF24	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		3.00E-04	3.00E-04
SJEFF25	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	15.0	1049.0	149.734	0.2		4.80E-04	0.00E+00
SJEFF26	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	20.7		1.73E+03	1.73E+03
SJEFF27	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	29.0		2.50E+03	2.50E+03
SJEFF28	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	30.0	985.0	105.633	1.3		8.52E-06	0.00E+00
SJEFF29	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	240.0	600.0	32.999	7.0		3.54E-03	3.54E-03
SJEFF59	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF60	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF61	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	4.20E-02	3.00E-04	3.00E-04
SJEFF62	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.000	1.7	1.12E-02	7.98E-05	7.98E-05
SJEFF63	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	27.0	1800.0	10.046	1.5	2.86E-02	1.63E-01	1.63E-01
SJEFF65	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.45E-02	4.34E-04	4.34E-04
SJEFF66	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.40E-02	4.20E-04	4.20E-04
SJEFF67	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	8.35E-02	5.97E-04	5.97E-04
SJEFF68	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	3.54E-01	2.53E-03	2.53E-03
SJEFF69	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	-459.7	0.003	2.0	2.51E-01	1.79E-03	1.79E-03
SJEFF70	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF71	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF72	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	3.32E-01	1.02E-01	0.00E+00
SJEFF73	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF74	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF82	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	7.38E-02	3.77E+00	3.77E+00
SJEFF83	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	1.96E-01	6.37E+00	6.37E+00

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SJEFF86	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	20.0	0.0	0.000	0.5	1.26E-01	9.00E-04	9.00E-04
SJEFF92	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	10.0	1100.0	23.333	0.5		2.17E+00	0.00E+00
SJEFF99	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	2.5	170.0	46.499	2.0	5.60E-01	4.25E-02	4.25E-02
SJEFF100	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	2.5	170.0	46.499	2.0	1.60E-01	1.14E-03	1.14E-03
SJEFF125	DEFAULT	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	20.0	250.0	49.249	5.0		5.88E-02	5.88E-02
SJEFF128	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.33E-01	2.33E-01
SJEFF129	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.92E-02	1.92E-02
SJEFF130	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		9.62E-03	9.62E-03
SJEFF131	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		3.50E-01	3.50E-01
SJEFF132	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.95E-01	2.95E-01
SJEFF133	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1347.0	16.316	1.0		1.54E-02	1.54E-02
SJEFF134	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		6.01E-03	6.01E-03
SJEFF135	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.44E-02	1.44E-02
SJEFF136	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1600.0	18.734	2.0		7.50E-02	7.50E-02
SJEFF137	DEFAULT	JEFFERSON COUNTY CREMATION SERVICES LC PEVELY	728536.07	4239554.88	583.23	10.0	1100.0	23.333	0.5		9.39E-02	9.39E-02
SJEFF138	DEFAULT	SIMPSON CONSTRUCTION MATERIALS PAULINA HILLS SITE	726459.86	4259186.04	426.64	12.0	885.0	42.441	0.5		1.29E-01	1.29E-01
SJEFF144	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	32.0	247.0	0.853	3.7	3.03E+00	1.21E+00	1.21E+00
SJEFF145	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	5.35E-02	3.07E-01	3.07E-01
SJEFF146	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	3.61E-03	9.62E-08	9.62E-08
SSTC1	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	138.7	46.759	23.6		2.32E+02	2.32E+02
SSTC2	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	136.6	46.844	23.6		2.89E+02	2.89E+02
SSTC3	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	212.0	325.0	50.000	4.5		8.90E-04	8.90E-04
SSTC4	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	25.0	1100.0	23.333	1.0		1.42E+00	0.00E+00
SSTC9	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC10	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC11	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC12	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC13	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC14	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC15	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	40.515	0.4		3.59E-01	0.00E+00
SSTC16	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC17	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.06E+00	0.00E+00
SSTC18	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	56.732	0.4		3.66E-01	2.38E-04
SSTC28	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC29	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		7.21E+02	7.21E+02
SSTC30	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC31	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	53.0	520.0	58.999	1.8		1.33E-01	1.33E-01
SSTC45	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.31E+00	2.31E+00
SSTC46	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.66E-02	2.66E-02
SSTC47	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	10.0	1100.0	23.333	0.5		1.52E+00	0.00E+00
SSTC48	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		1.50E-03	1.50E-03
SSTC57	DEFAULT	BLASTCO INC	690213.84	4297755.23	543.44	20.0	0.0	0.000	0.5		3.96E-04	3.96E-04
SSTC63	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	65.0	16.499	1.5		4.20E-03	4.20E-03
SSTC64	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	17.0	450.0	27.631	1.3		4.09E-03	4.09E-03
SSTC65	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	20.0	0.0	0.000	0.5		4.10E-03	4.10E-03
SSTC66	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		1.56E-03	1.56E-03
SSTC67	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		8.40E-04	8.40E-04
SSTC68	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	450.0	39.416	1.5		1.44E-03	1.44E-03
SSTC69	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	400.0	29.708	1.0		1.74E-03	1.74E-03
SSTC70	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	450.0	24.803	1.2		4.68E-03	4.68E-03
SSTC71	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	475.0	1.667	0.5		0.00E+00	0.00E+00
SSTC72	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	450.0	27.500	2.3		0.00E+00	0.00E+00
SSTC73	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	10.0	1100.0	23.333	0.5		3.07E+00	0.00E+00
SSTC87	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	2.10E-02	6.31E-04	6.31E-04
SSTC88	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	3.14E-02	1.73E-04	1.73E-04

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTC89	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	1.20E+00	3.65E-01	3.65E-01
SSTC98	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC99	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC100	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC101	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC102	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC103	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC104	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC105	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC106	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC107	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTL1	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.28E-02	2.28E-02
SSTL2	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.20E-02	2.20E-02
SSTL3	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	345.0	135.400	14.0		2.97E+02	2.97E+02
SSTL4	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	374.0	123.284	16.0		4.69E+02	4.69E+02
SSTL5	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	40.0	642.0	38.100	1.0		5.46E-03	5.46E-03
SSTL6	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL7	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.96E+00	1.96E+00
SSTL8	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL9	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		2.01E-02	2.01E-02
SSTL10	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL11	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.10E-02	1.10E-02
SSTL14	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	9.84E-01	1.42E+00	1.42E+00
SSTL15	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	1.06E-02	7.55E-05	7.55E-05
SSTL16	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	10.0	1100.0	23.333	0.5	5.03E+00	1.53E+00	0.00E+00
SSTL17	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	2.91E+00	4.19E+00	4.19E+00
SSTL18	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	9.59E-02	6.85E-04	6.85E-04
SSTL19	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.95E-05	2.95E-05
SSTL20	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.24E-02	2.24E-02
SSTL21	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		1.06E+00	0.00E+00
SSTL22	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		5.74E-04	0.00E+00
SSTL23	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.57E+01	2.57E+01
SSTL24	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		6.69E-03	6.69E-03
SSTL25	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.66E-02	2.66E-02
SSTL26	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	110.0	70.0	0.003	2.7		1.39E-02	1.39E-02
SSTL27	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.11E+01	1.11E+01
SSTL28	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.95E-02	1.95E-02
SSTL29	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		3.08E-05	3.08E-05
SSTL30	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		2.36E-02	2.36E-02
SSTL31	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.34E-01	0.00E+00
SSTL32	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-03	0.00E+00
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		3.77E+00	0.00E+00
SSTL37	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	0.00E+00	0.00E+00	0.00E+00
SSTL38	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	2.24E+00	1.60E-02	1.60E-02
SSTL39	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	0.00E+00	0.00E+00	0.00E+00
SSTL40	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	6.04E-01	4.31E-03	4.31E-03
SSTL41	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.39E+01	2.34E-03	0.00E+00
SSTL42	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	2.12E+01	3.78E-02	0.00E+00
SSTL43	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.59E+01	4.87E+00	0.00E+00
SSTL44	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.13E-02	2.37E+01	2.37E+01
SSTL45	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.02E-02	4.11E+01	4.11E+01
SSTL46	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	1.05E-01	1.48E+01	1.48E+01
SSTL47	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	2.86E-01	2.62E+01	2.62E+01
SSTL48	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7		2.04E-03	2.04E-03
SSTL66	DEFAULT	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	20.0	230.5	31.309	5.1		3.27E-01	3.27E-01

Off-Site Point Source Model Input (NAD83, Zone 1S)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL70	DEFAULT	FRED WEBER, INC. ANTIRE	711291.07	4264547.49	448.49	30.0	250.0	58.950	4.0		1.27E+00	1.27E+00
SSTL76	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	5.58E+00	8.24E+00	8.24E+00
SSTL77	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	1.38E+00	9.87E-03	9.87E-03
SSTL78	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	3.02E+00	4.47E+00	4.47E+00
SSTL79	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	1.06E+00	7.57E-03	7.57E-03
SSTL80	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	2.95E+00	4.36E+00	4.36E+00
SSTL81	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	7.02E-01	5.01E-03	5.01E-03
SSTL82	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	1.0	100.0	12.733	0.1	1.66E+00	1.19E-02	1.19E-02
SSTL83	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	15.0	955.0	19.800	0.7	2.52E+01	4.49E-02	0.00E+00
SSTL84	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	7.0	960.0	113.182	0.8	2.50E+01	7.63E+00	0.00E+00
SSTL85	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	30.0	965.0	31.234	5.0	2.03E-01	1.04E-02	1.04E-02
SSTL86	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	17.0	72.0	29.882	2.8		5.58E-03	5.58E-03
SSTL88	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	28.0	1400.0	25.466	1.0		1.01E+00	1.01E+00
SSTL89	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.3	1400.0	21.568	12.0		7.77E-01	7.77E-01
SSTL90	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.0	1400.0	21.568	12.0		6.35E-01	6.35E-01
SSTL92	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		1.86E-02	1.86E-02
SSTL93	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		6.98E-02	6.98E-02
SSTL94	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		1.70E+01	1.70E+01
SSTL95	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50.226	1.3		5.43E+01	5.43E+01
SSTL96	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	35.0	1200.0	53.051	1.0		1.22E-01	1.22E-01
SSTL97	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.08E-03	1.08E-03
SSTL98	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.07E-03	1.07E-03
SSTL100	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		9.06E+00	9.06E+00
SSTL101	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25.000	3.0		7.14E-03	7.14E-03
SSTL102	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	130.0	1009.0	53.156	1.0		2.56E+00	0.00E+00
SSTL106	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		6.63E-02	6.63E-02
SSTL107	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.15E-02	1.15E-02
SSTL108	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	12.0	900.0	38.100	1.2		8.33E+00	0.00E+00
SSTL109	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.37E-03	1.37E-03
SSTL111	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	3.02E+00	4.35E+00	4.35E+00
SSTL112	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.17E-01	2.98E-03	2.98E-03
SSTL113	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.40E-03	6.49E-03	6.49E-03
SSTL114	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	6.81E-01	4.86E-03	4.86E-03
SSTL115	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	10.0	1100.0	23.333	0.5	1.02E+02	3.11E+01	0.00E+00
SSTL116	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	1.45E-01	6.26E-03	6.26E-03
SSTL117	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	9.17E-01	6.55E-03	6.55E-03
SSTL118	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	15.0	-459.7	0.003	1.0	3.28E+01	3.00E-01	0.00E+00
SSTL120	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	15.0	65.0	7.165	2.2		3.20E-03	3.20E-03
SSTL121	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	16.0	75.0	26.949	1.1		8.96E-03	8.96E-03
SSTL122	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	600.0	14.167	2.5		4.83E-01	4.83E-01
SSTL123	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	30.0	365.0	12.001	1.2		4.48E-01	4.48E-01
SSTL124	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	360.0	25.499	0.7		1.63E-01	1.63E-01
SSTL126	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	20.0	0.0	0.000	0.5		1.23E-02	1.23E-02
SSTL127	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		3.60E-03	3.60E-03
SSTL128	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11.998	1.3		1.79E+01	1.79E+01
SSTL129	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		2.26E-03	2.26E-03
SSTL130	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		1.44E+01	1.44E+01
SSTL131	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	54.0	1800.0	17.218	2.3		1.21E-03	1.21E-03
SSTL132	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL133	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL141	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		3.40E+00	3.40E+00
SSTL142	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		8.76E-04	8.76E-04
SSTL143	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	30.0	450.0	0.003	1.5		5.59E-04	5.59E-04
SSTL144	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	10.0	1100.0	23.333	0.5		4.66E-02	0.00E+00
SSTL147	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	9.18E-01	8.00E-01	8.00E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL148	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	1.58E+00	5.47E-03	5.47E-03
SSTL149	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	4.42E-01	2.28E-01	2.28E-01
SSTL150	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	9.14E-02	4.81E-03	4.81E-03
SSTL151	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	16.0	77.0	4.774	2.0	2.46E+00	4.74E-01	4.74E-01
SSTL152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	42.0	300.0	38.494	4.2	2.49E+01	5.49E+00	5.49E+00
SSTL153	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	3.84E-03	1.20E-04	1.20E-04
SSTL154	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	4.60E-02	1.44E-03	1.44E-03
SSTL162	DEFAULT	MACLAN INDUSTRIES	742056.49	4291436.76	495.44	14.0	190.0	0.003	0.2		2.29E-01	2.29E-01
SSTL165	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	22.0	871.0	24.016	0.8		1.02E-01	1.02E-01
SSTL166	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	10.0	871.0	24.016	0.8		2.38E-01	2.38E-01
SSTL169	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	1.79E-01	1.28E-03	1.28E-03
SSTL170	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	25.0	-459.7	0.003	0.8	2.33E+01	3.69E-03	3.69E-03
SSTL171	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	18.0	-459.7	0.003	4.0	1.61E+00	6.69E-02	6.69E-02
SSTL172	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	15.0	-459.7	0.003	2.0	1.20E-02	8.60E-05	8.60E-05
SSTL173	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	16.0	-459.7	0.003	0.5	9.34E-01	2.85E-01	2.85E-01
SSTL174	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL175	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL196	DEFAULT	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	7.7	25.0	11.788	0.9	3.02E+00	1.28E-01	1.28E-01
SSTL199	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		1.59E-01	1.59E-01
SSTL200	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		7.25E-01	7.25E-01
SSTL209	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0		9.51E+00	9.51E+00
SSTL214	DEFAULT	THE HARPER COMPANY	731184.93	4292013.86	588.35	10.0	1100.0	23.333	0.5		2.75E-01	0.00E+00
SCITY1	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	330.0	21.217	10.0		2.38E-02	2.38E-02
SCITY2	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	100.0	350.0	47.149	3.0		5.80E-02	5.80E-02
SCITY3	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.67E+01	1.67E+01
SCITY4	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.78E-02	1.78E-02
SCITY5	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.53E+01	2.53E+01
SCITY6	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.15E-02	2.15E-02
SCITY7	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	135.0	950.0	19.367	1.5		1.75E+01	1.75E+01
SCITY8	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	20.0	50.0	70.000	1.0		1.69E+00	1.69E+00
SCITY9	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	1.33E+00	9.51E-03	9.51E-03
SCITY10	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	2.13E+00	1.52E-02	1.52E-02
SCITY11	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	2.53E+00	1.81E-02	1.81E-02
SCITY12	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	3.20E-01	2.29E-03	2.29E-03
SCITY13	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	12.0	200.0	0.335	1.0	3.77E+00	1.15E+00	0.00E+00
SCITY14	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.55E-02	1.07E-03	1.07E-03
SCITY15	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.07E-02	9.22E-04	9.22E-04
SCITY16	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	69.751	1.7	3.07E-02	9.22E-04	9.22E-04
SCITY17	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	16.0	77.0	24.600	0.2		1.41E-03	1.41E-03
SCITY18	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	3.0	800.0	0.335	0.5	1.63E-01	4.98E-02	0.00E+00
SCITY22	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	0.0	0.000	0.5	5.72E-03	1.72E-04	1.72E-04
SCITY23	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	6.00E-02	1.83E-02	0.00E+00
SCITY24	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	2.11E+00	6.44E-01	0.00E+00
SCITY25	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.3	8.12E-03	4.79E-03	0.00E+00
SCITY26	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	1.73E-02	5.29E-03	0.00E+00
SCITY27	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	42.0	77.0	3.734	0.2	4.35E-02	1.33E-02	0.00E+00
SCITY28	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	200.0	0.335	1.0	1.98E-01	6.04E-02	0.00E+00
SCITY29	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.07E-01	3.27E-02	0.00E+00
SCITY30	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.09E-04	3.32E-05	0.00E+00
SCITY31	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	22.0	212.0	1.296	1.0	5.28E-01	1.61E-01	0.00E+00
SCITY32	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	90.0	77.0	33.215	2.2	1.09E-04	3.32E-05	0.00E+00
SCITY33	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	3.65E-02	1.12E-02	0.00E+00
SCITY34	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.98E-01	6.04E-02	0.00E+00
SCITY48	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.58E-01	2.58E-01
SCITY49	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.42E-02	2.42E-02

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY50	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.20E+00	1.20E+00
SCITY51	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.51E-01	1.51E-01
SCITY52	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY53	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		6.91E-03	6.91E-03
SCITY54	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY55	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		7.87E-03	7.87E-03
SCITY56	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	30.0	975.0	237.684	0.8		3.10E-02	0.00E+00
SCITY57	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		2.59E+01	2.59E+01
SCITY58	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		5.09E+00	5.09E+00
SCITY59	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		3.48E-02	3.48E-02
SCITY60	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	3.97E-01	3.97E-01
SCITY61	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	5.32E-02	5.32E-02
SCITY62	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY63	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.30E+00	2.36E-02	2.36E-02
SCITY64	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.20E+00	2.29E-02	2.29E-02
SCITY66	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	20.0	0.0	0.000	0.5	4.42E+01	1.33E+00	1.33E+00
SCITY67	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	4.19E+00	4.64E+00	4.64E+00
SCITY68	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	6.11E-01	5.15E-03	5.15E-03
SCITY69	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.04E+00	4.48E+00	4.48E+00
SCITY70	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	1.14E+00	8.17E-03	8.17E-03
SCITY71	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	2.98E-03	4.70E-07	0.00E+00
SCITY72	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	7.05E+00	2.15E+00	0.00E+00
SCITY83	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		1.14E-04	1.14E-04
SCITY84	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		4.07E-03	4.07E-03
SCITY85	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.40E-03	8.40E-03
SCITY86	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY87	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY88	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY89	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY90	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	10.0	1100.0	23.333	0.5		2.47E+00	0.00E+00
SCITY110	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	32.0	120.0	15.453	2.0		2.08E-02	2.08E-02
SCITY111	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	481.0	200.0	9.432	3.0		5.70E-03	5.70E-03
SCITY112	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	400.0	15.922	4.0		6.81E+01	6.81E+01
SCITY113	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	400.0	15.922	4.0		3.75E-02	3.75E-02
SCITY114	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	45.0	122.0	151.818	2.0		1.14E-02	1.14E-02
SCITY115	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	80.0	171.0	69.682	2.0		5.14E-03	5.14E-03
SCITY116	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	78.0	176.0	88.484	1.2		1.43E-03	1.43E-03
SCITY117	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	10.0	1100.0	23.333	0.5		1.91E-03	1.91E-03
SCITY121	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		9.43E+01	9.43E+01
SCITY122	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		5.31E-02	5.31E-02
SCITY123	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		6.41E+00	6.41E+00
SCITY124	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		7.35E-03	7.35E-03
SCITY125	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		1.86E-02	1.86E-02
SCITY126	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		5.89E-04	5.89E-04
SCITY127	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	30.0	140.0	0.125	2.0		1.44E-03	1.44E-03
SCITY128	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	15.4	752.2	32.451	1.0		7.85E-03	0.00E+00
SCITY129	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY132	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	6.916	3.3		1.72E-02	1.72E-02
SCITY133	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	36.601	2.0		3.72E-03	3.72E-03
SCITY136	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1800.0	8.301	3.7		8.58E-03	8.58E-03
SCITY137	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	42.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY140	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY141	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	200.0	39.649	2.8		5.16E-03	5.16E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY143	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY144	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY145	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY146	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY147	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	25.0	300.0	14.865	2.0		1.14E-02	1.14E-02
SCITY148	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	20.0	0.0	0.000	0.5		3.30E-03	3.30E-03
SCITY149	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	37.0	600.0	38.983	1.2		1.98E-03	1.98E-03
SCITY156	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY157	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.20E-02	1.20E-02
SCITY158	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY159	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	14.0	490.0	60.200	0.5		7.80E-01	0.00E+00
SCITY160	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	12.6	200.0	205.400	0.5		7.80E-01	0.00E+00
SCITY162	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	2.69E+00	1.16E-01	1.16E-01
SCITY163	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	6.20E+00	4.43E-02	4.43E-02
SCITY164	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.20E+00	9.30E-03	0.00E+00
SCITY165	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.18E+00	9.20E-03	0.00E+00
SCITY166	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.77E+00	8.30E-03	0.00E+00
SCITY167	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.12E+00	9.10E-03	0.00E+00
SCITY168	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.01E+00	1.23E+00	0.00E+00
SCITY169	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.15E+00	1.80E-02	0.00E+00
SCITY170	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.90E+00	1.08E-02	0.00E+00
SCITY171	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.52E+00	1.88E-02	0.00E+00
SCITY172	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	4.71E+00	2.04E-01	2.04E-01
SCITY173	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	1.09E+01	7.76E-02	7.76E-02
SCITY174	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	2.50E+00	1.08E-01	1.08E-01
SCITY175	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	6.01E+00	4.29E-02	4.29E-02
SCITY176	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	6.24E+00	1.38E-02	0.00E+00
SCITY177	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	5.17E+00	1.14E-02	0.00E+00
SCITY178	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	9.14E+00	2.02E-02	0.00E+00
SCITY179	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.31E+00	9.84E-01	0.00E+00
SCITY180	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.98E+00	8.40E-03	0.00E+00
SCITY181	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	3.53E-03	3.53E-03
SCITY183	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	2.41E-03	2.41E-03
SCITY185	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.24E-02	5.89E-04	5.89E-04
SCITY187	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.36E-01	1.69E-03	1.69E-03
SCITY189	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	1.37E+00	4.86E-01	0.00E+00
SCITY190	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.35E-02	2.31E-03	2.31E-03
SCITY191	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.00E-01	3.57E-03	3.57E-03
SCITY192	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.69E+01	6.78E-02	0.00E+00
SCITY193	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.48E+00	1.56E-02	0.00E+00
SCITY194	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.09E+01	4.41E-02	0.00E+00
SCITY227	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0		2.54E-03	2.54E-03
SCITY228	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0		1.20E+00	1.20E+00
SCITY229	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	25.0	0.0	0.000	1.0		2.19E-04	2.19E-04
SCITY242	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	250.0	71.667	1.7		2.39E-03	2.39E-03
SCITY243	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	400.0	19.833	1.5		4.37E-03	4.37E-03
SCITY244	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		1.37E-04	1.37E-04
SCITY245	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	55.0	750.0	11.168	4.2		8.16E-03	8.16E-03
SCITY246	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	43.0	500.0	7.467	2.5		7.33E-05	7.33E-05
SCITY247	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		3.46E-04	3.46E-04
SCITY248	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	36.0	375.0	1.716	2.0		2.48E-03	2.48E-03
SCITY266	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	24.0	1139.0	15.515	1.7		1.10E-02	1.10E-02
SCITY267	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	28.0	1800.0	15.584	2.0		6.76E-01	6.76E-01
SCITY275	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		2.33E+01	2.33E+01
SCITY276	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		4.99E-03	4.99E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY277	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	23.5	800.0	0.003	0.5	7.11E-01	1.25E-05	0.00E+00
SCITY278	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.3	3.05E-01	1.28E-04	1.28E-04
SCITY279	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.3	6.87E-01	4.91E-03	4.91E-03
SCITY280	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.3	3.05E-02	1.28E-05	1.28E-05
SCITY281	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.3	6.89E-01	4.92E-03	4.92E-03
SCITY282	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	1.0	1.22E-01	5.27E-03	5.27E-03
SCITY283	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	1.0	2.73E-01	1.95E-03	1.95E-03
SCITY284	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.5	250.0	0.003	2.0	6.10E-01	2.56E-04	2.56E-04
SCITY285	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.5	250.0	0.003	2.0	1.38E+00	9.84E-03	9.84E-03
SCITY286	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	8.65E-01	1.53E-05	0.00E+00
SCITY287	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	7.84E+00	1.38E-04	0.00E+00
SCITY288	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	7.84E+00	1.38E-04	0.00E+00
SCITY289	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		2.26E-03	2.26E-03
SCITY290	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		2.91E+01	2.91E+01
SCITY291	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		1.63E-03	1.63E-03
SCITY292	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		1.28E+01	1.28E+01
SCITY293	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		3.47E+00	3.47E+00
SCITY295	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY296	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.81E+00	1.29E-02	1.29E-02
SCITY297	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	8.93E-01	2.57E+01	2.57E+01
SCITY298	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	6.62E+00	4.73E-02	4.73E-02
SCITY299	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.89E+00	5.45E+01	5.45E+01
SCITY300	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	7.92E+00	5.66E-02	5.66E-02
SCITY301	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY302	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.04E+00	7.40E-03	7.40E-03
SCITY303	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	9.62E+00	5.13E+00	0.00E+00
SCITY304	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	5.11E+00	6.08E+00	0.00E+00
SCITY315	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	6.50E+00	1.98E+00	0.00E+00
SCITY316	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY317	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	9.62E-01	3.00E-01	3.00E-01
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	2.00E-02	6.00E-04	6.00E-04
SCITY320	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	1.26E-02	3.70E-04	3.70E-04
SCITY321	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	8.99E-01	3.88E-02	3.88E-02
SCITY322	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	4.60E-01	3.28E-03	3.28E-03
SCITY323	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	1.40E-02	3.08E-05	0.00E+00
SCITY324	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	7.00E-04	1.54E-06	0.00E+00
SCITY325	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	5.78E-03	1.22E-05	0.00E+00
SCITY326	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.71E-02	3.76E-03	3.76E-03
SCITY327	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.30E-01	5.93E-03	5.93E-03
SCITY328	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	7.46E-01	3.22E-02	3.22E-02
SCITY329	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	9.04E-01	6.46E-03	6.46E-03
SCITY330	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	1007.0	51.050	0.7	4.68E-01	1.03E-03	0.00E+00
SCITY331	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	4.06E+00	1.24E+00	0.00E+00
SCITY332	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	2.02E-01	1.44E-03	1.44E-03
SCITY333	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	6.0	1157.0	35.000	0.3	8.24E+00	2.52E+00	0.00E+00
SCITY334	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	6.0	1076.0	151.667	0.3	2.56E+00	7.82E-01	0.00E+00
SCITY335	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	8.9	815.0	37.835	0.8	6.13E-01	1.35E-03	0.00E+00
SCITY344	DEFAULT	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	32.0	200.0	2.933	1.2		5.04E-03	5.04E-03
SCITY353	DEFAULT	CHRISTY REFRACTORIES CO L.L.C	738223.37	4278219.85	483.66	1.0	325.0	0.003	1.0		9.60E-02	9.60E-02
SCITY355	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	431.0	79.216	2.0		9.54E-01	9.54E-01
SCITY356	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	455.0	79.216	2.0		9.54E-01	9.54E-01
SCITY357	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	428.0	79.216	2.0		9.54E-01	9.54E-01
SCITY358	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY359	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01

R005021

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY360	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY361	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		1.09E-03	1.09E-03
SCITY362	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		4.92E-03	4.92E-03
SCITY363	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY364	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY365	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		1.19E+00	1.19E+00
SCITY366	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		5.13E+00	5.13E+00
SCITY367	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY368	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY380	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	25.0	450.0	20.000	2.5		2.46E-03	2.46E-03
SCITY381	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	12.0	150.0	8.333	1.0		1.63E-01	1.63E-01
SCITY394	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5		2.06E+00	0.00E+00
SCITY395	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		9.53E-03	9.53E-03
SCITY396	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		1.71E-03	1.71E-03
SCITY401	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		9.30E-05	9.30E-05
SCITY402	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		4.97E-03	4.97E-03
SCITY403	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		5.07E-05	5.07E-05
SCITY404	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		2.48E-03	2.48E-03
SCITY405	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	10.0	1100.0	23.333	0.5		1.83E-02	0.00E+00
SCITY406	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.55E+00	2.55E+00
SCITY407	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.87E-02	2.87E-02
CJEFF34	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	36.6	77.0	20.600	1.8	2.68E-02		
CJEFF35	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	350.0	40.000	2.0	2.90E-01		
CJEFF36	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	2.07E-01		
CJEFF37	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	20.0	0.0	0.000	0.5	9.13E-03		
CJEFF43	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	56.0	370.0	33.333	2.5	1.01E-01		
CJEFF44	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	8.06E-01		
CJEFF45	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	112.999	2.5	9.97E-02		
CJEFF46	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	20.600	2.5	2.58E-01		
CSTLC55	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.68E-02		
CSTLC56	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.27E+00		
CSTLC57	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	1.66E-02		
CSTLC58	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	3.85E-01		
CSTLC59	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	20.0	250.0	2.083	1.0	7.72E-02		
CSTLC60	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	3.28E+00		
CSTLC61	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	1.29E-01		
CSTLC62	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	9.99E-05		
CSTLC63	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	19.0	425.0	7.047	1.7	6.01E-01		
CSTLC64	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	24.0	270.0	105.951	2.0	3.24E+00		
CSTLC152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	43.0	-459.7	3.225	1.0	1.38E-01		
CSTLC155	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	37.0	230.0	51.250	4.2	2.57E+01		
CSTLC156	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	12.0	355.0	0.804	1.3	4.03E-01		
CSTLC157	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	31.0	230.0	80.499	4.2	3.93E+01		
CSTLC158	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	20.0	300.0	16.667	1.1	2.29E-01		
CSTLC207	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0	1.61E+02		
CCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	100.0	350.0	29.984	1.3	3.08E-02		
CCITY203	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0	3.56E-01		
CCITY204	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0	1.68E+02		
CCITY344	DEFAULT	GP RECYCLING, LLC	743830.86	4284034.28	422.18	20.0	0.0	0.000	0.5	1.72E-02		
CCITY368	DEFAULT	GP RECYCLING, LLC	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5	6.73E+00		
CCITY369	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	1.33E+00		
CCITY370	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	5.69E-02		

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr)		
								CO	SOx	SO2 (1-hour)
SJEFF64	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	16.4	3.8	15.3	1.28E-02	9.13E-05	9.13E-05
SJEFF84	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	4.68E-03	4.68E-03
SJEFF85	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	7.06E-03	7.06E-03
SJEFF87	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	16.4	3.8	15.3	2.29E-01	1.44E-03	1.44E-03
SJEFF88	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	3.91E-03	3.91E-03
SJEFF89	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.47E-03	1.47E-03
SJEFF90	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		2.29E-01	2.29E-01
SJEFF91	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		6.88E-03	6.88E-03
SJEFF93	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.38E-03	1.38E-03
SJEFF101	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	4.81E-01	2.40E-02	2.40E-02
SJEFF102	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	6.41E-01	1.42E-02	1.42E-02
SJEFF103	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	5.24E-01	6.09E-03	6.09E-03
SJEFF104	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	1.51E-01	3.75E-03	3.75E-03
SJEFF105	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.08E-03	1.08E-03
SJEFF106	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.14E-03	1.14E-03
SJEFF107	AERO METAL FINISHING	718099.61	4263747.23	613.55	8.2	2.3	7.6		2.43E-01	2.43E-01
SJEFF126	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	8.2	2.3	7.6		3.08E+00	3.08E+00
SSTC56	BLASTCO INC	690213.84	4297755.23	543.44	8.2	2.3	7.6		1.47E-01	1.47E-01
SSTL67	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		5.88E-04	5.88E-04
SSTL68	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		1.02E+00	1.02E+00
SSTL125	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	8.2	2.3	7.6		7.18E-03	7.18E-03
SSTL197	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	8.2	2.3	7.6		1.80E-01	1.80E-01
SCITY19	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	8.24E-02	2.47E-02	2.47E-02
SCITY20	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	4.44E-03	7.73E-01	7.73E-01
SCITY21	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	2.59E+00	7.94E-01	7.94E-01
SCITY44	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		6.22E-04	6.22E-04
SCITY45	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		2.76E-02	2.76E-02
SCITY118	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		7.50E-05	7.50E-05
SCITY119	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		4.00E-01	4.00E-01
SCITY120	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		2.61E-01	2.61E-01
SCITY130	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY131	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY134	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY135	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY138	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY139	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY182	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY184	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	6.59E-02	4.71E-04	4.71E-04
SCITY186	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY188	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	4.95E-02	3.53E-04	3.53E-04
SCITY195	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	8.2	2.3	7.6	8.40E-02	6.00E-04	6.00E-04
SCITY241	PQ CORPORATION -THE	739053.43	4285317.19	495.80	8.2	2.3	7.6		2.66E-02	2.66E-02
SCITY340	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		3.60E-04	3.60E-04
SCITY341	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.13E-03	1.13E-03
SCITY342	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-03	1.20E-03
SCITY343	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-02	1.20E-02
CJEFF33	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.49E-01		
CJEFF38	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.71E-03		
CJEFF39	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.22E-03		

R005023

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
CJEFF40	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.01E-01		
CJEFF41	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.10E-03		
CJEFF42	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.18E-04		
CJEFF47	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.55E-02		
CJEFF48	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.56E-06		
CJEFF49	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.09E-04		
CJEFF50	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.48E-04		
CJEFF51	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	5.28E-02		
CJEFF52	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.46E-03		
CJEFF53	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.53E-01		
CJEFF54	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.56E-02		
CJEFF55	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.16E-01		
CJEFF56	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.45E-03		
CJEFF57	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.42E-01		
CJEFF58	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.74E-03		
CJEFF59	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.92E-01		
CJEFF60	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.36E-02		
CSTLC92	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	8.2	2.3	7.6	2.25E-01		
CSTLC151	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	13.5	1.4	0.7	1.58E-01		
CSTLC195	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	13.5	1.4	0.7	5.97E-01		
CCITY343	GP RECYCLING, LLC	743830.86	4284034.28	422.18	8.2	2.3	7.6	5.57E-02		

ATTACHMENT B
MODEL SUMMARY OUTPUT

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	1157.328	746400	4286400	128.82	132.25		0 19020109	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	1094.348	750800	4288100	127.44	127.44		0 16121910	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	1036.463	745200	4287400	129.9	134.11		0 18112209	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	997.1573	746700	4287100	126.89	126.89		0 20010610	STL_LCN20	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	982.0781	748434.9	4287033	127.16	127.16		0 17051502	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	691.6775	748481.6	4286378	126.67	126.67		0 19041908	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	669.2078	748481.6	4286378	126.67	126.67		0 18111224	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	651.0973	750472	4287091	125.7	125.7		0 17090416	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	645.9934	748434.9	4287033	127.16	127.16		0 16110108	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	618.4866	748434.9	4287033	127.16	127.16		0 20041108	STL_LCN20	13	1	14098

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1157.3	2,000	58%
CO	8-HR	ALL	1ST	691.7	500	138%

10-5-22 US Steel CO NAAQS Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City NAAQS_2016_CO.SUM	CO	8-HR	ALL	2ND	1856.677	748434.9	4287033	127.16	127.16		0 16032208	STL_LCN16	584	1	205
AERMOD 22112	Granite City NAAQS_2017_CO.SUM	CO	8-HR	ALL	2ND	1941.224	748434.9	4287033	127.16	127.16		0 17121624	STL_LCN17	584	1	205
AERMOD 22112	Granite City NAAQS_2018_CO.SUM	CO	8-HR	ALL	2ND	1726.885	748470.1	4287000	126.94	126.94		0 18092424	STL_LCN18	584	1	205
AERMOD 22112	Granite City NAAQS_2019_CO.SUM	CO	8-HR	ALL	2ND	2045.17	748434.9	4287033	127.16	127.16		0 19110908	STL_LCN19	584	1	205
AERMOD 22112	Granite City NAAQS_2020_CO.SUM	CO	8-HR	ALL	2ND	1966.717	748434.9	4287033	127.16	127.16		0 20092408	STL_LCN20	584	1	205

10-5-22 US Steel CO NAAQS Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	% Standard
CO	8-HR	ALL	2ND	2045.2	1646	3691.2	10,000	37%

Background data from East St. Louis monitor (AQS No. 85-510-029), high second high value from 2016-2018.

REFERENCES

1. Guidelines on Air Quality Models, (Revised). Appendix W of 40 CFR Part 51, 82 FR 5182, January 17, 2017.

2 . Prevention of Significant Deterioration, The Art and Science of PSD Air Quality Analysis, The Modeling Perspective, Illinois Environmental Protection Agency, Modeling Unit, February 27, 2014..

3. AERSCREEN User's Guide. EPA-454/B-15-005, July 2015.

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. *Sierra Club v. EPA*, No. 10-1413, 2013 WL 216018 (Jan. 22, 2013).

6. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

7. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

Appendix D – Copies of Construction Permits

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19506, SPRINGFIELD, ILLINOIS 62794-9506 · (217) 782-2113

PAT QUINN, GOVERNOR JOHN J. KIM, INTERIM DIRECTOR

217/785-1705

CONSTRUCTION PERMIT/PSD APPROVAL
REVISED

PERMITTEE

U.S. Steel Granite City
Attn: Bryan Kresak, Environmental Director
Route 203 and 20th Street
Granite City, Illinois 62040

Application/Permit No.: 95010001 I.D. No.: 119813AAI
Applicant's Designation: Date Orig. Issued: January 25, 1996
Subject: Production Increase
Date Revision Request: May 30, 2012
Date Revision Issued: December 17, 2012 (See Finding 1(c))
Location: Southeastern Granite City

Permit is hereby granted to the above-designated Permittee for an increase in the allowable production rate of iron (from 2,372,500 to 3,165,000 net tons per year) and steel (from 2,774,000 to 3,580,000 net tons per year) as described in the above-referenced application. This permit is subject to standard conditions attached hereto and the following special conditions:

FINDINGS

1a. Various changes have been made to the provisions of this permit for the Basic Oxygen Furnaces (BOF's), at the request of the Permittee, so that the permit will accommodate an emission reduction project that is planned for particulate emissions from the BOFs. In particular, the revised permit does not include requirements for the operation of these BOF's and the existing electrostatic precipitator (ESP) control system that would be inconsistent with the use of a separate control system with a baghouse for secondary emissions of the BOFs, as is now planned (see Construction Permit Application 11050006).

b. Prior to issuance of this revised permit, a draft of the revised permit underwent a public comment period, including a public hearing.

c. This revised permit will become effective 33 days after the date of issuance unless a petition for review is filed, in accordance with 40 CFR Part 124, with the USEPA's Environmental Appeals Board (Board), in which case, this revised permit will only take effect when and if the Board declines the petition for review or the Board issues a decision on the merits of the appeal that does not include a remand of the proceeding.

BLAST FURNACE OPERATIONS

2a. Total combined production of hot metal (a.k.a., iron) from blast furnaces A and B shall not exceed 9,849 net tons per day, averaged over any calendar month, and;

b. Total combined production of hot metal from blast furnaces A and B shall not exceed 3,165,000 net tons per year.

3a. Particulate emissions from the blast furnace casthouse baghouse and iron spout baghouse shall not exceed 0.010 gr/dscf, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

b. The opacity of emissions from the blast furnace casthouse baghouse and the iron spout baghouse shall not exceed 10% on a 6 minute rolling average basis, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

4a. Emissions of particulate matter from any opening in the blast furnace casthouse shall not exceed 20% opacity on a 6-minute rolling average basis beginning from initiation of the opening of the tap hole up to the point where iron and slag stops flowing in the troughs, pursuant to 35 Ill. Adm. Code 212.445(a)(2).

5. Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.

BASIC OXYGEN FURNACE SHOP

6a. Total combined production of liquid steel from the Basic Oxygen Furnaces (BOF's) shall not exceed 11,000 net tons per day, averaged over any calendar month; and

b. Total combined production of liquid steel from the BOF's shall not exceed 3,580,000 net tons per year.

7. The emissions of PM-10 from the BOF stack for the total of all BOF processes (i.e., operations from the beginning of the charging process through the end of the tapping process) shall not exceed 60.0 lbs/hour and 0.225 lbs per ton of steel in process, pursuant to 35 Ill. Adm. Code 212.458(b)(23).

8. Opacity of emissions from any opening in the BOF shop (e.g., roof monitor) shall not exceed 20% on a 3 minute rolling average basis, pursuant to 35 IAC 212.446(c).

9. The Permittee shall operate and maintain the BOF's and associated capture and control systems in accordance with applicable requirements of the National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing Facilities, 40 CFR 63 Subpart FFFFF, including requirements for operational monitoring, performance testing for opacity and emissions of particulate matter,* operation of capture and control systems within established limits for operating parameters, implementation of specified operation and maintenance practices, recordkeeping and reporting.

* As related to testing of emissions, if the Permittee is not willing to consider all particulate matter measured by testing to be PM_{10}, as provided for by 35 IAC 212.108(a)(3), performance tests for emissions

of particulate matter shall also include measurements for emissions of PM_{10} in accordance with 35 IAC 212.108(a)(1) or (2).

Note: This condition requires the Permittee to comply with the operating and maintenance requirements of 40 CFR 63 Subpart FFFFF as the means to verify ongoing compliance with the requirements of Conditions 7 and 8 and to address implementation of good air pollution control practice for the BOF's.

(Former Condition 10 has been removed in this revised permit.)

11a. Flame suppression shall be used and maintained during the entire tapping process.

b. The above requirement for flame suppression and the various requirements for the BOF's in Condition 12 and 13 shall end after the Permittee begins operation of a capture and control system for secondary emissions from the BOF's that makes these requirements infeasible or unnecessary, as explicitly recognized by Construction Permit 11050006 or other construction permit issued by the Illinois EPA for a capture and control system for secondary emissions.

12a. Except for purposes of emissions testing as related to the set points for the capture system for the BOF's, this capture system shall be operated at the following minimum set points for gas flow rate in the ESP stack until and unless the Illinois EPA approves lower minimum set point(s) based on a demonstration that a better level of particulate matter capture efficiency would now be achieved by the charging hoods and primary hoods.

b. Set points requirements while only a single BOF vessel is in operation:

i. Minimum set point during charging process: 550,000 cfm.

ii. Minimum set point during refining process: 650,000 cfm.

iii. Minimum set point during tapping process: 200,000 cfm (until one minute after completing alloy addition).

c. i. During dual operation of BOF vessels (a.k.a., overlapping BOF operation), the minimum set point shall be 700,000 cfm.

ii. In addition, overlapping operation of the BOF vessels is subject to the following requirements. These requirements shall be part of the Standard Operating Procedure for the BOFs.

A. The hot metal charge of the second vessel shall be initiated and completed during the time between completion of the blow and start of tap on the first vessel while sufficient draft at the ESP capture system is established and maintained for both vessels.

B. The charge and/or blow on one vessel shall not begin until sufficient draft has been established at the associated ESP capture system (a.k.a., doghouse) and the alloy addition at the vessel tapping has been completed for a least 1 minute.

C. Sufficient draft at the ESP capture system of the vessel being tapped shall be maintained for at least 1 minute after alloy addition has been completed. After such period, the capture system draft may be transferred over to the other.

D. Only overlapping of the hot metal charge of the second vessel after the end of blow and prior to onset of tap of the first vessel and overlapping of tapping of the first vessel, after alloy addition, and the hot metal charge and/or blow on the second vessel are allowed.

13a. i. The Permittee shall operate, maintain and calibrate a continuous operational monitor to ESP stack gas flow rate.

ii. The Permittee shall record for each steel production cycle the various stack gas flow rates for each process (i.e., for each charge, each refine, each tap) of each steel production cycle. That is, the Permittee shall be able to distinguish the measured flow rate of stack gas during each production cycle.

b. i. The Permittee shall operate and maintain a continuous operational monitor for waste gas suction, i.e., the static pressure in the main downcomer duct of the ESP.

ii. The Permittee shall record the waste gas suction for each process (i.e., for each charge, each refine, each tap) of each steel production cycle.

c. These monitoring systems shall be calibrated on at least a quarterly basis.

d. These monitoring systems shall be operated at all times that a BOF is in operation and shall be used as mechanisms to ensure sufficient draft is maintained in the emissions capture hoods and transport ducts.

(Former Conditions 14 through 17 have been removed in this revised permit.)

18. Emissions from the BOF Shop shall not exceed the limits in attached Tables 2 and 5.

(The note that previously accompanied Condition 18 has been removed in this revised permit.)

CONTINUOUS CASTING OPERATIONS

19. The continuous casting operations shall comply with 35 Ill. Adm. Code 212.450 and 212.458(b)(8).

20. Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5.

FUEL COMBUSTION

21. Total fuel usage for blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares shall not exceed the following limits:

    a. Natural Gas usage: 225 million ft^3 per month and 1,346 million ft^3 per year;

    b. Blast Furnace Gas (BFG) usage: 30,800 million ft^3 per month and 185,030 million ft^3 per year;

    c. Fuel Oil usage: 60 thousand gallons per month and 365 thousand gallons per year.

22. Emissions from the fuel combustion units listed above shall not exceed the limits in Tables 4 and 5.

ON-SITE FUGITIVE DUST CONTROL

(Refer to Attachment B for a table which summarizes the required on-site fugitive dust roadway control measures and maps indicating the referred to road segments)

23. The Permittee shall immediately initiate and maintain the on-site fugitive dust control measures specified in this permit so as eliminate dust spillage on in-plant and out-of-plant roadways.

24a. The Permittee shall sweep or flush at least every day the paved access area below the BOF ESP where ESP dust collection bags are used, stored and transported.

  b. The Permittee shall implement a housekeeping program for the non-roadway areas below and around the BOF ESP. This program shall, at a minimum, contain the following:

    i. The ground and other accessible areas where dust may gather shall be swept or cleaned at least every day;

    ii. Cleaning shall be performed in such a manner as to minimize the escape of dust into the atmosphere;

    iii. Dust collection bags shall be inspected at least daily for rips, tears, or insecure connection to the discharge chutes of the ESP hoppers;

    iv. Dust collection bags shall be inspected after removal from, and connection to, the discharge chutes of the ESP hoppers;

v. Ripped or torn bags shall be taken out of service and transported as soon as practicable in a covered truck.

25. Fugitive emissions of particulate matter from any roadway or parking area shall not exceed an opacity of 5%, pursuant to 35 Ill. Adm. code 212.316(e)(1).

26a. UNPAVED ROADS: On unpaved roads that are part of normal traffic patterns as identified in attachment B (including roads B, C, E, N, F-F, and CS(2)) the Permittee shall apply a chemical dust suppressant at least three times a month, with the following exceptions:

i. Road segment G-G, which shall be sprayed at least quarterly;

ii. Road segments P, V, Z, D-D, E-E, and H, which shall be sprayed at least 4 times per month until paving is completed. Paving shall be completed on these roads no later than July 31, 1996;

iii. Road segment L, which shall be sprayed at least 4 times per month.

b. All other unpaved roads shall be treated as necessary.

c. Applications of suppressant may be less frequent than specified above if weather conditions, i.e., precipitation or temperature, interfere with the schedule for spraying, provided each such instance shall be recorded in accordance with the daily records for on-site fugitive dust control required by this permit.

27a. PAVED ROADWAYS AND AREAS: Paved roadways and areas shall be maintained in good condition.

b. On paved roadways and other areas, the Permittee shall sweep or flush as follows:

i. Road segments D, K, M, F, G, J, R, and O shall be swept or flushed at least daily;

ii. Road segments P, V, W, X, Z, D-D, E-E, and CS(1) shall be swept or flushed at least five days per week;

iii. Road segments S and T shall be swept or flushed at least every other day;

iv. Road segments A and H shall be swept or flushed at least once per month;

v. All gate areas leading from the Steelworks area shall be swept or flushed at least daily;

vi. All gate areas leading from the iron making area shall be swept or flushed at least five times per week.

28. The above on-site dust control measures shall be conducted to maximize their effectiveness by performing said measures when the roads or areas are not normally obstructed by parked vehicles and by preferentially using filter sweeping (e.g., Enviro-Whirl sweeper) for the gate areas, the roads and areas surrounding the BOF and BOF ESP, and other key areas.

29. The Permittee shall maintain daily records relative to the on-site fugitive dust control program which includes the following information as a minimum:

    a. The date (and time for the gate areas) each road or area was treated;

    b. The manner in which the road or area was treated (i.e., filter sweep, conventional sweep, suppressant spray or flush);

    c. Detailed information for use of dust suppressant, including but not limited to the application rate, dilution ratio, type of suppressant used, and the number of gallons of suppressant applied;

    d. Observations, if any, concerning the condition of the roadway, e.g., presence of parked vehicles, detection of potholes;

    e. The amount of precipitation and temperature recorded for each day, and if determination was made to suspend application of suppressant, include name and title of person who made determination to suspend application and explanation;

    f. Any and all suspensions or deviations from the designated control procedures, with date, description, and explanation for suspension of application.

OFF-SITE FUGITIVE DUST CONTROL

30. The Permittee or the Permittee's Agent shall sweep or flush the following Granite City street road areas:

    a. At least weekly, the quarter mile segment of Madison Avenue in front of the 16th street gate (i.e., 1/8 of a mile in either direction);

    b. At least weekly, segment of 20th street between Lee and Quincy roads;

    c. At least monthly, segment of 20th street between Madison and Route 203 (a.k.a. Edwardsville Road).

PM_{10} CONTINGENCY MEASURES

31. The Permittee shall comply with the additional control measures (e.g., PM_{10} contingency plan) required by 35 Ill Adm. Code Part 212 Subpart U.

COMPLIANCE DETERMINATIONS

32a. Compliance with the daily limits of this permit shall be determined from a monthly total of the relevant daily data divided by the number of days in the month.

b. Compliance with the monthly limits of this permit (e.g., fuel usage) shall be determined by direct comparison of monthly data to the applicable limit.

c. i. Compliance with the annual limits of this permit shall be determined based on a calendar year.

ii. A. Compliance with the production limits in conditions 2(b) and 6(b) shall also be determined on a month by month basis by showing that the actual production of iron and steel from the plant did not exceed the scheduled rate of production for a month given in the most recent production schedule provided to the Agency that shows compliance with the following requirements.

B. If no production schedule is submitted to the Agency by the Permittee for a particular year, the scheduled monthly production of iron and steel shall be set at one twelfth of the annual production limits in conditions 2(b) and 6(b).

C. 1. The Permittee may submit a schedule for iron and steel production for each month of the calendar year. Such schedule shall provide the scheduled monthly iron and steel production for each month and the total of such scheduled production shall not exceed the annual production limits in conditions 2(b) and 6(b). This schedule shall be submitted each year no later than December 15th of the preceding year.

2. During the course of the year, the Permittee may submit a revised production schedule which accounts for actual production levels which were below that scheduled for the previous months, provided that in no case shall the scheduled production for prior months in such a revised schedule be lowered to less than actual production levels or raised. Such revised schedule shall be submitted to the Agency no later than 15 days after the first day of the month for which scheduled production has been raised. Such schedule shall be accompanied by data on actual production in preceding months.

(Former Condition 33 has been removed from this revised permit.)

34a. Blast furnace hot metal production shall be measured at the BOF hot metal transfer station, and adjusted by documented slag and iron losses.

b. BOF liquid steel production shall be initially measured by a scale equipped crane and adjusted based upon documented steel production analysis of the continuous casters.

c. BFG usage shall be calculated based on the total BFG produced per net ton hot metal (NTHM) derived by the following formula and adjusted per analysis of documented BFG consumptions:

$$\text{mmft}^3 \text{ BFG per month} = \frac{(4.585277 \text{ NTHM/day} + 498.191)}{80} \times \begin{pmatrix} \text{Number of} \\ \text{days in} \\ \text{that month.} \end{pmatrix}$$

d. Natural gas usage shall be determined by metered volumes.

e. Fuel oil usage shall be determined by tank height differentials.

RECORD KEEPING

35. The Permittee shall keep records of the following items and such other items which may be appropriate to allow the Agency to review compliance:

a. Blast Furnace hot metal production (total combined daily, monthly and annual in tons), including documentation on iron and slag losses;

b. BOF liquid steel production (total combined daily, monthly and annual in tons), including documentation on adjustments made due to production analysis and losses;

c. Fuel usage as follows; Usage of natural gas and BFG (total combined million ft^3 per month and year, each) and fuel oil (total combined gallons/month and year) for the blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

36. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Agency and USEPA upon request. Any records retained in a computer shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Agency request for records during the course of a source inspection.

TESTING

37. The special conditions of this permit supplement the special conditions of any existing operating permits for this source as of January 15, 1996 and supersede such conditions in cases where a conflict exists.

38a. The following tests shall be performed by no later than August 6, 1997 to demonstrate compliance with the conditions of this permit.

i. Fuel Combustion Units testing: The emissions of particulate matter from boiler #12 while burning blast furnace gas shall be measured. This test shall be designed to verify compliance with the requirements of this permit and the emission factor used (i.e., 2.9 lbs particulate emitted per mmcf BFG burned);

b. The test shall be performed by an approved independent testing service during conditions which are representative of maximum emissions and at the maximum production rates allowed, or as close to such rates as reasonable if the Permittee demonstrates to the Agency prior to testing that testing at such production rates within the time constraints of an Agency request to test is not practicable.

c. i. The following methods and procedures shall be used for the testing, unless another method is approved by the Agency: Refer to 40 CFR 60, Appendix A for USEPA test methods;

Location of sample points	USEPA Method 1
Gas flow and velocity	USEPA Method 2
Particulate Matter	USEPA Method 5

ii. All particulate measured shall be considered PM-10 unless emissions are tested by an appropriate USEPA test method for measurement of PM-10, as specified in 35 Ill. Adm. Code 212.110(e).

d. At least 30 days prior to the actual date of testing, a written test plan shall be submitted to the Agency for review and approval. This plan shall describe the specific procedures for testing, including as a minimum:

i. The persons who will be performing sampling and analysis and their experience with similar tests;

ii. The specific conditions under which testing will be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which operating parameters for the source and the emissions capture and control system will be determined;

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations;

iv. The test methods which will be used, with the specific analysis methods;

v. Any proposed use of an alternative test method, with detailed justification;

vii. The format and content of the Source Test Report.

e. The Agency shall be notified before these tests to enable the Agency to observe these tests. Notification for the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual date of the test. The Agency may at its discretion accept notifications with shorter advance notice provided that the Agency will not accept such notifications if it interferes with the Agency's ability to observe testing.

f. The Final Report of these tests shall include as a minimum:

i. A tabular summary of results which includes:

- process weight rate and/or fuel usage rate
- production rate
- allowable emission limit
- measured emission rate
- determined emission factor
- compliance demonstrated - Yes/No
- any other pertinent information

ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule;

iii. Detailed description of test conditions, including,

- pertinent process information (e.g. fuel or raw material consumption)
- control equipment information, i.e. equipment condition and operating parameters during testing;

iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration;

g. Copies of the Final Report for these tests shall be submitted to the Agency within 14 days after the test results are compiled and finalized.

h. Submittals of information shall be made as follows:

i. Notice of Test - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section;

ii. Final Report - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section.

Pertinent Addresses are:

Illinois Environmental Protection Agency
Division of Air Pollution Control
9511 West Harrison
Des Plaines, Illinois 60016

Illinois Environmental Protection Agency
Division of Air Pollution Control
Regional Office
2009 Mall Street
Collinsville, Illinois 62234

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

(Condition 38 required emission testing following the initial operation of the source with the expansion that has already been conducted by the Permittee. This revised permit does not require that this testing be repeated.)

REPORTING

39. Unless otherwise provided for by the provisions for reporting of deviations in the Clean Air Act Permit Program (CAAPP) permit for the source, if there is a deviation from the requirements of this permit, the Permittee shall submit a report to the Illinois EPA within 30 days after the deviation. The report shall include a description of the deviation, the probable cause of the deviation, the corrective actions that were taken and any preventative measures taken to prevent similar deviations in the future.

40. The Permittee shall submit the following additional information from the prior calendar year with the Annual Emissions Report, due May 1st of each year:

    a. Iron and steel production (tons/month and tons/year, each);

    b. Natural gas and BFG usage ($mmft^3$/month and $mmft^3$/year, each);

    c. Fuel oil usage (thousand gallons/month and thousand gallons/year, for each type of oil).

APPLICABILITY OF MAJOR SOURCE RULES

41a. As a consequence of the above conditions, this permit is issued based upon the following changes in emissions, as further described in Table 6, accompanying increased production as allowed by this permit:

i. The increases in emissions of lead and VOM are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration;

ii. The increase in emissions of NO_x are being accompanied by contemporaneous emission decreases provided by the shutdown of equipment and operations such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

iii. The increase in emissions of PM and PM-10 are being accompanied by contemporaneous emission decreases provided by additional road dust control and BOF capture and control such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

Also, the Permittee has agreed to provide further additional dust control consisting of the sweeping of Granite City public streets and housekeeping measures in the area below and surrounding the BOF ESP. Attachment C is a listing of the emission reductions provided by these control measures.

b. The increases in emissions of SO_2 and CO are significant under 40 CFR 52.21 - Prevention of Significant Deterioration (PSD). Accordingly, the project is considered a major modification and must comply with the requirements of PSD. These requirements include a demonstration of best available control requirements for affected SO2 and CO emission units, an analysis of air quality impacts, an analysis of the impacts of the project on visibility, vegetation's and soils, and the application and proposed permit must undergo a public participation. The Agency has determined that these additional requirements have been met.

c. The changes in emissions pertinent to this project are summarized as follows:

Units = tons/year

- Emission increases which could occur from the project:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

- Creditable contemporaneous actual emission decreases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

- Other contemporaneous emission increases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

- Net emission changes:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

- Significant Levels:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

Explanatory Note:

PM	=	particulate matter = particulate;
PM_{10}	=	particulate matter less than or equal to 10 micrometers in size;
SO_2	=	sulfur dioxide;
NO_x	=	nitrogen oxides;
VOM	=	volatile organic material;
CO	=	carbon monoxide;
mm	=	million;
gr/dscf	=	grains per dry standard cubic foot;
acfm	=	actual cubic feet per minute;
mmcf	=	million cubic feet;
Mgal	=	thousands of gallons.

If you have any questions on this permit, please call Kevin Smith at 217/782-7048.

Edwin C. Bakowski

Edwin C. Bakowski, P.E.
Manager, Permit Section
Division of Air Pollution Control

Date Signed: December 17, 2012

DES:KLS:psj

cc: IEPA, FOS Region 3

TABLE 1

BLAST FURNACE OPERATIONS

Maximum Hot Metal Production = 3,165,000 net tons per year

1. Casthouse Baghouse (furnace tapping) - captured emissions ducted to baghouse, uncaptured emissions emitted through roof, other openings, etc.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0703	111.19
PM_{10}	0.0703	111.19
SO_2	0.2006	422.00
NO_x	0.0144	22.79
VOM	0.0946	149.68

2. Blast Furnace - uncaptured fugitives

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.031	49.06
PM_{10}	0.0155	24.53
SO_2	0.0104	21.94
NO_x	0.0007	1.14
VOM	0.0047	7.42

3. Blast Furnace Charging
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0024	5.17
PM_{10}	0.0024	5.17

4. Slag Pits

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00417	6.60
PM_{10}	0.00417	6.60
SO_2	0.0100	15.83

TABLE 1 (cont.)

5. Iron Spout Baghouse- captured emissions controlled by iron spout baghouse.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.02548	40.32
PM_{10}	0.02548	40.32
SO_2	0.0073	13.89

6. Iron Pellet Screen
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00279	6.01
PM_{10}	0.00279	6.01

TABLE 2

BOF SHOP

Maximum Liquid Steel Production = 3,580,000 net tons per year

1. BOF ESP Stack

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.16	262.80
PM_{10}	0.16	262.80
NO_x	0.0389	69.63
VOM	0.0060	10.74
CO	8.993	16,097.47
Lead	0.01934 lbs/hour	1.26 tons/year

2. BOF Roof Monitor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0987	176.71
PM_{10}	0.06614	118.40
Lead	0.0129 lbs/hour	0.08 tons/year

3. Desulfurization and Reladling - Hot Metal Transfer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.03721	58.88
PM_{10}	0.03721	58.88
VOM	0.0010	1.58
Lead	0.0133 lbs/hour	0.09 tons/year

4. BOF Additive System (i.e., fluxes) with Baghouse, a.k.a., BOF hopper baghouse

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00032	0.57
PM_{10}	0.00032	0.57

TABLE 2 (cont.)

5. Flux conveyor & transfer pits, bin floor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0016	2.86
PM_{10}	0.0016	2.86

6. Hot metal charging ladle slag skimmer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0050	7.94
PM_{10}	0.0050	7.94

TABLE 3

CONTINUOUS CASTING OPERATIONS

Maximum Liquid Steel Throughput = 3,580,000 net tons per year

1. Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00715	12.80
PM_{10}	0.00715	12.80

2. Deslagging Station and Material HS.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00355	6.35
PM_{10}	0.00355	6.35

3. Caster Molds - Casting

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.006	10.74
PM_{10}	0.006	10.74
NO_x	0.050	89.50

4. Casters Spray Chambers

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00852	15.25
PM_{10}	0.00852	15.25

5. Slab Cut-off

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.0071	12.71
PM_{10}	0.0071	12.71

TABLE 3 (cont.)

6. Slab Ripping

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	0.00722	12.92
PM_{10}	0.00722	12.92

TABLE 4

CERTAIN FUEL COMBUSTION UNITS

1. 10 boilers (#'s 1 - 10)
2. 2 boilers (#'s 11 - 12)
3. Blast Furnace Stoves A & B.
4. BFG Flares
5. Ladle Drying Preheaters (5 heaters).

Total combined fuel usage from affected units (i.e., Boilers, BF stoves, BF Flares, ladle drying preheaters)

	Maximum Usage (mmft^3/Year)
Natural Gas (Total)	1,346
BFG	185,030
Fuel Oil	365 thousand gallons/year

1. Natural Gas

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	5.1	3.43
PM_{10}	5.1	3.43
SO_2	0.6	0.40
NO_x	306.0	205.94
VOM	2.8	1.88
CO	40.0	26.92

2. BFG

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	2.9	268.29
PM_{10}	2.9	268.29
SO_2	6.65	615.22
NO_x	5.28	488.48
CO	13.7	1,267.46

TABLE 4 (cont.)

3. Fuel Oil

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Year)
PM	9.72	1.77
PM_{10}	9.72	1.77
SO_2	141.3	25.79
NO_x	55.0	10.04
VOM	0.28	0.05
CO	5.0	0.91
Lead	0.336	0.06 (waste oil)

TABLE 5

LIMITS ON EMISSIONS FROM MAJOR PROCESSES AND ACTIVITIES

Units = tons/year

	PM	PM_{10}	SO_2	NO_x	VOM	CO	Lead
Blast Furnace Operations	218	194	474	24	157	---	---
BOF Shop	510	451	---	70	12	16,097	1.43
Continuous Casting Operations	71	71	---	90	---	---	---
Certain Fuel Combustion Units[A]	274	274	641	706	2	1,295	0.06
Roadways	27	27	---	---	---	---	---
Material Handling	2	2	---	---	---	---	---
Total	1,102	1,019	1,115	890	171	17.392	1.49

[A] Blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

TABLE 6

EMISSIONS SUMMARY

Units = tons/year

- Emission increases which could occur from the project:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

- Creditable contemporaneous actual emission decreases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

- Other contemporaneous emission increases:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

- Net emission changes:

PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

- Significant Levels:

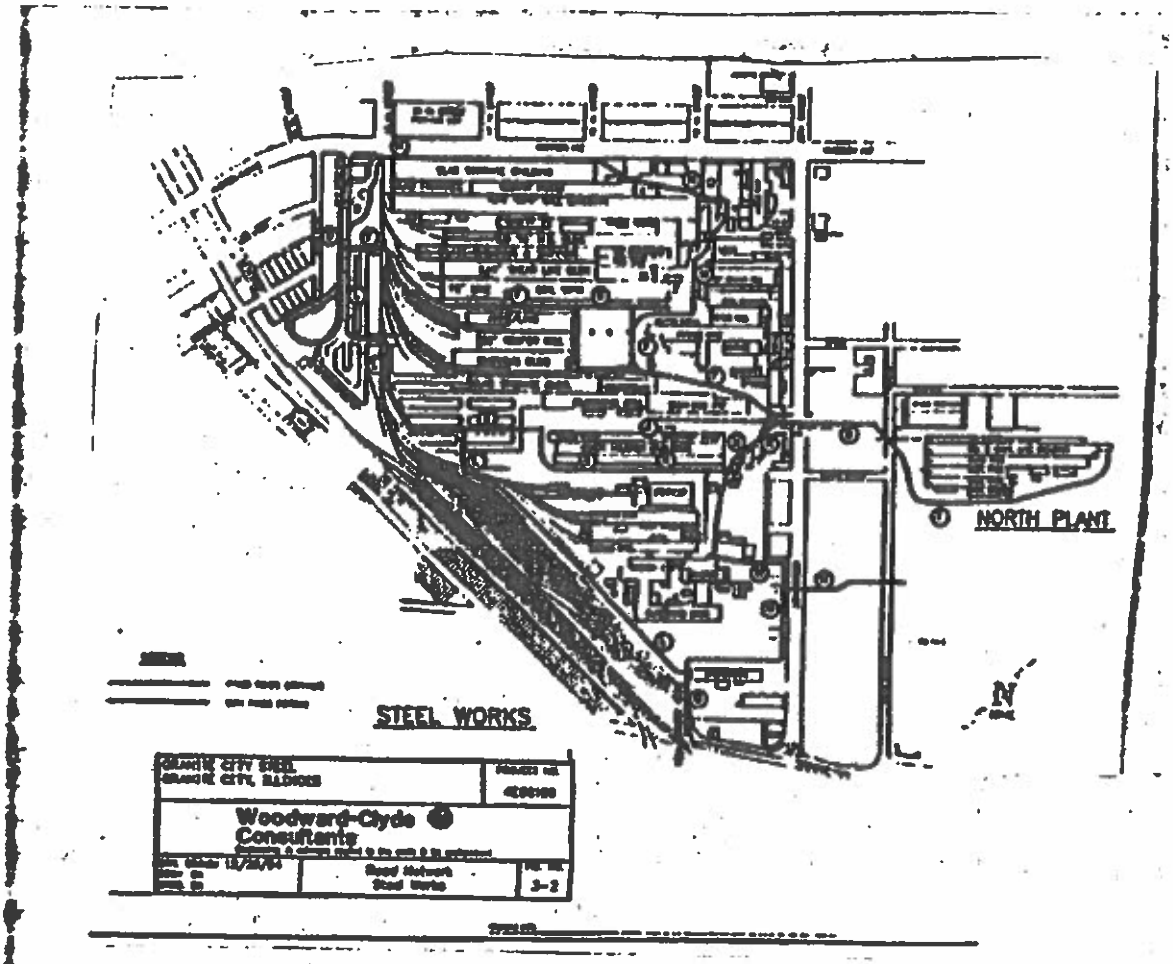
PM_{10}	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

ATTACHMENT A

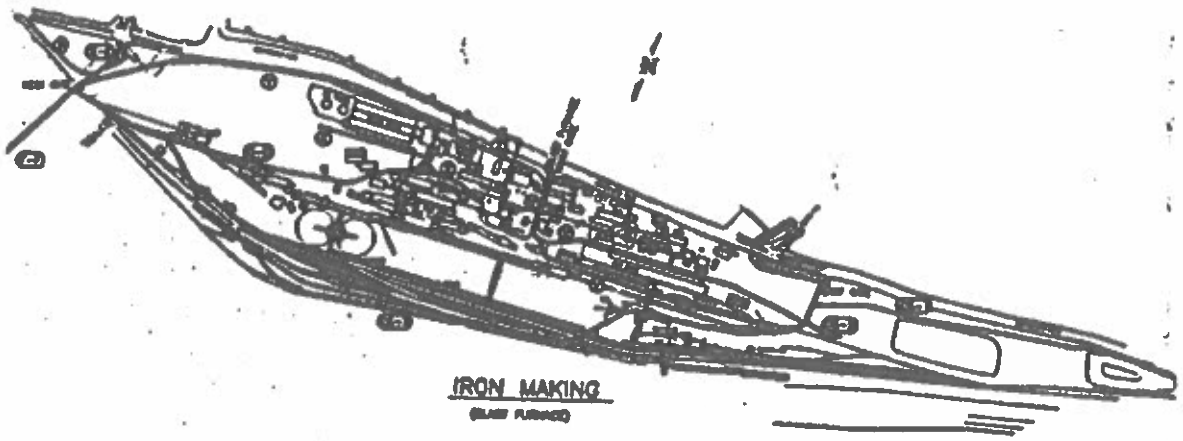
(Former Attachment A has been removed in this revised permit.)

ATTACHMENT B

ON-SITE FUGITIVE DUST ROADWAY CONTROL MEASURES AND MAPS SHOWING THE ROAD SEGMENTS

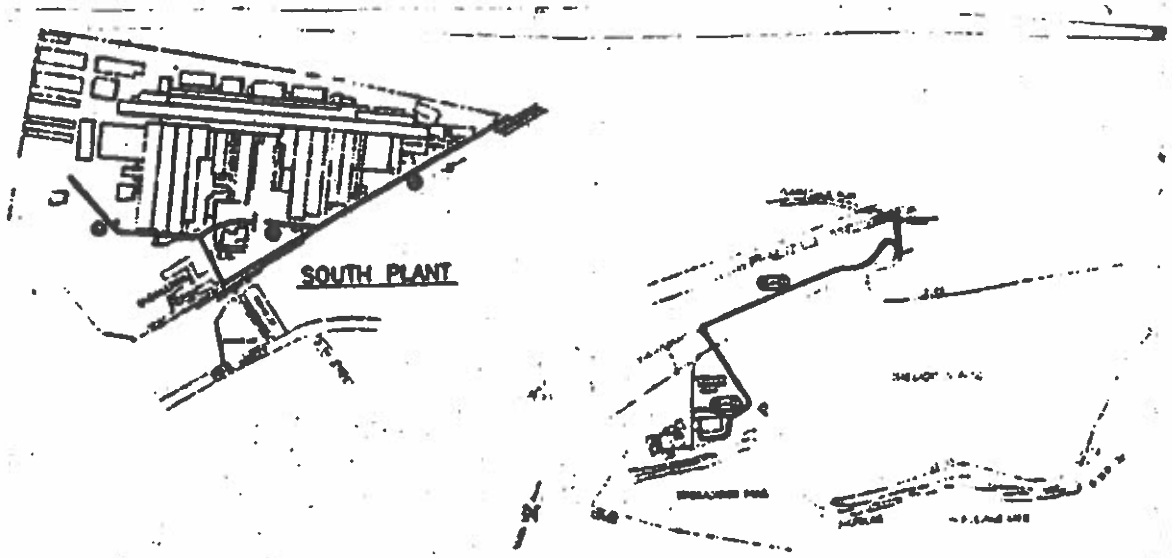


ATTACHMENT B (cont.)



GRANITE CITY STEEL GRANITE CITY, ILLINOIS	
Woodward-Clyde Consultants	
	3-3

ATTACHMENT B (cont.)



GRANITE CITY STEEL
GRANITE CITY, ILLINOIS

Woodward-Clyde Consultants

Road Network
South Plant & WWTP

ATTACHMENT C

CONTEMPORANEOUS REDUCTIONS IN THE EMISSIONS OF PM_{10}

- Historic roadway emissions of 428 tons/year, minus future potential roadway emissions of 27 tons/year, equals a resulting reduction in roadway emissions of 401 tons/year

- Historic material handling emissions of 17 tons/year minus future potential material handling emissions of 2 tons/year, equals a resulting reduction in material handling emissions of 15 tons/year.

- Emission reductions resulting from the sweeping of city streets = 52 tons/year*

- Emission reductions resulting from sweeping and housekeeping of areas below and around BOF ESP = 12 tons/year*

Total reductions in the emissions of PM_{10} as a result of the additional dust control measures required by Illinois' SIP and the special conditions of this permit = 480 tons/year

* These are considered reasonable estimates of reductions and are subject to change upon further investigation of the actual reductions which will occur as a result of the control measures required by this permit.

KLS:psj

State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director
217/782-2113

P. O. Box 19506, Springfield, IL 62794-9506

CONSTRUCTION PERMIT

PERMITTEE

Granite City Division
of National Steel Corporation
Attn: Joseph S. Kocot
20th and State Street
Granite City, Illinois 62040

Application No.: 95010001 I.D. No.: 119813AAI
Applicant's Designation: Date Received: January 3, 1995
Subject: Production Increase
Date Issued: January 25, 1996
Location: Southeastern Granite City

Permit is hereby granted to the above-designated Permittee for an increase in the allowable production rate of iron (from 2,372,500 to 3,165,000 net tons per year) and steel (from 2,774,000 to 3,580,000 net tons per year) as described in the above-referenced application. This permit is subject to standard conditions attached hereto and the following special conditions:

1. Prior to issuance of this permit, a draft of this permit has undergone a public notice and comment period, and a public hearing was held.

BLAST FURNACE OPERATIONS

2a. Total combined production of hot metal (a.k.a., iron) from blast furnaces A and B shall not exceed 9,849 net tons per day, averaged over any calendar month, and;

b. Total combined production of hot metal from blast furnaces A and B shall not exceed 3,165,000 net tons per year.

3a. Particulate emissions from the blast furnace casthouse baghouse and iron spout baghouse shall not exceed 0.010 gr/dscf, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

b. The opacity of emissions from the blast furnace casthouse baghouse and the iron spout baghouse shall not exceed 10% on a 6 minute rolling average basis, pursuant to 35 Ill. Adm. Code 212.445(b)(1).

4a. Emissions of particulate matter from any opening in the blast furnace casthouse shall not exceed 20% opacity on a 6-minute rolling average basis beginning from initiation of the opening of the tap hole up to the point where iron and slag stops flowing in the troughs, pursuant to 35 Ill. Adm. Code 212.445(a)(2).

5. Emissions from Blast Furnace operations shall not exceed the limits in attached Tables 1 and 5.

BASIC OXYGEN FURNACE SHOP

6a. Total combined production of liquid steel from the Basic Oxygen Furnaces (BOF's) shall not exceed 11,000 net tons per day, averaged over any calendar month, and;

b. Total combined production of liquid steel from the BOF's shall not exceed 3,580,000 net tons per year.

7. The emissions of PM-10 from the BOF ESP stack for the total of all BOF processes (i.e., operations from the beginning of the charging process through the end of the tapping process) shall not exceed 60.0 lbs/hr and 0.225 lbs per ton of steel in process, pursuant to 35 Ill. Adm. Code 212.458(b)(23).

8. Visible emissions from any opening in the BOF shop (e.g., roof monitor) shall not exceed 20% on a 3 minute rolling average basis.

9a. The Permittee shall determine the opacity from the openings BOF shop on at least a weekly basis. Observations shall be conducted for at least an hour or the entire BOF cycle, whichever is greater.

b. The Permittee shall determine the opacity from the BOF ESP stack for at least one hour on any normal work day (i.e., Monday through Friday) that the continuous opacity monitor on the BOF ESP stack has an outage that exceeds two consecutive hours and is still down. The readings shall commence as soon as possible after the opacity monitor has been down for two consecutive hours. If meteorological conditions or lack of visibility preclude these observations from being conducted, then this shall be noted in the log book.

c. The opacity shall be determined in accordance with the observation procedures set out in 40 CFR Part 60, Appendix A, Method 9 including the requirement that readings be taken by a certified observer.

d. These determinations shall be recorded in a log book, which at a minimum shall include the date and time of observations, name and title of observer, individual opacity readings, calculated opacity so as to determine compliance with Section 212.123, and calculated opacity relative to 20% opacity on a three minute rolling average basis.

10. The Permittee shall follow the BOF operating procedures and requirements specified in attachment A. These requirements are designed to ensure proper operation of the BOF control system. These procedures shall be posted in the BOF pulpit (a.k.a., control room).

11. Flame suppression shall be used and maintained during the entire tapping process.

12a. The stack gas pulpit set point of the BOF ESP control system shall be set in accordance with the following, so as to establish sufficient particulate matter capture efficiency of the charging and primary hoods:

i. Set point requirements while only a single BOF vessel is in operation;

A. Minimum set point during charging process: 550,000 cfm;

B. Minimum set point during refining process: 650,000 cfm;

C. Minimum set point during tapping process: 200,000 cfm (until one minute after completing alloy addition);

ii. During dual operation of BOF vessels (a.k.a., overlapping BOF operation) the set point shall be set to establish the total draft necessary to control the corresponding portion of the process which is occurring on each vessel during the overlap. For example, minimum set point while charging at one vessel and tapping at the other would be equal to that necessary to establish a flow of 700,000 cfm (i.e., 550,000 + 150,000).

iii. Overlapping operations of the BOF vessels is allowed only as specified in operating permit application number 72080043.

iv. The BOF capture system shall be operated at the above minimum set points until and unless the Agency approves a lower minimum set point based on a demonstration that a better level of particulate matter control will occur, except for purposes of emissions testing as related to the set point.

b. The Permittee shall calibrate, operate, and maintain a continuous strip chart recorder of the ESP stack gas flow rate as measured by the stack gas flow meter during ESP use.

c. The Permittee shall record for each steel production cycle the various stack gas flow rates for each process (i.e., for each charge, each refine, each tap) of each steel production cycle. That is, the Permittee shall be able to distinguish the measured flow rate of stack gas during each production cycle.

d. The stack gas flow meter shall be calibrated on at least a quarterly basis.

13a. Within 270 days of the date issued of this permit, the Permittee shall install, calibrate, operate, and maintain a monitoring device that continually measures and records for each process (i.e., for each charge, each refine, each tap) of each steel production cycle the various exhaust ventilation rates or levels of exhaust ventilation through the main downcommer duct of the ESP emissions capture and transport system.

b. The monitoring system shall be designed to be used as a mechanism to ensure sufficient draft is maintained in the emissions capture hoods and transport ducts so as to maximize emissions capture and transport and minimize uncaptured emissions and emission leaks.

c. The monitoring system shall be operated, tested and maintained to ensure accurate and useful data.

d. The Agency may allow an equivalent system or method instead of the above monitoring system provided the Permittee demonstrates, and the Agency approves, that such system or method will ensure sufficient draft is maintained in the emissions capture hoods and transport ducts so as to maximize emissions capture and transport and minimize uncaptured emissions and emission leaks in an equivalent manner, and that such system or method can be installed and operated within the time period required for the monitoring system as stated in this permit.

14a. The Permittee shall visually inspect at least monthly all visible BOF vessel enclosures, hooding and ducts used to capture and transport emissions for the BOF ESP control system.

b. A log shall maintained of these inspections which includes observations of the physical appearance of the capture system and any noted deficiencies (e.g., the presence of any holes in ductwork or hoods, flow constrictions caused by dents or accumulated dust in ductwork, and fan erosion).

c. Any leaks or areas otherwise noted to be in need of repair, shall be repaired as soon as practicable.

15a. The Permittee shall operate, maintain, and repair the BOF ESP in a manner that assures compliance with the conditions of this permit.

b. An adequate inventory of spare parts for the BOF ESP shall be maintained.

16. Written operating procedures for the BOF ESP shall be maintained and updated describing proper normal process and equipment operating parameters, monitoring and instrumentation for measuring control equipment operating parameters, control equipment inspection and maintenance practices, and the availability of spare parts from inventory, local suppliers and other sources.

17. The Permittee shall keep operating records, a maintenance log, and inspection log for the BOF ESP and associated control systems which includes the following:

a. Operating time of the BOF;

b. Operating time of the capture systems and performance parameters, including air flow and fan amperage through the fan motors, gas temperature at inlet to ESP, damper settings, and steam injection rate;

c. Operating time of the ESP and performance parameters, including voltage and amperage of each transformer/rectifier set, number of sections in use;

d. All routine and nonroutine maintenance performed, including dates and duration of outages, inspection schedule and findings, leaks detected, repair actions, and replacements.

18. Emissions from the BOF Shop shall not exceed the limits in attached Tables 2 and 5.

Note: For purposes of this permit, a BOF cycle is defined as the period from the beginning of the charging process through the end of the tapping process. The cycle is comprised of three main processes which are charging, refining, and tapping.

CONTINUOUS CASTING OPERATIONS

19. The continuous casting operations shall comply with 35 Ill. Adm. Code 212.450 and 212.458(b)(8).

20. Emissions from the continuous casting operations shall not exceed the limits in Tables 3 and 5.

FUEL COMBUSTION

21. Total fuel usage for blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares shall not exceed the following limits:

    a. Natural Gas usage: 190 million ft^3 per month and 1,145 million ft3 per year;

    b. Blast Furnace Gas (BFG) usage: 30,800 million ft3 per month and 185,030 million ft3 per year;

    c. Fuel Oil usage: 60 thousand gallons per month and 365 thousand gallons per year.

22. Emissions from the fuel combustion units listed above shall not exceed the limits in Tables 4 and 5.

ON-SITE FUGITIVE DUST CONTROL

(Refer to Attachment B for a table which summarizes the required on-site fugitive dust roadway control measures and maps indicating the referred to road segments)

23. The Permittee shall immediately initiate and maintain the on-site fugitive dust control measures specified in this permit so as eliminate dust spillage on in-plant and out-of-plant roadways.

24a. The Permittee shall sweep or flush at least every day the paved access area below the BOF ESP where ESP dust collection bags are used, stored and transported.

b. The Permittee shall implement a housekeeping program for the non-roadway areas below and around the BOF ESP. This program shall, at a minimum, contain the following:

    i. The ground and other accessible areas where dust may gather shall be swept or cleaned at least every day;

ii. Cleaning shall be performed in such a manner as to minimize the escape of dust into the atmosphere;

iii. Dust collection bags shall be inspected at least daily for rips, tears, or insecure connection to the discharge chutes of the ESP hoppers;

iv. Dust collection bags shall be inspected after removal from, and connection to, the discharge chutes of the ESP hoppers;

v. Ripped or torn bags shall be taken out of service and transported as soon as practicable in a covered truck.

25. Fugitive emissions of particulate matter from any roadway or parking area shall not exceed an opacity of 5%, pursuant to 35 Ill. Adm. code 212.316(e)(1).

26a. UNPAVED ROADS: On unpaved roads that are part of normal traffic patterns as identified in attachment B (including roads B, C, E, N, F-F, and CS(2)) the Permittee shall apply a chemical dust suppressant at least three times a month, with the following exceptions:

i. Road segment G-G, which shall be sprayed at least quarterly;

ii. Road segments P, V, Z, D-D, E-E, and H, which shall be sprayed at least 4 times per month until paving is completed. Paving shall be completed on these roads no later than July 31, 1996;

iii. Road segment L, which shall be sprayed at least 4 times per month.

b. All other unpaved roads shall be treated as necessary.

c. Applications of suppressant may be less frequent than specified above if weather conditions, i.e., precipitation or temperature, interfere with the schedule for spraying, provided each such instance shall be recorded in accordance with the daily records for on-site fugitive dust control required by this permit.

27a. PAVED ROADWAYS AND AREAS: Paved roadways and areas shall be maintained in good condition.

b. On paved roadways and other areas, the Permittee shall sweep or flush as follows:

i. Road segments D, K, M, F, G, J, R, and O shall be swept or flushed at least daily;

ii. Road segments P, V, W, X, Z, D-D, E-E, and CS(1) shall be swept or flushed at least five days per week;

iii. Road segments S and T shall be swept or flushed at least every other day;

iv. Road segments A and H shall be swept or flushed at least once per month;

v. All gate areas leading from the Steelworks area shall be swept or flushed at least daily;

vi. All gate areas leading from the iron making area shall be swept or flushed at least five times per week.

28. The above on-site dust control measures shall be conducted to maximize their effectiveness by performing said measures when the roads or areas are not normally obstructed by parked vehicles and by preferentially using filter sweeping (e.g., Enviro-Whirl sweeper) for the gate areas, the roads and areas surrounding the BOF and BOF ESP, and other key areas.

29. The Permittee shall maintain daily records relative to the on-site fugitive dust control program which includes the following information as a minimum:

a. The date (and time for the gate areas) each road or area was treated;

b. The manner in which the road or area was treated (i.e., filter sweep, conventional sweep, suppressant spray or flush);

c. Detailed information for use of dust suppressant, including but not limited to the application rate, dilution ratio, type of suppressant used, and the number of gallons of suppressant applied;

d. Observations, if any, concerning the condition of the roadway, e.g., presence of parked vehicles, detection of potholes;

e. The amount of precipitation and temperature recorded for each day, and if determination was made to suspend application of suppressant, include name and title of person who made determination to suspend application and explanation;

f. Any and all suspensions or deviations from the designated control procedures, with date, description, and explanation for suspension of application.

OFF-SITE FUGITIVE DUST CONTROL

30. The Permittee or the Permittee's Agent shall sweep or flush the following Granite City street road areas:

a. At least weekly, the quarter mile segment of Madison Avenue in front of the 16th street gate (i.e., 1/8 of a mile in either direction);

b. At least weekly, segment of 20th street between Lee and Quincy roads;

c. At least monthly, segment of 20th street between Madison and Route 203 (a.k.a. Edwardsville Road).

PM-10 CONTINGENCY MEASURES

31. The Permittee shall comply with the additional control measures (e.g., PM-10 contingency plan) required by 35 Ill Adm. Code Part 212 Subpart U.

COMPLIANCE DETERMINATIONS

32a. Compliance with the daily limits of this permit shall be determined from a monthly total of the relevant daily data divided by the number of days in the month.

b. Compliance with the monthly limits of this permit (e.g., fuel usage) shall be determined by direct comparison of monthly data to the applicable limit.

c. i. Compliance with the annual limits of this permit shall be determined based on a calendar year.

ii. A. Compliance with the production limits in conditions 2(b) and 6(b) shall also be determined on a month by month basis by showing that the actual production of iron and steel from the plant did not exceed the scheduled rate of production for a month given in the most recent production schedule provided to the Agency that shows compliance with the following requirements.

B. If no production schedule is submitted to the Agency by the Permittee for a particular year, the scheduled monthly production of iron and steel shall be set at one twelfth of the annual production limits in conditions 2(b) and 6(b).

C. 1. The Permittee may submit a schedule for iron and steel production for each month of the calendar year. Such schedule shall provide the scheduled monthly iron and steel production for each month and the total of such scheduled production shall not exceed the annual production limits in conditions 2(b) and 6(b). This schedule shall be submitted each year no later than December 15th of the preceding year.

2. During the course of the year, the Permittee may submit a revised production schedule which accounts for actual production levels which were below that scheduled for the previous months, provided that in no case shall the scheduled production for prior months in such a revised schedule be lowered to less than actual production levels or raised. Such revised schedule shall be submitted to the Agency no later than 15 days

after the first day of the month for which scheduled production has been raised. Such schedule shall be accompanied by data on actual production in preceding months.

33a. Compliance with opacity limits and measurements of opacity shall be made by opacity readings taken in accordance with the observation procedures set out in 40 CFR Part 60, Appendix A, Method 9.

b. The Permittee shall have at least two employees or agents experienced in making opacity readings to the extent that it is reasonably possible to do so, who shall be able to make the opacity readings required by this permit.

34a. Blast furnace hot metal production shall be measured at the BOF hot metal transfer station, and adjusted by documented slag and iron losses.

b. BOF liquid steel production shall be initially measured by a scale equipped crane and adjusted based upon documented steel production analysis of the continuous casters.

c. BFG usage shall be calculated based on 0.05846 mmft^3 BFG generated per net ton of hot metal produced.

d. Natural gas usage shall be determined by metered volumes.

e. Fuel oil usage shall be determined by tank height differentials.

RECORD KEEPING

35. The Permittee shall keep records of the following items and such other items which may be appropriate to allow the Agency to review compliance:

a. Blast Furnace hot metal production (total combined daily, monthly and annual in tons), including documentation on iron and slag losses;

b. BOF liquid steel production (total combined daily, monthly and annual in tons), including documentation on adjustments made due to production analysis and losses;

c. Fuel usage as follows; Usage of natural gas and BFG (total combined million ft^3 per month and year, each) and fuel oil (total combined gallons/month and year) for the blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

36. All records and logs required by this permit shall be retained at a readily accessible location at the source for at least three years from the date of entry and shall be made available for inspection and copying by the Agency and USEPA upon request. Any records retained in a computer shall be capable of being retrieved and

printed on paper during normal source office hours so as to be able to respond to an Agency request for records during the course of a source inspection.

STARTUP AND TESTING

37. The special conditions of this permit supplement the special conditions of any existing operating permits for this source, and supersede such conditions in cases where a conflict exists.

38. Operation at the increased production rates specified in this permit is allowed for 270 days from the date issued under this construction permit.

39a. The following tests shall be performed to demonstrate compliance with the conditions of this permit within 270 days from the date issued of this permit:

i. Blast Furnace testing: The emissions of particulate matter, volatile organic material, sulfur dioxide, nitrogen oxides, and the opacity from the blast furnace casthouse stack shall be measured. These tests shall be designed to verify compliance with 35 Ill. Adm. Code 212.445 and the requirements of this permit;

ii. Hot Metal Desulfurization testing: The emissions of particulate matter from the desulfurization baghouse shall be measured. These tests shall be designed to verify compliance with the requirements of this permit and 35 Ill. Adm. Code 212.446(b)(2);

iii. BOF testing: The emissions of particulate matter, carbon monoxide, and lead from the BOF ESP stack, and the opacity from both the BOF ESP stack and BOF Shop shall be measured. These tests shall be designed to verify compliance with 35 Ill. Adm. Code 212.446, 212.458 and the requirements of this permit;

iv. Fuel Combustion Units testing: The emissions of particulate matter from a representative boiler while burning blast furnace gas shall be measured. This test shall be designed to verify compliance with the requirements of this permit and the emission factor used (i.e., 2.9 lbs particulate emitted per mmcf BFG burned);

v. BFG generation testing: The amount of blast furnace gas generated ($mmft^3$) per ton of hot metal produced shall be determined. The Agency may waive this requirement for testing providing the Permittee submit a sufficient explanation of how BFG generation is determined with justification that such determination is appropriate for purposes of compliance determinations with this permit.

b. These tests shall be performed by an approved independent testing service during conditions which are representative of maximum emissions and at the maximum production rates allowed, or as close

to such rates as reasonable if the Permittee demonstrates to the Agency prior to testing that testing at such production rates within the time constraints of an Agency request to test is not practicable.

c. i. The following methods and procedures shall be used for the testing, unless another method is approved by the Agency: Refer to 40 CFR 60, Appendix A for USEPA test methods;

Location of sample points	USEPA Method 1
Gas flow and velocity	USEPA Method 2
Particulate Matter	USEPA Method 5
Sulfur Dioxide	USEPA Method 6
Nitrogen Oxides	USEPA Method 7
Opacity	USEPA Method 9
Carbon Monoxide	USEPA Method 10
Lead	USEPA Method 12

ii. All particulate measured shall be considered PM-10 unless emissions are tested by an appropriate USEPA test method for measurement of PM-10, as specified in 35 Ill. Adm. Code 212.110(e).

d. At least 60 days prior to the actual date of testing of the BOF, a written test plan shall be submitted to the Agency for review and approval. This plan shall be describe the specific procedures for testing the BOF, including as a minimum:

i. The persons who will be performing sampling and analysis and their experience with similar tests;

ii. The specific conditions under which testing will be performed including a discussion of why these conditions will be representative of maximum emissions and the means by which operating parameters for the source and the emissions capture and control system will be determined;

iii. The specific determinations of emissions and operation which are intended to be made, including sampling and monitoring locations;

iv. The test methods which will be used, with the specific analysis methods;

v. Any proposed use of an alternative test method, with detailed justification;

vii. The format and content of the Source Test Report.

e. The Agency shall be notified before these tests to enable the Agency to observe these tests. Notification for the expected date of testing shall be submitted a minimum of thirty (30) days prior to the expected date. Notification of the actual and expected time of testing shall be submitted a minimum of five (5) working days prior to the actual date of the test. The Agency may at its discretion

accept notifications with shorter advance notice provided that the Agency will not accept such notifications if it interferes with the Agency's ability to observe testing.

f. The Final Report of these tests shall include as a minimum:

i. A tabular summary of results which includes:

- process weight rate and/or fuel usage rate
- production rate
- allowable emission limit
- measured emission rate
- determined emission factor
- compliance demonstrated - Yes/No
- other pertinent information (e.g., for the BOF, pulpit set point for each process of the BOF cycle - charging, refining, and tapping);

ii. Description of test methods and procedures used, including description of sampling train, analysis equipment, and test schedule;

iii. Detailed description of test conditions, including,

- pertinent process information (e.g. fuel or raw material consumption)
- control equipment information, i.e. equipment condition and operating parameters during testing;

iv. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration;

g. Copies of the Final Report for these tests shall be submitted to the Agency within 14 days after the test results are compiled and finalized and in no case later than upon the submittal of the operating permit application for this production increase.

h. Submittals of information shall be made as follows:

i. Notice of Test - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section;

ii. Final Report - one copy to Source Emission Test Specialist, one copy to Regional Office, and one copy to Permit Section.

Pertinent Addresses are:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Source Emission Test Specialist
Intercontinental Center
1701 1st Avenue
Maywood, Illinois 60153

Illinois Environmental Protection Agency
Division of Air Pollution Control
Regional Office
2009 Mall Street
Collinsville, Illinois 62234

Illinois Environmental Protection Agency
Division of Air Pollution Control
Attn: Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

REPORTING

40. If there is an exceedance of the requirements of this permit as determined by the records required by this permit, the Permittee shall submit a report to the Agency's Compliance Unit in Springfield, Illinois within 30 days after the exceedance. The report shall include the emissions released in accordance with the record keeping requirements, a copy of the relevant records, and a description of the exceedance or violation, cause of the exceedance, and efforts to reduce emissions and future occurrences. This report shall be sent to:

Illinois EPA
Bureau of Air
Compliance Unit (#39)
P.O. Box 19276
Springfield, Illinois 62794-9276

41. The Permittee shall submit the following additional information from the prior calendar year with the Annual Emissions Report, due May 1st of each year:

a. Iron and steel production (tons/month and tons/yr, each);

b. Natural gas and BFG usage (mmft3/month and mmft3/yr, each);

c. Fuel oil usage (thousand gallons/month and thousand gallons/yr, for each type of oil).

APPLICABILITY OF MAJOR SOURCE RULES

42a. As a consequence of the above conditions, this permit is issued based upon the following changes in emissions, as further described in Table 6, accompanying increased production as allowed by this permit:

i. The increases in emissions of lead and VOM are not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration;

ii. The increase in emissions of NO_x are being accompanied by contemporaneous emission decreases provided by the shutdown of equipment and operations such that the net emissions change is

not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

iii. The increase in emissions of PM and PM-10 are being accompanied by contemporaneous emission decreases provided by additional road dust control and BOF capture and control such that the net emissions change is not significant under 35 Ill. Adm. Code Part 203 or 40 CFR 52.21 - Prevention of Significant Deterioration.

Also, the Permittee has agreed to provide further additional dust control consisting of the sweeping of Granite City public streets and housekeeping measures in the area below and surrounding the BOF ESP. Attachment C is a listing of the emission reductions provided by these control measures.

b. The increases in emissions of SO_2 and CO are significant under 40 CFR 52.21 - Prevention of Significant Deterioration (PSD).. Accordingly, the project is considered a major modification and must comply with the requirements of PSD. These requirements include a demonstration of best available control requirements for affected SO2 and CO emission units, an analysis of air quality impacts, an analysis of the impacts of the project on visibility, vegetation's and soils, and the application and proposed permit must undergo a public participation. The Agency has determined that these additional requirements have been met.

c. The changes in emissions pertinent to this project are summarized as follows:

Units = tons/year

- Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	~ 52.0	238.8	476.0	5,685	59.3	0.54

- Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

- Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

- Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

- Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

Explanatory Note:

PM	=	particulate matter = particulate;
PM-10	=	particulate matter less than or equal to 10 micrometers in size;
SO_2	=	sulfur dioxide;
NO_x	=	nitrogen oxides;
VOM	=	volatile organic material;
CO	=	carbon monoxide;
mm	=	million;
gr/dscf	=	grains per dry standard cubic foot;
acfm	=	actual cubic feet per minute;
mmcf	=	million cubic feet;
Mgal	=	thousands of gallons.

If you have any questions on this permit, please call Jim Ross at 217/782-2113.

Donald E. Sutton, P.E.
Manager, Permit Section
Division of Air Pollution Control

DES:JRR:jar

cc: IEPA, FOS Region 3

COPY
Original Signed by
Donald E. Sutton, P.E.

Permit Application #95010001

TABLE 1

BLAST FURNACE OPERATIONS

Maximum Hot Metal Production = 3,165,000 net tons per year

1. Casthouse Baghouse (furnace tapping)- captured emissions ducted to baghouse, uncaptured emissions emitted through roof, other openings, etc.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0703	111.19
PM-10	0.0703	111.19
SO_2	0.2006	422.0
NO_x	0.0144	22.79
VOM	0.0946	149.68

2. Blast Furnace - uncaptured fugitives

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.031	49.06
PM-10	0.0155	24.53
SO_2	0.0104	21.94
NO_x	0.0007	1.14
VOM	0.0047	7.42

3. Blast Furnace Charging
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0024	5.17
PM-10	0.0024	5.17

4. Slag Pits

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00417	6.60
PM-10	0.00417	6.60
SO_2	0.0100	15.83

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TABLE 1 (cont.)

5. Iron Spout Baghouse- captured emissions controlled by iron spout baghouse.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.02548	40.32
PM-10	0.02548	40.32
SO_2	0.0073	13.89

6. Iron Pellet Screen
Maximum pellets charged = 4,308,581 tons/yr

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00279	6.01
PM-10	0.00279	6.01

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TABLE 2

BOF SHOP

Maximum Liquid Steel Production = 3,580,000 net tons per year

1. BOF ESP Stack (charge, refine, tap)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.16	262.80
PM-10	0.16	262.80
NO_x	0.0389	69.63
VOM	0.0060	10.74
CO	8.993	16,097.47
Lead	0.1934 lbs/hr	1.26 tons/yr

2. BOF Roof Monitor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0987	176.71
PM-10	0.06614	118.40
Lead	0.0129 lbs/hr	0.08 tons/yr

3. Desulfurization and Reladling - Hot Metal Transfer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.03721	58.88
PM-10	0.03721	58.88
VOM	0.0010	1.58
Lead	0.0133 lbs/hr	0.09 tons/yr

4. BOF Additive System (i.e., fluxes) with Baghouse, a.k.a., BOF hopper baghouse

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00032	0.57
PM-10	0.00032	0.57

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TABLE 2 (cont.)

5. Flux conveyor & transfer pits, bin floor

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0016	2.86
PM-10	0.0016	2.86

6. Hot metal charging ladle slag skimmer

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0050	7.94
PM-10	0.0050	7.94

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TABLE 3

CONTINUOUS CASTING OPERATIONS

Maximum Liquid Steel Throughput = 3,580,000 net tons per year

1. Argon Stirring Station and Material Handling Tripper (Ladle Metallurgy)

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00715	12.80
PM-10	0.00715	12.80

2. Deslagging Station and Material HS.

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00355	6.35
PM-10	0.00355	6.35

3. Caster Molds - Casting

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.006	10.74
PM-10	0.006	10.74
NO_x	0.050	89.50

4. Casters Spray Chambers

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00852	15.25
PM-10	0.00852	15.25

5. Slab Cut-off

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.0071	12.71
PM-10	0.0071	12.71

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TABLE 3 (cont.)

6. Slab Ripping

Pollutant	Emission Factor (Lbs/Ton)	Maximum Emissions (Tons/Yr)
PM	0.00722	12.92
PM-10	0.00722	12.92

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TABLE 4

CERTAIN FUEL COMBUSTION UNITS

1. 10 boilers (#'s 1 - 10)
2. 2 boilers (#'s 11 - 12)
3. Blast Furnace Stoves A & B.
4. BFG Flares
5. Ladle Drying Preheaters (5 heaters).

Total combined fuel usage from affected units (i.e., Boilers, BF stoves, BF Flares, ladle drying preheaters)

	Maximum Usage ($mmft^3/Yr$)
NATURAL Gas (Total)	1,145
BFG	185,030

Fuel Oil 365 thousand gallons/yr

1. Natural Gas

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	5.1	2.92
PM-10	5.1	2.92
SO_2	0.6	0.34
NO_x	306	175.19
VOM	2.8	1.60
CO	40	22.90

2. BFG

Pollutant	Emission Factor (Lbs/mmcf)	Maximum Emissions (Tons/Yr)
PM	2.9	268.29
PM-10	2.9	268.29
SO_2	6.65	615.22
NO_x	5.28	488.48
CO	13.7	1,267.46

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TABLE 4 (cont.)

3. Fuel Oil

Pollutant	Emission Factor (Lbs/Mgal)	Maximum Emissions (Tons/Yr)
PM	9.72	1.77
PM-10	9.72	1.77
SO_2	141.3	25.79
NO_x	55	10.04
VOM	0.28	0.05
CO	5.0	0.91
Lead	0.336	0.06 (waste oil)

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TABLE 5

LIMITS ON EMISSIONS FROM MAJOR PROCESSES AND ACTIVITIES

Units = tons/year

	PM	PM-10	SO_2	NO_x	VOM	CO	Lead
Blast Furnace Operations	218	194	474	24	157	--	--
BOF Shop	510	451	--	70	12	16,097	1.43
Continuous Casting Operations	71	71	--	90	--	--	--
Certain Fuel Combustion Units[A]	273	273	641	674	2	1,291	0.06
Roadways	27	27	--	--	--	--	--
Material Handling	2	2	--	--	--	--	--

	PM	PM-10	SO_2	NO_x	VOM	CO	Lead
TOTAL	1,101	1,018	1,115	858	171	17,388	1.49

[A] Blast furnace stoves (A and B), boiler house boilers (1-10), blast furnace boilers (11 and 12), ladle drying preheaters and blast furnace gas flares.

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TABLE 6

EMISSIONS SUMMARY

Units = tons/year

- Emission increases which could occur from the project:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
51.6	-52.0	238.8	476.0	5,685	59.3	0.54

- Creditable contemporaneous actual emission decreases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
58.0	58.0	226.5	0.38	23.31	32.8	0.0

- Other contemporaneous emission increases:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
20.7	20.3	26.0	0.25	11.8	1.6	0.0

- Net emission changes:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
+14.3	-89.2	+38.3	+475.9	+5,673	+28.1	+0.54

- Significant Levels:

PM-10	PM	NO_x	SO_2	CO	VOM	Lead
15	25	40	40	100	40	0.6

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ATTACHMENT A

PROCEDURES TO ENSURE PROPER OPERATION
OF BOF ESP CONTROL SYSTEM

1. The emissions control operator shall:

   a. Check on a regular basis and report to the emissions control foreman or melter:

      i. Any ESP fields down;

      ii. Any ESP fields in which the meter readings are showing no current or a fault;

   b. Check on a regular basis that doors on all hopper screws are closed;

   c. Inspect on a regular basis the fans and motors for unusual sounds and/or visual problems. Any abnormalities will be immediately reported to the melter or maintenance foreman for investigation.

2. The melter shall:

   a. Check on a regular basis and report to the emissions control foreman or the area electrician any fields which the pulpit precipitator field short indicators shows as having a short and is able to reset;

   b. Check on a regular basis and report to the emissions control foreman or the maintenance foreman any draft or fan problems;

   c. Check the ESP stack opacity monitor on a regular basis and initiate the following in the event that the stack opacity level, as determined by the opacity monitor, exceeds 30% opacity on a six minute average:

      i. Check the pulpit indicators for proper operation of the steam and spray water system. Report any problems to emission control foreman or maintenance foreman;

      ii. Check the stack gas pulpit set point for proper setting;

      iii. Call the emissions control operator who shall perform the following steps;

         A. Check the AVC operation and power level. Report any problems to electrical maintenance foreman or area electrician;

         B. Check to ensure that doors on all hopper screws are closed;

   d. Check oxygen blow rates and adjust, if necessary;

   e. Check hot metal chemistry;

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ATTACHMENT A (cont.)

f. A log shall be maintained of the above checks and any actions taken as a result.

3. The emission control foreman shall:

   a. Check on a regular basis the opacity monitor exceedances and trends. The control specialist shall be contacted to correct any problems;

   b. Check on a regular basis the draft rate set points;

   c. Check on a regular basis primary and secondary damper settings;

   d. Check on a regular basis ESP operation, including the following:

      i. Fields down;

      ii. Fields indicating shorts and unable to reset;

      iii. Hopper screw doors are closed;

   e. Check on a regular basis blow rates;

   f. Check on a regular basis spray water system operation;

   g. Check on a regular basis steam injection rate;

   h. Contact the area manager regarding electrical maintenance and to schedule the ESP repair work;

   i. Contact the area manger for mechanical maintenance to schedule the isolation of the ESP channel by closing the inlet and outlet gates of that chamber and opening the top hatches for entry into the chamber;

   j. Notify the emissions control operator and melter when isolation work begins;

   k. A log shall be maintained of the above checks and any actions taken as a result.

4. The crane operator shall use the following procedures, as appropriate, to minimize emissions and maximize emissions capture by the hoods:

   a. Use controlled pouring of the hot metal into the BOF vessel;

   b. Use careful positioning of the hot metal ladle with respect to the hood face and furnace mouth;

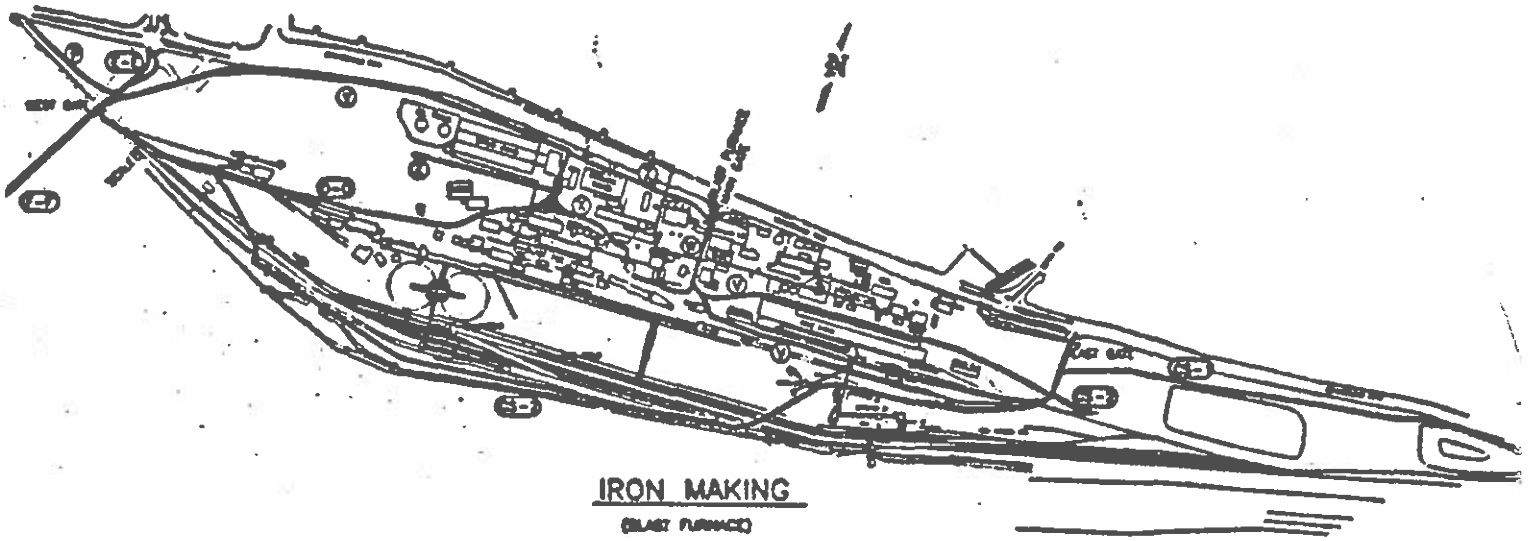
   c. Use the most beneficial furnace tilt angle;

   d. These procedures shall be posted in the crane operator booth.

Permit Application #95010001

ATTACHMENT B

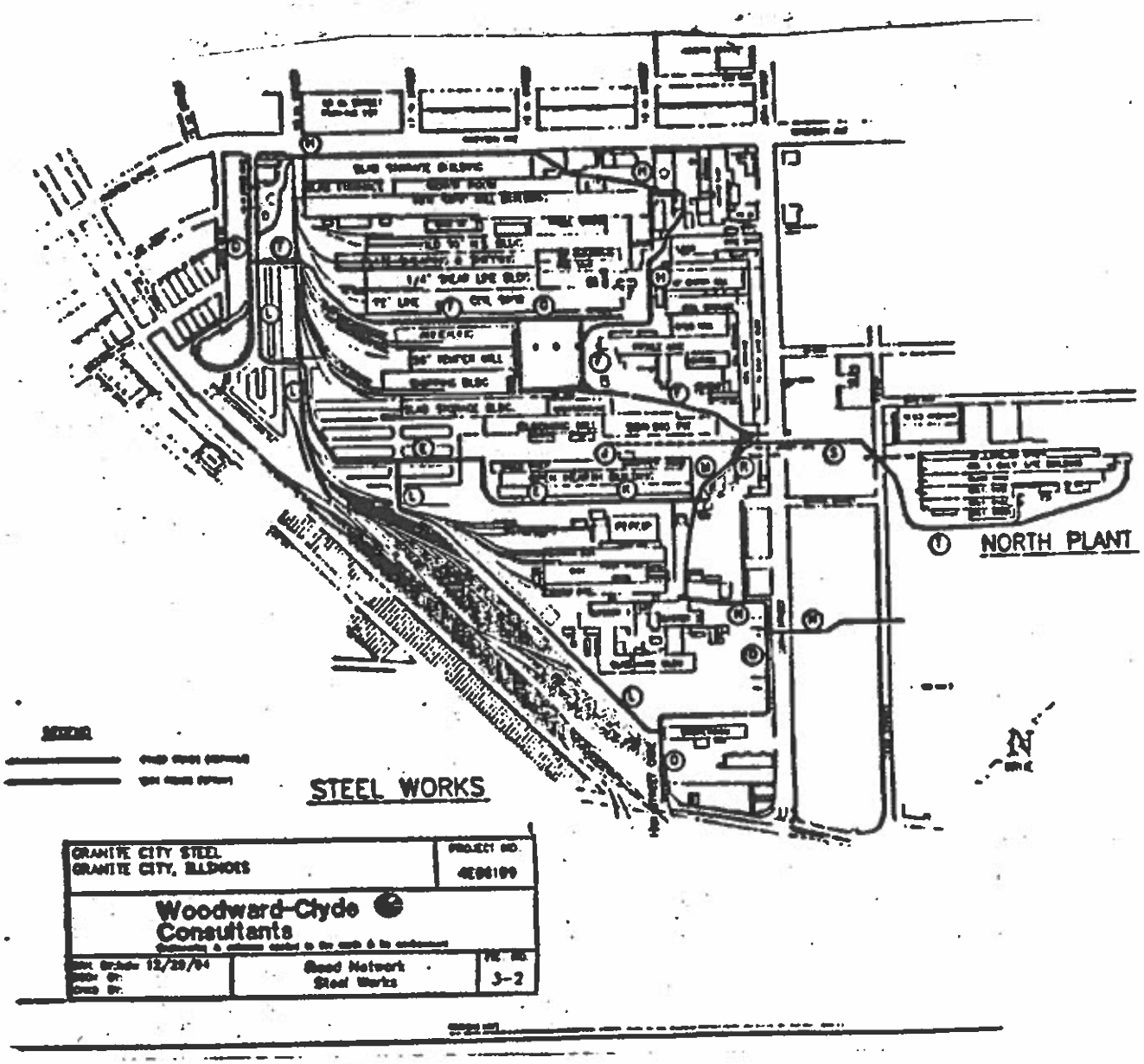
ON-SITE FUGITIVE DUST ROADWAY CONTROL MEASURES AND
MAPS SHOWING THE ROAD SEGMENTS



GRANITE CITY STEEL GRANITE CITY, ILLINOIS	PROJECT NO.
Woodward-Clyde Consultants	
Road Network Iron Making Area	FIG. NO. 3-3

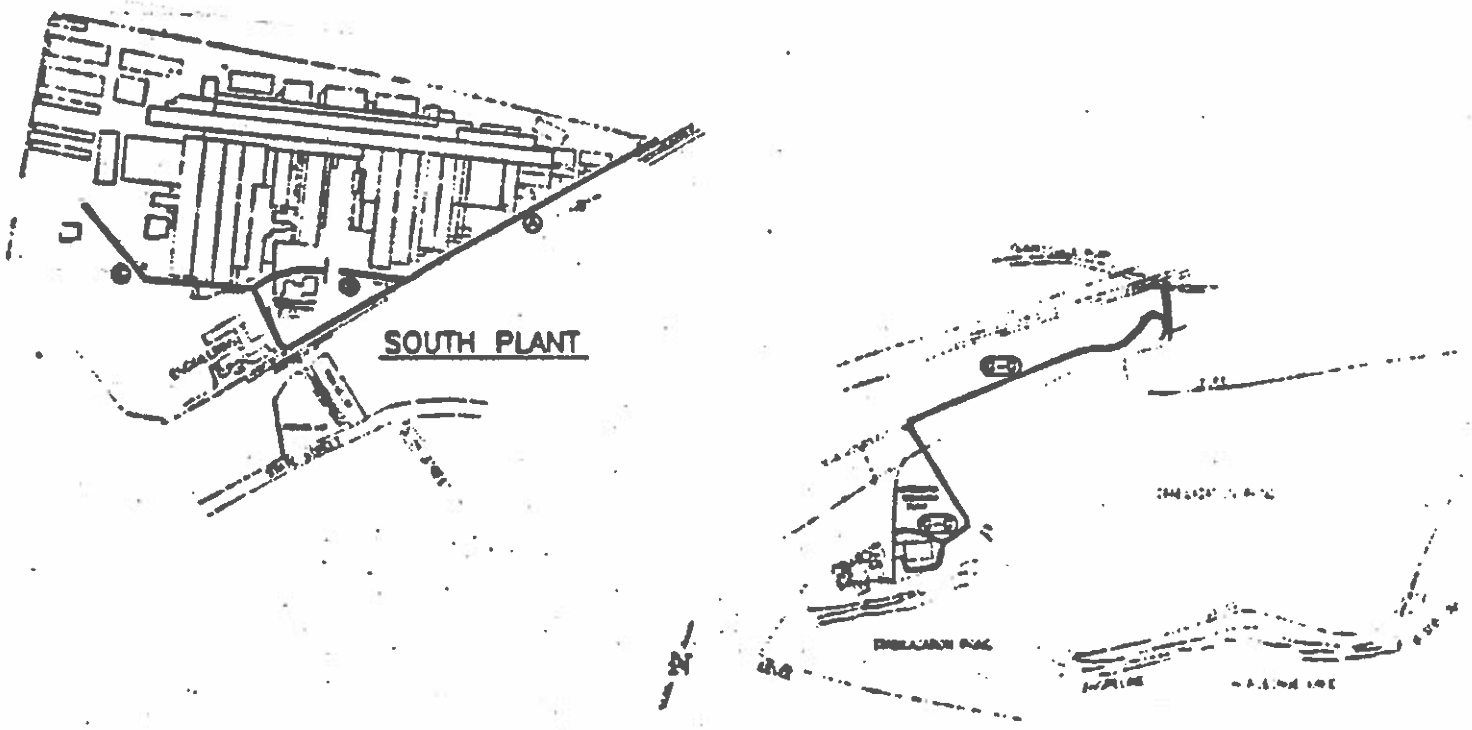
Permit Application #95010001

ATTACHMENT B (cont.)



Permit Application #95010001

ATTACHMENT B (cont.)



GRANITE CITY STEEL
GRANITE CITY, ILLINOIS

PROJECT NO. 4E88199

Woodward-Clyde Consultants

12/29/94

Road Network
South Plant & WWTP

FIG. NO. 3-4

Permit Application #95010001

ATTACHMENT C

CONTEMPORANEOUS REDUCTIONS IN THE EMISSIONS OF PM-10

- Historic roadway emissions of 428 tons/yr, minus future potential roadway emissions of 27 tons/yr, equals a resulting reduction in roadway emissions of 401 tons/yr
- Historic material handling emissions of 17 tons/yr minus future potential material handling emissions of 2 tons/yr, equals a resulting reduction in material handling emissions of 15 tons/yr.
- Emission reductions resulting from the sweeping of city streets = 52 tons/yr*
- Emission reductions resulting from sweeping and housekeeping of areas below and around BOF ESP = 12 tons/yr*

Total reductions in the emissions of PM-10 as a result of the additional dust control measures required by Illinois' SIP and the special conditions of this permit = 480 tons/yr

* These are considered reasonable estimates of reductions and are subject to change upon further investigation of the actual reductions which will occur as a result of the control measures required by this permit.

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Appendix E – Copies of EPA Determinations

IN RE SHELL OFFSHORE, INC.

OCS Appeal Nos. 11-05, 11-06 & 11-07

ORDER DENYING PETITIONS FOR REVIEW

Decided March 30, 2012

Syllabus

This decision addresses petitions for review that challenge an Outer Continental Shelf ("OCS") Permit to Construct and Title V Air Quality Operating Permit ("Permit") Region 10 ("Region") of the U.S. Environmental Protection Agency ("EPA" or "Agency") issued to Shell Offshore, Inc. ("Shell"). The Region issued the Permit on October 21, 2011, pursuant to Clean Air Act ("CAA or "Act") section 328, 42 U.S.C. § 7627, and applicable regulations governing air emissions from OCS sources at 40 C.F.R. part 55, and pursuant to Title V of the CAA, 42 U.S.C. § 7661, and implementing regulations at 40 C.F.R. part 71, as well as applicable Alaska code and regulatory provisions. The Permit authorizes Shell to "construct and operate the Conical Drilling Unit *Kulluk* and associated air emission units and to conduct other air pollutant emitting activities" within Shell's lease blocks in the Beaufort Sea off the North Slope of Alaska. The Permit also provides for the use of an associated fleet of support ships, including icebreakers, supply ships, and oil spill response vessels in addition to the *Kulluk*.

The Board received three petitions for review of the Permit. One petition was filed by Resisting Environmental Destruction of Indigenous Lands ("REDOIL"), Alaska Wilderness League, Center for Biological Diversity, Natural Resources Defense Council, Northern Alaska Environmental Center, Oceana, Pacific Environment, Sierra Club, and the Wilderness Society (collectively, "REDOIL Petitioners"). A second petition was filed by the Inupiat Community of the Arctic Slope ("ICAS"). The third petition was filed by Mr. Daniel Lum.

The three petitions collectively raise seven issues for review: (1) Have Petitioners demonstrated that the Region clearly erred in establishing limitations to restrict the *Kulluk* drilling unit's potential to emit? (2) Have REDOIL Petitioners demonstrated that the Region clearly erred in declining to require prevention of significant deterioration ("PSD") increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process? (3) Did REDOIL Petitioners raise below their contention that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance? (4) Have REDOIL Petitioners demonstrated that the Region clearly erred in its ambient air exemption determination? (5) Have Petitioners demonstrated that the Region failed to satisfy its obligation to consider environmental justice under Executive Order 12898 and comply with applicable Board precedent? (6) Has ICAS demonstrated that the Region clearly erred or abused its discretion in providing forty-six days to comment on the draft permit and in denying ICAS's request for non-overlapping comment periods? (7) Has ICAS demonstrated that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review?

Held: The Board denies review of the Permit. Petitioners have not met their burden of demonstrating that review is warranted on any of the grounds presented.

(1) Limitations on Potential to Emit. The Board concludes that Petitioners have failed to demonstrate that the Region erred in establishing limitations to restrict the potential to emit nitrogen dioxide ("NO_2"), carbon monoxide ("CO"), sulfur dioxide ("SO_2"), and greenhouse gases ("GHGs") for emission units located on the *Kulluk* and on the Associated Fleet when operating within twenty-five miles of the *Kulluk* while it is an OCS source. The Region exercised its discretion and applied its technical expertise to establish practically enforceable source-wide emission limits that accommodate the substantial and unpredictable variations in emissions based on the atypical nature of Shell's operations. The Region explained in the record its rationale, based on the Region's technical expertise and applied in certain limited circumstances, for supplementing source-specific emission factors derived for most of the emission units or groups of emission units with either AP-42 emission factors, or emission factors derived from source test data Shell submitted to the Region in support of two separate, previously issued OCS PSD permits authorizing Shell to conduct exploratory activities in the Chukchi and Beaufort Seas using the *Discoverer* drillship.

(2) PSD Increment Consumption Analyses. The Board concludes that REDOIL Petitioners failed to demonstrate clear error in the Region's decision not to require PSD increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process. The Board holds that the Region provided a reasonable interpretation of CAA section 504(e), which imposes permitting requirements on "temporary" stationary sources, in its Response to Comments document. The Region determined that "PSD major sources are subject to NAAQS and increment in the permitting process, whereas non-PSD sources are subject only to the NAAQS unless the applicable minor source program also includes the [PSD] increment[s]." The Region concluded that the State of Alaska's minor source preconstruction program does not require permanent minor sources to demonstrate compliance with PSD increments as a condition of construction, so neither would it require such compliance of temporary minor sources. The Board finds REDOIL Petitioners' series of challenges to this basic analysis to be deficient in a variety of ways and therefore upholds the Region's decision.

(3) Ambient Air Quality Analysis. REDOIL Petitioners contend that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance. Upon examination of the administrative record, the Board concludes that REDOIL Petitioners failed to raise this issue during the comment period. This issue, therefore, was not preserved for review.

(4) Ambient Air Exemption Determination. The Board concludes that REDOIL Petitioners have not shown that the Region clearly erred in its decision to exempt the area within a 500 meter radius from the *Kulluk* – the area within the U.S. Coast Guard safety zone – from the definition of "ambient air." The Region, in its Response to Comments, provided a reasonable interpretation of the ambient air regulation and the Agency's longstanding interpretation of that regulation as applied in the OCS context.

(5) Environmental Justice Analysis. The Board concludes that ICAS and Mr. Lum have not demonstrated that the Region failed to satisfy its obligations to comply with Executive Order 12898 and applicable Board precedent. The Region conducted an environmental justice analysis that demonstrated compliance with the NAAQS and endeavored to include and analyze data that is germane to the environmental justice issues raised during the comment period. The Region appropriately determined that it was not required to analyze the mobile source emissions from vessels that operate outside of twenty-five miles from the *Kulluk* while it is an OCS source where, as here, the Title V permit did not address these

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mobile source emissions, and the record lacked sufficient data for such an analysis. In addition, in the remaining arguments they put forth in their petitions, ICAS and Mr. Lum do not demonstrate how the Region's responses to comments are inadequate, overcome the particularly heavy burden a petitioner must meet to demonstrate that review of the Region's technical decisions is warranted, or raise issues within the Board's jurisdiction.

(6) Public Comment Period. The Board concludes that ICAS has failed to show that the Region clearly erred or abused its discretion in either selecting a 46-day comment period or in denying ICAS's request for nonconcurrent comment periods. The length of time the Region provided for comment on this permit was 16 days more than the 30-day regulatory minimum and 1 day more than the amount of time ICAS had specifically requested. ICAS's attempt to recalculate the length of the comment period based on an unexplained mathematical formula involving the number and lengths of other comment periods is unconvincing. Furthermore, ICAS has not pointed to any regulations that prohibit the Agency from issuing concurrent permits or that require – or even specify – a different comment period length when the Agency does issue concurrent permits. Finally, it is clear from the administrative record that the Region appropriately balanced conflicting considerations in deciding on the length of the comment period for this permit and in denying the request for nonoverlapping periods, and ICAS has failed to demonstrate otherwise.

(7) Public Hearing. The Board concludes that ICAS has failed to demonstrate that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review. ICAS has not shown that the Region violated any part 71 or 124 procedural regulation. Moreover, the alleged problems ICAS has identified do not, even if the Board were to find them to constitute a deficiency in some way, warrant Board review.

Before Environmental Appeals Judges Charles J. Sheehan, Kathie A. Stein, and Anna L. Wolgast.

Opinion of the Board by Judge Stein:

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I. *STATEMENT OF THE CASE*

A group of conservation petitioners ("REDOIL Petitioners"),[1] the Inupiat Community of the Arctic Slope ("ICAS"), and Mr. Daniel Lum each petitioned[2] the Environmental Appeals Board ("Board") to review an Outer Continental Shelf ("OCS") Permit to Construct and Title V Air Quality Operating Permit ("Permit") that U.S. Environmental Protection Agency ("EPA" or "Agency") Region 10 ("Region") had issued to Shell Offshore, Inc. ("Shell"). *See generally* OCS Permit to Construct and Title V Air Quality Operating Permit, Permit No. R10 OCS030000 (Oct. 21, 2011) (Administrative Record ("A.R.") J-2). The Region issued the Permit pursuant to Clean Air Act ("CAA" or "Act") section 328, 42 U.S.C. § 7627, and applicable regulations governing air emissions from OCS sources at 40 C.F.R. part 55, and pursuant to Title V of the CAA, 42 U.S.C. § 7661, and implementing regulations at 40 C.F.R. part 71, as well as applicable Alaska code and regulatory provisions.[3] *See* Permit at 6 (citing all relevant provisions).

The Permit authorizes Shell to construct and operate the *Kulluk* drilling unit and associated air emission drilling units in certain lease blocks within the Beaufort Sea. *Id.* at 1. The Region and Shell each filed a response to the petitions. Thereafter, both REDOIL Petitioners and ICAS filed motions requesting leave to file reply briefs. These motions are currently pending before the Board and are addressed below in Part V. The Board did not hold oral argument in this case. For the reasons discussed below, the Board denies review of the Permit.

---

[1] REDOIL Petitioners include Resisting Environmental Destruction of Indigenous Lands ("REDOIL"), Alaska Wilderness League, Center for Biological Diversity, Natural Resources Defense Council, Northern Alaska Environmental Center, Oceana, Pacific Environment, Sierra Club, and The Wilderness Society.

[2] Mr. Lum's petition was designated as OCS Appeal No. 11-05, REDOIL Petitioners' petition was designated as OCS Appeal No. 11-06, and ICAS's petition was designated as OCS Appeal No. 11-07.

[3] The Permit was issued under multiple CAA and Alaska air pollution provisions because it is a consolidation of three air permits. According to the Region, it consolidated "an OCS/Title V permit under 40 CFR Parts 55 and 71 for operations beyond 25 miles of Alaska's seaward boundary; an OCS/minor permit for air quality protection under 40 CFR Part 55 and 18 Alaska Administrative Code (AAC) 50.502 and for owner requested limitations under 40 CFR Part 55 and 18 AAC 50.508 for operations within 25 miles of Alaska's seaward boundary; and an OCS/Title V permit under 40 CFR Part 55 and 18 AAC 50.326 for operations within 25 miles of Alaska's seaward boundary." Response to Comments for OCS Permit to Construct and Title V Air Quality Operating Permit Conical Drilling Unit Kulluk at 1 (A.R. J-3).

II. *ISSUES*

The Board has determined that the three petitions filed in this case, collectively, present the following seven issues for review:

A. Have Petitioners demonstrated that the Region clearly erred in establishing limitations to restrict the *Kulluk* drilling unit's potential to emit?

B. Have REDOIL Petitioners demonstrated that the Region clearly erred in declining to require PSD increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process?

C. Did REDOIL Petitioners raise below their contention that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance?

D. Have REDOIL Petitioners demonstrated that the Region clearly erred in its ambient air exemption determination?

E. Have Petitioners demonstrated that the Region failed to satisfy its obligation to consider environmental justice under Executive Order 12898 and comply with applicable Board precedent?

F. Has ICAS demonstrated that the Region clearly erred or abused its discretion in providing 46 days to comment on the draft permit and in denying ICAS's request for nonoverlapping comment periods?

G. Has ICAS demonstrated that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review?

III. *STANDARD OF REVIEW*

Under the part 124 procedural regulations, which apply to OCS permits,[4] the Board will not ordinarily review a permit unless it is based on a clearly erroneous finding of fact or conclusion of law, or involves a matter of policy or exercise of discretion that warrants review. 40 C.F.R. § 124.19(a); Consolidated Per-

[4] The OCS regulations direct the Agency to follow the applicable part 124 permit regulations in processing OCS permits. 40 C.F.R. § 55.6(a)(3). Accordingly, the part 124 permit appeal provision, 40 C.F.R. § 124.19, applies here. *See In re Shell Gulf of Mex., Inc.*, 15 E.A.D. 470, 476 (EAD 2012) [hereinafter *Shell Discoverer 2012*].

mit Regulations, 45 Fed. Reg. 33,290, 33,412 (May 19, 1980). The Board also applies this standard in reviewing Title V permits issued under part 71.[5] *See* 40 C.F.R. § 71.11(*l*)(1); *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 32-33 (EAB 2005). When analyzing permits, the Board is cognizant of the preamble to section 124.19, in which the Agency states that the Board's power of review "should be only sparingly exercised" and that "most permit conditions should be finally determined at the [permit issuer's] level." Consolidated Permit Regulations, 45 Fed. Reg. at 33,412; *accord In re Cardinal FG Co.*, 12 E.A.D. 153, 160 (EAB 2005); *see also Peabody*, 12 E.A.D. at 33 (applying these same principles in the context of a part 71 permit appeal).

The petitioner bears the burden of demonstrating that review is warranted. *See* 40 C.F.R. § 124.19; *id.* § 71.11(l)(1). To meet this burden, the petitioner must satisfy threshold pleading requirements including timeliness, standing, and issue preservation. *See* 40 C.F.R. § 124.19; *id.* § 71.11(l)(1); *In re Russell City Energy Ctr., LLC* ("*Russell City II*"), 15 E.A.D. 1, 10 (EAB 2010), *appeal docketed sub nom. Chabot-Las Positas Cmty. Coll. Dist. v. EPA*, No. 10-73870 (9th Cir. Dec. 20, 2010); *In re BP Cherry Point*, 12 E.A.D. 209, 216 (EAB 2005). For example, a petitioner seeking review must file an appeal of the permit decision within 30 days of service of the decision, and must have filed comments on the draft permit or participated in the public hearing. 40 C.F.R. § 124.19(a); *accord Russell City II*, 15 E.A.D. at 10. In addition, a petitioner must not only specify objections to the permit, but also explain why the permit issuer's previous response to those objections is clearly erroneous or otherwise warrants review. *See* 40 C.F.R. § 124.13 (requiring that all persons who believe a condition of a draft permit is inappropriate "must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period"); *id.* § 124.19(a) (stating that a petition for review to the Board "shall include * * * a demonstration that any issues being raised were raised during the public comment period"); *see also In re Avenal Power Ctr., LLC*, 15 E.A.D. 384, 387 (EAB 2011), *appeals docketed sub nom. Sierra Club v. EPA*, No. 11-73342 (9th Cir. Nov. 3, 2011), *El Pueblo Para el Aire y Agua Limpio v. EPA*, No. 11-73356 (9th Cir. Nov. 4, 2011); *BP Cherry Point*, 12 E.A.D. at 216-17. The petitioner's burden is particularly heavy in cases where a petitioner seeks review of an issue that is fundamentally technical or scientific in nature, as the Board will typically defer to a permit issuer's technical expertise and experience on such matters if the permit issuer adequately explains its rationale and supports its reasoning in the administrative record. *See, e.g., In re Dominion Energy Brayton Point, LLC*, 12 E.A.D. 490, 510 (EAB 2006); *Peabody*, 12 E.A.D. at 33-34; *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567-68 (EAB

[5] The part 71 regulatory language governing Title V permit appeals is nearly identical to the part 124 regulatory language governing review of other types of permits. *Compare* 40 C.F.R. § 71.11(l)(1) *with* 40 C.F.R. § 124.19; *see also Peabody*, 12 E.A.D. at 33 n.26.

1998), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3rd Cir. 1999); *see also In re Ash Grove Cement Co.*, 7 E.A.D. 387, 404 (EAB 1997).

When evaluating a permit appeal, the Board examines the administrative record prepared in support of the permit to determine whether the permit issuer exercised his or her "considered judgment." *Ash Grove Cement*, 7 E.A.D. at 417-18; *accord In re Cape Wind Assocs., LLC*, 15 E.A.D. 327, 330 (EAB 2011); *In re GSX Servs. of S.C., Inc.*, 4 E.A.D. 451, 454 (EAB 1992). The permit issuer must articulate with reasonable clarity the reasons supporting its conclusion and the significance of the crucial facts it relied upon when reaching its conclusion. *E.g., In re Shell Offshore, Inc. ("Shell 2007")*, 13 E.A.D. 357, 386 (EAB 2007) (citing *In re Carolina Light & Power Co.*, 1 E.A.D. 448, 451 (Act'g Adm'r 1978)); *Ash Grove Cement*, 7 E.A.D. at 417 (same). As a whole, the record must demonstrate that the permit issuer "duly considered the issues raised in the comments and [that] the approach ultimately adopted by the [permit issuer] is rational in light of all information in the record." *In re Gov't of D.C. Mun. Separate Storm Sewer Sys.*, 10 E.A.D. 323, 342 (EAB 2005); *accord In re City of Moscow*, 10 E.A.D. 135, 142 (EAB 2001); *NE Hub*, 7 E.A.D. at 568.

Finally, the Board endeavors to construe liberally objections raised by parties unrepresented by counsel (i.e., those proceeding pro se), so as to fairly identify the substance of the arguments being raised. *In re Sutter Power Plant*, 8 E.A.D. 680, 687 & n.9 (EAB 1999); *accord In re Shell Gulf of Mex., Inc. ("Shell Discoverer 2012")*, 15 E.A.D. 470, 478 (EAB 2012); *Russell City II*, 15 E.A.D. at 12. While the Board does not expect such petitions to contain sophisticated legal arguments or to utilize precise technical or legal terms, the Board nonetheless expects such petitions "to articulate some supportable reason or reasons as to why the permitting authority erred or why review is otherwise warranted." *Sutter*, 8 E.A.D. at 687-88 (citing *In re Beckman Prod. Servs.*, 5 E.A.D. 10, 19 (EAB 1994)).

IV. *SUMMARY OF DECISION*

For all of the reasons stated below, the Board concludes that: (a) Petitioners failed to demonstrate that the Region clearly erred in establishing limits to restrict the *Kulluk's* potential to emit; (b) REDOIL Petitioners failed to demonstrate that the Region clearly erred in declining to require PSD increment consumption analyses for the *Kulluk's* proposed emissions as part of the Title V permitting process; (c) REDOIL Petitioners failed to raise below their contention that Shell's ambient air quality analysis was flawed in that it failed to conform to applicable Agency guidance; (d) REDOIL Petitioners failed to demonstrate that the Region clearly erred in its ambient air exemption determination; (e) Petitioners have not demonstrated that the Region's environmental justice analysis and related conclusions

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failed to satisfy its obligation to comply with Executive Order 12898 and applicable Board precedent; (f) ICAS failed to demonstrate that the Region clearly erred or abused its discretion in providing 46 days to comment on the draft permit and in denying ICAS's request for nonoverlapping comment periods; and (g) ICAS failed to demonstrate that the Region clearly erred in its public hearing procedures or that any alleged procedural deficiencies otherwise warrant review. Accordingly, the Board denies review of the Permit.

V. *RELEVANT PROCEDURAL AND FACTUAL HISTORY*

On July 22, 2011, the Region issued a draft permit consolidating three permits that regulated air pollution from Shell's proposed exploratory drilling operations on OCS lease blocks in the Beaufort Sea off the North Slope of Alaska, as authorized by the United States Bureau of Ocean Energy Management, Regulation and Enforcement ("BOEMRE").[6] The Region solicited public comment on the draft permit from July 22, 2011, through September 6, 2011. *See* Statement of Basis for Draft OCS Permit to Construct and Title V Air Quality Operating Permit ("Statement of Basis") at 10 (A.R. H-4). In addition, the Region held an informational meeting and public hearing on the draft permit on August 23, 2011, in Barrow, Alaska, and a separate public hearing on August 26, 2011, in Anchorage, Alaska. *Id.* at 11. All of the petitioners submitted comments on the draft permit. *See* E-mail from Daniel Lum to EPA Region 10 (Aug. 10, 2011) (A.R. I-31) [hereinafter Lum Comments]; E-mail from Alaska Wilderness League, Audubon Alaska, Center for Biological Diversity, Defenders of Wildlife, Earthjustice, Eyak Preservation Council, Greenpeace, National Wildlife Federation, Natural Resources Defense Council, Northern Alaska Environmental Center, Ocean Conservancy, Oceana, Pacific Environment, REDOIL, Sierra Club, The Wilderness Society, and World Wildlife Fund to EPA Region 10 (Sept. 6, 2011) (A.R. I-53) [hereinafter REDOIL Comments]; Letter from North Slope Borough, AEWC, and ICAS to Doug Hardesty, Air Permits Project Manager, EPA Region 10 (Sept. 6, 2011) (A.R. I-54) [hereinafter ICAS Comments]; *see also* Lum Petition at 1 (noting that he also provided comments at the public hearing).

On October 21, 2011, the Region issued the Permit. *See* Permit at 1. At the same time, the Region issued a response to both the written comments it had received on the draft permit and the oral comments that had been presented at the public hearings. *See generally* Response to Comments for OCS Permit to Construct and Title V Air Quality Operating Permit Conical Drilling Unit Kulluk ("RTC") (A.R. J-3); *see id.* at 2 (describing comments to which the document responded). The Permit authorizes Shell to conduct air pollutant emitting activities for the purpose of oil exploration with the conical drilling unit *Kulluk* on lease

[6] For a description of the three permits, *see supra* note 3.

blocks in the Beaufort Sea. The Permit provides for the use of an associated fleet of support vessels ("Associated Fleet"), such as icebreakers, oil spill response vessels ("OSRVs"), and a supply ship, in addition to the *Kulluk*.

The Board received three timely petitions for review of the Permit: one from Mr. Lum, one from REDOIL Petitioners, and one from ICAS. The Region and Shell each filed a single response to those petitions. ICAS and REDOIL Petitioners each filed motions requesting leave to file reply briefs and attached their proposed reply briefs. Shell filed an opposition to the motions for leave to file replies. Before addressing the issues raised by the petitions, the Board first considers whether it is appropriate to grant Petitioners' motions.

A petitioner seeking leave to file a reply brief in an appeal of a new source review ("NSR") permit issued pursuant to the CAA, such as the OCS Permit at issue here, must state "with particularity the arguments to which the Petitioner seeks to respond and the reasons the Petitioner believes it is both necessary to file a reply to those arguments * * * and how those reasons overcome the presumption in the Standing Order."[7] *Shell Discoverer 2012*, 15 E.A.D. at 481 (citing Order Governing Petitions for Review of Clean Air Act New Source Review Permits 3 (Apr. 19, 2011) ("Standing Order"), *available at* http://www.epa.gov/eab (click on Standing Orders)).

Upon consideration of Petitioners' motions to file reply briefs and proposed reply briefs, the Board finds that only two select issues within REDOIL Petitioners' and ICAS's reply briefs meet the high threshold required to overcome the presumption against reply briefs that the Board applies in NSR appeals. *See* Standing Order at 3. In particular, in its reply brief, ICAS responds to arguments concerning ICAS's challenge to the public hearing procedures that the Region advances for the first time in the response brief. ICAS could not have responded to these particular arguments prior to the Region's response because a portion of the Region's rationale in its response brief does not appear in the administrative record. In addition, both ICAS and REDOIL Petitioners assert that the Region referenced for the first time in its response a decision by the Administrator as support for the Region's rationale that the Agency has previously concluded that rolling emission limits accompanied by prescribed emission factors and appropriate monitoring and recordkeeping sufficiently restrict a source's potential to emit. *See* Region Response at 17 (citing *In re Pope & Talbot, Inc.*, Petition No. VIII-2006-04 (Adm'r 2007) (A.R. B-24)). ICAS and REDOIL Petitioners did not have an op-

[7] In April 2011, the Board issued a standing order in which it adopted certain procedures intended to facilitate expeditious resolution of petitions requesting review of permits issued under the CAA NSR program, including OCS permits. *See* Standing Order at 1 n.2; *see also* 40 C.F.R. § 124.19. Among other things, the Board will apply a presumption against the filing of reply briefs and sur-replies in NSR appeals. *See* Standing Order at 3. However, the Board maintains discretion to modify these procedures as appropriate on a case-specific basis. *Id.* at 6.

portunity to review the Administrator's decision in the context of this appeal or to analyze its relevance to the Region's stated rationale until the Region cited it for support in its response brief. Accordingly, the Board grants, in part, ICAS's and REDOIL Petitioners' motions for leave to file a reply brief. Thus the Board, in reaching its conclusions set forth in this order, has considered the portions of ICAS's reply brief and REDOIL Petitioners' reply brief that address the public process for the permit and the Region's inclusion of the *Pope & Talbot* decision as support for the Region's PTE decisions. *See* ICAS Reply at 3, 6-7; REDOIL Petition at 9-10. The Board denies REDOIL Petitioners' and ICAS's motions for leave to file a reply brief with respect to all other issues.[8]

The Board analyzes the parties' arguments and sets forth its determinations below.

VI. *ANALYSIS*

A. *ICAS and REDOIL Petitioners Have Not Demonstrated That the Region Clearly Erred in Establishing Limitations to Restrict the Kulluk Drilling Unit's PTE*

ICAS and REDOIL Petitioners both challenge the Region's determination of the *Kulluk's* potential to emit ("PTE") and argue that the Region should require Shell to obtain a preconstruction prevention of significant deterioration ("PSD") permit. They complain that the PTE restrictions Shell requested and the Region included in the permit to ensure that the *Kulluk* remains a synthetic minor source for nitrogen oxides ("NO_x"), carbon monoxide ("CO"), greenhouse gases ("GHGs"), and sulfur dioxide ("SO_2") are practically unenforceable.[9] The Region counters that the restrictions it imposed in the permit that reduce Shell's emissions below the PSD threshold levels for all criteria pollutants are practically enforceable and constitute fundamentally technical decisions that are consistent with CAA statutory and regulatory authority as well as Agency guidance and past practice. This PTE question is central to the Board's analysis because the Region uses the potential to emit to determine which provisions of the CAA, including both the Title V permit requirements and the PSD preconstruction permit requirements, apply to the *Kulluk*. The question the Board must resolve, then, is whether the restrictions the Region included in the permit to limit the *Kulluk's* PTE are both

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[8] The Board notes that Mr. Lum attempted to file by e-mail a request to file a reply brief and a request for oral argument. *See* E-mail from Daniel Lum to Eurika Durr, Clerk of the Board, Environmental Appeals Board, U.S. EPA (Nov. 4, 2011 6:18 pm EDT). The Board denies Mr. Lum's requests.

[9] While ICAS challenges the Region's PTE limitations for all of these pollutants, REDOIL Petitioners only challenge the Region's PTE limitations with respect to NO_x and CO. *See* ICAS Petition at 10-28; REDOIL Petition at 9-14.

practically enforceable and reasonable in light of the applicable statutory and regulatory authorities as well as Agency guidance and practice, and whether the Region provided adequate support for its decisions in the administrative record.

Before addressing the parties' arguments, a brief review of the relevant statutory and regulatory authorities is warranted.

1. *Statutory and Regulatory Context*

a. *CAA Section 328 and OCS Air Regulations*

Section 328 of the CAA, 42 U.S.C. § 7627, establishes air pollution controls for OCS sources[10] and requires OCS sources to "attain and maintain Federal and State ambient air quality standards" and to comply with the PSD provisions contained in CAA Title I, part C. EPA promulgated the Outer Continental Shelf Air Regulations, 40 C.F.R. part 55, to implement CAA section 328 and established within part 55 "the air pollution control requirements for OCS sources and the procedures for implementation and enforcement of the requirements." 40 C.F.R. § 55.1.

Section 328(a)(1), 42 U.S.C. § 7627(a)(1), also requires that, for OCS sources located within 25 miles of a state's seaward boundary, the requirements shall be the same as would apply if the source were located in the corresponding onshore area ("COA"), including, but not limited to, state and local requirements for emission controls, emission limitations, offsets, permitting, monitoring, testing, and reporting. As the Board has explained before, "OCS sources must obtain

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[10] Section 328 defines an OCS source as follows:

> The terms "Outer Continental Shelf source" and "OCS source" include any equipment, activity, or facility which –
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> (i) emits or has the potential to emit any air pollutant,
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> (ii) is regulated or authorized under the Outer Continental Shelf Lands Act [43 U.S.C. § 1331 et seq.], and
>
> (iii) is located on the Outer Continental Shelf or in or on waters above the Outer Continental Shelf.
>
> Such activities include, but are not limited to, platform and drill ship exploration, construction, development, production, processing, and transportation. For purposes of this subsection, emissions from any vessel servicing or associated with an OCS source, including emissions while at the OCS source or en route to or from the OCS source within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.

CAA § 328(a)(4)(C), 42 U.S.C. § 7627(a)(4)(C).

a preconstruction permit from either EPA or an EPA-delegated agency if the OCS source is located within twenty-five miles of a state's seaward boundary and is subject to either federal or state requirements listed in 40 C.F.R. §§ 55.13 or 55.14."[11] *Shell 2007*, 13 E.A.D. at 365 (citing 40 C.F.R. §§ 55.6(b)(1), 55.11 and CAA § 328(a)(3), 42 U.S.C. § 7627(a)(3)). The Agency has retained the authority to implement and enforce section 328 in the OCS off the coast of Alaska as opposed to delegating that authority to the state. Accordingly, as mentioned above, Shell submitted its permit applications to the Region, and the procedural rules contained at 40 C.F.R. part 124 apply. 40 C.F.R. § 55.6(a)(3).

Because requirements for these OCS sources are based on onshore requirements, which may change, section 328(a)(1) and the corresponding regulations in part 55 require EPA to update the OCS requirements as necessary to maintain consistency with onshore requirements. *See* CAA § 328(a)(1), 42 U.S.C. § 7627(a)(1); 40 C.F.R. §§ 55.6(b)(2), 55.12; *see also Shell 2007*, 13 E.A.D. at 364 & n.6. In response to Shell's December 10, 2010, notice of intent submitted to the Agency pursuant to 40 C.F.R. § 55.4, the Agency first proposed in the Federal Register a consistency update on February 10, 2011, and later published the final consistency update on June 27, 2011, subsequent to a public notice and comment period. *See* Outer Continental Shelf Air Regulations Consistency Update for Alaska, 76 Fed. Reg. 37,274 (June 27, 2011) (codified at 40 C.F.R. § 55.14(e) & appx. A); Statement of Basis at 17. This most recent consistency update incorporated, except where specifically noted, Alaska Administrative Code title 18, articles 1 through 5 and article 9, into part 55. 76 Fed. Reg. at 37,279-80; Statement of Basis at 17. In particular, articles 3 and 5 establish the minor source and major source permitting requirements with which the *Kulluk* must comply. *See Shell 2007*, 13 E.A.D. at 364 & n.6.

In addition, because the permit authorizes the *Kulluk* to operate on a group of lease blocks located both within 25 miles and beyond 25 miles of the state's seaward boundary, the permit conditions that refer to lease blocks wholly or partially located beyond 25 miles of the seaward boundary are designated as "outer

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[11] Section 55.13 states, among other things, that the PSD program applies to OCS sources located within 25 miles of a state's seaward boundary whenever the OCS source requires construction of a new major stationary source or a modification at an existing major source and the COA is classified under the PSD program as in attainment or unclassifiable. 40 C.F.R. § 55.13(d)(1) ("40 C.F.R. [§] 52.21 shall apply to OCS sources [l]ocated within 25 miles of a state's seaward boundary if the requirements of 40 C.F.R. [§] 52.21 are in effect in the COA."); *see also Shell 2007*, 13 E.A.D. at 364.

Section 55.14 incorporates by reference regulatory requirements that states which border the OCS in the Pacific, Atlantic, and Arctic Oceans and the Gulf of Mexico have promulgated to meet the national ambient air quality standards ("NAAQS"). 40 C.F.R. § 55.14(d); CAA § 328(a)(1), 42 U.S.C. § 7627(a)(1) (defining the geographic scope of EPA authority to regulate air pollution from OCS sources). These state regulations are known as state implementation plans ("SIPs") and are created pursuant to CAA § 110, 42 U.S.C. § 7410.

OCS," and conditions that refer to lease blocks wholly or partially located within 25 miles of the seaward boundary are designated as "COA." Permit at 9 (noting that conditions identified with "COA" are those that apply on the "inner OCS," within 25 miles of the state's seaward boundary, and that all other conditions not identified as "COA" or "outer OCS" apply to lease blocks on both the inner and outer OCS); *see also* Statement of Basis at 7.

b. *The PSD Program and PTE*

The PSD program is a preconstruction NSR program that applies to areas designated as either in attainment with the national ambient air quality standards ("NAAQS")[12] or unclassifiable and requires new major stationary sources[13] to limit their impact on ambient air quality by obtaining a PSD permit before construction begins. CAA §§ 160-169, 42 U.S.C. §§ 7470-7479; 40 C.F.R. § 52.21(a)(2).

A source's PTE relates to its inherent ability to emit air pollutants. *Shell 2007*, 13 E.A.D. at 365; *Peabody*, 12 E.A.D. at 30. Under the PSD program, a permitting authority must determine a source's PTE to identify which sources are "major sources" subject to regulation under the applicable PSD requirements, making PTE a technical determination that "is jurisdictional in nature." *Ala. Power Co. v. Costle*, 636 F.3d 323, 352 (D.C. Cir. 1979), *quoted in Peabody*, 12 E.A.D. at 30; *see also* CAA § 165(a), 42 U.S.C. § 7475(a) (requiring a PSD permit for any "major emitting facility"); *Shell Discoverer 2012*, 15 E.A.D. at 515 n.58. The regulations that implement the PSD program define PTE as:

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[12] The NAAQS are maximum ambient air concentrations for specific pollutants that EPA has determined are necessary to protect public health and welfare. *See* CAA §§ 108(a)(1)(A), 109, 42 U.S.C. §§ 7408(a)(1)(A), 7409; 40 C.F.R. § 50.4-.12.

[13] EPA regulations define a major stationary source as any of certain specifically listed stationary sources that emit or have a potential to emit 100 tons per year ("tpy") or more of any regulated NSR pollutant, *see* 40 C.F.R. § 52.21(b)(50), or any other stationary source that emits, or has the potential to emit, 250 tpy or more of a regulated NSR pollutant. 40 C.F.R. § 52.21(b)(1)(i)(a)-(b); *accord* CAA § 169(1), 42 U.S.C. § 7479(1) (defining a "major emitting facility" in the same way).

Alaska regulations, which incorporate large parts of the federal PSD regulations into title 18 of the Alaska Administrative Code, provide that a new PSD permit is required prior to actual construction of a new major stationary source. Alaska Admin. Code tit. 18, § 50.040 (adopting federal standards by reference); *id.* §§ 50.302(a)(1), 50.306. The Alaska regulations also define a major stationary source as any of certain specifically listed stationary sources that emit or have a potential to emit 100 tpy or more of any regulated NSR pollutant, or any other stationary source that emits, or has the potential to emit, 250 tpy or more of a regulated NSR pollutant. *Id.* § 50.990(52) (incorporating by reference definition of major stationary source from 40 C.F.R. § 51.166(b)(1)); *accord* Alaska Stat. § 46.14.990 (same).

> [T]he maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable.

40 C.F.R. § 52.21(b)(4).[14] In sum, PTE reflects a source's maximum emissions capacity considering the application of any emission control equipment, or other capacity-limiting restrictions, that effectively and enforceably limit emissions capacity. *Shell 2007*, 13 E.A.D. at 366; *Peabody*, 12 E.A.D. at 31 (citing Part 71 Rulemaking, 61 Fed.Reg. 34,202, 34,212 (July 1, 1996)).

Alaska regulations require that, under certain circumstances, a stationary source with a PTE of less than 250 tons per year ("tpy") obtain a minor source permit. Alaska Admin. Code tit. 18, § 50.502. Specifically in terms of the *Kulluk's* operations, Alaska regulations require a minor source permit prior to the construction of a new stationary source with the potential to emit more than 40 tpy of NO_x. *Id.* § 50.502(c)(1)(B). Thus, as the Board noted in *Shell 2007*, under the Alaska PSD program, a new stationary source that has a PTE between 40 and 250 tpy of NO_x must obtain a minor source permit before commencing construction, and a stationary source with a PTE greater than 250 tpy of NO_x must obtain a major source permit. 13 E.A.D. at 366.

A source that would otherwise exceed the applicable PSD major source threshold of 250 tpy of any regulated NSR pollutant may, as in this instance, seek to avoid regulation as a major source under the PSD program by requesting that the permitting authority impose enforceable permit restrictions on the source's PTE. *Shell* 2007, 13 E.A.D. at 366, *cited in* RTC at 20; *see also Peabody*, 12 E.A.D. at 26 & n.11, 31. A Title V permit may function as a vehicle for a permitting authority to establish enforceable permit limits that restrict the source's potential to emit air pollutants to a level below the PSD major source threshold, in this instance 250 tpy, allowing the source to qualify instead as a "synthetic minor" source.[15] *Peabody*, 12 E.A.D. at 31 & n.21.

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[14] The OCS regulations define the term "potential emissions" almost identically to the PTE definition in part 52, with the exception of first sentence, which instead states that "[p]otential emissions means the maximum emissions of a pollutant from an OCS source." 40 C.F.R. § 55.2.

[15] EPA guidance defines the term "synthetic minor" as "air pollution sources whose maximum capacity to emit air pollution under their physical and operational design is large enough to exceed the
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If a source accepts limitations that restrict its potential to emit air pollutants to a level below the PSD threshold, that source will be a synthetic minor source for purposes of the PSD program and will therefore not be subject to PSD permitting requirements "unless future facility modifications increase emission capacity enough to exceed the PSD major source threshold." *Id.* at 31-32. As the Board noted in *Peabody*, in order for a capacity restriction to be cognizable as a PTE limit, it must be practically enforceable, which Agency guidance has interpreted to mean that:

> [T]he permit's provisions must specify: (1) a technically accurate limitation and the portions of the source subject to the limitation; (2) the time period for the limitation (hourly, daily, monthly, and annual limits such as rolling annual limits); and (3) the method to determine compliance including appropriate monitoring, recordkeeping, and reporting.

12 E.A.D. at 32 (quoting Memorandum from John Seitz, Dir., Office of Air Quality Planning & Standards, U.S. EPA, to EPA Reg'l Air Div. Dirs., *Options for Limiting the Potential to Emit (PTE) of a Stationary Source Under Section 112 and Title V of the Clean Air Act* 5-6 (Jan. 25, 1995) [hereinafter *Options for Limiting PTE*] (A.R. B-9)).

In this instance, the pre-permit PTE for units located on the *Kulluk*, and on the Associated Fleet when operating within 25 miles of the *Kulluk* while it is an OCS source,[16] exceeded applicable PSD thresholds for NO_x, CO, SO_2, and GHGs. Statement of Basis at 24-25 & tbl. 2-1.[17] To avoid exceeding the PSD major

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(continued)
major source threshold but [is] limited by an enforceable emissions restriction that prevents this physical potential from being realized." Memorandum from John Seitz, Dir., Office of Air Quality Planning & Standards, U.S. EPA, & Eric Schaeffer, Dir., Office of Regulatory Enforcement, U.S. EPA, *Potential to Emit Transition Policy for Part 71 Implementation in Indian Country* 2 n.2 (Mar. 7, 1999), *quoted in Shell Discoverer 2012*, 15 E.A.D. at 515-16 n.59, and *Peabody*, 12 E.A.D. at 31 n.21.

Alaska regulations refer to such a limitation as an owner requested limit ("ORL"), which can be used to "avoid one or more permit classifications * * * at a stationary source that will still be subject to at least one permit classification; a limitation approved under an ORL is an enforceable limitation for the purpose of determining * * * a stationary source's potential to emit." Alaska Admin. Code tit. 18, § 50.508(5).

[16] The permit states that the *Kulluk* will be an OCS source at any time it is attached to the seabed at a drill site by at least one anchor. Permit at 8; Statement of Basis at 17, 19-20 (A.R. H-4).

[17] The primary emission sources on the *Kulluk* and the Associated Fleet are internal combustion engines that consume diesel fuel. Statement of Basis at 9, 12-14. Incinerators, heaters, boilers, and seldom used sources on the *Kulluk* and the Associated Fleet also emit pollution but to a far lesser extent. *Id.*

source thresholds, Shell requested that the Region include in the permit practically enforceable restrictions that will reduce the *Kulluk's* PTE below PSD threshold levels for each of the four pollutants. *See* Letter from Susan Childs, Alaska Venture Support Integrator Manager, Shell Offshore Inc., to Doug Hardesty, EPA Region 10, attach. 2 (Apr. 29, 2011) (describing Shell's proposed restrictions and how they would affect emissions) (A.R. E-17). The final permit authorizing the *Kulluk* to operate within the Beaufort Sea contains source-wide emission limits, operational restrictions, and monitoring, recordkeeping and reporting requirements intended to ensure that the *Kulluk* can operate as a synthetic minor source. Permit Conditions D.1-D.4.

With this framework in mind, the Board now turns its attention to Petitioners' arguments presented in these appeals.

2. *The Region Did Not Clearly Err in Establishing Source-Wide Emission Limits to Restrict PTE for NO_x and CO*

The Permit restricts emissions from the *Kulluk* and the Associated Fleet to no more than 240 tpy of NO_x and no more than 200 tpy of CO.[18] Permit Conditions D.4.1, D.4.2. For both pollutants, the PTE limits are determined on a rolling 365-day basis by calculating emissions for each day and adding the emissions calculated for the previous 364 days. *Id.* For both NO_x and CO, daily emissions from each emission unit or group of emission units "shall be determined by multiplying the appropriate emission factor (lb/unit) specified in Tables D.2.1 – D.2.2 (until a test-derived emission factor has been determined according to Permit Condition E.2) by the recorded daily operation rate (units/day) and dividing by 2000 lb/ton." *Id.* The Region further explained that "[c]ompliance with the emissions limits for NO_x and CO is determined by applying the relevant emission factor to the amount of fuel combusted by each emission unit (or hours of operation for incinerators)." RTC at 29. The Permit also includes conditions that require source-wide recordkeeping and monitoring to ensure that Shell complies with the source-wide limits. Permit at 56-61 (including operations and fuel monitoring in Permit Condition F.2 as well as selective catalytic reduction ("SCR") and oxida-

[18] ICAS asserts that the Region should include a 5-10% buffer zone between the PSD threshold emissions level of 250 tpy and the *Kulluk's* restricted PTE, and that the NO_x emission limit of 240 tpy does not provide this. ICAS Petition at 15 (citing a comment letter from Region 9 to the Nevada Division of Environmental Protection in which Region 9 "encourage[d] a 5-10% buffer between the permitted emission limits and the federal threshold" for a permit that established a CO synthetic minor limit of 249 tpy). However, the 240 tpy emission limit for NO_x contained in the current Permit represents a 4% buffer between the synthetic minor limit and the PSD threshold emission level of 250 tpy, which is ten times larger than the 0.4% buffer between a 249 tpy emission limit and the PSD threshold of 250 tpy contained in the Nevada permit. The Board agrees with the Region that Congress established specific thresholds to determine when a source would be considered major for purposes of PSD review. *See* RTC at 30. The buffer that ICAS requests is neither a legal requirement nor an established Agency policy, and thus the Region appropriately declined ICAS's request.

tion catalyst ("OxyCat") control device monitoring in Permit Conditions F.3 – F.4).

REDOIL Petitioners and ICAS make several challenges to the Region's decision to restrict the *Kulluk's* PTE for NO_x and CO using source-wide emission limits. Both petitioners assert that the Region's decision to limit CO and NO_x emissions using source-wide limits in effect applies blanket emission limits, which Agency guidance expressly prohibits because they are practically unenforceable, and that the limited exception in the Agency guidance that allows for source-wide limits is inapplicable to the *Kulluk's* operations. REDOIL Petition at 10-11; ICAS Petition at 11. Both petitioners also object to the Region's use of generic emission factors[19] to calculate source-wide emission limits. In particular, both petitioners assert that (1) the Region should have developed source-specific emission factors for all units of the OCS source; (2) the AP-42 emission factors applied to the emergency generator, the OSRVs, and heaters and boilers lead to inaccurate and underestimated emissions for those sources; and (3) the Region did not require Shell to conduct enough stack tests to accurately calculate source-specific emission factors. ICAS Petition at 15-20; REDOIL Petition at 11-14.

The Region responds that Agency guidance documents generally "illustrate that the Clean Air Act and the implementing regulations allow for a flexible, case-by-case evaluation of appropriate methods for ensuring practical enforceability of PTE limits." Region Response at 14-15 (quoting *In re Orange Recycling & Ethanol Prod. Facility*, Pet. No. II-2001-05, at 5 (Adm'r Apr. 8, 2002) (A.R. B-17)). Specifically, the Region asserts that source-wide emission limits for NO_x and CO are indeed practically enforceable and are most appropriate given the uncertainty of a number of factors that otherwise preclude the Region from establishing PTE restrictions based on operational limits. *Id.* at 18; RTC at 26-27, 29-30. In addition, the Region asserts that the emission factors used to calculate NO_x and CO emissions provide reliable emission calculations. Region Response at 19-23. In particular, the Region asserts that it made an appropriate technical determination to apply AP-42 emission factors or emission factors derived from *Discoverer*[20] data rather than source-specific emission factors for certain emission units. *Id.* The Region adds that the permit conditions that apply to source-specific

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[19] *See infra* Part VI.A.2.b.

[20] The Region issued Shell two OCS PSD permits to conduct exploratory drilling activities in the Chukchi and Beaufort Seas utilizing the drillship *Discoverer* that were twice appealed to the Board, first in 2010, and then again in 2011 subsequent to a Board remand of the permits to the Region. *See Shell Discoverer 2012*, 15 E.A.D. at 474-75 (describing history of *Discoverer* permit proceedings). In preparing the permit applications for the *Discoverer's* operations, Shell conducted source-specific emission tests for various emission units on the *Discoverer* and an associated fleet of support ships, including icebreakers, supply ships, and oil spill response vessels. *See id.*, 15 E.A.D. at 479-80 (describing associated fleet).

emission factors require source tests that are inadequate in frequency and unrepresentative of the variation in Shell's proposed operations to allow the Region to derive accurate emission factors. *Id.*

a. *Blanket Emission Limits and Practical Enforceability*

ICAS and REDOIL Petitioners correctly assert that the use of blanket emission limits alone, essentially statements that actual emissions of a pollutant will not exceed a particular quantity, is generally prohibited to restrict PTE because such limits are not enforceable as a practical matter. *See United States v. La.-Pac. Corp.*, 682 F. Supp. 1122, 1133 (D. Colo. 1987) ("[C]ompliance with blanket restrictions on actual emissions would be virtually impossible to verify or enforce."), *quoted in* REDOIL Petition at 11; *see also* Office of Air Quality Planning & Standards, U.S. EPA, *New Source Review Workshop Manual* at C.4 (draft Oct. 1990) [hereinafter *NSR Manual*] ("Blanket emissions limits alone (e.g., tons/[year], lb/[hour]) are virtually impossible to verify or enforce, and are therefore not enforceable as a practical matter."), *quoted in* ICAS Petition at 13; Memorandum from Terrell Hunt, Assoc. Enforcement Counsel, U.S. EPA, & John Seitz, Dir., Stationary Source Compliance Div., U.S. EPA, *Guidance on Limiting Potential to Emit in New Source Permitting* 7 (June 13, 1989) (A.R. B-4) [hereinafter *1989 Guidance on Limiting PTE*].[21] However, the Petitioners' characterization of the source-wide emission limits for NO_x and CO contained in the Permit as blanket emission limits must fail. ICAS and REDOIL Petitioners do not acknowledge the Region's explanation in the Response to Comments for why it chose to apply source-wide emission limits in the Permit, nor do they establish that the Region's fundamentally technical determinations contravene Agency guidance.

The Region made clear in the Response to Comments that its decision to employ source-wide emission limits calculated as rolling 365-day limits to restrict NO_x and CO was based in large part on the substantial and unpredictable variations in emissions based on the atypical nature of Shell's operations. RTC at 26-27; Region Response at 18. Variability in Shell's exploratory operations, multiple engines and generators located on both the *Kulluk* and numerous vessels in the Associated Fleet, the state of the weather and the sea, ice thickness, and the changing nature of the activities that Shell may need to conduct all influenced the Region's conclusion that the need for operational flexibility made it impractical to establish unit-specific limits or operating parameters for some pollutants, such as NO_x and CO, that might typically be applied to limit a stationary source's PTE. RTC at 27; *see* Statement of Basis at 38. The Region continued that, in its judgment, the choice to restrict the *Kulluk*'s PTE for NO_x and CO using source-wide emissions limits "accounts for variability in operations and emissions, yet still

[21] Appendix C of the NSR Manual is based largely on the 1989 Guidance on Limiting PTE. *NSR Manual* at C.1 n.1.

provides assurance that limits on potential to emit can be enforced as a practical matter." RTC at 28.

Although the restrictions to limit the PTE of emission units located on the *Kulluk* and the Associated Fleet utilize a rolling 365-day limit, a longer time period than generally recommended in Agency guidance,[22] as the Region points out, the continuous monitoring and recording of fuel usage and the application of source-test derived or specified emission factors have the practical effect of constraining Shell's fuel use, thus ensuring compliance with the PTE limits. Region Response at 15, 17 (citing *In re Pope & Talbot, Inc.*, Petition No. VIII-2006-04 (Adm'r 2007) (A.R. B-24), in which rolling emission limits in addition to prescribed emission factors and appropriate monitoring and recordkeeping were sufficient to restrict PTE).[23] In essence, although the Region could not incorporate more traditional operational limits into the Permit based on the atypical nature of the permitted activities, the daily calculation of NO_x and CO emissions in conjunction with continuous monitoring and recording of fuel usage ensure that the NO_x and CO PTE restrictions can be practically enforced.

Despite the Region's explanation in the Response to Comments regarding the need to consider the facts unique to this Permit, neither ICAS nor REDOIL Petitioners explain why, especially in light of the *Kulluk*'s atypical operations as

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[22] The 1989 Guidance on Limiting PTE recommends that the time limit over which production or operational limits extend should be "as short term as possible" in order for such limitations to be enforceable as a practical matter, and generally not exceeding one month, but the Guidance also recognizes that in rare circumstances a limit spanning a longer time may be appropriate. *1989 Guidance on Limiting PTE* at 9. The Guidance specifies that a limit spanning a longer time is appropriate if it is rolling and that it should not exceed an annual limit rolled on a monthly basis. *Id.* The Guidance also notes that:

> [P]ermits where longer rolling limits are used to restrict production should be issued only to sources with substantial and unpredictable annual variation in production[.] * * * Rolling limits could be used as well for sources which shut down or curtail operation during part of a year on a regular seasonal cycle, but the permitting authority should first explore the possibility of imposing a month-by-month limit.

Id. at 9-10. In this instance, although the Guidance was written prior to Congress authorizing EPA to regulate air emissions from sources located on certain areas of the OCS, *see* Region Response at 17, including the Arctic, the circumstances the Guidance anticipates that would make a longer time limit appropriate apply in this instance to the *Kulluk* permit, where the operations are seasonal and thus variation in production would be substantial. *See 1989 Guidance on Limiting PTE* at 9-10.

[23] Although the Board agrees with Petitioners that the Region did not cite this decision until it submitted its response to the petitions for review, and thus accepts their reply briefs with respect to this point, *see supra* Part V, the Board nonetheless disagrees that this publicly available decision of the Administrator is inapposite to the current appeal. The *Pope & Talbot* decision underscores the Agency's ability to exercise its discretion and its technical expertise in order to craft practically enforceable synthetic minor limits.

compared to other stationary sources, the Permit's PTE limits are not practically enforceable. *See* Region Response at 17. Rather, Petitioners hew closely to the language in the 1989 Guidance on Limiting PTE prohibiting blanket emissions, asserting instead that because the Permit does not contain production or operational limits to restrict PTE, the NO_x and CO emission limits constitute blanket emission limits that contravene Agency guidance. ICAS Petition at 11-14; REDOIL Petition at 9-11. The 1989 Guidance on Limiting PTE sets forth the types of limitations that will restrict a source's PTE and states in relevant part:

> To appropriately limit potential to emit * * * permits * * * must contain a production or operational limitation in addition to the emission limitation in cases where the emission limitation does not reflect the maximum emissions of the source operating at full design capacity without pollution control equipment. Restrictions on production or operation that will limit potential to emit include limitations on quantities of raw materials consumed, fuel combusted, hours of operation, or conditions which specify that the source must install and maintain controls that reduce emissions to a specified emission rate or to a specified efficiency level.

1989 Guidance on Limiting PTE at 5-6.[24] In addition, neither ICAS nor REDOIL Petitioners address the operational limits included in the Permit and discussed in

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[24] The Guidance also acknowledges that the "particular circumstances of some individual sources make it difficult to state operating parameters for control equipment limits in a manner that is easily enforceable as a practical matter" and lists two exceptions. *1989 Guidance on Limiting PTE* at 7. Although the Guidance preceded EPA's authority to regulate air emissions on parts of the OCS, *see* Region Response at 17, and thus could not have anticipated the circumstances of the permit at issue in these appeals, the Region nonetheless asserts that the circumstances surrounding the current permit are sufficiently analogous to the second exception for volatile organic compound ("VOC") surface coating operations, which contemplates no add-on controls but allows for the restriction of PTE by limiting the VOC contents and quantities of coatings used. *Id.* at 17-19 (referring to *1989 Guidance on Limiting PTE* at 8).

The VOC exception focuses on circumstances where operating and production parameters could not be readily set due to the wide variety of coatings and products and due to the unpredictable nature of the operations. *1989 Guidance on Limiting PTE* at 8. The Region asserted that the rationale informing the VOC surface coating operation exception is sufficiently similar to the present circumstances and analogized that an effective way to restrict NO_x and CO was through source-wide emissions limits supported by test-derived or specified emission factors, similar to the VOC content of coatings, continuous monitoring and recording of operational parameters, and tracking the quantity of VOC coating used. RTC at 30; Region Response at 18. REDOIL Petitioners and ICAS assert that the VOC exception should be construed quite narrowly and that the VOC surface coating operation exception within the 1989 Guidance on Limiting PTE could not apply to the *Kulluk* and the Associated Fleet. *See* ICAS Petition at 20; REDOIL Petition at 13-14. Petitioners do not state more than a differ-

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the Response to Comments. *See* RTC at 29 (discussing hourly operational limits on mudline cellar drilling and overall drilling activity and the installation of SCR and OcyCat controls to limit NO_x emissions).

Finally, ICAS challenges the Region's inclusion of requirements in the Permit to calculate daily emissions for NO_x and CO on a weekly basis, arguing that it is a "critical flaw to enforceability of the permit because it means that Shell will only know where it stands vis-a-vie [sic] its NO_x and CO permit limits once a week." ICAS Petition at 14 (citing Permit Conditions D.1.1, D.1.2). The Board finds ICAS's argument here unavailing in light of the Region's thorough explanation in the Response to Comments. *See* RTC at 44; Region Response at 19, 23. The Region explained that although the calculations of emission limits will be conducted weekly, data is continuously collected and recorded and will eventually be generated in the same terms as the emission limits. *See* RTC at 44; Region Response at 23. Moreover, the Region points out that Shell is required to process data from numerous emission units across multiple vessels for 168 individual hours (24 hours x 7 days). RTC at 44. The permit requirements to continuously monitor and record data necessary to conduct daily emissions calculations ensures, as ICAS raises, the ability to assess and verify compliance immediately should an inspector, the Region, or Shell require it. RTC at 44; Region Response at 23. In this instance, ICAS does not acknowledge the Region's response or address why that response is inadequate and thus warrants review. As this Board has previously stated, "[p]etitions for review may not simply repeat objections made during the comment period; instead they must demonstrate why the permitting authority's response to those objections warrants review." *Peabody*, 12 E.A.D. at 46 n.58; *accord In re Knauf Fiber Glass GmbH, ("Knauf II")*, 9 E.A.D. 1, 5 (EAB 2000); *see also* standard of review discussion *supra* Part III.

In addition, as the Board noted above in Part VI.A.1.b, the determination of a source's PTE is inherently an exercise that requires technical expertise. Neither REDOIL Petitioners nor ICAS have met the particularly heavy burden of demonstrating that review of the Region's decisions to employ source-wide emission limits to restrict the *Kulluk*'s PTE is warranted. *See, e.g.*, *Peabody*, 12 E.A.D. at 33; *NE Hub*, 7 E.A.D. at 567 ("When issues raised on appeal challenge a Region's technical judgments, clear error or a reviewable exercise of discretion is not

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ence of opinion or alternative view on a technical issue. *See NE Hub*, 7 E.A.D. at 567. Without more, petitioners cannot sustain the burden of demonstrating that review of the Region's exercise of its technical judgment is warranted. *See Peabody*, 12 E.A.D. at 33; *In re Teck Cominco Alaska Inc.*, 11 E.A.D. 457, 473 (EAB 2004).

established simply because petitioners document a difference in opinion or an alternative theory regarding a technical matter.").

b. *Emission Factors*

An emission factor is a representative value used to relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of that pollutant. U.S. EPA, AP-42, *Compilation of Air Pollutant Emission Factors*, Volume 1: Stationary Point and Area Sources 1 (Jan. 1995) (5th ed.) ("AP-42 Guidance"). Emission factors essentially represent an average of a range of emission rates of the subject sources. *Id.* at 2. As stated above in Part VI.A.2, in this instance compliance with the PTE restrictions for NO_x and CO are determined by calculating daily emissions of each pollutant, which requires multiplying the appropriate emission factor by the recorded daily operation rate and dividing by 2000 lb/ton. Permit Conditions D.4.1, D.4.2.

REDOIL Petitioners and ICAS challenge several aspects of the Region's use of emission factors to assist in calculating compliance with the restricted PTE for both NO_x and CO. Both petitioners challenge the Region's decision to forgo source-specific emission testing to establish emission factors for all emission units on the *Kulluk* and the Associated Fleet and further assert that this will cause the Region and Shell to underestimate the quantities of NO_x and CO emitted by the OCS source. ICAS Petition at 15-19; REDOIL Petition at 11-13. REDOIL Petitioners and ICAS assert that the use of AP-42 emission factors and emission factors derived from *Discoverer* test results for those emission units that will not undergo source-specific testing constitutes clear error because these more generic emission factors will likely lead to an underestimation of emissions from the units to which they are applied. ICAS Petition at 16-18; REDOIL Petition at 11-12 (referring to AP-42 emission factors as "notoriously inaccurate default factors"). Finally, ICAS challenges the frequency and number of stack tests used to develop source-specific emission factors for emission units and further asserts that by Shell's own admission there is a 15% variability in stack test data that results in a less conservative emission factor than the Region claims. ICAS Petition at 16-17.

The Board notes at the outset that the development of emission factors for use in calculating daily emissions to determine compliance with PTE restrictions requires the sort of quintessential technical expertise the permit issuer possesses, here the Region, to which the Board will defer if "the record demonstrates that the Region duly considered the issues raised in the comments and if the approach ultimately selected by the Region is rational in light all of the information in the record." *NE Hub*, 7 E.A.D. at 567-68, *quoted in Peabody*, 12 E.A.D. at 34; *see also Avenal Energy Ctr.*, 15 E.A.D. at 387. As explained more fully below, for each challenge regarding the derivation and use of emission factors set forth in the Permit, REDOIL Petitioners and ICAS have failed to sustain the particularly heavy burden petitioners must overcome to demonstrate that review of a funda-

mentally technical decision is warranted. *See, e.g., Peabody*, 12 E.A.D. at 33; *NE Hub*, 7 E.A.D. at 567-68.

The Region fully explained in the Response to Comments its rationale for supplementing source-specific emission factors derived for most of the emission units or groups of emission units located on the *Kulluk* or the Associated Fleet with either AP-42 emission factors[25] or emission factors derived from *Discoverer* source test data for a minority of units. RTC at 32-33; *see also* Region Response at 20-21. In support of its decision to utilize a mix of source-specific testing for emission factors in addition to using AP-42 and *Discoverer* test data emission factors, the Region stated that it "believes the permit strikes an appropriate balance between the need for accurate emission factors to reliably calculate emis-

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[25] ICAS's attempt to analogize the situation the Board confronted in *Peabody* to the current permit appeal falls short. Although *Peabody* discusses the use of AP-42 emission factors in a PTE calculation where the source was seeking synthetic minor status, ICAS fails to acknowledge critical factual elements that distinguish *Peabody* from the current appeal.

In *Peabody*, the permittee was a large coal-processing plant built prior to the effective date of the PSD program that requested a PTE limit for particulate matter with a diameter of 10 microns or less ("PM_{10}") in the permittee's Title V permit so that the facility could remain a synthetic minor source for PM_{10} emissions should it conduct any major modifications in the future. *See Peabody*, 12 E.A.D. at 24-34. Of critical importance, the facility's emissions were primarily fugitive, and thus, emission testing to directly measure PM_{10} emissions was not feasible. *Id.* at 34. The permittee consequently submitted a request for a PTE limit based on a quantitative estimate of the facility's capacity to emit PM_{10}, which in turn relied on estimates of uncontrolled emissions from each unit based on the application of AP-42 emission factors that were then used to estimate net emissions by applying assumed emission control efficiencies for the emission control equipment in use. *Id.* at 34-35 & n.31. Peabody's proposed compliance regimen did not include direct measurement of PM_{10} emissions. As the Board stated, "[b]ecause Peabody's approach would rely entirely on the application of emission factors and assumed control efficiencies, for purposes of both estimating maximum emissions capacity and monitoring ongoing compliance, the accuracy and appropriateness of the emission factors and the control efficiency assumptions were the focal point of Region IX's analysis of Peabody's proposal." *Id.* at 35-36.

Contrary to the facility in *Peabody*, in this instance the use of AP-42 factors to calculate compliance with restricted PTE for NO_x and CO was essentially a last resort method for calculating compliance, whereas the emission units that accounted for at least 90% of the NO_x and CO emissions were subject to source-specific emission testing. *See id.* at 32-33. The Region made clear that in the relatively small number of instances where an AP-42 emission factor was employed to calculate compliance with PTE, the Region chose conservatively higher emission factors. In *Peabody*, the Region made a technical determination and "concluded that Peabody had not sufficiently demonstrated that it met the central criteria for establishing [PTE] – technical accuracy and a reliable method of determining compliance." *Id.* at 39. In this instance, the Region made a technical determination that Shell has sufficiently demonstrated that the *Kulluk* could demonstrate compliance with the NO_x and CO PTE limits included in the permit in a manner that is technically accurate, and that the compliance of the emission units can be verified based on source-specific testing. The Region's exercise of its technical expertise to conclude that in limited circumstances AP-42 emission factors were appropriate to demonstrate compliance with the restricted PTE is rational in light of all of the information in the record. Thus, ICAS's contention that *Peabody* governs the appeal currently before the Board is unpersuasive.

sions for comparison to permit limits and the complexity of testing numerous emission units in a short period of time." RTC at 33. The Region also noted that, in response to comments received, it decided to require source-specific emission testing for incinerators and that, after that change, the permit will require source testing of emission units that constitute 91% of NO_x and 97% of CO emissions. *Id.* at 32. Of the remaining units that were not required to undergo source testing to develop an emission factor, the Region set forth in detail why it had chosen emission factors derived from *Discoverer* source test data or the AP-42 emission factors, in many instances raising the value of an emission factor to provide a more conservative estimate of emissions.[26] *Id.* at 32-33; *see also* Region Response at 20; Statement of Basis at 38 (noting that testing for source-specific emission factors (Permit Condition E.2) uses a protocol that results in conservatively high unit-specific emission factors that in turn help to ensure compliance with PTE).

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[26] The Region explained in the Statement of Basis that an important element of Permit Condition E.2, which catalogues the procedures for conducting tests to determine equipment-specific emission factors, "is the selection of worst[-]case emission factors for each emission unit or group of emission units tested." Statement of Basis at 43; *see also* Permit at 52-56. The record demonstrates that the Region thoughtfully and judiciously employed emission factors derived from *Discoverer* test data and AP-42 emission factors, and consistently chose higher, more conservative emission factors when there was any question or discrepancy. For example, for those NO_x emission units for which the Permit does not require source testing and that rely on emission factors based on *Discoverer* test data, the Region adjusted the emission factor to reflect the conservative 90th percentile (or higher) values from the test data. RTC at 32. The Region further explained that for heaters and boilers – the only remaining group of NO_x emission units that rely on AP-42 for emission factors – the Region expects the AP-42 emission factor to be a conservative representation of actual emissions. *Id.* (noting that while AP-42 predicted an NO_x emission factor for heaters and boilers of 0.02 lb/gal, Shell testing of *Discoverer* boilers shows a range of values between 0.011 lb/gal and 0.015 lb/gal); *see also* RTC at 46 (noting that the boiler and heater NO_x emission factor used in the *Kulluk* permit is "lower than the *Discoverer* BACT limit for similar equipment, but is higher than available test data for a similar source"). ICAS challenged the Region's use of an NO_x emission factor in the Permit that is lower than the one in the *Discoverer* permits, *see* ICAS Petition at 18-19, but ICAS failed in its petition to even acknowledge the Region's response to its comment regarding the NO_x emission factor for heaters and boilers, let alone "substantively confront the permit issuer's subsequent explanation." *Peabody*, 12 E.A.D. at 33 (citing *In re Zion Energy, LLC*, 9 E.A.D. 701, 705 (EAB 2011)).

With respect to emission units that will not undergo source testing to verify CO emission factors, the Region similarly explained that it believed emission factors are reasonable for use in the permit given that AP-42 emission factors will represent only 3% of the total CO emissions. RTC at 32. In addition, the Region notes that the CO emissions from tests conducted for two boilers on the *Discoverer* were nearly identical to the AP-42 emission factor. *Id.* at 33 (explaining that the Region chose the highest, most conservative emission factor of the three). Finally, the Region notes that one of the potential oil spill and response boats has an actual CO emission factor for its propulsion engine that is based on the manufacturer's data and is one tenth of what the AP-42 factor predicts. *Id.*; *see also* Permit Table D.2.2 (demonstrating that the Region chose to include the much higher AP-42 emission factor for the OSRV propulsion engine).

While REDOIL Petitioners[27] and ICAS may disagree with the Region's approach, Petitioners do not demonstrate that the Region's choices in deriving emission factors for emission units will result in an underestimation of pollutants emitted by the *Kulluk* and the Associated Fleet. The Region has demonstrated that it balanced its primary task of accurately calculating NO_x and CO emission factors to ensure that the *Kulluk* and the Associated Fleet will not exceed the restricted PTE with the practical need to calculate emission factors for numerous and varied emission units aboard both the *Kulluk* and the Associated Fleet. The Board has frequently stated that it will not grant review where, as here, the record demonstrates a bona fide difference of opinion or alternative theory regarding a technical matter but the approach the Region ultimately selected is rational in light of all the information in the record. *Peabody*, 12 E.A.D. at 34 (quoting *NE Hub*, 7 E.A.D. at 567).

Finally, ICAS asserts that the *Discoverer* source test data is not sufficient to accurately generate worst-case scenario emission factors for *Kulluk* emission units because similar sources tested on the *Discoverer* were subject to BACT, and further, that in using stack test results from the *Discoverer* to develop emission factors for the *Kulluk* permit, the Region never accounted for "15% variability in Shell's stack tests," resulting in inadequate emission factors. ICAS Petition at 17-19. The Region points out, however, that the *Discoverer* stack tests on which the Region relied to calculate the 90th percentile value and assess the appropriateness of AP-42 factors were not subject to post-combustion controls limiting NO_x or CO and thus provided an appropriate comparison for purposes of deriving emission factors for the *Kulluk*. Region Response at 21 (citing *Discoverer* stack test results and communications discussing them in the administrative record, specifically A.R. B-55, B-63, C-406, and C-489). With respect to the 15% variability in stack test results[28] that ICAS alleges, the Region points to the technical litera-

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[27] REDOIL Petitioners contend that the Region's recognition that Shell's approach involves "inherent uncertainty" regarding what equipment will be aboard the *Kulluk* and the Associated Fleet, which in turn requires "thorough source testing," coupled with the Region's refusal to require source testing for all equipment, is "internally inconsistent and thus arbitrary and unlawful." REDOIL Petition at 12. However, the Region responded that it used its technical expertise to determine that in this instance, a mix of both source-specific testing to derive emission factors, in addition to using AP-42 factors and emission factors derived from *Discoverer* test data where appropriate, was reasonable and not inconsistent. Region Response at 20-21. The Board agrees with the Region that the decision to use source-specific testing to derive emission factors, in conjunction with the emission factors developed from *Discoverer* data and from AP-42, is inherently technical. In order to effectively exercise its expertise, the Region should not, as REDOIL Petitioners suggest, be cabined by a rigid interpretation of how emission factors should be determined. REDOIL Petitioners have failed to meet the particularly high threshold for demonstrating that Board review of the Region's fundamentally technical decision is warranted. *Peabody*, 12 E.A.D. at 33-34.

[28] ICAS also asserts that stack tests are "conducted once a year for one or two years depending on the source," at three different loads, and even when the worst-case emissions are used, the stack tests fail to account for Shell's varying emissions. ICAS Petition at 16. The Region explained in re-
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ture Shell referenced in Shell's comments, which addresses "uncertainty in determining front-half PM [particulate matter] emission rates" and does not directly address procedures for deriving NO_X and CO emission factors. *Id.* at 22-23; *see also* Permit Conditions E.1.2, E.1.7, E.1.14 (requiring Shell to submit a testing plan and follow EPA-approved test methods, and establishing Region's authority to require additional stack tests if necessary). As the Region correctly points out, ICAS has not demonstrated that the worst-case stack test results, which embody the Region's fundamentally technical determinations, will be biased low and underreport emissions. Region Response at 22-23; *see, e.g., Teck Cominco*, 11 E.A.D. at 473 (discussing heavy burden assigned to petitioners seeking review of issues that are essentially technical in nature).

3. *ICAS Has Failed to Demonstrate That the Region Clearly Erred in Restricting the Kulluk and the Associated Fleet's Potential to Emit GHGs*

ICAS also challenges the Permit's GHG emission limit, which restricts Shell's annual GHG emissions to 80,000 tpy of carbon dioxide equivalent ("CO_2e").[29] *See* ICAS Petition at 21-26; *see also* Permit Condition D.4.4; RTC at 28. EPA promulgated regulations, commonly referred to as the "Tailoring Rule," that set forth applicability criteria to determine which GHG emission sources become subject to the PSD and Title V programs under the Act.[30] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514, 31,516 (June 3, 2010). In this instance, despite the fact that

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sponse that Permit Condition E.2.1 requires each source-tested unit to be tested prior to each of the first two drilling seasons and subsequently every two or five years depending on any variability observed in the results of the two initial tests. Region Response at 22; *see also* Statement of Basis at 44 (frequency of source-specific emission factor testing after first two years based on variability of results). Further, each test requires three 1-hour runs at each of the three tested operating loads, which results in nine results total for each aggregate source test. Region Response at 22. Without more than its bare assertion that the current source tests do not adequately address Shell's varying emissions when the data is used to derive emission factors, ICAS cannot demonstrate that the permit conditions that dictate the frequency and parameters of source tests warrant Board review.

[29] GHGs are defined as "the aggregate group of six greenhouse gases: carbon dioxide, nitrous oxide, methane, hydroflourocarbons, perflourocarbons, and sulfur hexaflouride." 40 C.F.R. § 52.21(b)(49)(i). CO_2e represents the amount of GHGs emitted and is computed by "[m]ultiplying the mass amount of emissions (tpy), for each of the six greenhouse gases in the pollutant GHGs, by the gas's associated global warming potential published at Table A-1 subpart A of [40 C.F.R.] part 98 of this chapter – Global Warming Potentials." *Id.* § 52.21(b)(49)(ii)(a).

[30] The regulations provide that any source that is considered a new major source for a regulated NSR pollutant other than GHGs will also be subject to regulation for GHGs if it emits or has the potential to emit 75,000 tpy or more of CO_2e. 40 C.F.R. § 52.21(b)(49)(iv). New stationary sources that emit or have the potential to emit more than 100,000 tpy or more of CO_2e are also subject to regulation for GHGs. *Id.* § 52.21(b)(49)(v).

the OCS source's pre-permitted potential to emit exceeded 100,000 tpy of CO_2e, *see* Statement of Basis at 24, the Permit restricts the potential to emit GHGs to 80,000 tpy of CO_2e and thus prevents Shell from being subject to regulation for GHGs under the PSD program. *See* RTC at 24.

As noted previously, the vast majority of emissions, including GHG emissions, from both the *Kulluk* and the Associated Fleet result from internal combustion sources such as engines and boilers, along with incinerators. Statement of Basis at 12, 14, 39; RTC at 35. The Permit contains operational restrictions on the amount of time a source can operate, the amount of fuel and waste combusted, and the type of fuel combusted to ensure compliance with the Permit's GHG emission limit.[31] *See* Statement of Basis at 37-39; RTC at 33-36; *id.* at 34-35 (noting that in response to comments the Region adjusted the methane emission factor upward by a factor of four to represent a reasonable upper-bound estimate of the number of wells that could be drilled in a single season, which in turn required a small reduction to the total amount of fuel that may be combusted in engines and boilers during any rolling 12-month period). In addition to the combustion sources and the incinerators, a relatively small amount of GHG emissions in the form of methane results from the drilling mud system ("DMS").[32] *See* RTC at 35. GHG emissions from the DMS, calculated at 85 tpy of CO_2e, represent only 0.11% of the total GHG emissions allowed under the permit, 80,000 tpy of CO_2e. *Id.* The Region calculated an unrestricted PTE for methane emissions of 1,596 lbs/month,

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[31] The Permit imposes annual limits of 120 days of operation as an OCS source during a drilling season, which spans from July 1 through November 30, and 1,632 hours of total drilling activity in a drilling season, of which only 480 hours may be used to conduct mudline cellar drilling activity, which is expected to generate the most air pollution. *See* Permit Conditions D.3.1-D.3.5. The Permit also limits the total aggregate combustion of fuel over a 12-month rolling period, the type of fuel combusted, and the total aggregate daily waste-combusting capacity of incinerators. *See* Permit Conditions D.4.6-.7, .9; *see also* RTC at 34-35. In addition, the Permit includes various monitoring and recordkeeping requirements to document when emissions should be counted toward emission limits, testing requirements for the derivation of source-specific emission factors, tracking and documentation requirements for the fuel and waste combusted, and maintenance requirements to ensure that emission units are properly operated and maintained. *See* Permit Conditions D.1-.4, D.8, F.2.1-.7; *see also* RTC at 36-37, 43.

[32] The Region explained methane emissions from the DMS as follows:

> When wells are drilled through porous, hydrocarbon[-]bearing rock, drilling fluids (mud) circulated through the drill bit can carry gaseous hydrocarbons from the well back to [the] Kulluk. These gases are typically released as fugitive emissions when the mud is processed for reuse on the Kulluk or stored and shipped away; however, some of the emissions pass through a vent.

Statement of Basis at 38.

the equivalent of 17 tons per month ("tpm") of CO_2e.[33] *Id.* The Permit accounts in Condition 4.4.2 for methane emissions encompassing the source's full unrestricted PTE of 17 tpm of CO_2e, which are added to GHG emissions from combustion sources when calculating total GHG emissions. *See* Statement of Basis at 39; *Shell Discoverer 2012*, 15 E.A.D. at 516.

ICAS raises several challenges to the Permit's GHG emission limit. Similar to its challenges of the Permit's synthetic minor limits for NO_x, CO, and SO_2, ICAS contends that the Permit contains a blanket emission limit for GHGs that is practically unenforceable and further asserts that the requirement that GHG emissions only be calculated monthly to determine compliance with the established rolling 12-month limit is inadequate to verify compliance "in a given moment." ICAS Petition at 21-22 (citing *NSR Manual* at C.3, C.5, H.5); *see* Permit Conditions D.1.3-.4. In addition, ICAS asserts that the Region clearly erred by accepting an owner-requested limit for methane attributable to mud off-gassing from the DMS that is not only unenforceable, but also less than the "maximum expected capacity" or "upper-bound projection" ConocoPhillips submitted in another Arctic OCS permit proceeding. *Id.* at 22-26.

Based on the foregoing information, ICAS's general assertion that the GHG emission limit is practically unenforceable must fail. The Region has demonstrated in both the Permit and the documentation in the record supporting the Permit that it crafted a synthetic minor limit that would not only prevent Shell from being subject to regulation under the PSD program for GHG emissions, but also

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[33] In calculating the unrestricted PTE for DMS methane emissions, the Region included several conservative assumptions to ensure a wide margin of safety for total methane emissions over Shell's five-month period of operation. *See* RTC at 34; *Options for Limiting PTE* at 8 (noting that for sources with inherent physical limitations that restrict the potential emissions of an emissions unit, if such limitations can be documented and confirmed, the permitting authority may factor them into estimates of a stationary source's PTE). For example, the Region assumed that the total unrestricted PTE for DMS methane emissions for the entire five months of drilling operations would be emitted during each of the five months. RTC at 35.

In addition, despite much of the methane emissions being fugitive emissions that are not counted towards PSD applicability for exploratory drill rigs, *see* 40 C.F.R. § 52.21(b)(1)(iii), Shell agreed to consider all of the methane emissions from the DMS as point source emissions that would count towards Shell's potential to emit GHGs. *See* RTC at 35; *see also* Statement of Basis at 38-39. In its petition, ICAS disputes the Region's claim that counting such fugitive emissions towards PTE represents a conservative approach that lends a "measure of safety" and asserts that the part 71 regulations governing Title V permits require such fugitive emissions to be included. ICAS Petition at 24 (citing 40 C.F.R. § 71.3(d), which states that fugitive emissions from a part 71 source "shall be included in the permit application and the part 71 permit in the same manner as stack emissions"). However, as the Region correctly points out in its response, the definitions of major source in both 40 C.F.R. § 52.21(b)(1)(iii) and 40 C.F.R. § 71.2 make clear that fugitive emissions are not considered when determining whether a source is a major source. Region's Response at 26 n.21 (citing the Tailoring Rule and noting that it retained this approach of determining whether a source becomes subject to regulation for GHGs).

would be practically enforceable as a result of the numerous operational restrictions in combination with monitoring, recordkeeping, and reporting requirements contained in the Permit. While ICAS acknowledges the operational limits contained in the Permit, ICAS simultaneously disputes their efficacy without explaining why such operational limits will not have their intended effect of restricting Shell's potential to emit GHGs.[34] *See* ICAS Petition at 21-22. Without stating more than mere disagreement, ICAS cannot meet the especially high threshold of demonstrating that the Region's inherently technical decisions regarding the GHG emission limit warrant Board review. *See, e.g.*, *NE Hub Partners*, 7 E.A.D. at 567; *Shell Discoverer 2012*, 15 E.A.D. at 501.

ICAS's more specific contention that the Region clearly erred by accepting an owner requested restriction for methane from mud off-gassing that is practically unenforceable is unavailing. *See* ICAS Petition at 22-26. ICAS raised this same argument in previous appeals of two OCS PSD permits the Region issued to Shell for operations in the Chukchi Sea of the Arctic OCS. *See Shell Discoverer 2012*, 15 E.A.D. at 514-19; *see also supra* note 20. In brief, the monthly calculation of methane to be released in mud off-gassing in both *Shell Discoverer 2012* and the current appeal are not only the same amount, 17 tpm, they also both reflect the unrestricted PTE for methane emissions from DMS operations. *See* RTC at 34-35; *Shell Discoverer 2012*, 15 E.A.D. at 517-18. The Board rejects ICAS's assertion in this instance, relying on the same reasons it gave in *Shell Discoverer 2012*:

> [T]he Permit[] in this case do[es] not include owner requested limits on PTE for methane emissions. Rather, * * * methane emissions were assumed to occur at the source['s] full PTE for the five-month drilling season

[34] Similarly, ICAS's contention that the Region clearly erred by not requiring more frequent calculations of GHG emissions than the monthly calculations the Permit requires, *see* Conditions D.1.3-.4, falls short. The Region explained that its decision to calculate emissions on a monthly basis stemmed from "good confidence in the overall [GHG emission] compliance technique and therefore 'yearly' emissions are required to be summed only monthly." Statement of Basis at 38. Although GHG emission calculations will be calculated once a month based on the Region's stated confidence in its compliance method, the data required to make such calculations is collected continuously through fuel usage monitoring. RTC at 43-44 ("Shell is generally required to continuously measure and record, on an hourly basis, the fuel consumed by each emission unit or group of emission units."); *see also* Region Response at 24 (citing *1989 Guidance on Limiting PTE* and noting that "in light of annual variations in operations and the fact that the source operates during only part of the year" the Region determined that a 12-month rolling limit for CO_2e was appropriate as stated). Again, ICAS has failed to meet its burden of demonstrating that review is warranted, where, as here, it has not addressed the Region's stated rationale for requiring only monthly calculation of GHG emissions and has not demonstrated that monthly calculation of GHG emission would inhibit verification of compliance with the GHG emission limit. *See supra* Part III.

> (0.798 tons per month),[35] and the Permit[] count[s] these emissions towards the total GHG limitation * * * . The Region determined that because these unrestricted emissions of methane (when combined with GHG emissions from combustion sources) would not result in an exceedance of the Permit['s] total GHG emissions limit, additional permitting restriction limits were not required.
>
> Under these circumstances, ICAS's reliance on the requirement that permits include conditions ensuring the enforceability of limitations on a source's PTE is misplaced, as the Permits do not contain owner requested limits on methane emissions or otherwise limit the source['s] PTE from DMS operations.

Shell Discoverer 2012, 15 E.A.D. at 517-18 (citations omitted).

In addition, ICAS has not demonstrated that the Region's calculation of methane emissions from the DMS underestimated the "upper-limit" projection that is in turn used to identify the "maximum capacity" of a source based on an "inherent physical limitation." RTC at 34 (citing *Options for Limiting PTE* at 8 and Memorandum from John Seitz, Dir., Office of Air Quality Planning & Standards, to Reg'l Air Dirs., U.S. EPA, *Calculating Potential to Emit (PTE) and Other Guidance for Grain Handling Facilities* at 4-5 (Nov. 14, 1995) (A.R. B-10) [hereinafter *Grain Handling Guidance*]). ICAS's assertion is premised on ConocoPhillips' higher estimate of DMS methane emissions submitted to the Region in another permit proceeding concerning exploratory drilling in the Arctic OCS. ICAS Petition at 23-26. However, ICAS simply states that the discrepancy between Shell's and ConocoPhillips' calculations of DMS methane emissions means that the Region clearly erred in accepting Shell's methane calculations, but it does not acknowledge or evaluate the record information Shell submitted that explains in depth the causes for the divergent methane calculations.[36] Upon considering this

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[35] This is the same unrestricted PTE for methane emissions as in the *Kulluk* permit (1596 lb / 2000 lb = 0.798 tons).

[36] In *Shell Discoverer 2012*, ICAS asserted that it was unable to evaluate the basis for Shell's estimates of DMS methane emissions that the Region had relied on to calculate PTE because Shell did not release its estimates until after the close of the comment period. 15 E.A.D. at 517 n.63. In that instance, the Board concluded that the Region was authorized to supplement the record with previously unavailable information confirming that Shell's estimate of methane PTE was a reasonable upper-bound estimation, and "[t]hus, ICAS had the opportunity to evaluate the basis for Shell's PTE estimates and the Region's assessment of those estimates in preparing its appeal to this Board." *Id.* (citing *In re Cape Wind Assoc., LLC*, 15 E.A.D. 327, 332-33, 335 (EAB 2011), and 40 C.F.R. §§ 124.17(a)-(b), .18(b)).

Continued

information, the Region exercised its technical expertise in concluding that Shell's estimates of methane emissions from the DMS were permissible, especially given the conservative assumptions the Region incorporated when calculating PTE. ICAS does not address either the record information that supports the Region's decision to accept Shell's methane estimate or the Region's stated rationale for concluding that methane monitoring is not required. *See* RTC at 35-36 (explaining that, based on the inherent limitations that exist and the relatively small contribution of the DMS to overall GHG emissions, the Region does not believe monitoring of DMS emissions or operations is necessary in addition to the monitoring already required in the permit). As this Board has often stated, a petitioner cannot demonstrate that review is warranted if the petitioner fails to substantively confront a permit issuer's response. *Peabody*, 12 E.A.D. at 33 (noting that to obtain review a petitioner must "explain why, in light of the permit issuer's rationale, the permit is clearly erroneous or otherwise deserving of review"); *see also In re BP Cherry Point*, 12 E.A.D. 209, 217 (EAB 2005). Moreover, as stated above, the Region's decision regarding the GHG emission limit is inherently technical in nature, and ICAS has fallen short of the particularly high threshold it must meet to demonstrate that review of the Region's technical determination is warranted. *See Peabody*, 12 E.A.D. at 33-34; *see also NE Hub*, 7 E.A.D. at 567-68.

4. *The Region Did Not Clearly Err in Restricting OCS Source's Potential to Emit SO_2*

The Permit restricts SO_2 emissions from the *Kulluk* and the Associated Fleet to no more than 10 tpy, well below the 250 tpy PSD threshold level. *See* Permit Condition D.4.3. Compliance with this limit is determined on a rolling 12-month basis and is achieved by requiring that Shell not combust any liquid fuel with sulfur content greater than 0.01 percent by weight in any emission unit on the *Kulluk* or the Associated Fleet and that all fuel purchased for use in emission units on the *Kulluk* and Associated Fleet have a maximum sulfur content of 0.0015 percent by weight. Permit Conditions D.4.5, D.4.9. Shell is required to keep diesel

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(continued)

The material in question is not only in the record submitted with the *Discoverer* appeals, it also appears in the record for the instant appeal. *See* E-mail from Susan Childs, Shell, to Doug Hardesty, EPA Region 10 (Sept. 16, 2011 14:31 pm PDT) (A.R. CCC-438 in *Shell Discoverer 2012* and A.R. C-575 in the current appeal). Thus in the current appeal there is no question that the information from Shell clarifying and explaining its estimate of DMS methane emissions, including the highly conservative assumptions Shell included in its estimate, was at ICAS's disposal. In addition, Shell submitted further clarification of its DMS methane estimates as compared to ConocoPhillips' in order to "explain how different assumptions led to different results, and why Shell believes that ConocoPhillips' estimate is unrealistically high." E-mail from Susan Childs, Shell, to EPA Region 10 (Sept. 20, 2011 17:57 pm PDT) (A.R. C-577). ICAS's petition does not address either of these record submissions or the Region's reliance on this information to determine that the Region's calculation of methane emissions from the DMS represents "a reasonable upper-bound projection for Shell's operations [that] is not expected to be exceeded under any reasonably anticipated operating scenario." RTC at 35.

fuel purchase records documenting sulfur content for each batch of fuel purchased. Permit Condition D.4.9.2. In addition, the total amount of fuel combusted in engines and boilers must not exceed 7,004,428 gallons during any rolling 12-month period. Permit Condition D.4.6; *see also* Permit Condition F.2.4 (requiring Shell to (1) obtain representative fuel samples and determine fuel sulfur content in parts per million from fuel storage tanks on the *Kulluk* and the Associated Fleet prior to their mobilization, (2) determine the sulfur content of each delivery of fuel to the *Kulluk* and the Associated Fleet once the vessels are mobilized, and (3) maintain records of all sampling and analysis).

ICAS asserts that the Region justifies its blanket SO_2 emissions limits by including "purported 'operational limits'" that restrict fuel content and usage and concludes that compliance with the restricted PTE for SO_2 is practically unenforceable because these operational limits are not unit-specific and because the overall limit is based on a 12-month rolling limit. ICAS Petition at 26-27. ICAS offers no explanation as to why the operational limits and averaging time the Region chose to include in the Permit, both of which are clearly considered legitimate in Agency guidance, nonetheless constitute clear error. *See* Region Response at 28; *Options on Limiting PTE* attach. 1 at 5 ("[L]imitations on sulfur dioxide emissions could be based on specified sulfur content of fuel and the source's obligation to limit usage to certain maximum amounts."); *1989 Guidance on Limiting PTE* at 9-10 (noting that in certain situations a rolling limit of up to a year may be appropriate for sources with "substantial and unpredictable annual variation in production," including "source which shut down or curtail operation during part of the year on a regular seasonal cycle").

ICAS also challenges the monitoring provisions for small and/or infrequently used emission units that are not required to have fuel flow monitors. ICAS Petition at 27. As the Region correctly points out, however, ICAS makes no attempt to explain why the specified fuel measurement alternatives, together with the requirement to measure and record fuel usage before and after operation, do not allow for a reliable and accurate assessment of fuel usage. Region Response at 28 (citing Permit Condition F.2.2.2). Here again, ICAS offers nothing more than a bald assertion of clear error without any analysis of why the Region erred. Where, as here, the Region's decision was technical in nature, ICAS has failed to meet the particularly high threshold for establishing that review of the Region's technical determination is warranted.

5. *Shell's Minor Source Permit Is Not a "Sham" Permit*

ICAS asserts that in order to ensure the *Kulluk*'s status as a minor source, Shell has agreed to operational limitations in its OCS/Title V permit that are not represented in other authorizations and permit applications for Shell's exploratory activities in the Beaufort Sea. ICAS Petition at 28. ICAS alleges that Shell's incidental hazard assessment, required under the Marine Mammal Protection Act,

16 U.S.C. § 1371(a)(5)(A), (D), authorizes 78 days of drilling whereas the OCS/Title V permit only authorizes 68 days of drilling. *Id.* Based on this single discrepancy, ICAS categorically concludes that "Shell is submitting permit applications and seeking authorization from other agencies with different plans than are provided for in its air permit." ICAS Petition at 28-29. ICAS also asserts that the Region did not adequately respond to its concern that Shell's application for a minor source permit is a sham.[37] *Id.*

At the outset, the Board notes that ICAS's assertion that Shell has secured a sham minor source permit with the intention to avoid preconstruction review as a major source under the PSD program is wholly unsupported in the record.[38] As the Region noted in the Response to Comments, there is nothing to indicate that Shell intends to later apply to the Region to remove the synthetic limits contained in the Permit. RTC at 22. The Region continued that, regardless of what the incidental hazard assessment says regarding the number of days Shell may drill, Shell nonetheless "must comply with all requirements of the Kulluk Permit and failure to do so is a violation of the CAA." *Id.* (citing Permit Condition A.3). Finally, the Region made clear that whether an original request for a minor source permit is a "sham" may be evaluated when the Region receives a request to remove the synthetic limits. *Id.*

ICAS rejects the Region's statement that there is nothing to suggest that Shell intends to obtain a minor source permit now and then apply for a major source permit down the road, and baldly asserts that "this is not the proper test." ICAS Petition at 28. ICAS ignores the element of intent to obtain a minor source

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[37] The NSR Manual defines a sham permit as follows:

> A sham permit is a federally enforceable permit with operating restrictions limiting a source's potential to emit such that potential emissions do not exceed the major or de minimis levels for the purpose of allowing construction to commence prior to applying for a major source permit. Permits with conditions that do not reflect a source's *planned* mode of operation may be considered void and cannot shield the source from the requirement to undergo major source preconstruction review. In other words, if a source accepts operational limits to obtain a minor source construction permit but intends to operate the source in excess of those limitations once the unit is built, the permit is considered a sham.

NSR Manual at C.6.

[38] ICAS asserts that its concern with the potential for Shell to obtain a minor source sham permit arose because "Region 10 has provided no assurance that reporting mechanisms in the permit will provide sufficient time for Shell to halt drilling with enough of an emissions buffer remaining to secure a partially drilled well for the entire winter season * * *." ICAS Petition at 29. ICAS also acknowledges that any exceedance of an emission limit would allow the Agency to exercise its enforcement powers. *Id.* Without more, ICAS cannot demonstrate that the Region clearly erred in determining that Shell's minor source permit is not a sham.

sham permit that both the Region in the Response to Comments and the 1989 Guidance on Limiting PTE discuss and instead quotes the NSR Manual language for the proposition that the "proper test" is a permit that does not reflect a source's "*planned* mode of operation." ICAS Petition at 28 (citing *NSR Manual* at C.6) (emphasis in original); *see also 1989 Guidance on Limiting PTE* at 12. However, the 1989 Guidance on Limiting PTE contains guidelines for determining, based on an evaluation of specific facts and evidence in each individual case, when minor source construction permits are shams and includes two of four criteria that discuss the intent of the source to circumvent the PSD preconstruction review process. *1989 Guidance on Limiting PTE* at 14-15.[39]

ICAS has not identified any information in the record that supports its assertion that Shell is seeking to avoid preconstruction review. Moreover, minor source sham permits are generally discovered when a source seeks another air emissions permit that requests the permit issuer to relax the synthetic limits in the minor permit, *see 1989 Guidance on Limiting PTE* at 12-14, rather than when the source seeks another authorization under a different statute such as the Marine Mammals Protection Act. Finally, ICAS has not demonstrated any deficiency in the Region's response to its comment regarding sham permits. *See, e.g., Russell City II*, 15 E.A.D. at 24 (noting that the part 124 regulations require a response to comments document to "demonstrate that all significant comments were considered but does not require a permit issuer to respond to each comment in an individualized manner or require the permit issuer's response to be of the same length or level of detail as comment") (citation omitted).

For all of the reasons stated above, the Board denies review of this issue.

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[39] Specifically, the guidelines for determining when minor source construction permits are shams state in relevant part:

> 1. Filing a PSD or nonattainment NSR permit application
>
> If a major source or major modification permit application is filed simultaneously with or at the same time as the minor source construction permit, this is strong evidence of *an intent to circumvent the requirements of preconstruction review*.
>
> * * *
>
> 4. Statement of authorized representatives of the source regarding plans for operation
>
> Statements by representatives of the source to EPA or to state or local permitting agencies about the source's plans for operation can be evidence *to show intent to circumvent preconstruction review requirements*.

1989 Guidance on Limiting PTE at 14-15 (emphasis added).

B. *REDOIL Petitioners Have Not Demonstrated That the Region Clearly Erred in Declining to Require PSD Increment Consumption Analyses for the Kulluk's Proposed Emissions as Part of the Title V Permitting Process*

1. *Section 504(e) of CAA Title V Imposes Permitting Requirements on "Temporary" Stationary Sources*

The CAA's PSD program requires permit applicants to demonstrate compliance with ambient air quality "increments" (also called "PSD increments") for specific air pollutants. *See* CAA §§ 161, 163, 165(a)(3)(A), 42 U.S.C. §§ 7471, 7473, 7475(a)(3)(A); 40 C.F.R. § 52.21(c), (k). Such increments are maximum allowable increases in pollutant concentrations that may occur in particular areas.[40] They are designed to "prevent significant deterioration" of air quality in locations that already have relatively clean air by ensuring that contaminants contributed by proposed new sources, combined with levels of contamination already present in the ambient air as of a specific baseline date, fall within bounds established by the Agency. *See generally NSR Manual* ch. C.

As noted in Part VI.A.1.b above, Congress designed the PSD program to regulate "major" sources of air pollution, which have potential to emit certain specific pollutants in amounts exceeding major source threshold levels. "Minor" sources, which have projected emissions that fall below the PSD major source thresholds, generally are not regulated under the PSD program. The Board determined above that the *Kulluk* qualifies as a minor source for PSD purposes, and so it is not required to obtain a PSD permit. The *Kulluk* nonetheless is still subject to permitting under the CAA's Title V program. The question presented is whether section 504(e) of Title V imposes PSD increment requirements in this circumstance.

In section 504(e) of Title V Congress set out permitting requirements for "temporary" stationary sources of air pollution as follows:

> The permitting authority may issue a single [Title V] permit authorizing emissions from similar operations at multiple temporary locations. No such permit shall be issued unless it includes conditions that will assure compliance with all the requirements of this chapter [i.e., the CAA] at

[40] To date, EPA has established PSD increments for four pollutants – SO_2, NO_2, PM_{10}, and $PM_{2.5}$. The increments consist of numeric concentrations, measured in micrograms of pollutant per cubic meter of air, that vary according to averaging period (3-hour, 24-hour, or annual averages) and geographic location (areas designated as "Class I," "Class II," or "Class III"). *See* 40 C.F.R. § 52.21(c) (table of increment levels).

> all authorized locations, including, but not limited to, ambient standards and compliance with any applicable increment or visibility requirements under part C of subchapter I of this chapter [i.e., the PSD program].

CAA § 504(e), 42 U.S.C. § 7661c(e). In allowing for a streamlined permitting process in which a single permit could authorize emissions at multiple temporary locations, Congress explained:

> Some sources requiring [Title V] permits do not operate at fixed locations. These might include asbestos demolition contractors and certain asphalt plants. Subsection (e) allows the permittee to receive a permit allowing operations, after notification to the permitting authority, at numerous fixed locations without requiring a new permit at each site. Any such permit must assure compliance at all locations of operation with all applicable requirements of the Act, including visibility protection and PSD requirements and ambient standards.

H.R. Rep. No. 101-490, pt. 1, at 350 (1990).

The parties' dispute centers on competing interpretations of section 504(e) and whether, in providing for a streamlined permitting process for temporary sources, Congress intended temporary minor sources to have increment provisions in their Title V permits where the state implementation plans do not otherwise impose increment provisions on such sources.

Section 504(e) is an unusual provision, not only because it addresses temporary rather than permanent stationary sources of air pollution (which comprise the majority of Title V sources), but also because it imposes substantive air requirements on temporary sources. As a general matter, Title V is a procedural rather than a substantive statute. It serves as a vehicle for collecting diverse CAA requirements otherwise applicable to a source into one all-encompassing air permit for that source. *See, e.g., Ohio Pub. Interest Research Grp., Inc. v. Whitman*, 386 F.3d 792, 794 (6th Cir. 2004) ("Title V does not impose new obligations; rather, it consolidates pre-existing requirements into a single, comprehensive document for each source"); Operating Permit Program, 57 Fed. Reg. 32,250, 32,251 (July 21, 1992) (explaining that Title V "generally does not impose substantive new requirements" on sources but instead attempts to "clarify, in a single document, which requirements apply to a source," thereby enabling all parties to better understand and track that source's CAA compliance). For the most part, requirements that are "applicable" to a source's emissions units under a Title V permit are directly imposed not by Title V itself but, rather, by state or federal implementation plans, preconstruction permits, the air toxics or acid rain programs, and other

substantive CAA provisions. *See* 40 C.F.R. §§ 70.2, 71.2 (definitions of "applicable requirements" under state and federal operating permit program regulations, respectively).

To ensure adequate regulation of temporary sources, Congress directed that Title V permits for such sources must include, as noted above, "conditions that will assure compliance with all the requirements of [the CAA] at all authorized locations, including, but not limited to, ambient standards and compliance with any applicable increment or visibility requirements under [the PSD program]." CAA § 504(e), 42 U.S.C. § 7661c(e). The parties do not dispute that this language serves to impose, through Title V itself, substantive CAA requirements on temporary sources. *See* REDOIL Petition at 19-25; Region Response at 5-6. Indeed, they agree that, because of section 504(e), the *Kulluk*'s Title V permit "must contain terms and conditions that ensure compliance with the NAAQS at all relevant locations." Statement of Basis at 26, *quoted in* Region Response at 5; *see* REDOIL Petition at 21. The parties strongly dispute, however, whether PSD increments should also be included in the complement of substantive requirements for the *Kulluk*.

2. *Under the Region's Interpretation, PSD Increment Compliance Demonstrations Are Not Mandatory for Temporary Minor Sources but May Be Required by States*

The Region's basic position is that section 504(e) uniformly imposes ambient standards (i.e., NAAQS) compliance requirements on all temporary sources, but that it does not uniformly so impose PSD increment requirements. The Region initially based this distinction on the language of section 504(e) and the implementing regulations, as well as on a prior Agency interpretation of these authorities. *See* Statement of Basis at 25-27. The distinction hinged primarily on Congress' insertion of the adjective "applicable" in section 504(e) to modify not "ambient standards" but only "increment or visibility requirements under [the PSD program]." *Id.* at 26; *see* CAA § 504(e), 42 U.S.C. § 7661c(e). PSD increments are only "applicable" to a temporary source, the Region reasoned, if the source also qualifies as a PSD major source, obligated to obtain a PSD permit. Statement of Basis at 26 ("applicable" increment requirements are those applicable "under [the PSD program]" (i.e., part C of subchapter I of the CAA), which covers only PSD major sources). By this logic, the *Kulluk*, a PSD minor source, would not have to demonstrate compliance with PSD increments at any of its authorized locations. *Id.*

Commentors on the *Kulluk*'s draft permit pressed the Region on this point, which prompted it to take a closer look at the entire issue. The Region prepared a lengthy, detailed Response to Comments document, in which it repeated the above points, but also added a far more robust discussion of the preconstruction permitting programs for major and minor sources. The Region explained that,

under the statute and implementing regulations, states have discretion to impose PSD increment requirements on PSD minor sources as part of their minor source construction permitting programs, if the states deem such requirements necessary to prevent significant deterioration of air quality. *See* RTC at 102-09 (citing and discussing, e.g., CAA §§ 110(a)(2)(C), 161, 163, 165(a)(3)(A), 504(e), 42 U.S.C. §§ 7410(a)(2)(C), 7471, 7473, 7475(a)(3)(A), 7661c(e); 40 C.F.R. §§ 51.160(a)(2), (b)(2), .166(a)(1), (3), 70.2, 71.2, 71.6(e)). The Region emphasized that states are not *obliged* to do this but have discretionary authority to pursue this course if they deem it necessary to fulfill their obligations under CAA sections 161 and 163(a). *See id.* at 103-06.

These clarifications led the Region to encapsulate its understanding of section 504(e) and the preconstruction programs in the following way: "PSD major sources are subject to NAAQS and increment in the permitting process, whereas non-PSD sources are subject only to the NAAQS unless the applicable minor source program also includes the [PSD] increment[s]." *Id.* at 107. The Region concluded that the State of Alaska's minor source preconstruction program does not require permanent minor sources to demonstrate compliance with PSD increments as a condition of construction, so neither would it require such compliance of temporary minor sources. *See id.* at 103-04, 107-08; *see also* Region Response at 12, 11 n.7. For this reason, the Region declined to require that Shell conduct PSD increment compliance analyses for *Kulluk* emissions at any of its authorized locations in the Beaufort Sea.

The Region's statutory and regulatory interpretation of the Title V temporary source program finds support in Board case law that recognizes the states' primary role in using PSD increments to manage economic growth. In *In re West Suburban Recycling & Energy Center, LP*, 8 E.A.D. 192 (EAB 1999), the Board observed the following:

> From the beginning of the PSD program, EPA has acknowledged that decisions about how increment should be used or allocated are primarily within the province of the states. For example, in the preamble to the original PSD regulations, EPA noted that allocation of PSD increment could affect economic development and that EPA should endeavor to preserve the states' authority on issues of economic development and growth:
>
> > "EPA should not make decisions [that] would have a significant impact upon future growth options of the [s]tates."

8 E.A.D. at 196 (quoting Approval and Promulgation of State Implementation Plans, 43 Fed. Reg. 26,388, 26,401 (June 19, 1978)); *accord In re Commonwealth*

Chesapeake Corp., 6 E.A.D. 764, 768 (EAB 1997) ("'The PSD requirements provide for a system of area classifications [that] affords [s]tates an opportunity to identify local land use goals. * * * Each classification differs in terms of the amount of [industrial or other] growth it will permit before significant air quality deterioration would be deemed to occur.'" (quoting *NSR Manual* at C.4-.5)).

3. *REDOIL Petitioners Have Not Demonstrated That the Region's Interpretation Is Clearly Erroneous*

On appeal, REDOIL Petitioners claim on a number of grounds that the Region's interpretation is clearly erroneous and thus a basis for remand of this permit. REDOIL Petition at 19-37. REDOIL Petitioners' central contention is that the plain language, structure, and purpose of section 504(e) reveal Congress' "unambiguously expressed intent" to tie increment requirement applicability to the increment status of the geographic area or areas in which a temporary source will emit pollutants. *See id.* at 20-32. REDOIL Petitioners also contend that the Agency's implementing regulations confirm the plain meaning of the statutory language and, additionally, contain provisions that "at least imply" independent obligations to ensure PSD increment compliance. *Id.* at 33-35.

REDOIL Petitioners observe that section 504(e) distinguishes between ambient standards (i.e., NAAQS), which apply to all temporary sources "at all times and in all locations," *id.* at 21, and PSD increment standards, which do not apply at all times and in all locations because they "are not universally applicable to all areas." *Id.* Rather, as designed by Congress, PSD increments "apply" only in areas where they specifically have been triggered, by means of the submission of an initial, complete PSD permit application to emit in a particular area. *Id.*; *see* CAA §§ 163, 169(4), 42 U.S.C. §§ 7473, 7479(4); 40 C.F.R. § 52.21(b)(14)(ii), (15)(i). The concentration of pollutants in such an area's ambient air is measured at the time the initial application is submitted (the "baseline date") and then fixed as the "baseline concentration" for that area. *See NSR Manual* at C.6-.8, .12-.15. From that point forward, PSD increments serve as the maximum allowable increases that pollutant concentrations may rise above the established baseline levels. CAA § 163, 42 U.S.C. § 7473; 40 C.F.R. § 52.21(c).

REDOIL Petitioners reason from this basic design that Congress intended "applicable increment * * * requirements" in section 504(e) to be area-dependent rather than source-dependent. *See* REDOIL Petition at 21-22, 25-27, 29. By this logic, any new source, including any new temporary minor source, that proposes to emit in geographic areas where increments previously have been triggered would be obligated to demonstrate compliance with such increments as "applicable" requirements under section 504(e). Only in areas where increments have not yet been triggered would PSD increments be inapplicable to temporary minor sources. *See id.* REDOIL Petitioners claim the Agency's implementing regula-

tions are fully in accord with this interpretation and thus do not bar increment compliance demonstrations prior to issuance of Title V permits. *Id.* at 33-35.

As described below, the Region did not clearly err in its own interpretation of these authorities. The Board agrees with the Region that its interpretation more fully comports with the structure and language of the CAA and the implementing regulations, and rejects REDOIL Petitioners' assertion that the statutory language is so plain that there is no ambiguity about whether Congress intended to impose increment provisions on temporary minor sources where the state implementation plan does not otherwise impose increment requirements on such sources. REDOIL Petitioners misapprehend or fail to grapple with several key points that formed the basis for the Region's interpretation in its final permitting decision and Response to Comments.

a. *REDOIL Petitioners Misunderstand Portions of the Region's Response to Comments*

In several of its points of advocacy before this Board, REDOIL Petitioners reveal a misunderstanding of the explanations the Region set forth in the Response to Comments. In the most significant example, REDOIL Petitioners argue that the Region erroneously construes "any applicable increment * * * requirements under Part C" in section 504(e) to mean that only those temporary sources that are also PSD major sources must demonstrate PSD increment compliance. REDOIL Petition at 29, 33-34. While this description reflects the position the Region advanced in the Statement of Basis,[41] it fails to acknowledge the very substantial further interpretive exegesis the Region developed and presented in its Response to Comments on the draft permitting record (which included the Statement of Basis). In that later and more comprehensive analysis, the Region made clear that, in its view, states have discretionary authority in their minor source preconstruction programs to impose PSD increment requirements on temporary minor sources, either as implementation plan requirements or on a case-by-case basis, as they deem necessary to protect the NAAQS. *See* RTC at 103-06. REDOIL Petitioners fail to address or demonstrate why the Region's position, as more fully articulated in the Response to Comments, is clearly erroneous. Because REDOIL Petitioners have failed to substantively confront the Region's Response to Comments, they cannot prevail on this ground. *See, e.g., In re Guam Waterworks Auth.*, 15 E.A.D. 437, 450 (EAB 2011) (petitioners "must substantively confront the permit issuer's explanations in its response to comments document"); *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 33 (EAB 2005) (same).

[41] The Region acknowledges that statements in the Statement of Basis could be read to suggest such an approach. Region Response at 8.

REDOIL Petitioners also misunderstand the interplay of sections 161, 165, and 504(e) of the Act, as those provisions are discussed by the Region in the Response to Comments. *See* RTC at 103-06. REDOIL Petitioners point out that section 163, not section 165, is the source of increment requirements within the PSD program and contends that the Region "ignore[d]" this provision in interpreting section 504(e). REDOIL Petition at 30. In so arguing, REDOIL Petitioners take the position that section 504(e) makes the section 163 increments directly applicable to temporary sources. *See id.* at 30-31. The plain language of section 163, however, is to the contrary. It provides that "each applicable implementation plan shall contain measures assuring that maximum allowable increases over baseline concentrations [i.e., increments] * * * shall not be exceeded." CAA § 163(a), 42 U.S.C. § 7473(a). Moreover, the text of section 161, which establishes implementation plan requirements, provides that such plans "shall contain emission limitations and such other measures as may be necessary * * * to prevent significant deterioration of air quality." CAA § 161, 42 U.S.C. § 7471.

Increments, in other words, are not directly imposed by section 504(e). Instead, they must be implemented (i.e., applied to a source) through either of two means: (1) a state implementation plan, per section 161 and 40 C.F.R. § 51.166(a)(1); or (2) the PSD major source permitting program, per section 165(a)(3)(A) and 40 C.F.R. § 52.21. *See* RTC at 103-04. Thus, while section 504(e) can serve as the direct source of NAAQS compliance requirements and other CAA requirements for temporary sources (*see infra* note 44 and accompanying text), it only imposes PSD increment requirements to the extent such requirements are "applicable" to the source.

Finally, REDOIL Petitioners also suggest that the State of Alaska's operating permit regulations are "more lenient" than the federal regulations because they do not require PSD minor sources to demonstrate compliance with PSD increments as a preconstruction condition. REDOIL Petition at 27-28. Noting that the Alaska rules apply to sources on the inner OCS only, and not on the outer OCS, REDOIL Petitioners suggest that the purportedly more stringent federal operating permit rules in effect on the outer OCS require temporary sources situated on the outer OCS to demonstrate compliance with PSD increments. *Id.* at 28 (citing 40 C.F.R. §§ 71.2, 71.6(e)). REDOIL Petitioners claim, therefore, that Shell must conduct, at the very least, a PSD increment analysis for the *Kulluk*'s authorized locations on the outer OCS. *Id.*

This argument reveals a misunderstanding of the Region's discussion of relevant legal requirements on the inner versus outer OCS. In the Response to Comments, the Region explained:

> In this case, the requirements for Title V temporary sources in the inner OCS and outer OCS off of Alaska are the same because Alaska has adopted EPA's Part 71 rules

> with respect to Title V temporary sources by reference for application onshore and Region 10 has in turn adopted these requirements into the [Corresponding Onshore Area] regulations for application in the inner OCS.

RTC at 109. As the Region explained, PSD increments are not applicable to any temporary minor sources, wherever they might be located on the OCS, *unless* a state exercises its discretion to require minor source compliance with such increments. A state, of course, has limited jurisdiction, and its authority does not extend beyond its borders. *E.g.*, CAA § 107(a), 42 U.S.C. § 7407(a) ("[e]ach [s]tate shall have the primary responsibility for assuring air quality within the entire geographic area comprising such [s]tate"). That would mean, therefore, that in the outer OCS or other places where only federal operating permit rules apply, PSD increments would not be applicable to temporary minor sources, *unless* federal OCS regulations required it or EPA chose to add increment compliance obligations under 40 C.F.R. § 55.13(h)[42] once the source becomes operational. *See* RTC at 109. REDOIL Petitioners fail to squarely confront this legal landscape, which results in a failure to demonstrate how the Region's interpretation is clearly erroneous. *See, e.g., In re Teck Cominco Alaska, Inc.*, 11 E.A.D. 457, 494-95 (EAB 2004) (burden of demonstrating review is warranted rests with the petitioner, who must raise objections to the permit and explain why the permit issuer's previous response to those objections is clearly erroneous or otherwise warrants review); *In re Westborough*, 10 E.A.D. 297, 305, 311-12 (EAB 2002) (same).

b. *REDOIL Petitioners Mischaracterize the Title V Regulatory Scheme*

REDOIL Petitioners' notion that "applicable increment requirements" in section 504(e) mean "applicable to the *area*" rather than "applicable to the *source*" is not supported by the Title V regulatory model as a whole. A Title V permit for a temporary source to operate at multiple locations must include, among other things, "[c]onditions that will assure compliance with all applicable requirements at all authorized locations." 40 C.F.R. §§ 70.6(e)(1), 71.6(e)(1). Broadly speaking, the Board has recognized that "'[a]pplicable requirement' is a term of art in the Title V program that, in general, refers to any substantive requirement that applies to an *emissions source* under any CAA regulatory provisions." *Peabody*,

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[42] This OCS-specific regulation provides:

> If the Administrator determines that additional requirements are necessary to protect [f]ederal and [s]tate ambient air quality standards or to comply with part C of title I, such requirements will be incorporated in this part.

40 C.F.R. § 55.13(h).

12 E.A.D. at 28 n.14 (emphasis added) (citing 40 C.F.R. § 71.2). Further, the regulations implementing the federal Title V program provide that "[a]pplicable requirement means all of the following as they apply to *emissions units in a part 71 source*." 40 C.F.R. § 71.2 (emphasis added). In turn, the term "emissions unit" means "any part or activity of a *stationary source* that emits or has the potential to emit any regulated air pollutant." *Id.* (emphasis added).

Accordingly, the Region's interpretation of the term "applicable" in section 504(e) as meaning "applicable to the source" is consistent with the Agency's Title V regulations, in which applicability is determined by reference to the *source*, not the *area*. REDOIL Petitioners fail to present legal authorities supporting their own novel view of applicability in a way sufficient to demonstrate that the Region's different approach is clearly erroneous.

c. *REDOIL Petitioners Confuse Air Quality Management Obligations with Permitting Obligations*

REDOIL Petitioners argue that the Region's interpretation of section 504(e) should be rejected because it is inherently inconsistent. REDOIL Petition at 31-32. On the one hand, REDOIL Petitioners note, the Region explicitly recognized that the *Kulluk* will consume a portion of the available PSD increments in its authorized drilling areas, but the Region nonetheless refused to impose preconstruction increment compliance requirements in the Title V permit, finding them "inapplicable." RTC at 102, 105-06. On the other hand, the Region acknowledged that after the *Kulluk* becomes operational, it might be necessary to impose increment-related restrictions; i.e., increments would be "applicable." In the Response to Comments, the Region stated:

> If, at any time after the *Kulluk* begins operation under its Title V/OCS permit, Region 10 determines that the actual emissions increases from the permitted OCS source cause or contribute to an increment violation, Region 10 has authority to adopt additional requirements to ensure that increments are not violated.

Id. at 106 (footnote omitted). REDOIL Petitioners argue that the Region cannot have it both ways, contending on this basis that the Region's interpretation should not be sustained. REDOIL Petition at 32.

The Board perceives no conflict between the Region's purportedly "inconsistent" positions on increment applicability. As the Region noted in its Response to Comments, EPA has authority, separate and apart from section 504(e) and the preconstruction programs, to address violations of increment standards that might arise once sources become operational. *See* RTC at 106 (citing CAA §§ 301, 328, 42 U.S.C. §§ 7601, 7627; 40 C.F.R. § 55.13(h)). Moreover, states have authority

to revise their implementation plans to adopt emission limits and other remedial control measures in cases where existing controls are not adequately protecting air quality increments. 40 C.F.R. § 51.166(a)(3), *cited in* RTC at 106.[43] REDOIL Petitioners confuse permitting obligations with ongoing air quality management obligations, but the two are distinct. *See* RTC at 105-06. Simply positing that the Region's view of "applicable" increments is inconsistent is not sufficient to overcome the specific statutory and regulatory authority the Region references in support of its position. The Board therefore finds no showing of clear error justifying a remand on this ground.

d. *REDOIL Petitioners Misconstrue the Regulations*

The Agency's Title V implementing regulations for state and federal operating permit programs closely parallel the language of section 504(e). *Compare* CAA § 504(e), 42 U.S.C. § 7661c(e), *with* 40 C.F.R. §§ 70.6(e), 71.6(e). The regulations define "applicable requirement" for Title V purposes as (among other things): "(2) [a]ny term or condition of any preconstruction permits" issued under parts C or D of title I; and "(13) [a]ny [NAAQS] or increment or visibility requirement under part C of title I of the Act, but only as it would apply to temporary sources permitted pursuant to section 504(e) of the Act." 40 C.F.R. §§ 70.2, 71.2. REDOIL Petitioners argue on appeal, as commentors did on the draft permit, that the Region's interpretation of "applicable requirement" improperly reads the thirteenth requirement out of the regulations by subsuming it within the second requirement. REDOIL Petition at 33-34.

The Region explained in the Response to Comments why this was not so. *See* RTC at 107-08. The Region stated that "the intent of the Title V temporary source provisions is to relieve sources of the burden of applying for Title V permits for each new location, while at the same time[] assuring compliance with all requirements to which the source would be subject if it were a new [permanent] source at each such new location." *Id.* at 108. For a temporary source that is also a PSD major source, this would include ensuring that the NAAQS and increment standards are met at each future location – a requirement that, the Region pointed out, would exceed the requirements otherwise applicable to the source under the

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[43] This state implementation plan regulation provides, in relevant part:

> If the [s]tate or the Administrator determines that a[n implementation] plan is substantially inadequate to prevent significant deterioration or that an applicable increment is being violated, the plan shall be revised to correct the inadequacy or the violation.

40 C.F.R. § 51.166(a)(3). The regulations also provide, in the next subsection, that the state "shall review the adequacy of a[n implementation] plan on a periodic basis and within 60 days of such time as information becomes available that an applicable increment is being violated." *Id.* § 51.166(a)(4).

PSD program alone.[44] *Id.* at 107. For a temporary source that is also a PSD minor source, this would include ensuring that the NAAQS and, if required under the implementation plan for minor permanent sources, PSD increment standards are met at each future location, even if the implementation plan did not require such a demonstration for temporary minor sources. *See id.* at 107-08; Region Response at 12.

REDOIL Petitioners fail to meaningfully confront the Region's reasoning on this issue or demonstrate why it is clearly erroneous. Instead, REDOIL Petitioners reference an irrelevant minor permit modification provision (40 C.F.R. § 71.7(e)(1)(i)(A)(3)), rather than a minor source provision, as support for their position. REDOIL Petition at 34. REDOIL Petitioners also suggest that the Title V permitting regulations in sections 70.6(e) and 71.6(e) establish a more expansive regulatory program than the one the Region finds present in section 504(e); indeed, one that would even be broad enough to require the *Kulluk* to demonstrate PSD increment compliance. *Id.* at 33. The Board finds otherwise, in light of the fact that sections 70.6(e) and 71.6(e) are expressly limited by a reference to section 504(e) itself and therefore cannot expand the meaning of the statute. *See* RTC at 107-08.

4. *Increment Section Conclusion*

The Board has carefully examined each of REDOIL Petitioners' increment-related arguments and determined that none have merit. Petitioners' burden is to show clear error, but REDOIL Petitioners have failed in all instances to achieve this standard. The Board therefore denies review of the Permit on this ground.[45]

C. *REDOIL Petitioners Failed to Raise Below Their Contention That Shell's Ambient Air Quality Analysis Was Flawed in That It Failed to Conform to Applicable Agency Guidance*

On February 9, 2010, EPA published in the Federal Register a final rule (effective April 12, 2010) revising the primary NO_2 NAAQS "in order to provide requisite protection of public health as appropriate under section 109 of the Clean Air Act." Primary NAAQS for NO_2, 75 Fed. Reg. 6474, 6475 (Feb. 9, 2010); *see also Shell 2010*, 15 E.A.D. at 149-50 & n.74. This rule set the new 1-hour NO_2

[44] As such, the NAAQS and PSD increment requirements for future locations would be "additional" requirements imposed on the temporary source by section 504(e). RTC at 107-08.

[45] In light of the Board's decision to uphold the Region's interpretation of section 504(e) and the implementing regulations, the Board need not reach REDOIL Petitioners' final argument, which challenges the Region's finding that air quality modeling establishes the *Kulluk*'s emissions will not violate the PSD increments.

NAAQS standard (hereinafter "the 1-hour NO_2 NAAQS") at 100 parts per billion ("ppb") to supplement the existing annual standard, set at 53 ppb. 75 Fed. Reg. at 6475. EPA regulations specify how attainment of the standard is to be calculated, providing that the 100 ppb standard is met "when the annual 98th percentile of the daily maximum 1-hour average concentration is less than or equal to 100 ppb, as determined in accordance with Appendix S of this part for the 1-hour standard." 40 C.F.R. § 50.11(f). This calculation is sometimes referred to as "the form."[46] *See* 75 Fed. Reg. at 6477 n.5, 6492-93. The 100 ppb standard reflects the maximum allowable NO_2 concentrations anywhere in an area. *Id.* at 6493, 6502. EPA has issued guidance clarifying procedures for demonstrating compliance with the new 1-hour NO_2 NAAQS. *See* REDOIL Petition Ex. 16 (Memorandum from Stephen D. Page, Dir., Office of Air Quality Planning & Standards, U.S. EPA, to Reg'l Air Dirs., U.S. EPA, *Guidance Concerning the Implementation of the 1-Hour NO_2 NAAQS for the Prevention of Significant Deterioration* (June 29, 2010) ("Page Memo"));[47] Memorandum from Tyler Fox, Leader, Air Quality Monitoring Grp., Office of Air Quality Planning & Standards, U.S. EPA, to Reg'l Air Dirs., U.S. EPA, *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO_2 National Ambient Air Quality Standard* (Mar. 1, 2011) ("Fox Memo") (A.R. BB-83).

REDOIL Petitioners assert that Shell's ambient air quality analysis was flawed.[48] In particular, REDOIL Petitioners state that in "identifying the Kulluk's

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[46] The 98th percentile form corresponds approximately to the 7th or 8th highest daily maximum concentration in a year. 75 Fed. Reg. at 6492.

[47] According to the Page Memo, the guidance was issued in response to reports that sources were modeling potential violations of the 1-hour NO_2 NAAQS. Page Memo at 1. The Memo states that "[t]o respond to these reports and facilitate the PSD permitting of new and modified major stationary sources, we are issuing the attached guidance in the form of two memoranda." *Id.* The attached memoranda are titled "General Guidance for Implementing the 1-hour NO_2 National Ambient Quality Standard in Prevention of Significant Deterioration Permits, Including an Interim 1-hour NO_2 Significant Impact Level" and "Applicability of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard." *Id.* at 1-2. Although the Page Memo attaches these two memoranda, the Memo is consecutively numbered as a single document.

[48] In order to establish compliance with the NAAQS and PSD increments, permit applicants must conduct an "ambient air quality analysis," which applicants must prepare under the permitting rules for each regulated pollutant their proposed facilities will emit in "significant" amounts. 40 C.F.R. § 52.21(b)(23)(i), (m)(1)(i). This analysis predicts a pollutant's future concentration in the ambient air by modeling a proposed facility's expected emissions of the pollutant against the backdrop of existing ambient conditions. To conduct an air quality analysis, a permit applicant compiles data on the proposed facility's physical specifications and anticipated emission rates, local topography, existing ambient air quality, meteorology, and related factors. *See, e.g., id.* § 52.21(l), (m); *id.* pt. 51 app. W (Guideline on Air Quality Models); *In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 145-48 (EAB 1999); *NSR Manual* at C.16-.23, .31-.50. These data are then processed using mathematical models that calculate the rates at which pollutants are likely to disperse into the atmosphere under various climatological conditions, with the goals of determining whether emissions from the proposed source will cause or

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98th percentile cumulative impact – *i.e.*, the Kulluk's impact added to background levels of pollutants – for comparison to the 1-hour NO_2 standard, Shell used an approach that the Region admits is 'less conservative.' More specifically, Shell used background values that were already adjusted to the 98th percentile, instead of basing its calculations on the full distribution of background values." REDOIL Petition at 38 (footnote omitted). According to REDOIL Petitioners, this method for demonstrating compliance with the 1-hour NAAQS was rejected in the Page Memo as "not being protective of the [NAAQS]." *Id.* at 38-39 (quoting Page Memo at 18). REDOIL Petitioners then cite to a portion of the more recent Fox Memo which, according to them, allows for the method Shell used to calculate background values. *Id.* at 39. That is, the Fox Memo states that the approach used in the Page Memo was overly conservative and should not be used in certain cases. *Id.* (citing Fox Memo at 17-20). REDOIL Petitioners assert that the Region allowed Shell to demonstrate compliance with the form of the 1-hour NAAQS using the approach permitted in the Fox Memo without providing an explanation as to why the determination in the Page Memo was incorrect. *Id.* at 40. REDOIL Petitioners argue that "[b]ecause neither EPA nor the Region provided any explanation about whether and, if so, how, its earlier conclusion [in the Page Memo] that the use of the 98th percentile background values is 'not protective' of the national ambient air quality standard was incorrect, EPA's new guidance and the approach taken by the Region here in reliance on it are arbitrary." *Id.* (quoting Page Memo at 17-20). REDOIL Petitioners contend that the Region had an obligation to explain this "departure from its prior analysis." *Id.* at 40-41.

Upon examination of the record, the Board concludes that this issue was not adequately raised during the comment period and was therefore not preserved for review. As stated above, the regulations require any person who believes that a permit condition is inappropriate to raise "all reasonably ascertainable issues and * * * all reasonably available arguments supporting [petitioner's] position" during the comment period on the draft permit. 40 C.F.R. § 124.13. That requirement is made a prerequisite to appeal by 40 C.F.R. § 124.19(a), which requires any petitioner to "demonstrat[e] that any issue[] being raised [was] raised during the public comment period * * * to the extent required[.]". *In re ConocoPhillips Co.*, 13 E.A.D. 768, 800-01 (EAB 2008); *accord In re Christian Cnty. Generation, LLC*, 13 E.A.D. 449, 457 (EAB 2008); *Shell 2007*, 13 E.A.D. at 394 n.55.

The requirement that an issue must have been raised during the public comment period in order to preserve it for review is not an arbitrary hurdle placed in the path of potential petitioners. *Russell City II*, 15 E.A.D. at 10; *In re City of Marlborough*, 12 E.A.D. 235, 244 n.13 (EAB 2005), *appeal dismissed for lack of*

(continued)
contribute to a violation of either the NAAQS or the PSD increments. *See* 40 C.F.R. § 52.21(f); *id.* pt. 51 app. W; *NSR Manual* at C.24-.27, .51-.70.

juris., No. 05-2022 (1st Cir. Sept. 30, 2005); *In re BP Cherry Point*, 12 E.A.D. 209, 219 (EAB 2005). Rather, the requirement serves an important function related to the efficiency and integrity of the overall administrative permitting scheme. *Marlborough*, 12 E.A.D. at 244 n.13. The intent of the rule is to ensure that the permitting authority first has the opportunity to address permit objections and to give some finality to the permitting process. *Id.*; *In re Sutter Power Plant*, 8 E.A.D. 680, 687 (EAB 1999). As the Board has explained, "[t]he effective, efficient and predictable administration of the permitting process demands that the permit issuer be given the opportunity to address potential problems with draft permits before they become final." *In re Teck Cominco*, 11 E.A.D. 457, 481 (EAB 2004) (quoting *In re Encogen Cogeneration Facility*, 8 E.A.D. 244, 250 (EAB 1999)). "In this manner, the permit issuer can make timely and appropriate adjustments to the permit determination, or, if no adjustments are made, the permit issuer can include an explanation of why none are necessary." *In re Essex Cnty. (N.J.) Res. Recovery Facility*, 5 E.A.D. 218, 224 (EAB 1994).

Although REDOIL Petitioners' comments on the draft permit asserted that Shell had used background ambient air data in a manner that understated the impact of its operations, *see* REDOIL Comments at 9-11, nowhere in these comments did Petitioners assert that Shell's approach conflicted with the Page Memo or that the Region had any obligation to provide an explanation for its alleged departure from the Page Memo. Indeed, REDOIL Petitioners' comments recognized that, according to the Fox Memo, Shell's approach is appropriate in some circumstances. *Id.* at 11. The comments, however, did not assert any conflict between the Page Memo and the Fox Memo nor is it clear to this Board that any such conflict exists. Thus, this "battle of the memos" issue was not preserved for review.[49] *See Shell Discoverer 2012*, 15 E.A.D. at 507.

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[49] *See Teck Cominco*, 11 E.A.D. at 481-82 (denying review where issue was not specifically raised during the comment period). The Board notes that the issue REDOIL Petitioners did raise during the comment period was fully and adequately addressed in the Region's Response to Comments. Specifically, in commenting on the draft permit, REDOIL Petitioners raised the argument that Shell had failed to demonstrate compliance with the 1-hour NO_2 NAAQS because, according to REDOIL Petitioners, Shell used background ambient air data in a manner that understated the impact of its operations. REDOIL Comments at 10-11. As stated above, REDOIL Petitioners' comments recognized that Shell's approach to analyzing background data was consistent with the Fox Memo, but argued that Shell's approach was inconsistent with the 1-hour NO_2 NAAQS standard itself. *Id.* at 11. The Region provided a detailed response to this assertion in the Response to Comments. RTC at 74-78. Nothing in the REDOIL Petition indicates why the Region's response on this issue was erroneous or otherwise warrants Board review, nor does the Board find anything erroneous in the Region's response. Thus, even if Petitioners had preserved this issue, the Board would deny review. *See, e.g., In re Guam Waterworks Auth.*, 15 E.A.D. 437, 450 (EAB 2011) (stating that "a petitioner may not simply reiterate comments made during the public comment period, but must substantively confront the permit issuer's explanations in its response to comments document"); *In re Peabody W. Coal Co.*, 12 E.A.D. 22, 33 (EAB 2005) (same).

D. *REDOIL Petitioners Have Not Demonstrated That the Region Clearly Erred in Its Ambient Air Exemption Determination*

REDOIL Petitioners allege that the Region clearly erred in exempting the area within a 500 meter radius from the *Kulluk* from the definition of "ambient air."[50] REDOIL Petition at 15. This area is also referred to throughout the record as the United States Coast Guard ("USCG") "safety zone." *See, e.g.*, RTC at 52-54. REDOIL Petitioners claim that the Region's decision "contravenes both EPA's definition of 'ambient air' as well as EPA's longstanding interpretation of that regulation." REDOIL Petition at 16. In particular, they assert that the Region's 500 meter ambient air boundary fails to meet either of the two criteria the Agency has previously used in evaluating the appropriateness of an exemption. *Id.* at 16-18. According to REDOIL Petitioners, the Region's decision essentially allows Shell to emit more pollution, and possibly with fewer controls, than would otherwise be lawful.[51] *Id.* at 15-16.

The CAA regulations define "ambient air" as "that portion of the atmosphere, external to buildings, to which the general public has access." 40 C.F.R. § 50.1(e). Based on this definition, the Agency has, on occasion, exempted certain areas from the definition of ambient air. *E.g.*, Letter from Steven C. Riva, Chief, Permitting Sec., U.S. EPA Region 2, to Leon Sedefian, Air Pollution Meteorologist, N.Y. State Dep't of Env't Conservation, at 1-2 (Oct. 9, 2007) (A.R. BB-19) [hereinafter Broadwater Letter]; Letter from Douglas M. Costle, Adm'r, U.S. EPA, to Sen. Jennings Randolf, Chairman, Env't & Pub. Works Comm., at 1 (Dec. 19, 1980) (A.R. BB-1) [hereinafter Costle Letter]; *see also* Letter from Nancy Helm, Fed. & Delegated Air Programs, U.S. EPA, to John Kuterbach, Alaska Dep't of Envtl. Quality, at 2 (Sept. 11, 2007) (area exempt if certain conditions met) [hereinafter Helm Letter]. The parties agree that the Agency's "longstanding interpretation" of this exemption is set forth in a letter signed by former EPA Administrator Douglas Costle, which states that "the exemption from ambi-

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[50] For an area that is not considered within the definition of "ambient air," Shell would not have to demonstrate compliance with the NAAQS. *See* CAA §§ 109(b), 160, 163, 42 U.S.C. §§ 7409(b), 7470,7473 (NAAQS apply to areas meeting the definition of ambient air); 40 C.F.R. § 50.1(e) (definition of "ambient air"); *In re Hibbing Taconite Co.*, 2 E.A.D. 838, 848 & nn.23-24 (Adm'r 1989); RTC at 53.

[51] REDOIL Petitioners additionally argue that, should the Region's response contain a "natural physical feature" argument similar to an argument the Region raised in its response brief in *Shell Discoverer 2012*, the Board should consider such an argument a "*post hoc* rationalization" and should disallow it. REDOIL Petition at 19; *see also Shell Discoverer 2012*, 15 E.A.D. at 510 n.52 (discussing this issue). REDOIL Petitioners also reserve the right to request leave to file a reply brief addressing this issue. REDOIL Petition at 19. Unlike the situation in *Shell Discoverer 2012*, the Board does not find that the Region's response brief contains an explanation that is clearly different than the rationale set forth in the Response to Comments. Moreover, REDOIL Petitioners do not raise this particular issue in their reply brief. Consequently, the Board does not consider REDOIL Petitioners' "post hoc rationalization" argument further.

ent air is available only for the atmosphere over land owned or controlled by the source and to which the public access is precluded by a fence or other physical barriers." Costle Letter at 1; REDOIL Petition at 16 (quoting same letter); Region Response at 29-30 (referring to same letter); Shell Response at 26-27 & n.27 (same); *see also* RTC at 51 (same). The Costle Letter also indicates that, in determining whether the exemption applies, the Agency reviews "individual situations on a case-by-case basis." Costle Letter at 1; *see also* Approval and Promulgation of State Implementation Plans, 50 Fed. Reg. 7056, 7057 (Feb. 20, 1985) (noting that, in considering ambient air exemptions, "individual variations in the type of land and nature of the limitation on access necessitate a case-by-case evaluation of the facts, and application of the principles involved in this determination").

Here, in its permitting decisions, the Region determined that, as long as certain permit conditions were being met, it was appropriate to set the ambient air boundary at a 500 meter radius from the *Kulluk*, or, in other words, the 500 meter radius "safety zone" was exempt from the ambient air definition. RTC at 51-52; *see also* Statement of Basis at 40. The terms and conditions upon which the Region relied to exempt this area prohibit the operation of vessels and emissions units unless (1) the USCG establishes a safety zone within at least 500 meters from the center of the *Kulluk*, (2) members of the public are precluded from entering the safety zone, and (3) Shell develops and implements a "public access control program."[52] Permit at 42-43. The Region determined that, as long as these safety zone and public access restriction permit conditions are complied with, ex-

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[52] The precise terms and conditions of the Permit are as follows:

> The permit does not authorize operation unless:
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> > 5.1.1. The Kulluk is subject to a currently effective safety zone established by the [USCG] which encompasses an area within at least 500 meters from the hull of the Kulluk and which prohibits members of the public from entering this area except for attending vessels or vessels authorized by the USCG (such area shall be referred to as the "Safety Zone"); and
> >
> > 5.1.2. The permittee has developed in writing and is implementing a public access control program to:
> >
> > 5.1.2.1. Locate, identify, and intercept the general public by radio, physical contact, or other reasonable measures to inform the public that they are prohibited by Coast Guard regulations from entering the Safety Zone; and
> >
> > 5.1.2.2. Communicate to the North Slope communities on the Beaufort Sea on a periodic basis when exploration activities are expected to begin and end at a drill site, the location of the drill site, and any restrictions on activities in the vicinity of the Kulluk's exploration operations.

Permit at 42-43.

empting the area within the safety zone from the ambient air definition would generally be consistent with previous Agency interpretations. RTC at 51-52. In so finding, the Region noted that "[g]iven that the permitted activities occur over open water in the Arctic, the[] criteria [for exemption included in the Costle Letter] must be adapted to some extent when applied to this environment." *Id.* In specifically considering the applicability of the two exemption criteria, the Region stated:

> Region 10 recognizes that Shell does not "own" the areas of the Beaufort Sea on which the Kulluk will be operating as might be the case for a stationary source on land. Shell has a lease authorizing the company to use these areas for the activities covered by the permits. A Coast Guard safety zone establishes legal authority for excluding the general public from the area inside the zone. EPA has previously recognized a safety zone established by the Coast Guard as evidence of sufficient ownership or control by a source over areas over water so as to qualify as a boundary for defining ambient air where that safety zone is monitored to pose a barrier to public access. Letter from Steven C. Riva, EPA Region 2, to Leon Sedefian, New York State Department of Conservation, re: Ambient Air for the Offshore LNG Broadwater Project, dated October 9, 2007 (Broadwater Letter).
>
> To meet the second of the criteria applied by EPA and ensure the source actually takes steps to preclude public access, Shell proposed and Region 10 required as a condition of operation under the permits that Shell develop in writing and implement a public access control program to locate, identify, and intercept the general public by radio, physical contact, or other reasonable measures to inform the public that they are prohibited by Coast Guard regulations from entering the area within 500 meters of the hull of the Kulluk. Region 10 believes that, for the overwater locations in the arctic environment at issue in these permitting actions, such a program of monitoring and notification is sufficiently similar to a fence or physical barrier on land such that the area within the Coast Guard safety zone qualifies for exclusion from ambient air. *See* Broadwater Letter at 2.

RTC at 52.[53]

Upon consideration of the administrative record and the parties' arguments, the Board concludes that Petitioners have not shown that the Region clearly erred in its decision to exempt the area within the USCG safety zone from the definition of "ambient air." The Region, in its Response to Comments, provided a reasonable interpretation of the ambient air regulation and the Agency's "longstanding interpretation" of that regulation as applied in the OCS context.[54] Furthermore, the Region's analysis was entirely consistent with a similar analysis undertaken by Region 2 in which that Region determined that it was appropriate for a permittee to use the USCG safety zone to define an ambient air boundary around a proposed offshore liquefied natural gas facility. *See* Broadwater Letter at 2. The Broadwater Letter, moreover, suggests that Region 2's analysis, as well as Region 10's, is not unique, stating that "*[i]n previous permitting decisions involving * * * drilling operations, EPA Regional offices have used the USCG's safety zone as the boundary for defining ambient air.*" *Id.* at 2 (emphasis added). The letter explains that the Agency has found that "[t]he 'safety zone' approach represents a reasonable surrogate for a source's fence or physical barrier and thus could act as an ambient air boundary." *Id.*

Thus, while it is true, as Petitioners allege, that the Agency has generally required the source to own or control access over the area in question for that area to meet the first criterion, REDOIL Petition at 16-17, this requirement has been limited to sources located on land.[55] *See, e.g.*, Helm Letter at 1 (referring to possi-

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[53] REDOIL Petitioners also seem to suggest that the Region's approach is flawed because it "is based upon an assumption that Shell will request, and the [USCG] will establish, a safety zone restricting the passage of other vessels." REDOIL Petition at 15 & n.45. This argument is unpersuasive because it fails to recognize that, as the permit conditions quoted in note 52 state, operation is prohibited unless these two conditions are met. *See* Permit at 42-43.

[54] As the Region rightly noted, *see* RTC at 51-52, the regulation and the Costle Letter, by their very terms, were clearly written with overland situations in mind. *See* 40 C.F.R. § 50.1(e) (referring to "buildings"); Costle Letter at 1 (referring to "land" and "fences").

[55] In support of their contention, REDOIL Petitioners rely on a previous Agency determination that leased property could not be exempted from the definition of ambient air because the lessee did not have control over access to its leased property (only the landlord did). REDOIL Petition at 17 & n.52 (citing Helm Letter). Petitioners assert that this onshore interpretation must apply equally to an OCS lease BOEMRE issued. *Id.* As the Petitioners themselves note, federal courts have found agency action to be arbitrary when the agency's "explanation 'runs counter to the evidence,'" *id.* at 17 (quoting *Motor Vehicle Mfrs. Ass'n of the U.S., Inc. v. State Farm Mut. Auto Ins. Co.*, 463 U.S. 29, 43 (1983)), and "'the agency offer[s] insufficient reasons for treating similar situations differently,'" *id.* (quoting *Transactive Corp. v. United States*, 91 F.3d 232, 237 (D.C. Cir. 1996)); *see also FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 514-15, 129 S.Ct. 1800, 1810-11 (2009) (discussing standard of review of an agency's policy change). Here, not only are the situations dissimilar enough to arguably not be governed by these cases, but the Agency did offer persuasive reasons for treating the two situations differently.

ble exemption near coal-fired power plant); Memorandum from Steven D. Page, Director, Office of Air Quality Planning & Standards, U.S. EPA, to Reg'l Air Div. Dirs., U.S. EPA, *Interpretation of "Ambient Air" in Situations Involving Leased Land Under the Regulations for the Prevention of Significant Deterioration (PSD)* (June 22, 2007) (A.R. B-26) (discussing the applicability of the exemption where a source is located on "land" leased to them by another source). The Region (and the Agency before it) reasonably determined that application of the regulation and the interpretive letter to an "overwater" situation requires some leeway. REDOIL Petitioners' reliance solely on land-based exemption decisions is thus unpersuasive.[56] Finally, as mentioned above, the Agency has consistently taken the position that ambient air exemption determinations are analyzed on a case-by-case basis.

For all the reasons stated above, REDOIL Petitioners have not shown that the Region clearly erred in its ambient air exemption determination.[57] Consequently, review of the Permit based on this issue is denied.

E. *ICAS and Mr. Lum Have Not Demonstrated That the Region Failed to Satisfy Its Obligation to Comply with Executive Order 12898 and Applicable Board Precedent*

ICAS and Mr. Lum argue that the Region's environmental justice analysis lacked a valid basis on which to conclude that Shell's oil exploration activities in the Beaufort Sea will not have a disproportionately high and adverse effect on the health of the Alaska Native population living on the North Slope. ICAS alleges that the Region's environmental justice analysis fails to account for the impacts of short-term NO_2 and ozone exposures on the Alaska Native population residing on the North Slope, and also asserts that the opportunities for public participation were inadequate. Mr. Lum challenges the lack of analysis regarding the impacts

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[56] REDOIL Petitioners' arguments that the Region's determination fails to meet the second criteria because the safety zone "fails to effectuate a barrier that 'precludes' public access" are equally unpersuasive. REDOIL Petition at 17. REDOIL Petitioners focus on the fact that the USCG will limit access to the area based on safety concerns rather than for air quality considerations. *Id.* at 17-18. The important fact is that access within the zone will be strictly limited, not the reason behind it. Moreover, REDOIL Petitioners do not address the other condition of the permit that the Region relied upon for its ambient air boundary determination: the public access control program Shell is required to implement. The Board does not find clear error in the Region's conclusion that, based on the USCG limiting access to the safety zone and the permittee implementing a public access control program, the latter of which will include notification to the local residents of the location of the drilling and the fact that the public is restricted from the safety zone, the general public will be denied access to the area inside the safety zone.

[57] The Board came to the same conclusion in *Shell Discoverer 2012*. *See* 15 E.A.D. at 513-14. In that case, the Region had adopted and followed the same or a very similar interpretation as described in the text above. *See id.* 15 E.A.D. at 511-13. Nothing REDOIL Petitioners offer in the present case convinces the Board that anything in the prior analysis – and reiterated here – was in error.

emissions from Shell's activities in the Beaufort Sea could have on traditional subsistence food sources and also challenges Shell's oil spill response capabilities. The Region counters that its environmental justice analysis and resulting conclusions comply with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" ("Executive Order"). The issue the Board must resolve is: did the Region satisfy its obligation to comply with the Executive Order and applicable Board precedent?

The Executive Order states in relevant part:

> *Agency Responsibilities.* To the greatest extent practicable and permitted by law, and consistent with principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice a part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations * * * .

Exec. Order 12898, 59 Fed. Reg. 7629, 7629 (Feb. 11, 1994) (A.R. FF-1). Federal agencies are required to implement the Executive Order "consistent with, and to the extent permitted by, existing law." *Id.* at 7632. The Board has held that a permit issuer should exercise its discretion to examine any "superficially plausible" claim that a minority or low-income population[58] may be disproportionately affected by a particular facility seeking a PSD permit. *In re EcoEléctrica, LP*, 7 E.A.D. 56, 69 n.17 (EAB 1997); *accord Shell 2010*, 15 E.A.D. at 148-49 & n.71 (citing PSD cases).

At the outset, the Board notes that both ICAS and Mr. Lum recently challenged the Region's environmental justice analysis in *Shell Discoverer 2012*. *See* 15 E.A.D. at 493-501. In addition, the environmental justice analysis the Region prepared in the current matter is reminiscent of the environmental justice analysis prepared for the *Discoverer* permits that were the subject of the Board's *Shell Discoverer 2012* decision. Moreover, while their petitions for review in *Shell Discoverer 2012* and the current appeal are not identical, both ICAS and Mr. Lum raise substantially similar arguments in their current appeals as they did in their appeals of the *Discoverer* permits.[59] *Compare* Lum Petition *with* Eskimo

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[58] Under the Executive Order, the Alaska Native population residing on the North Slope qualifies as a minority population. *See* Statement of Basis at 55; ICAS Petition at 30.

[59] ICAS's remaining challenges to the amount and quality of public participation opportunities available pertaining to the environmental justice analysis appear to mirror its more general arguments
Continued

Whaler Petition for Review, *Shell Discoverer 2012* (Doc. No. 24), *and* ICAS Petition *with* ICAS and AEWC Petition for Review, *Shell Discoverer 2012* (Doc. No. 7).

1. *Region's Environmental Justice Analysis*

The Region included a fifteen-page environmental justice analysis in the administrative record to accompany the Permit and to allow for public comment on the analysis. Environmental Justice Analysis for Proposed OCS Permit No. R10 OCS030000 Kulluk Drilling Unit (undated) ("EJ Analysis") (A.R. F-1). The Region's analysis begins with a discussion of environmental justice in the permitting context and notes that "[t]he Title V operating permit program does not generally impose new substantive air quality control requirements."[60] EJ Analysis at 2. In addition, the analysis includes a discussion of how the national ambient air quality standards ("NAAQS") are crafted by integrating scientific information and evidence from rigorously reviewed studies, and a summary of the Board's case law stating that the Board views compliance with the NAAQS as "emblematic of achieving a level of public health protection that, based on the level of protection afforded by the NAAQS, demonstrates that minority or low-income populations will not experience disproportionately high and adverse human health or environmental effects due to exposure to relevant criteria pollutants." *Id.* (quoting *Shell 2010*, 15 E.A.D. at 156) (citations omitted); *see also* Statement of Basis at 54-55.

(continued)
regarding the public participation process. *See* ICAS Petition at 6-10, 38-39. Accordingly, the Board addresses ICAS's challenges to the adequacy of the public participation process, both generally and with respect to the environmental justice analysis, in Parts VI.F and VI.G below.

[60] The Region further explained that:

> [T]he Title V operating permit program is generally a vehicle for ensuring that existing air quality control requirements are appropriately applied to facility emission units and that compliance with these requirements is assured. Accordingly, the primary means of addressing environmental justice issues in the Title V program is through increased public participation and review by permitting agencies, and conditions to assure compliance with applicable requirements. As discussed above, the Title V permit at issue in this case is unusual in that it requires the source, as a Title V temporary source, to meet the NAAQS and also establishes limits on the potential to emit. Region 10 has considered environmental justice concerns in this permitting action where possible in the context of assuring compliance with applicable requirements for the source, in particular assuring compliance with the NAAQS as a Title V temporary source and establishing PSD avoidance limits.

EJ Analysis at 2; *see also* Statement of Basis at 54.

The analysis goes on to catalogue the distances between Inupiat communities on the coast of the North Slope that are closest to Shell's lease blocks in the Beaufort Sea, and discusses the importance of subsistence foods obtained through hunting, fishing, and whaling to the Inupiat diet, and more generally the nexus between subsistence activities and Inupiat culture. EJ Analysis at 3, 5. The Region also included an illustration that juxtaposes the location of Shell's lease blocks, including proposed exploration sites, with onshore and offshore subsistence use areas for the northern Inupiat communities.[61] *Id.* at 4; *see also* Statement of Basis at 56.

The Region then proceeded to analyze demographic, health-related, and air quality data.[62] The demographic analysis indicates that 68% of residents living in the North Slope Borough classify themselves as Alaska Natives. EJ Analysis at 7. In addition, nearly half of North Slope residents speak a language other than English at home. *Id.* at 8. The analysis of health data revealed, among other things, that from 1990 to 2007 there has been a 158% rate of increase in the prevalence of diabetes for Alaska Natives residing on the Arctic Slope, whereas during the same time period there has been a 117% rate of increase in the prevalence in diabetes for Alaska Natives statewide.[63] *Id.* at 9. In addition, there is a higher incidence of outpatient visits for respiratory problems ranging from the common cold to pneumonia in the Arctic Slope than in the rest of Alaska. *Id.*

In the air impacts analysis, the Region first noted that the North Slope Borough is currently designated as attainment/unclassifiable for all of the NAAQS, meaning that the North Slope has sufficient data to determine that the area is meeting the NAAQS or that, due to no data or insufficient data, EPA cannot make a determination. *Id.* at 11 & n.15 (citing CAA § 107(d), 42 U.S.C. § 7407(d)). The

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[61] The analysis also includes, for some of the northern Inupiat communities, the distances residents have reported traveling offshore to hunt for traditional subsistence food sources. *See* EJ Analysis at 6 (noting that Nuiqsut residents have traveled up to 60 miles offshore to the north and as far east as Camden Bay to hunt for bowhead whale and that Kaktovik residents have traveled as far as 35 miles offshore to hunt for bowhead whale and walrus); Statement of Basis at 55; *see also Shell 2010*, 15 E.A.D. at 155 n.80 (noting that subsistence activities, which can take Inupiat residents living on the North Slope far from their local communities and closer to emissions sources, are a potential environmental justice consideration that may be unique to the OCS PSD permitting context); *Shell Discoverer 2012*, 15 E.A.D. at 496 n.32 (same).

[62] The Region used demographic information gathered from the 2000 U.S. Census to compare the population of the North Slope Borough to the populations of both the State of Alaska and the entire United States, which served as reference populations for the demographic analysis. EJ Analysis at 6-8 & n.6. The North Slope Borough consists of the following eight incorporated villages: Point Hope, Point Lay, Wainwright, Atqasuk, Barrow, Nuiqsut, Kaktovik, and Anaktuvuk Pass. *See* Statement of Basis at 55.

[63] The Region utilized data from the Alaska Native Health Status Report 2009, which the Alaska Native Epidemiology Center and the Alaska Native Tribal Health Consortium had prepared to analyze health conditions in the North Slope Borough. *See* EJ Analysis at 8-10 & n.11.

Region then examined the total modeled concentrations of NO_2, particulate matter with a diameter of 10 micrometers or less ("PM_{10}"), particulate matter with a diameter of 2.5 micrometers or less ("$PM_{2.5}$"), SO_2, and CO,[64] including background concentrations and maximum concentrations from the *Kulluk* and the Associated Fleet.[65] *Id.* at 13-14 & tbl.6. The Region compared the total modeled concentrations for each of the three nearest communities while the source is in operation and found that the total maximum modeled concentrations demonstrate that the NAAQS will be attained at all locations beyond the 500-meter boundary, and that the modeled concentrations in the North Slope communities and in areas where the communities conduct subsistence activities will be below the relevant standard.[66] *Id.* at 14. Finally, the Region noted that a majority of the total impacts result from background concentrations. *Id.*

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[64] The Board notes that the information included in table 5 of the air quality analysis includes modeled impacts in the nearest onshore communities from operation of the *Kulluk* alone, without impacts from the Associated Fleet or background concentrations. EJ Analysis at 12 & tbl.5. The Region explains that the maximum modeled concentrations in Nuiqsut, Deadhorse, and Kaktovik listed in table 5 are all below the significant impact levels ("SILs") established for each criteria pollutant. *Id.* at 12. In the PSD program, SILs function as threshold levels for ambient concentrations of a given pollutant; for a given pollutant and averaging period, any source that has a measured concentration that is below the SIL is considered too small to cause or contribute to a violation of the NAAQS. *Id.*

The Region made clear earlier in the environmental justice analysis that emissions from the Associated Fleet while operating within 25 miles of the *Kulluk*, together with emissions from the *Kulluk*, are considered in conducting an ambient air quality analysis to determine whether emissions from the project will cause or contribute to a violation of the NAAQS. *Id.* at 4. The Region's analysis repeatedly emphasized that compliance with the NAAQS is "emblematic of achieving a level of public health protection" that demonstrates that minority or low-income populations will not experience disproportionately high and adverse human health or environmental impacts due to exposure to relevant criteria pollutants. *Id.* at 4-5 (quoting *Shell 2010*, 15 E.A.D. at 156). While the inclusion of information on modeled impacts of emissions from the *Kulluk* alone on the nearest onshore communities is illustrative regarding the *Kulluk*'s contribution to the overall emissions profile, it is the information that encompasses both background concentrations and emissions from the *Kulluk* and the Associated Fleet when it is within 25 miles of the *Kulluk* that establishes the Region has satisfied its obligation to comply with the Executive Order.

[65] Monitoring data from Prudhoe Bay, Deadhorse, and Endicott were used for background values. EJ Analysis at 13. The Region also noted that the modeled impacts are based on conservative assumptions, including that all four wells are drilled at the same location to account for overlapping plumes, even though the drilling of four wells at a fixed location and the overlap of plumes will not occur. *Id.*

[66] Specifically, the Region noted that in Kaktovik, located 8 miles from Shell's closest lease block in the Beaufort Sea, the total maximum modeled concentrations, assuming Shell's *Discoverer* is in operation and considering background concentrations, are measured at the following percentages of the NAAQS: 11% for the 1-hour NO_2 NAAQS; 20% for the 24-hour $PM_{2.5}$ NAAQS; 35% for the 24-hour PM_{10} NAAQS, and; 20% for the annual $PM_{2.5}$ NAAQS. EJ Analysis at 13-14 & tbl.6. Similarly, in Nuiqsut, located 33 miles from Shell's closest lease block in the Beaufort Sea, and applying the same assumptions, the total maximum modeled concentrations are measured at the following percentages of the NAAQS: 50% for the 1-hour NO_2 NAAQS; 48% for the 24-hour $PM_{2.5}$ NAAQS, 35% for the 24-hour PM_{10} NAAQS, and 26% for the annual $PM_{2.5}$ NAAQS. *Id.*

Overall, the Region concluded that Shell's proposed OCS activities in the Beaufort Sea will not result in disproportionately high and adverse human health or environmental effects with respect to Alaska Natives residing on the North Slope, and further, in reaching this conclusion the Region considered the impact on these communities while engaging in subsistence activities in the areas where such activities are regularly conducted. *Id.* at 15. With this background in mind, the Board now turns to the specific assertions both ICAS and Mr. Lum make in support of their arguments that the Region has not complied with its obligation under the Executive Order.

2. *One-Hour NO_2 NAAQS Analysis*

ICAS challenges the Region's consideration of 1-hour NO_2 NAAQS[67] compliance in the environmental justice analysis on several grounds, arguing that it is "insufficient and ignores salient record evidence." ICAS Petition at 34. ICAS asserts that in addition to NO_2 emissions from the *Kulluk* when it is an OCS source and from the Associated Fleet when it is within 25 miles of the *Kulluk*, the Region must also account for mobile source NO_2 emissions that remain unregulated by the Permit when assessing potentially adverse health impacts of NO_2 emissions on North Slope communities. *Id.* at 35-38. In addition, ICAS challenges the Region's "fatal flaw of the environmental justice analysis," namely the failure to *analyze* the impacts of Shell's emissions on residents of the North Slope conducting subsistence activities offshore. *Id.* at 36-37 (emphasis in original). Finally, ICAS challenges the Region's analysis of Shell's 1-hour NO_2 NAAQS compliance based on several technical decisions the Region made. *Id.* at 37-38.

ICAS asserts that the Region's environmental justice analysis is inadequate because it does not account for emissions from mobile sources that are not included in the air quality impact analysis conducted to determine whether emissions from the project will cause or contribute to a violation of the NAAQS. *See id.* at 34 & n.30; EJ Analysis at 4. The Board disagrees.

The Region appropriately determined that it was not required to analyze these mobile source emissions where, as here, the Title V permit did not address mobile source emissions, and the record lacked sufficient data for such an analy-

[67] NAAQS are health based-standards, designed to protect public health with an adequate margin of safety, including sensitive populations such as children, the elderly, and asthmatics. *See In re AES Puerto Rico, L.P.*, 8 E.A.D. 324, 351 (EAB 1999), *aff'd sub nom. Sur Contra La Contaminación v. EPA*, 202 F.3d 443 (1st Cir. 2000), *cited in Shell 2010*, 15 E.A.D. at 149 n.72. The Administrator is required to carry out periodic reviews of the air quality criteria published under section 108 of the CAA, 42 U.S.C. § 7408, as well as the NAAQS, and to revise the criteria and standards as appropriate. CAA § 109(d)(1), 42 U.S.C. § 7409(d)(1). The Board outlined the history of the NO_2 NAAQS reviews in its December 2010 remand order. *See Shell 2010*, 15 E.A.D at 150 nn.73-74.

sis.[68] RTC at 114; Statement of Basis at 54; *see also* EJ Analysis at 2; Region Response at 36 n.34. The Region acknowledged that the Title V permit at issue in this case is unusual in that it requires a temporary Title V source to meet the NAAQS, and the permit also establishes limits on PTE. EJ Analysis at 2; Statement of Basis at 54; RTC at 114. However, the Title V permit does not regulate mobile source emissions.[69]

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[68] ICAS asserts that the Board should remand the *Kulluk* permit so that the Region can assess mobile source emissions included in Shell's emissions inventory submitted to BOEMRE as part of Shell's Exploration Plan, both because it "shows that the additional emissions estimates are not as hard to obtain as Region 10 implies," and because once the Region assesses the accuracy of the inventory it can "use the information to conduct an EJ analysis that accounts *for all* of Shell's emissions." ICAS Petition at 35 (emphasis in original).

Nowhere in its petition does ICAS acknowledge the Region's statement, in the Response to Comments, that "[t]he Exploration Plan * * * does not include estimates of air emissions from these other vessels during the time they are more than 25 miles from the Kulluk or before the Kulluk becomes an OCS source." RTC at 15. The Board has consistently stated that, in order to sustain its burden of demonstrating that review is warranted, the petitioner must address the permit issuer's responses to relevant comments made during the permit proceeding. *See, e.g., Peabody*, 12 E.A.D. at 33 ("[T]he petitioner may not simply reiterate comments made during the public comment period, but must substantively confront the permit issuer's subsequent explanations.").

Furthermore, ICAS's suggestion that the Region should "compile rough estimates" of these mobile source emissions because "[s]ome additional steps are particularly necessary here" is similarly unavailing. ICAS Petition at 36. ICAS has acknowledged its ongoing concern regarding emissions that are not included in the PTE analysis, along with its efforts to compel Region 10 to consider non-PTE emissions as OCS source emissions in prior appeals to this Board. ICAS Petition at 34. Despite its concerns, ICAS cannot demonstrate that review is warranted where, as here, ICAS offers a generalized objection to the Region's consideration of mobile sources in the environmental justice analysis, and the Region has demonstrated that it lacks sufficient data to reach a determinative conclusion regarding these mobile source emissions in the environmental justice context. *See Avenal*, 15 E.A.D. at 401-02; *see also In re Cape Wind Assocs., LLC*, 15 E.A.D. 327, 330 (EAB 2011) (noting that petitioners "must raise specific objections to the permit"); *In re BP Cherry Point*, 12 E.A.D. 209, 217 (EAB 2005) (same).

[69] In a memorandum addressing environmental justice in the permitting context, the Agency stated:

> Unlike PSD/[New Source Review] permitting, Title V generally does not impose substantive emission control requirements, but rather requires all applicable requirements to be included in a Title V operating permit. * * * Because Title V does not directly impose substantive emissions control requirements, it is not clear whether or how EPA could take environmental justice issues into account in Title V permitting – other than to allow public participation to serve as a motivating factor for applying closer scrutiny to a Title V permit's compliance with applicable CAA requirements.

Memorandum from Gary Guzy, General Counsel, U.S. EPA, to Assistant Administrators, U.S. EPA, *EPA Statutory and Regulatory Authorities Under Which Environmental Justice Issues May Be Addressed in Permitting* 13 (Dec. 1, 2000) (A.R. FF-7).

Despite the fact that mobile source emissions are not regulated under the Title V permit, the Region did go beyond its required review to consider mobile source emissions with respect to environmental justice in the Response to Comments. *See* RTC at 114-15. The Region was unable to reach a determinative conclusion with respect to these emissions due to insufficient information.

ICAS's attempt to construe the Executive Order and Board precedent to *require* in this instance the analysis of emissions from mobile sources that the Region may not have accurate or sufficient data to complete in the context of a Title V permit is unpersuasive. Notably, the Board has held that it will decline to review a permit issuer's environmental justice analysis that cannot reach a determinative conclusion due to the insufficiency of available valid data. *See* RTC at 115; *Avenal*, 15 E.A.D. at 401-02 (stating that where a permit issuer conducts a substantive environmental justice analysis that endeavors to include and analyze data that is germane to the environmental justice issue raised during the comment period, and the permit issuer demonstrated it exercised its considered judgment when determining that it cannot reach a determinative conclusion due to the insufficiency of available data, the Board will decline to grant review of the environmental justice analysis). Moreover, "[t]he plain language of the Executive Order imparts considerable leeway to federal agencies in determining how to comply with the spirit and letter of the Executive Order." *Avenal*, 15 E.A.D. at 401. ICAS overreads *Avenal* when it suggests that *Avenal* compels the analysis of these mobile source emissions in the context of this permit. *See* ICAS Petition at 35 ("The Agency has considered mobile emissions previously in its EJ analyses and should be required to do so here." (citing *Avenal*, 15 E.A.D. at 399)).[70]

ICAS's challenge also fails because ICAS never responded to the Region's stated rationale in the administrative record that Title V permits generally do not impose new substantive air quality control requirements. A petitioner cannot sim-

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[70] ICAS includes a citation to *Avenal* for the proposition that "motor vehicle emissions are by far the greatest concern," in support of its contention that mobile source emissions should be included in the short-term NO_2 NAAQS assessment included in the environmental justice analysis, but the quote is taken out of context and does not support ICAS's position. *See* ICAS Petition at 35. The circumstances in *Avenal* are markedly different than those in the present case. In *Avenal*, the Agency conducted an environmental justice analysis that focused in particular on short-term NO_2 impacts in support of a PSD permit to build a 600-megawatt power plant. 15 E.A.D. at 399. The Agency noted that in the area surrounding the proposed site for the new source, motor vehicles accounted for 91% of NO_2 emissions locally, as compared to 61% of NO_2 emissions nationwide. *Id.* In addition, the environmental justice analysis in *Avenal* noted that the area surrounding the proposed facility was designated as extreme nonattainment for ozone, and NO_2 is a precursor emission. *Id.* Finally, the Agency further explained that NO_2 concentrations on or near major *roadways* have appreciably higher emissions than those measured at monitors in the Agency-approved network. *Id.* ICAS has not demonstrated that the need to assess NO_2 impacts from mobile sources in *Avenal*, where NO_2 emissions near roadways were known to be much higher, translates into a requirement that the Agency account for these mobile emissions on the Arctic OCS to demonstrate that its environmental justice analysis is sufficient.

ply repeat comments made during the comment period, but must substantively confront the permit issuer's substantive explanations in order to demonstrate that review of a particular issue is warranted. *Peabody*, 12 E.A.D. at 33.

Further, ICAS's assertion that the Region failed "to *analyze* the impacts of Shell's emissions on subsistence hunters and fishers while offshore," is unsupported by the record. ICAS Petition at 36-37 (emphasis in original); *see also Shell Discoverer 2012*, 15 E.A.D. at 500. The environmental justice analysis stated that mobile source emissions will dissipate while vessels are in transit, RTC at 115, and the environmental justice analysis analyzed how the subsistence areas located in close proximity to Shell's lease blocks might be affected by Shell's OCS activities. EJ Analysis at 5; *id.* at 6 (discussing distances subsistence hunters, whalers, and fishermen have traveled offshore in search of subsistence foods); *id.* at 4 (depicting subsistence use areas mapped over Shell exploration plan well sites). In addition to demonstrating compliance with the applicable NAAQS, the Region conducted an environmental justice analysis that included and analyzed data that is germane to the environmental justice issues raised during the comment period. *See Shell 2010*, 15 E.A.D. at 160-61 n.87. Although ICAS may disagree with the contents or conclusions of the Region's environmental justice analysis, ICAS has not demonstrated that this difference in opinion equates to an insufficient effort on the Region's part regarding environmental justice, or that the Region failed to analyze impacts. *See Shell Discoverer 2012*, 15 E.A.D. at 500.

Finally, ICAS enumerates several problems with the Region's environmental justice analysis that amount to challenges to the Region's technical expertise. *See* ICAS Petition at 37; Region Response at 43-44; *see also Shell 2012*, 15 E.A.D. at 500-01. Without elaborating any further, ICAS expresses "significant concerns" with, among other things, installed NO_2 controls and their ability to function properly in cold weather, the use of generic NO_x/NO_2 ratios in lieu of actual source tests, the use of "diurnal pairing" of NO_2 data, and the need for additional "tracer experiments" to supply data for the AERMOD model. ICAS Petition at 37. It is axiomatic that a challenge to the fundamental technical expertise of a permit issuer requires a petitioner to overcome a particularly heavy burden, and that a successful challenge to a permit issuer's technical expertise must consist of more than just a difference of opinion. *Shell 2012*, 15 E.A.D. at 501; *accord In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567 (EAB 1998), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3rd Cir. 1999). Here, ICAS has failed to overcome this particularly heavy burden because it does nothing more than list its broad objections to the Region's environmental justice analysis.

3. *Ozone NAAQS Analysis*

ICAS also challenges the Region's compliance with its obligation under the Executive Order based on the Region's alleged failure to adequately address both the latest scientific findings regarding ozone and the potential impacts of ozone on

local communities. ICAS Petition at 31. ICAS's assertions focus in large part on the Region's decision to demonstrate compliance with the current 8-hour ozone NAAQS, which is set at 0.75 parts per million ("ppm"), as opposed to the range of 0.60 to 0.70 ppm for the 8-hour ozone NAAQS that EPA's Administrator proposed in January 2010 but never finalized. *See id.* at 30-34; Region Response at 40-42; RTC at 96-98, 119-20. On September 2, 2011, four days before the close of the public comment period and prior to the Region issuing the Permit, the President requested that the Administrator withdraw the proposed 8-hour ozone NAAQS standard and instead enforce the current 8-hour ozone standard of 0.75 ppm until the ozone standard is reconsidered again in 2013. Statement on the Ozone National Ambient Air Quality Standards, 2011 Daily Comp. Pres. Doc. 607, at 1 (Sept. 2, 2011), *available at* http://www.gpo.gov/fdsys/ (click on Compilation of Presidential Documents). ICAS also asserts that the Region's conclusion not to model emissions from ozone precursors based on available background data that does not account for the cumulative impacts of proposed activities on the Arctic OCS was in error, and that the Region's response to its comments regarding ozone were inadequate. ICAS Petition at 33.

The Region responds that ICAS's petition raises issues that are largely technical, and that the Region appropriately relied on the Agency's current legal standard of 0.75 ppm when assessing Shell's compliance with the 8-hour ozone NAAQS. Region Response at 40. The Region further asserts that it exercised its technical expertise to determine that ozone levels in the area were not expected to exceed even the lowest level of 0.60 ppm that EPA included in its proposed 8-hour ozone NAAQS. *Id.* at 42. Finally, the Region asserts that it appropriately responded to comments received, including comments specifically raising concerns about the cumulative impacts of proposed OCS operations with respect to attaining the ozone NAAQS. *Id.*

Although ICAS argues to the contrary, the current, enforceable 8-hour ozone NAAQS that Shell must demonstrate compliance with is 0.75 ppm. As this Board has stated previously, "[a] permit issuer must apply the statutes and implementing regulations in effect at the time the final permit decision is made." *Russell City II*, 15 E.A.D. at 81 n.98 (quoting *In re Phelps Dodge Corp.*, 10 E.A.D. 460, 478 n.10 (EAB 2002)). The Region's decision to require Shell to comply with the 0.75 ppm 8-hour ozone NAAQS is consistent with applicable law and the corresponding regulations in effect at the time the Region issued the Permit.

In addition, ICAS does not demonstrate that the Region's analysis of the impacts the 8-hour ozone NAAQS may have on Alaska Natives residing on the North Slope would result in a disproportionately high or adverse impact on the

health of Alaska Natives.[71] In the Response to Comments supporting the Permit, the Region stated that it "stands by its decision" to forego regional photochemical modeling and further explained that "Region 10 reviewed ozone monitoring data along with existing precursor emissions that will impact ozone formation. Based on this review, Region 10 determined further analysis of ozone was not warranted." RTC at 97. In addition, the Region explained that the most recent ozone data indicates that current ozone levels in the Beaufort Sea are well below 0.60 ppm, which represents the low end of the range of the proposed 8-hour ozone NAAQS.[72] *Id.* at 97-98, 120.

Finally, ICAS's assertion that the Region failed to consider the cumulative impacts of emissions from proposed Arctic OCS operations is unavailing. *See* ICAS Petition at 33. ICAS's petition for review not only lacks any further support for this statement, it also fails to substantively confront the Region's explanation in the Response to Comments. *See Peabody*, 12 E.A.D. at 33 (petitioner must

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[71] ICAS's assertion that in the context of an environmental justice analysis the Region's treatment of the 8-hour ozone standard in the current appeal is analogous to the Region's treatment of the newly promulgated 1-hour NO_2 NAAQS in *Shell 2010* must also fail. *See* ICAS Petition at 32. As the Board recently explained, the context of the challenge to the environmental justice analysis in *Shell 2010* was unusual in that the OCS PSD permits at issue were finalized in the interim between the Administrator's publication of the final rule establishing the hourly NO_2 NAAQS in the Federal Register on February 9, 2010, and the effective date of the new hourly NO_2 standard, April 12, 2010. *Avenal*, 15 E.A.D. at 401. The Board emphasized that the environmental justice aspect of the *Shell 2010* remand order turned on the Region's scant environmental justice analysis, which provided no examination or analysis of short-term NO_2 impacts whatsoever. *Id.*

Here, the Region not only analyzed impacts from ozone emissions, *see* RTC at 96-98, 119-20, it further explained that current levels of ozone in the area are well below the low end of the range EPA had requested comment on in the proposed ozone NAAQS, and that emissions of ozone precursors would also not lead to an exceedance of the low range of the proposed ozone NAAQS. *Id.* at 120; *see also* Region Response at 41 n.37 (noting that the discussion of ozone in the Region's environmental justice analysis was brief, but that both the Response to Comments and the technical support document contained in the administrative record provide more detailed discussions of the Region's determination regarding ozone). Of equal importance, and unlike the events leading up to the Board's remand order in *Shell 2010*, in this instance the Agency has not made a final determination or issued a final rule stating that the current 8-hour ozone standard is inadequate. *See* Region Response at 41. ICAS has not demonstrated that the Region's consideration of the ozone NAAQS in the current appeal warrants Board review based on similarities to the Region's treatment of the hourly NO_2 NAAQS in *Shell 2010*.

[72] ICAS challenges the Region's conclusion not to model emissions of ozone and ozone precursors, and alleges that the "limited background data" that exists does not demonstrate that current ozone levels are well below the proposed ozone NAAQS. ICAS Petition at 33. ICAS does not provide any citation or reference as support for this statement, which amounts to a challenge to the Region's technical expertise. This Board recently stated that "it is axiomatic that a challenge to the fundamental technical expertise of a permit issuer requires a petitioner to overcome a particularly heavy burden, and that a successful challenge to a permit issuer's technical expertise must consist of more than just a difference of opinion." *Shell Discoverer 2012*, 15 E.A.D. at 501 (citing *Shell 2011*, 15 E.A.D. at 203, and *NE Hub*, 7 E.A.D. at 567). ICAS's bald assertion that background ozone data was limited and does not support the Region's conclusions cannot overcome this particularly heavy burden.

demonstrate why a permitting authority's response to objections made during the public comment period warrants review). In this instance, the Region explained:

> [T]he Clean Air Act permitting programs are essentially 'first come, first served' programs and each subsequent permitting action needs to account for all of those that went before but not any actions that will occur subsequent to that action. The permits for the Discoverer drill ship in the Chukchi Sea and Beaufort Sea are the first permits in their respective vicinities and they only need to assess their impacts on the existing air quality situation.
>
> The Kulluk drill rig in the Beaufort Sea is the second permit and EPA has addressed cumulative impacts by including conditions in the permit that prevent Shell from operating the Kulluk drill rig and the Discoverer drill ship in the Beaufort Sea during the same drilling season. Permit Condition D.4.8. As such, only one of the two drill rigs can operate in the Beaufort in any year so there will be no overlapping impacts with respect to compliance with short[]term NAAQS. * * *
>
> As discussed above, ConocoPhillips has withdrawn its permit application for operation of a jack-up drill rig in the Chukchi Sea.

RTC at 101; *see also* EJ Analysis at 14 (reporting total maximum modeled concentrations for criteria pollutants in Kaktovik and Nuiqsut, which account for both the *Discoverer*'s operation and background concentrations); Region Response at 42 n.39 (noting that "[p]otential OCS operations in the Chukchi Sea and the Beaufort Sea are over 200 miles apart at the closest point"). Aside from its plain statement that the Region did not consider the emissions from all proposed OCS operations, ICAS does not address the Region's response to its comment, and thus cannot demonstrate that this issue warrants Board review. *Peabody*, 12 E.A.D. at 33.

4. *Oil Spill Response Capabilities*

Mr. Lum asserts that EPA has failed to require Shell to demonstrate its oil spill response capabilities in "clear, windy, broken ice and sheet ice conditions." Lum Petition at 1-2. The Region responds that this issue is outside the scope of these permit proceedings and thus is not properly subject to review. Region Response at 47.

The Board has previously emphasized that "[t]he PSD review process is not an open forum for consideration of every environmental aspect of a proposed project, or even every issue that bears on air quality."[73] *In re Knauf Fiber Glass GmbH*, 8 E.A.D. 121, 127 (EAB 1999) ("*Knauf I*"), *quoted in In re Sutter Power Plant*, 8 E.A.D. 680, 688 (EAB 1999); *see also In re Encogen Cogeneration Facility*, 8 E.A.D. 244, 259-60 (EAB 1999). The Board has jurisdiction "to review issues directly related to permit conditions that implement the federal PSD program," *Sutter*, 8 E.A.D. at 688, but will deny review of issues not governed by the PSD regulations because it lacks jurisdiction over them. *Id.*; *see also Encogen*, 8 E.A.D. at 259 (noting that petitioners had not shown how the issues they requested the Board to review fell within the Board's PSD jurisdiction). Moreover, there are often other regulatory programs in place that may address environmental concerns that fall outside the Board's scope of review. *Knauf I*, 8 E.A.D. at 162; *see also Shell 2007*, 13 E.A.D. at 405 n.66.

EPA's jurisdiction over portions of the OCS applies to air emissions subject to the CAA and its implementing regulations. In this instance, BOEMRE[74] is responsible for implementing regulations that address oil spill and response capabilities.[75] The Board does not have jurisdiction to consider Shell's oil spill and re-

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[73] As noted above, see Part VI.A.1.a, the OCS air regulations require that OCS permit proceedings follow the procedures used to issue PSD permits contained in 40 C.F.R. part 124, 40 C.F.R. § 55.6(a)(3).

[74] As the Board has noted in previous *Shell* decisions, in May 2010 the Secretary of the Department of the Interior ("DOI") signed a Secretarial Order reorganizing the former Minerals Management Service ("MMS") into three independent entities to better carry out its three missions of: (1) improving the management, oversight, and accountability of activities on the OCS; (2) ensuring a fair return to the taxpayer from offshore royalty and revenue collection and disbursement activities; and (3) providing independent safety and environmental oversight and enforcement of offshore activities. *Shell 2012*, 15 E.A.D. at 492 n.29; *see also Shell 2010*, 15 E.A.D. at 112 n.7; U.S. DOI, Departmental Manual, pts. 118 & 119, ch. 1 (Sept. 30, 2011), *available at* http://elips.doi.gov/app_dm/dm.cfm ("Departmental Manual") (establishing the creation, authorities, objectives, and reporting relationships for the Bureau of Ocean Energy Management ("BOEM") and Bureau of Safety and Environmental Enforcement ("BSEE")). BOEMRE assumed all of MMS's responsibilities in the interim until the full implementation of the reorganization into the three separate entities was complete. *Shell 2012*, 15 E.A.D. at 492 n.29; *see Shell 2010*, 15 E.A.D. at 112 n.7. The transfer of the revenue collection function to the Office of Natural Resources Revenue was completed on October 1, 2010. *See* Secretary of the Interior, U.S. DOI, Order No. 3306, *Organizational Changes Under the Assistant Secretary – Policy, Management and Budget* (Sept. 20, 2010), *available at* http://elips.doi.gov/app_SO/so.cfm; Departmental Manual, pt. 112, ch. 34 (Apr. 15, 2011). One year later, on October 1, 2011, the reorganization was completed when BOEMRE was replaced by BOEM and BSEE. *See* Departmental Manual, pts. 118 & 119. For consistency the Board refers to BOEMRE because the Permit and the supporting documentation refer exclusively to BOEMRE.

[75] On August 4, 2011, BOEMRE (now BOEM, see note 74 above) conditionally approved Shell's exploration plan for the Beaufort Sea. Letter from Jeff Walker, Regional Supervisor, Field Operations, Alaska OCS Region, BOEMRE, U.S. DOI, to Susan Childs, Shell Offshore, Inc. (Aug. 4,

Continued

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sponse capabilities in the Arctic OCS, and thus, the Board denies Mr. Lum's petition for review on these grounds.

5. *Impacts of Air Emissions on Traditional Subsistence Food Sources*

Mr. Lum asserts that the *Kulluk*'s operations in the Beaufort Sea will introduce toxins into the ocean "via the exhaust [from the *Kulluk*] that settles down into it," and contaminate the marine mammals and fish the coastal Inupiat consume as part of their indigenous diet. Lum Petition at 2-3. Mr. Lum continues that this will not only contaminate the food supply but also alter traditional Inupiat culture. *Id.* The Region responds that this issue is outside the scope of these permit proceedings and thus is not properly subject to Board review. Region Response at 47. The Board construes Mr. Lum's assertions as a challenge to the adequacy of the Region's compliance with the Executive Order.

Mr. Lum also raised this issue in the appeals that led to the Board's *Shell Discoverer 2012* decision. *See* 15 E.A.D. at 502. In *Shell Discoverer 2012*, the Board denied review on procedural grounds because the impacts of air emissions on traditional subsistence food sources was not raised at the time of the first appeals.[76] *Id.* In the current appeal, Mr. Lum timely submitted comments on this issue and thus his petition for review is procedurally sound. *See* Lum Comments at 1. The Board, however, has previously held that "[i]mpacts on subsistence hunting and fishing are outside the scope of the PSD program and therefore the Board's jurisdiction." *Shell 2007*, 13 E.A.D. at 405 n.66 (citing *Knauf I*, 8 E.A.D. at 161-62), *quoted in* RTC at 125. The Board does not have jurisdiction to consider the impacts of air emissions on traditional subsistence food sources and Inupiat culture, and thus, the Board denies Mr. Lum's petition for review on these grounds.

(continued)
2011) [hereinafter Beaufort EP Letter]. The approval of the Beaufort Sea exploration plan was conditioned, among other things, on Shell submitting to BOEMRE prior to the commencement of exploratory drilling operations documentation regarding the subsea well capping and containment system Shell has committed to have at its disposal. *Id.* at 3. Specifically, Shell must "submit documentation on the procedures for deployment, installation, and operation of the system under anticipated environmental conditions, including the potential presence of sea ice for approval by BOEMRE. Shell will also be required to conduct a field exercise to demonstrate Shell's ability to deploy the system." *Id.*

[76] As mentioned above, the Board remanded to the Region two OCS PSD permits in December 2010. *See generally Shell 2010*, 15 E.A.D. at 161-62. In the subsequent appeals of the permits issued upon completion of remand proceedings, the Board unequivocally stated that "in the current appeals, '[n]o new issues may be raised that could have been raised, but were not raised,' in the previous appeals." *Shell Discoverer 2012*, 15 E.A.D. at 477 (quoting *Shell 2010*, 15 E.A.D. at 162).

For all of the foregoing reasons, the Board declines to review the Region's compliance with the Executive Order and applicable Board precedent.

F. *ICAS Has Failed to Demonstrate That the Region Clearly Erred or Abused Its Discretion in Providing 46 Days for Comment on the Draft Permit and in Denying ICAS's Request for Nonoverlapping Comment Periods*

ICAS claims that the Region "committed clear legal error by failing to provide the public an adequate opportunity to comment on" the draft permit.[77] ICAS Petition at 6. More specifically, ICAS alleges that the Region failed to meet the parts 71 and 124 procedural requirements that require permit issuers to "allow *at least* 30 days for public comment" on draft permits. *Id.* at 7 (citing 40 C.F.R. §§ 71.11(d)(2)(i), 124.1) (emphasis added by Petitioners). Although ICAS acknowledges that the comment periods for the Permit ran from July 22, 2011, to September 6, 2011, an interval of 46 days, ICAS contends that, because the Region issued the draft *Kulluk* permit for comment at the same time it issued another draft minor source air permit for comment and in the middle of comment periods for two major source air permits for another Shell drillship,[78] in reality, ICAS only "had 16 days to comment on each of the[] permits," rather than the required minimum of 30. *Id.* at 7. This is because, according to ICAS, it "does not have the resources to comment on more than one air permit at a time." *Id.* ICAS further claims that "the short and overlapping comment periods * * * deprived [them] of a meaningful opportunity to comment on Shell's new air modeling results." *Id.* at 8.

In a related argument, ICAS asserts that the Region clearly erred in denying its request that the Region "hold nonoverlapping comment periods on the OCS permits and [] provide 45 days to comment on each permit." *Id.* at 8-9. ICAS claims that it met the regulatory standard for demonstrating the need for additional time to prepare comments. *Id.* (referring to the standard at 40 C.F.R. § 71.11(g)); *see also id.* attach. 8 (Letter from Harry Brower, Chairman, Alaska Eskimo Whaling Commission ("AEWC"), et al., to Doug Hardesty, Air Permits Project Manager, U.S. EPA Region 10 (June 15, 2011) (A.R. C-487)) (AEWC and ICAS request for nonoverlapping comment periods) [hereinafter ICAS Let-

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[77] The Board also considers ICAS's claim under an abuse of discretion standard. *See infra* note 80.

[78] The Region had issued two draft permits for Shell's *Discoverer* drillship earlier in July of 2011. *See Shell Discoverer 2012*, 15 E.A.D. at 480. The comment period for those two permits ran from July 6 to August 5, 2011. *Id.*; ICAS Petition at 7. In addition, on the same date the Region had issued the *Kulluk* draft permit, it had also issued a draft permit for ConocoPhillips to operate a jackup drill rig in the Chukchi Sea. ICAS Petition at 7. The comment period for this permit originally ended at the same time as the *Kulluk* draft permit, but was later extended to September 21, 2011. ICAS Petition at 8-9; RTC at 7.

ter]; *id.* attach. 9 (Letter from Richard Albright, Director, Office of Air, Waste, & Toxics, U.S. EPA Region 10, to Harry Brower, AEWC Chairman, et al. (July 21, 2011) (A.R. C-532)) (EPA response).

The part 71 procedural regulation governing public notices and public comment periods specifically provides that "[p]ublic notice of the preparation of a draft permit * * * shall allow at least 30 days for public comment." 40 C.F.R. § 71.11(d)(2)(i). The part 124 procedural regulations, which also apply to the Permit,[79] contain the same language. *See* 40 C.F.R. § 124.10(b). The Board has traditionally read these regulations to establish a minimum comment period length of 30 days, recognizing that the regulations clearly allow the permit issuer, in its discretion, to grant a longer comment period. *Shell Discoverer 2012*, 15 E.A.D. at 520-21 (discussing the applicable part 124 regulation); *see also In re Genesee Power Station*, 4 E.A.D. 832, 841 (EAB 1993) (noting that the part 124 regulation governing public comment periods "only require[s them] to last 30 days"). In addition, as ICAS points out, part 71 contains a separate provision specifically authorizing a permit issuer to grant additional time. It states that "[a] comment period longer than 30 days may be necessary to give commenters a reasonable opportunity to comply with the requirements of this section. Additional time shall be granted to the extent that a commenter who requests additional time demonstrates the need for such time."[80] 40 C.F.R. § 71.11(g)).

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[79] As the Region explained, the Permit is subject to the procedural requirements of both part 55 (and consequently part 124) as well as part 71:

> The portion of this permit that is a Part 71 permit (e.g., the portion of the permit that applies on the Outer OCS) is issued under 40 CFR Part 55 and 40 CFR Part 71 and subject to the procedural requirements of 40 CFR Part 71 as provided in 40 CFR § 71.4(d). The portion of this permit that is a COA Title V permit and a COA minor source permit (e.g., the portion of the permit that applies on the Inner OCS) is issued under 40 CFR Part 55 and, in the absence of other applicable procedures, subject to the permit issuance procedures for PSD permits under 40 CFR Part 124, Subpart A and C. *See* 40 CFR §§ 55.6(a) (3) and 124.1.

RTC at 6 n.3.

[80] Because the regulations authorize the permit issuer to grant a longer comment period upon an adequate showing of need, the Board also considers ICAS's challenge under an abuse of discretion even though ICAS did not clearly present its challenge as such, alleging instead only "clear error." *See Shell Discoverer 2012*, 15 E.A.D. at 521 (considering similar argument as raising an abuse of discretion claim); *In re Guam Waterworks Auth.*, 15 E.A.D. 437, 443 n.7 (EAB 2011) (explaining Board's standard in reviewing claims involving a permit issuer's exercise of discretion); *In re Desert Rock Energy Co.*, 14 E.A.D. 484, 530 (EAB 2009) (using an abuse of discretion standard where the permit issuer had "broad discretion" in making the challenged determination). The Board similarly reads ICAS's challenge to the Region's denial of nonoverlapping comment periods as raising an abuse of discretion claim.

In the present case, the Region provided a 46 day public comment period for the *Kulluk* draft permit, albeit a comment period that partially overlapped with several other comment periods. The Region, in its Response to Comments, provided a lengthy, well-reasoned explanation for its establishment of a 46 day comment period for the *Kulluk* permit and for its denial of ICAS's request for nonconcurrent comment periods. *See* RTC at 5-8. In addressing comments on these topics, the Region pointed out that it had granted a period longer than the regulatory minimum for this permit and had also extended the comment period for one of the other permits, the ConocoPhillips permit. *Id.* at 6; *accord id.* at 7. The Region further noted that the ConocoPhillips permit, for which it had extended the comment period to 60 days, was for a proposed 2013 operation, whereas Shell "intends to begin its exploratory drill operations with the Kulluk in July 2012." *Id.* at 7. The Region also enumerated the many steps it had taken before and during the public comment period "to promote meaningful public involvement." *Id.* at 6.

In addition, the Region observed that, while "it agree[d] with the commenters that some aspects of the Draft Permit are technically and legally complex," on the other hand, "[t]he comments submitted * * * demonstrate[d] that the public was able to review, evaluate, and comment on many complex issues during the comment period provided." RTC at 8. The Region noted that among the more than 14,500 public comments it had received, a number of them had contained "substantive comments on, among other issues, the definition of OCS Source, limits on the source's potential to emit, choice of model, modeling data, ambient air boundary, source testing, emission factors, air quality analysis, applicability of increments and visibility, and cumulative impacts." *Id.* Accordingly, the Region believed that "[t]he volume of comments received and the substantive issues addressing technically and legally complex issues demonstrate[d] that the public was able to meaningfully review and comment on the Draft Permit." *Id.*

The Region also explained that "40 CFR § 71.7(a)(2) requires that it take a final action on a Title V permit application within 18 months of receiving a complete application. In conducting the permitting process, Region 10 must strike a balance between its obligation to provide for meaningful public participation and its responsibility to make a final permitting decision in a timely manner." *Id.* Based on all these factors, the Region had determined that "the commenters have not demonstrated that a period of more than 46 days is necessary to give the public a reasonable opportunity to comment." *Id.* at 7 (citing 40 C.F.R. §§ 71.11(g) and 124.13).

In its petition, ICAS does not explain why the Region's response to these comments is clearly erroneous or an abuse of discretion. In fact, ICAS does not even address the Region's response. ICAS's failure to address the Region's response is, in and of itself, sufficient to deny its claims of procedural error con-

cerning the comment period.[81]

Nevertheless, even if the Board considered ICAS's claim of procedural error, the Board would deny review of this claim for several reasons. First, the length of time the Region provided for comment on this permit – 46 days – is 16 days more than the regulatory minimum required by 40 C.F.R. §§ 71.11(d)(2)(i) and 124.10(b). It is also one day more than the amount of time ICAS had specifically requested for each permit in its letter.[82] *See* ICAS Letter at 2 (requesting nonconcurrent comment periods of 45 days). ICAS's attempt to recalculate the length of the comment period as "16 days" based on an unexplained mathematical formula involving the number and lengths of other comment periods is unconvincing and does not demonstrate clear error. *See Shell Discoverer 2012*, 15 E.A.D. at 521; *see also Russell City II*, 15 E.A.D. at 95-98 (denying review of a procedural error claim where petitioners fail to point to a part 124 procedural regulation that was violated); *Knauf II*, 9 E.A.D. at 17 (denying review where the permit issuer fulfilled the applicable regulatory obligations, but did not go beyond those requirements).

Furthermore, while it is true that the Region did not grant ICAS's request for nonoverlapping comment periods, ICAS has not pointed to any regulations that prohibit the Agency from issuing concurrent permits or that require – or even specify – a different comment period length when the Agency does issue concurrent permits. To the contrary, the relevant regulations authorize the Agency to issue a single public notice to "describe more than one permit or permit actions," 40 C.F.R. §§ 71.11(d)(1)(iii), 124.10 (a)(3), without mentioning a different time frame for public comment when concurrent permits are issued. While section 71.11(g) authorizes the Agency to extend a particular comment period on a case-by-case basis where a commenter has demonstrated the need for additional time – which would thereby provide an avenue for commenters to obtain longer comment periods in situations where comment periods overlap[83] – the provision does not prohibit, or even mention, overlapping comment periods.

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[81] As the Board discussed above in Part III, a petitioner must explain why the permit issuer's previous response to those objections is clearly erroneous or otherwise warrants review. "[A] petitioner's failure to address the permit issuer's response is fatal to its request for review." *In re Indeck-Elwood LLC*, 13 E.A.D. 126, 143, 170 (EAB 2006); *accord Russell City II*, 15 E.A.D. at 10.

[82] Notably, therefore, for this permit, by providing a longer comment period, the Region did in essence partially grant ICAS's request.

[83] And, in this case, the Region did, provide additional time for comment on two of the permits whose comment period overlapped. The Region increased the comment period for the Shell *Kulluk* permit to 46 days and the comment period for the ConocoPhillips permit to 60 days. *See supra* note 78.

Finally, it is clear from the administrative record that the Region appropriately balanced conflicting considerations in deciding on the length of the comment period for this permit and in denying the request for nonoverlapping periods. ICAS has not demonstrated otherwise[84] and has therefore failed to show that the Region clearly erred or abused its discretion in either selecting a 46 day comment period or in denying ICAS's request for nonconcurrent comment periods. *See Shell Discoverer 2012*, 15 E.A.D. at 523 (denying review of a similar claim based on similar facts). Review of the Permit is therefore denied on this issue.

G. *ICAS Has Failed to Demonstrate That the Region Clearly Erred in Its Public Hearing Procedures or That Any of the Alleged Procedural Deficiencies Otherwise Warrant Review*

As noted above in Part V, the Region held two public hearings on the draft permit, one in Barrow, and a second in Anchorage. The Region also held an informational meeting prior to the Barrow public hearing. *See* Statement of Basis at 11 (scheduling informational hearing from 5:00-6:30 pm, public hearing from 7:00-9:00 pm); RTC at 6-7.

ICAS claims that the Region "committed clear legal error by failing to provide the public an adequate opportunity" to participate in the Barrow public hearing. ICAS Petition at 6; *see also id.* at 9-10. ICAS alleges three procedural problems with the Barrow hearing. *Id.* at 9-10. ICAS first claims that the Region continued with the hearing despite difficulties with the teleconference phone system that allegedly impaired the ability of the Region to hear all comments. *Id.* at 9. ICAS next alleges that, "for a significant portion of the hearing," the Region discussed a PowerPoint presentation that was not made available to the public attending the hearing. *Id.* at 9-10. Finally, ICAS contends that the Region failed to sufficiently inform those attending the public hearing that it had procured an

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[84] The Board is unpersuaded by ICAS's argument that it had difficulty locating an expert to review the air modeling. *See* ICAS Petition at 8. As the Region indicated in its Response to Comments, RTC at 8, other commenters provided substantive, technical comments on the air modeling, which suggests that the comment period was sufficient to allow opportunity for meaningful comment. *See Fla. Power & Light Co. v. United States*, 846 F.2d 765, 772 (D.C. Cir. 1988) (upholding a short comment period as sufficient where the agency had received numerous comments, some lengthy, and the comments had had a "measurable impact" on the final rule); *Conference of State Bank Supervisors v. Office of Thrift Supervision*, 792 F. Supp. 837, 844 (D.D.C. 1992) (holding length of comment period not unreasonable especially in light of the comments that plaintiffs and other parties submitted). Furthermore, as the Region points out, it notified ICAS in May that the comment periods would begin in July. *See* Letter from Doug Hardesty, EPA, to North Slope Borough et al. (May 25, 2011) (A.R. HH-1). The Region also conducted three separate informational meetings in Barrow and Kaktovik, Alaska, more than a month prior to the start of the public comment period for the Permit "to inform the North Slope community of the draft permit and to describe opportunities for public participation." RTC at 6.

Inupiat interpreter for the hearing.[85] *Id.* at 10. ICAS asserts that making an interpreter "available in this fashion is akin to not having [one] at all." *Id.*

Part 71 and part 124 each contain a provision governing public hearings. *See* 40 C.F.R. §§ 71.11(f), 124.12. Both public hearing regulations require the permitting authority to hold a public hearing when the permitting authority "finds, on the basis of requests, a significant degree of public interest in a draft permit." *Id.* §§ 71.11(f)(1), 124.12(a)(1). The regulations also authorize the permitting authority to hold a public hearing "at its discretion, whenever, for instance, such a hearing might clarify one or more issues involved in the permit decision." *Id.* §§ 71.11(f)(2), 124.12(a)(2); *accord In re Russell City Energy Ctr.* ("*Russell City I*"), 14 E.A.D. 159, 164 n.6 (EAB 2008). The public hearing regulations also prescribe the method of giving public notice of the hearing, 40 C.F.R. §§ 71.11(f)(3), 124.12 (a)(4), the procedure for designating a presiding officer to preside at the hearing, *id.* §§ 71.11(f)(4), 124.12 (b), and the procedures for the public to comment at the hearing, *id.* §§ 71.11(f)(5), 124.12 (c). Finally, both regulations require that a tape recording or written transcript of the hearing be made publically available. *Id.* §§ 71.11(f)(6), 124.12 (d).

Parts 71 and 124 also both require the permit issuer, in making its final decision, to consider all comments it receives during the public comment period and at any public hearings and to issue a "response to comments." *Id.* §§ 71.11(j), 124.17(a); *see also id.* §§ 71.11(e), 124.11. More particularly, these provisions require the permit issuer to "[b]riefly describe and respond to all significant comments on the draft permit * * * raised during the public comment period, or during any hearing" in the response to comments document issued at the same time the final permit decision is issued. *Id.* §§ 77.11(j)(1)(ii), 124.17(a)(1). Importantly, none of the aforementioned regulations refer to, or in any way mention, a requirement to provide an interpreter or a requirement to provide written materials at the hearing.

Upon review of the administrative record and the parties' arguments, the Board concludes that ICAS has not shown that the Region clearly erred in its handling of the Barrow public hearing for any of the three reasons ICAS advances. Not only does ICAS fail to point to any specific regulatory provision that the Region violated, but none of the alleged problems otherwise warrant Board review. The Board addresses each alleged deficiency in more detail below.

ICAS's first contention – that the Region committed clear error because it was allegedly unable to adequately obtain input from the public due to telecom-

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[85] According to ICAS, although the Region may have noted that an interpreter was available at the top of the hearing's sign-in sheet, it did not make a public announcement of this fact at the outset of the hearing. ICAS Petition at 10; ICAS Reply at 6; *see also infra* note 89.

munication problems during the hearing – is unpersuasive. The Region addressed this concern in its Response to Comments. *See* RTC at 9. There, the Region explained that, because such telecommunication problems are common on the North Slope, it had "recorded the public hearing in addition to having the hearing transcribed by a court reporter. From these *two* sources, Region 10 was able to capture the comments provided during the public hearing." *Id.* (emphasis added); *see also* Public Hearing Transcript ("Pub. Hrg Tr.") at 3 (explaining that the hearing was recorded on the teleconference line as a "safety net"). In response, ICAS merely asserts that "this does not change the fact that people were not able to be heard via phone." ICAS Petition at 9. Significantly, however, ICAS does not identify any comment that the Region failed to hear or for which the Region failed to provide a response.[86] *See id.* at 9; ICAS Reply at 6. Nor has any commenter come forward alleging that the Region failed to respond to his or her public hearing comments. The fact that the call center experienced some telecommunications problems during the public hearing – which the Region appears to have adequately anticipated and addressed by utilizing two methods of note taking – does not, without more, constitute clear legal error. Speculative claims that a permitting authority may have failed to hear a comment are insufficient to warrant Board review.

ICAS's contention that the Region committed clear procedural error by failing to provide pre-meeting copies of a Powerpoint presentation is inapposite. In its response to the petition, the Region explains that this presentation was given during the informational meeting, not during the public hearing. Region Response at 39; *see also* Statement of Basis at 11 (scheduling informational hearing prior to public hearing); RTC at 6-7 (mentioning informational meeting). ICAS does not dispute this.[87] *See* ICAS Reply at 5-7. Furthermore, nowhere do the regulations require a permitting authority to provide informational handouts at an informational meeting (or at a public hearing).[88] Thus, while it may be useful for a permit

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[86] As discussed above, the regulatory requirement is for a permit issuer to respond to significant comments. *See* 40 C.F.R. § 77.11(j)(1)(ii), 124.17(a)(1). Thus, had ICAS identified significant comments raised at the public hearing that the Region failed to address, ICAS's arguments would have been more persuasive. *See, e.g., In re Rockgen Energy Ctr.*, 8 E.A.D. 536, 557 (EAB 1999) (remanding so that permit issuer could demonstrate it had given thoughtful and full consideration to public comments); *In re W. Suburban Recycling & Energy Ctr., L.P.*, 6 E.A.D. 692, 710-12 (EAB 1996) (remanding permit and requiring permit issuer to comply with procedures under part 124 including provision requiring a response to all significant comments received); *see also In re N. Mich. Univ.*, 14 E.A.D. 283, 317-18 (EAB 2009) (discussing part 124 requirement to adequately respond to comments).

[87] The Region's explanation makes sense in light of the purpose of the two meetings. While the permitting authority may present its analyses, findings, and conclusions about the draft permit at an informational meeting, the purpose of the public hearing is to obtain comments *from* the public.

[88] The only document the public hearing regulations require a permit issuer make available to the public is the transcript of the hearing. 40 C.F.R. §§ 71.11(f)(6), 124.12 (d).

issuer to provide copies of a presentation to the audience attending an informational meeting, failure to do so at the meeting – or at a subsequent public hearing – does not constitute clear error or otherwise warrant Board review.

ICAS's final contention – that the Region committed clear procedural error by not adequately informing the public that an interpreter was available at the public hearing – is also unconvincing. Importantly, as noted above, there is no regulatory requirement for an interpreter in either part 71 or part 124, nor is there a provision specifying the method a permit issuer should use to inform the public of the availability of an interpreter at the public hearing.[89] ICAS has not pointed to any other requirement, regulatory or otherwise, requiring an interpreter or prescribing the method for announcing one. Accordingly, while it may be preferable for the permit issuer to formally announce the availability of an interpreter at the beginning of the public hearing, and in both languages, failure to do so does not constitute clear error or otherwise warrant Board review.

In sum, ICAS has failed to demonstrate that the public hearing procedures utilized by the Region constituted clear error. ICAS has not shown that the Region violated any part 71 or 124 procedural regulation. Moreover, the alleged problems ICAS has identified do not, even if the Board were to find them to constitute a deficiency in some way, warrant Board review. Consequently, the Board denies review of the Permit on this ground.

VII. *CONCLUSION AND ORDER*

For the foregoing reasons, the Board concludes that none of the petitioners have demonstrated that review of Permit No. R10 OCS030000 is warranted on any of the grounds presented. The Board therefore denies review of the Permit.

So ordered.

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[89] The parties seemingly dispute the method in which the Region notified the public of the availability of the interpreter. The Region stated in its Response to Comments that, "[p]rior to the Barrow public hearing, Region 10 contacted [ICAS] to arrange for an Inupiat speaker to be available to provide Inupiat interpretation at the hearing if requested by any participant. At the beginning of the hearing, participants were provided the opportunity to request Inupiat interpretation during the hearing. No participant requested translation and therefore an interpreter was not used." RTC at 10-11. In response, ICAS claims that attendees only recall mention of an interpreter on the sign-up sheet, and only in English. ICAS Petition at 10. ICAS further asserts that the transcript of the public hearing does not indicate that an announcement was made. ICAS Reply at 6. In light of the Board's conclusion on this issue, it is unnecessary to determine the precise methodology the Region used to notify the public of the interpreter's availability.

IN RE TUCSON ELECTRIC POWER

PSD Appeal No. 18-02

ORDER DENYING REVIEW

Decided December 3, 2018

Syllabus

The Sierra Club petitions the Environmental Appeals Board ("Board") to review a decision by the Department of Environmental Quality for Pima County, Arizona ("Pima County") to issue a federal Prevention of Significant Deterioration ("PSD") permit to Tucson Electric Power. The permit authorizes Tucson Electric Power to construct and operate up to ten additional electricity-generating units ("Units") at its Irvington Generating Station facility. Sierra Club challenges Pima County's determination that PSD requirements do not apply to the nitrogen oxide ("NO_x") emissions from the modified facility. Although the permit contains a cap that limits NO_x emissions below the level triggering PSD requirements, Sierra Club argues that the permit's monitoring requirements are not adequate to render the NO_x emissions cap practically enforceable and thus PSD requirements should apply.

The permit imposes several monitoring requirements to verify compliance with the NO_x emissions cap. Those requirements include, among other things: (i) biennial performance (stack) tests to determine how much NO_x each Unit emits; (ii) calculation of monthly and yearly NO_x emissions using information from the required stack tests and monitoring of ongoing operations; and (iii) monitoring of the pollution control devices for the new Units to ensure that the devices are working properly. Pima County concluded that these compliance monitoring requirements were sufficient to make the NO_x emissions cap practically enforceable.

Held: The Board denies Sierra Club's Petition for Review. Sierra Club has not carried its burden of showing that Pima County clearly erred or abused its discretion in determining that the NO_x emissions cap is practically enforceable.

Sierra Club's argument that the NO_x emissions cap is not practically enforceable because the permit's compliance monitoring requirements rely solely on biennial stack tests lacks merit because monitoring of the facility's pollution control devices is also an integral part of the permit's compliance monitoring requirements. Sierra Club's contention that the monitoring of the pollution control devices does not cure the problem with the permit's reliance on biennial stack tests was not preserved for review because that assertion

was not raised during the public comment period. In any event, Sierra Club's contention is not responsive to the role of monitoring of the pollution control devices as described by Pima County. Additionally, Sierra Club does not substantiate its argument that Pima County failed to support in the administrative record its conclusion that the method for calculating monthly and yearly NO_x emissions would likely overstate emissions. Lastly, Pima County adequately responded to Sierra Club's comments on the practical enforceability of the NO_x emissions cap. Pima County responded to Sierra Club's generalized claims on the inadequacy of biennial stack testing to monitor compliance throughout the year by providing a description of all the elements of the permit's compliance monitoring requirements. Given the general nature of Sierra Club's comments, more was not required.

Before Environmental Appeals Judges Aaron P. Avila, Mary Kay Lynch, and Mary Beth Ward.

Opinion of the Board by Judge Ward:

I. *STATEMENT OF THE CASE*

This case involves a challenge by the Sierra Club to a determination in a federal Clean Air Act permit that the Act's Prevention of Significant Deterioration ("PSD") requirements do not apply to the emissions of nitrogen oxides – commonly referred to as NO_x – from a facility owned and operated by Tucson Electric Power ("Tucson Electric"). Potential NO_x emissions from the facility are reduced by pollution control devices, and the permit imposes a limit (or cap) on NO_x emissions consistent with the control devices' ability to reduce emissions. In such circumstances, the applicability of PSD requirements is based on the facility's emission rate, as reduced by the control devices, so long as the cap on the reduced emissions is enforceable as a practical matter. The specific issue presented here is whether the challenged permit's compliance monitoring requirements are sufficient to make the NO_x emissions cap practically enforceable.

In August 2018, the Department of Environmental Quality for Pima County, Arizona ("Pima County") issued a federal PSD permit ("Permit") to Tucson Electric authorizing the construction and operation of up to ten additional electricity-generating units ("Units") at Tucson Electric's Irvington Generating Station facility. Although the expanded facility would emit several pollutants above levels that trigger PSD requirements, the Permit imposes certain requirements as to NO_x emissions that bring those emissions below levels that trigger such requirements. Specifically, the Permit requires two existing electricity-generating units at the facility to be shut down, mandates the use of pollution control devices on the new Units that reduce NO_x emissions, and imposes a NO_x emissions cap consistent with that reduction.

The Permit further imposes monitoring and recordkeeping requirements to verify compliance with the NO_x emissions cap. Those compliance monitoring requirements include, among other things: (i) biennial performance (stack) tests to determine how much NO_x each Unit emits; (ii) calculation of monthly and yearly NO_x emissions using information from the required stack tests and monitoring of ongoing operations; and (iii) monitoring of pollution control devices to ensure that they are working properly. Finding that these compliance monitoring requirements made the NO_x emissions cap practically enforceable, Pima County concluded that PSD requirements do not apply to the new Units as to their NO_x emissions.

In its Petition for Review, Sierra Club argues that the NO_x emissions cap is not practically enforceable – that is, compliance with the cap cannot be verified – because the stack tests are conducted too infrequently, the monthly and yearly emission calculations rely solely on these infrequent stack tests, and the monitoring of pollution control devices does not cure the problem with the infrequent stack tests. As a consequence, Sierra Club contends that PSD requirements should apply to the facility's increased NO_x emissions resulting from its proposed expansion.

We conclude that Sierra Club has not carried its burden of showing that Pima County clearly erred or abused its discretion in determining that the NO_x emissions cap is practically enforceable. The Petition for Review is therefore denied.

II. *PRINCIPLES GOVERNING BOARD REVIEW*

In considering a petition filed under 40 C.F.R. § 124.19(a), the Board first evaluates whether the petitioner has met threshold procedural requirements such as timeliness, standing, issue preservation, and specificity. *In re Indeck-Elwood, LLC*, 13 E.A.D. 126, 143 (EAB 2006). For example, a petitioner must demonstrate that any issues and arguments it raises on appeal have been preserved for Board review (i.e., were raised during the public comment period or public hearing on the proposed permit), unless the issues or arguments were not reasonably ascertainable at the time. 40 C.F.R. §§ 124.13, .19(a)(4)(ii); *see, e.g.*, *In re City of Attleboro*, 14 E.A.D. 398, 405-06, 444 (EAB 2009); *In re City of Moscow*, 10 E.A.D. 135, 141, 149-50 (EAB 2001).

Under part 124, the petitioner bears the burden of demonstrating that review is warranted. *See* 40 C.F.R. § 124.19(a)(4). Ordinarily, the Board will deny review of a permit decision and thus not remand it unless the petitioner demonstrates that the permit decision is based on a clearly erroneous finding of fact or conclusion of law or involves a matter of policy or exercise of discretion that warrants review. *Id.* § 124.19(a)(4)(i)(A)-(B); *see, e.g.*, *In re La Paloma Energy Ctr., LLC*,

16 E.A.D. 267, 269 (EAB 2014). The Board's power to grant review "should be only sparingly exercised," and "most permit conditions should be finally determined at the [permit issuer's] level." Consolidated Permit Regulations, 45 Fed. Reg. 33,290, 33,412 (May 19, 1980); *see also* Revisions to Procedural Rules Applicable in Permit Appeals, 78 Fed. Reg. 5281, 5282 (Jan. 25, 2013).

When evaluating a permit decision for clear error, the Board examines the administrative record that serves as the basis for the permit to determine whether the permit issuer exercised "considered judgment" in rendering its decision. *See, e.g.*, *In re Steel Dynamics, Inc.*, 9 E.A.D. 165, 191, 224-25 (EAB 2000); *In re Ash Grove Cement Co.*, 7 E.A.D. 387, 417-18 (EAB 1997). Similarly, the Board will uphold a permitting authority's exercise of discretion if that decision is cogently explained and supported in the record. *See, e.g.*, *La Paloma Energy Ctr.*, 16 E.A.D. at 270, 284, 292. The Board does not find clear error or an abuse of discretion simply because petitioner presents a difference of opinion or alternative theory regarding a matter. *See In re Town of Ashland Wastewater Treatment Facility*, 9 E.A.D. 661, 667 (EAB 2001); *In re NE Hub Partners, L.P.*, 7 E.A.D. 561, 567-68 (EAB 1998), *review denied sub nom. Penn Fuel Gas, Inc. v. EPA*, 185 F.3d 862 (3d Cir. 1999). And on matters that are fundamentally technical or scientific in nature, the Board typically defers to a permit issuer's technical expertise and experience, as long as the permit issuer has adequately explained its rationale and supported its reasoning in the administrative record. *See, e.g.*, *In re FutureGen Indus. All., Inc.*, 16 E.A.D. 717, 733-35 (EAB 2015), *review dismissed as moot sub nom. DJL Farm LLC v. EPA*, 813 F.3d 1048 (7th Cir. 2016).

III. *STATUTORY AND REGULATORY HISTORY*

The PSD provisions of the Clean Air Act govern air pollution both in "attainment" areas, where the air quality meets or is cleaner than the Environmental Protection Agency's ("EPA") national ambient air quality standards, and in "unclassifiable" areas where EPA has not categorized the air quality as having attainment or nonattainment status. Clean Air Act ("CAA") §§ 160-169, 42 U.S.C. §§ 7470-7479; *see also In re Palmdale Energy, LLC*, PSD Appeal No. 18-01, slip op. at 4-7 (EAB Oct. 23, 2018), 17 E.A.D. ___ (providing in-depth description of the PSD program). In both these areas, the PSD program requires that new "major stationary sources" of air pollutants or "major modifications" to such sources obtain a permit prior to construction.[1] *See* CAA § 165, 42 U.S.C. § 7475; 40 C.F.R.

[1] The actual term in the PSD statutory provisions is "major emitting facility." *See* CAA § 169(1), (2)(C), 42 U.S.C. § 7479(1), (2)(C). The related term "major stationary source" is used elsewhere in the Clean Air Act, *see* CAA § 111(a), (f), 40 U.S.C. § 7411(a),

§ 52.21. Among other things, an applicant for a PSD permit must show that its facility will achieve emission limits attainable by the "best available control technology" for pollutants emitted from the facility above designated levels. CAA § 165(a)(4), 42 U.S.C. § 7475(a)(4); 40 C.F.R. § 52.21(b)(23), (j)(2)-(3).

Under the regulations implementing the PSD program, a "major stationary source" is, among other things, any source from certain source categories (including fossil fuel-fired steam electric power plants such as the facility here) that have the "potential to emit" 100 tons per year or more of any of several regulated pollutants, including NO_x.[2] 40 C.F.R. § 52.21(b)(1)(i). A "major modification" is "any physical change in or change in the method of operation of a major stationary source" that would result in: (1) a "significant emissions increase" of any of such pollutants; and (2) a "significant net emissions increase" of any of such pollutants. *Id.* § 52.21(b)(2)(i). The regulations define a significant emissions increase and significant net emissions increase on a pollutant-by-pollutant basis. *Id.* § 52.21(b)(23), (40). For NO_x, a significant increase and a significant net increase are both defined as an increase of 40 tons per year. *Id.*

A critical aspect of determining whether a new source or the modification of a source would be a major source or major modification, respectively, is ascertaining the new source or modification's "potential to emit" pollutants and whether that potential meets or exceeds designated levels. "Potential to emit" has been defined by regulation as requiring consideration of "[a]ny physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment." *Id.* § 52.21(b)(4). However, the definition makes clear that a pollution control device's limitation on capacity can only be considered in determining a facility's potential to emit "if the limitation or the effect it would have on emissions is federally enforceable." *Id.*

(f). The Act recognizes the similarity between the two terms by defining "major stationary source" and "major emitting facility" as synonymous "[e]xcept as otherwise expressly provided." CAA § 302(j), 42 U.S.C. § 7602(j); *see Chevron, U.S.A., Inc. v. NRDC, Inc.*, 467 U.S. 837, 860 (1984). In implementing the PSD program, EPA uses the terms "major stationary source" and "major modification," 40 C.F.R. § 52.21(b)(1), (2), and, therefore, the Board will use that terminology as well. *See* U.S. EPA, *New Source Review Workshop Manual*, at A.1 (draft Oct. 1990).

[2] The applicable regulation defines these pollutants as including "[a]ny pollutant for which a national ambient air quality standard has been promulgated." 40 C.F.R. § 50.21(b)(50)(i).

Whether a physical or operational limitation on a source's emissions is "federally enforceable" has been interpreted by EPA as meaning that the emission limit reflecting the physical or operational limitation is "enforceable as a practical matter," or "practically enforceable." Memorandum from John S. Seitz, Dir., Office of Air Quality Planning & Standards, U.S. EPA, and Robert I. Van Heuvelen, Dir., Office of Regulatory Enf't, U.S. EPA, to EPA Reg'l Air Div. Dirs., Options for Limiting the Potential to Emit (PTE) of a Stationary Source Under Section 112 and Title V of the Clean Air Act 3 & attach. 3, at 1 (Jan. 25, 1995) ("Seitz Memorandum"); *see also In re Peabody W. Coal Co.*, 12 E.A.D. 22, 32 (EAB 2005). To be practically enforceable, a permit must, among other things, specify "the method to determine compliance including appropriate monitoring, recordkeeping, and reporting." Seitz Memorandum at 6; *cf.* 40 C.F.R. § 49.152 (defining "enforceable as a practical matter" in a similar manner for air quality planning and management in Indian country). To be appropriate, such monitoring, recordkeeping, and reporting must be sufficient to allow a permitting agency to verify a source's compliance with the permit's emission limit. *See In re Shell Offshore, Inc.*, 15 E.A.D. 536, 557, 559 n.25 (EAB 2012) (holding that the permit issuer did not clearly err in concluding that emission limits were practically enforceable because the permit's monitoring requirements provided "the ability to assess and verify compliance"); *Peabody*, 12 E.A.D. at 39-41 (finding no clear error by the permit issuer in determining that the permittee's proposed monitoring requirements were insufficient to make an emission limit practically enforceable because the requirements did not provide "a reliable method of determining compliance"); *In re Pencor-Masada Oxynol, LLC*, Pet. No. II-2001-05, 2002 EPA CAA Title V LEXIS 44, at *16 (Adm'r Apr. 8, 2002) (stating that for an emission limit to be practically enforceable, the permit must contain terms and conditions sufficient "to determine whether the limit has been exceeded").

Pima County's Department of Environmental Quality administers the federal PSD permitting program within Pima County, Arizona pursuant to a delegation from EPA. *See* Agreement for Delegation of Source Review under the Federal Prevention of Significant Deterioration (PSD) Program Set Forth in 40 CFR 52.21 by the United States Environmental Protection Agency, Region 9 to the Pima County Air Quality Control District (June 5, 2018). Accordingly, the Tucson Electric Permit is a federally-issued permit appealable to the Board under section 124.19 of Title 40 of the Code of Federal Regulations. 40 C.F.R. § 124.19(a)(1).

IV. *FACTUAL AND PROCEDURAL HISTORY*

A. *Tucson Electric's Proposed Expansion of the Irvington Generating Station Facility*

Tucson Electric is proposing to expand its fossil fuel-fired steam electric power plant, known as the Irvington Generating Station, by building up to ten new internal combustion engine units ("Units"). Pima Cty. Dep't of Envtl. Quality, *Prevention of Significant Deterioration Air Quality Permit, Permit No. 1052*, at 4 (Aug. 8, 2018) (Administrative Record ("A.R.") 23) ("Permit"). Tucson Electric plans to use these new Units to support increased use of wind and solar-generated electrical power sources. The new Units can compensate for the variability of wind and solar power sources by providing "[r]eliable, efficient, grid-balancing resources which can ramp up quickly and provide 100 percent of their [effective load carrying capability] during multiple peak periods of any length." Tucson Elec. Power, *Application for a Prevention of Significant Deterioration (PSD) Authorization and Significant Revision to Class I Air Quality Permit for Irvington Generating Station* 2-2, 2-5 (July 2017) (A.R. 2) ("Permit Application").

The Irvington Generating Station is a major stationary source subject to the Clean Air Act's PSD program and is in an area designated by EPA as in attainment. Permit at 4. Because the proposed addition of ten new Units would significantly increase potential emissions of several regulated pollutants, this expansion of the facility qualifies as a major modification and triggers PSD requirements. *Id.* Accordingly, Tucson Electric applied to Pima County to amend its existing air quality permit (referred to as a Class I permit) and convert it to a combined PSD permit and Class I permit.[3]

The modified facility would have triggered PSD requirements for its NO_x emissions; however, Tucson Electric requested a limit on NO_x emissions – referred to by the parties as a NO_x emissions cap – for the new Units to keep their emissions below the PSD threshold.[4] *See* Letter from Conrad Spencer, Tucson Elec. Power,

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[3] The Class I permit was required to allow construction and operation of the original facility under the Arizona Administrative Code, *see* Ariz. Admin. Code § R18-2-302, which implements Arizona's operating permits program, authorized by EPA under Title V of the Clean Air Act, 42 U.S.C. §§ 7661-7661f. *See* Clean Air Act Full Approval of the Arizona Operating Permits Program, 66 Fed. Reg. 63,175 (Dec. 5, 2001) (final rule fully approving Arizona's operating permits program).

[4] In the Administrative Record, the limitation on NO_x emissions is described interchangeably as a "cap" and a "limit." *See, e.g.*, Permit at Part B § II.A.1. For clarity

to Rupesh Patel, Pima Cty. Dep't of Envtl. Prot. (Feb. 23, 2018) (A.R. 13) (requesting NO_x emissions cap of 170 tons per year). Tucson Electric also identified in its permit application three other aspects of the modified facility that would curtail NO_x emissions from the new Units or the overall facility. First, each new Unit would be equipped with a selective catalytic reduction device that would substantially reduce NO_x emissions. *See* Permit Application at 2-6, 3-3. Second, the Units would be limited to five startups per day. *See id.* at 2-6. Third, two existing steam-generating units at the facility would be permanently shut down offsetting, in part, the increase in NO_x emissions from the addition of the ten new Units. *See id.* at 2-5, 4-9. In combination, these terms of operation would limit the net increase in NO_x emissions from the expansion of the Irvington facility to an amount that is below the "significant" level of 40 tons per year.[5] Permit at 4.

We describe below: (i) the terms of the proposed combined PSD and Class I permit ("Proposed Permit") noticed for public comment with a focus on the compliance monitoring requirements pertaining to the NO_x emissions cap, *see* Part IV.B; and (ii) Sierra Club's comments on the Proposed Permit and Pima County's response to those comments, *see* Part IV.C.

B. *The Proposed Permit's Requirements Concerning the NO_x Emissions Cap*

In February 2018, Pima County issued the Proposed Permit for public comment. The Proposed Permit included the conditions necessary to restrict NO_x emissions below the level triggering PSD requirements – requiring use of selective catalytic reduction devices on each new Unit, limiting startups of the new Units to five per day, retiring two existing steam-generating units, and a 170 tons per year NO_x emissions cap – and imposed requirements to verify compliance with the NO_x

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and consistency, the Board will use the term "cap" to refer to the limitation on NO_x emissions.

[5] The to-be-eliminated steam units emit approximately 140 tons per year of NO_x. Thus, the replacement of these units with the ten new Units (limited to a combined total of 170 tons per year of NO_x) would result in a net legally-allowed increase of NO_x of approximately 30 tons per year. *See* Pima Cty. Dep't of Envtl. Quality, *Responses to Public Comments* 7 (Aug. 8, 2018) (A.R. 22) ("RTC"). Further, Pima County estimated that the ten Units would emit 152.8 tons per year of NO_x – i.e., less than the 170 tons per year cap – based on the manufacturer's specifications on NO_x emissions from the Units with selective catalytic reduction devices and assuming five startups per day, the maximum allowed under the Permit. Pima Cty. Dep't of Envtl. Quality, *Technical Support Document* attach. B at 2 tbl.B-2 (Aug. 2018) (A.R. 24).

emissions cap. Pima Cty. Dep't of Envtl. Quality, *Proposed Prevention of Significant Deterioration Air Quality Permit, Permit No. 1052*, at 4 & Part B § V.E (Feb. 9, 2018) (A.R. 12.1) ("Proposed Permit").

As to the verification of compliance, the Proposed Permit specified that "[c]ompliance with the NO_x emission [cap] shall be demonstrated by performance tests as detailed in Condition II.D, monitoring as detailed in Condition II.B, and recordkeeping as detailed in Condition II.C." *Id.* at Part B § II.A.1.b. The performance tests, monitoring, and recordkeeping required for compliance are described further below.

First, the Proposed Permit called for performance tests – also referred to as "stack tests" – for each of the new Units to be conducted "using the methods and procedures in 40 C.F.R. § 60.4244 and Table 2 of 40 C.F.R. part 60, subpart JJJJ." Proposed Permit at Part B § II.D.2.a. For NO_x emissions, these stack tests measure "the concentration of NO_x in the engine exhaust" during operation of the facility at periods other than at startup (i.e., non-startup operating periods). 40 C.F.R. § 60.4244(b), (d). Because the selective catalytic reduction devices must be operated "at all times while fuel is flowing to the [Unit], excluding periods of startup," stack tests reflect the impact the selective catalytic reduction devices have on NO_x emissions. *See* Proposed Permit at Part B § II.A.c.

In addition to the regulatory procedures for stack tests, the Proposed Permit specified that the tests "shall be performed at 25, 40, 70, and 100 percent of peak load" or at the minimum and peak load levels based on the prior twelve months of operation. *Id.* at Part B § II.D.2.b. As to the frequency of testing, each Unit must be tested "within 60 days after achieving the maximum production rate, but not later than 180 days after initial startup." *Id.* at Part B § II.D.1. Thereafter, each Unit must be subjected to a stack test "no less frequently than once in each period of two consecutive calendar years," but at least five of the Units must be tested each calendar year. *Id.* This means that each Unit will be tested at least once every two years.

Second, the Proposed Permit imposed several monitoring and recordkeeping requirements to verify continuing compliance with the NO_x emissions cap. These monitoring and recordkeeping requirements established a procedure for calculating monthly and yearly NO_x emissions and a program for ensuring that the selective catalytic reduction devices are operated properly at all times. *See id.* at Part B § II.C.

The Proposed Permit required the calculation of NO_x emissions on a monthly and yearly basis for non-startup and startup operating periods. For non-

startup operating periods, the Proposed Permit required that monthly NO_x emissions be calculated by combining information on NO_x emission rates measured in required stack tests with monitoring data on the operation of the Units. Specifically, the Proposed Permit required that Tucson Electric calculate a NO_x "emission factor" from the most recent stack test expressed in terms of pounds of NO_x emitted per the heat input measured in British thermal units ("BTUs") of natural gas used to power the Unit. *Id.* at Part B § II.D.2.c. Additionally, the Proposed Permit required Tucson Electric to monitor and record the hours of operation of each Unit and natural gas consumption in BTUs during operation. *Id.* at Part B § II.B.1. The Proposed Permit then directed that Tucson Electric calculate monthly NO_x emissions during non-startup operating periods on a Unit-by-Unit basis by multiplying each Unit's emission factor by the BTUs of heat input used by the Unit over the month during these operating periods. *Id.* at Part B § II.C.9.

For startup operating periods, the Proposed Permit required that monthly NO_x emissions be calculated by multiplying the number of startups per Unit in a month by the manufacturer-supplied NO_x rate of emissions for startup ("startup emission rate") of the Unit. *Id.* at Part B § II.C.9. To implement this requirement, the Proposed Permit specified that Tucson Electric monitor the number of startups for all Units and record the number and duration of all startups. *Id.* at Part B § II.B.2, II.C.1. Emission calculations for startup operating periods are then combined with emission calculations for non-startup operating periods to calculate total monthly emissions and a twelve-month (i.e., yearly) rolling average of NO_x emissions. *Id.* at Part B § II.C.9.

Lastly, the Proposed Permit imposed additional requirements as to the selective catalytic reduction devices to assure proper functioning of these devices. These monitoring and recordkeeping requirements included the following: (i) the devices must be maintained and operated in a manner consistent with good air pollution control practice for minimizing NOx emissions; (ii) the catalyst in the devices must be cleaned and replaced according to the manufacturer's recommendations; (iii) two key operating parameters of the devices – ammonia injection rate and temperature – must be monitored and recorded at least once every fifteen minutes; (iv) if ammonia injection to a device fails and cannot be restored in ten minutes, the Unit must be shut down; (v) records must be kept of any instance in which ammonia injection fails for more than two minutes; and (vi) the selective catalytic reduction devices must have a continuous NO_x process monitor (which measures NO_x concentration and adjusts ammonia injection levels to achieve desired NO_x reduction). Proposed Permit at Part B § II.A.1.c, II.B.3, II.C.4; *see* Hug Eng'g, *Operating Manual: Control Unit SNQ* 1 (v03.00 Mar. 6, 2013) (A.R. 12).

C. *Sierra Club's Comments on the Proposed Permit and Pima County's Response*

Sierra Club submitted comments on the Proposed Permit arguing, among other things, that the NO_x emissions cap is not "practically enforceable,"[6] and thus the cap cannot be considered a limitation on the facility's potential to emit NO_x. Sierra Club, *Intent to Approve: Proposed Revision to the existing Air Quality Permit No. 1052 to Tucson Electric Power (TEP) Irvington/H. Wilson Sundt Generating Station (IGS)* 8-9 & attach. at 20 (Mar. 29, 2018) (A.R. 21.2) ("Sierra Club Comments"). Sierra Club contended that absent a practically enforceable limitation on the facility's potential to emit NO_x, Pima County erred in concluding that PSD requirements are not applicable to NO_x emissions. In its comments and in an expert report attached to its comments, Sierra Club advanced three arguments as to why the NO_x emissions cap is not practically enforceable.

First, Sierra Club contended that the Proposed Permit's compliance monitoring for NO_x was inadequate because it relied on stack tests that could be performed as infrequently as every two years. *Id.* at 2, 9. Sierra Club argued that "using stack tests once every two years to determine whether the [Units] are in compliance with the permit is woefully inadequate." *Id.* The expert report attached to Sierra Club's comments asserted that stack tests "may not be representative for emissions during routine operations" because stack tests do not provide data on whether pollution control devices at a facility are functioning at an effective level at times other than when the stack test is performed. *Id.* attach. at 21-22 & n.59 (citing to EPA comment letters on state permits that raise this concern as a reason to require additional compliance monitoring to supplement annual stack tests). The solution, according to the expert report, would be to require Continuous Emissions Monitors. *Id.* attach. at 23. The report argued that without Continuous Emissions Monitors, "community members will not be able to protect themselves against harmful emissions and local, state, and federal regulatory agencies cannot detect and cure violations of permit conditions." *Id.*

Second, Sierra Club argued that the NO_x emissions cap is not practically enforceable because the Permit does not contain an "unambiguous methodology for calculating NO_x emissions from the emission [stack] test." *Id.* attach. at 25; *see*

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[6] Sierra Club uses the term "practicably enforceable" as well as "practically enforceable" in its Petition. *See, e.g.*, Petition for Review of Prevention of Significant Deterioration Permit 1, 6 (Sept. 7, 2018) ("Pet."). But as we see no difference between the two (and Sierra Club does not assert that there is), the Board will use the term "practically enforceable" for clarity and consistency.

also id. at 2, 9. Sierra Club requested that the Proposed Permit "be revised to include an equation that lays out the emission calculation in detail." *Id.* attach. at 25.

Third, Sierra Club asserted that there was no record support for a manufacturer-supplied NO_x emission rate during startup, which was to be used to calculate emissions during startup operating periods. *Id.* at 2, 9 & attach. at 25. Although the Proposed Permit referred to the NO_x startup emission rate as "guaranteed," Sierra Club noted that there was no manufacturer guarantee provided for a startup NO_x emission rate included in an attachment to the draft Technical Support Document. *Id.* attach. at 25.

In August 2018, Pima County issued the Permit and its response to the public comments ("Response to Comments") received on the Proposed Permit, including its response to each of Sierra Club's comments on whether the NO_x emissions cap is practically enforceable.

As to Sierra Club's comment about the adequacy of stack tests for determining continuing compliance with the NO_x emissions cap, Pima County acknowledged that "EPA has indicated * * * that annual [stack] tests alone are insufficient to assure compliance with emission limits." Pima Cty. Dep't of Envtl. Quality, *Responses to Public Comments* 10 (Aug. 8, 2018) (A.R. 22) ("RTC"). However, Pima County explained that the Permit does not rely solely on the results of stack tests to determine compliance. *Id.* Pima County detailed how monthly and yearly NO_x emissions would be calculated using conservative non-startup emission factors and a similarly conservative startup emission rate and how monitoring of the selective catalytic reduction devices would assure that these control devices function properly at all times. *Id.* at 10-13.

In response to the request for an unambiguous methodology in calculating NO_x emissions, Pima County revised the Permit to include "a more detailed compliance determination methodology, expressed in the form of an equation." *Id.* at 13. Pima County noted that "[t]his methodology clearly indicates the emission factors and monitored data that will be used when calculating total NO_x emissions from the engines." *Id.*; *compare* Proposed Permit at Part B § II.C.9 *with* Permit at Part B § II.C.9.

Finally, to address the concern with the manufacturer-supplied startup emission rates, Pima County clarified that it had meant to reference the manufacturer-specified, not manufacturer-guaranteed, startup emission rates, and it amended the Permit accordingly. RTC at 12; *see* Permit at Part B § II.C.9. Further, Pima County admitted it had not included the latest manufacturer data in the

administrative record and explained that it had corrected this error by obtaining a waiver of the manufacturer's confidentiality claim concerning this information and included the information on its website. RTC at 4, 12.

This appeal followed.

V. *ANALYSIS*

In its Petition for Review, Sierra Club renews its challenge to Pima County's determination that the Permit's inclusion of a NO_x emissions cap prevents the addition of the ten new Units to Tucson Electric's Irvington facility from triggering PSD requirements for NO_x emissions. The sole issue that Sierra Club raises on appeal is whether the NO_x emissions cap is practically enforceable.

Specifically, Sierra Club argues (as it did in its comments) that biennial stack tests – used to develop each Unit's emission factor for calculating non-startup operating period emissions – are too infrequent to verify compliance with the NO_x emissions cap. Petition for Review of Prevention of Significant Deterioration Permit 5, 7 (Sept. 7, 2018) ("Pet."). Sierra Club further contends that reliance on biennial stack testing is not cured by the Permit's compliance monitoring requirements for the selective catalytic reduction devices or by Pima County's assertion that the emission factors for non-startup operating periods are required to be calculated in a conservative fashion. *Id.* at 12, 16 n.37. In a related vein, Sierra Club also asserts that Pima County's response to its comments was inadequate because Pima County did not "show that the permit relies on sufficient monitoring data to assure accurate and continuous monthly compliance with the NO_x cap." *Id.* at 12.

Mirroring its response to Sierra Club's comments, Pima County defends the practical enforceability of the NO_x emissions cap in its Response to the Petition by emphasizing the interconnected relationship of the entire suite of the Permit's compliance monitoring requirements. Pima County's Response to Sierra Club's Petition for Review 15, 17-19 (Oct. 1, 2018) ("Pima County Resp."); *see also* Response of Permittee Tucson Electric Power to Petition for Review 10-15 (Sept. 28, 2018) ("Tucson Electric Resp.").[7] Pima County does not claim that biennial

[7] Additionally, Tucson Electric contends that the Petition should be summarily dismissed because the question of whether a permit's compliance monitoring requirements are sufficient to ensure the practical enforceability of an emissions cap is not a "novel issue," as the Board and the Administrator have upheld substantially similar challenges to the practical enforceability of an emissions cap in *In re Shell Offshore, Inc.*, 15 E.A.D. 536,

stack testing is sufficient to make the NO_x emissions cap practically enforceable. Pima County Resp. at 16. Nor do we read Pima County's Response to Comments or its Response to the Petition as contending that biennial stack testing combined with monthly and yearly emission calculations based on that testing would *alone* provide adequate compliance monitoring requirements for the expansion of the Irvington facility. *Id.* Rather, Pima County argues that the NO_x emissions cap is practically enforceable based on how the biennial stack testing and the monthly and yearly emission calculations requirements are complemented by: (i) the requirements pertaining to the use, operation, and monitoring of the selective catalytic reduction devices; and (ii) the Permit's conservative methodology for calculating emission factors. *Id.* at 15-19; *see also* Tucson Electric Resp. at 11-15.

Given the Permit's compliance monitoring requirements and Pima County's justification for the practical enforceability of the NO_x emissions cap, the issues before us are narrower than stated by Sierra Club. Sierra Club's objections to the adequacy of the biennial stack tests and stack test-derived emission factors are not responsive to the actual compliance monitoring requirements in this Permit – which include more than stack tests and stack-test derived emission factors – and Pima County's explanation of how compliance with the Permit's NO_x emissions cap will be verified.[8] Thus, we need not determine whether biennial stack tests and use of

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546-67 (EAB 2012), and *In re Pope & Talbot, Inc., Lumber Mill*, Pet. No. VIII-2006-04, 2007 EPA CAA Title V LEXIS 3, at *12-13 (Adm'r Mar. 22, 2007). Tucson Electric Resp. at 7. We reject this argument. The Board's two main decisions involving a similar issue, *Shell Offshore* and *Peabody*, 12 E.A.D. at 34-47, as well as the Administrator's decision in *Pope & Talbot*, turned on a fact-based analysis of the permit in question, the nature of the facility, and the claims of the petitioner. They do not stand for the proposition that any permit using emission factors and monitoring of control devices to verify compliance with an emissions cap can be summarily affirmed as sufficient to ensure the practical enforceability of that cap.

[8] At times, several of Sierra Club's statements in its Petition and its comments appear to question the adequacy of the regulatorily-established requirements for conducting performance (stack) tests in subpart JJJJ, 40 C.F.R. § 60.4244, to determine the compliance of internal combustion engines with NO_x emission limitations. *See* Pet. at 11 (arguing that stack tests provide inadequate emissions compliance data due to the shortness of the tests and because they are conducted under ideal, prearranged conditions); Sierra Club Comments attach. at 21-22 & n.59 (same). To the extent Sierra Club intends this Petition to be a challenge to the requirements for tests in subpart JJJJ, 40 C.F.R. § 60.4244, that question is not properly before the Board because challenges to Clean Air Act regulations must be brought in the U.S. Court of Appeals, District of Columbia Circuit, within 60 days of promulgation. 42 U.S.C. § 7607(b). Moreover, the Board does not

emission factors based on those biennial stack tests to project monthly and yearly emissions – standing alone – would be sufficient to verify compliance with the NO_x emissions cap. What remains at issue, however, are Sierra Club's challenges to: (i) Pima County's reliance on two aspects of the Permit's compliance monitoring requirements – monitoring of the selective catalytic reduction devices and the conservative methodology for calculating emission factors for non-startup operating periods – to ensure the NO_x emissions cap is practically enforceable; and (ii) the adequacy of Pima County's response to Sierra Club's comments on the practical enforceability of the NO_x emissions cap. We address these contentions in turn below.

A. *Sierra Club's Challenges to the Permit's Compliance Monitoring Requirements*

1. *Sierra Club Fails to Show Clear Error in Pima County's Reliance on Monitoring of the Selective Catalytic Reduction Devices to Ensure the NO_x Emissions Cap is Practically Enforceable*

As discussed, the Permit's compliance monitoring requirements have two main components in addition to stack tests. The first component involves calculating monthly and yearly NO_x emissions for each Unit during non-startup and startup operating periods. NO_x emissions for non-startup periods are based on NO_x emission factors derived from stack tests conducted every two years and for startup periods are based on manufacturer data. The second component is monitoring of the selective catalytic reduction devices.

In its Petition, Sierra Club contends that the monitoring requirements for the selective catalytic reduction devices do not cure the problem with the Permit's reliance on stack tests and stack test-derived emission factors because the monitoring does not produce data to be "included in the formula to establish the NO_x emission factor." Pet. at 12. To the extent Sierra Club is challenging Pima County's conclusion that the monitoring requirements for the selective catalytic reduction devices are, in combination with the Permit's other monitoring requirements, adequate to ensure the NO_x emissions cap is practically enforceable, this argument is raised for the first time in Sierra Club's Petition. As a result, it has not been preserved for Board review. The regulations governing Board review of

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review EPA regulations as part of permit appeals. *See In re FutureGen Indus. All., Inc.*, 16 E.A.D. 717, 724 (EAB 2015) (the Board "is not the appropriate forum" for raising dissatisfaction with an EPA regulation); *In re Tondu Energy Co.*, 9 E.A.D. 710, 715-16 (EAB 2001) ("As we have repeatedly stated, permit appeals are not appropriate fora for challenging Agency regulations.").

permit appeals, require that the party seeking review establish "that each issue being raised in the petition was raised during the public comment period (including any public hearing)," or demonstrate that the issue was not "reasonably ascertainable" at that time. 40 C.F.R. § 124.13, 19(a)(4)(ii); *see, e.g.*, *In re Seneca Res. Corp.*, 16 E.A.D. 411, 415 (EAD 2014). As the Board has previously explained, "[t]he effective, efficient and predictable administration of the permitting process demands that the permit issuer be given the opportunity to address potential problems with draft permits before they become final." *In re Encogen Cogeneration Facility*, 8 E.A.D. 244, 250 (EAB 1999). This is a particularly important requirement as to technical issues such as the adequacy of the compliance monitoring requirements presented here because "the locus of responsibility for important technical decisionmaking rests primarily with the permitting authority, which has the relevant specialized expertise and experience." *Peabody*, 12 E.A.D. at 33.

Although Sierra Club did challenge the practical enforceability of the NO_x emissions cap in its comments, Sierra Club did not include as part of that challenge any critique of the role that the monitoring requirements for the selective catalytic reduction devices play. In fact, Sierra Club's comments never even mentioned the Permit's monitoring requirements for the selective catalytic reduction devices.

The section in Sierra Club's comments addressing practical enforceability of the NO_x emissions cap contains four paragraphs: (1) two paragraphs describing in general terms the legal requirement for practically enforceable emission limits; (2) one paragraph arguing that the Permit contained nothing more than a "[b]lanket" emission limitation, which was not practically enforceable; and (3) a final paragraph raising the frequency of stack tests and two other unrelated concerns with practical enforceability of the NO_x emissions cap. Sierra Club Comments at 8-9. The two other concerns were described in that final paragraph as follows:

> [Sierra Club's] expert comments detail at length the enforceability issues with the proposed permit. Specifically, using stack tests once every two years to determine whether the [Units] are in compliance with the permit is woefully inadequate. *The permit does not contain an unambiguous methodology for demonstrating compliance with the annual NO_x emission cap, and there is no support for the applicant's "vendor-guaranteed" NO_x rate that is used to demonstrate compliance.*

Id. at 9 (emphasis added) (footnote omitted). While Sierra Club's expert report, which was attached to its comments, expanded on the concerns raised with stack

tests, the methodology issue as to emission factors, and the manufacturer data on NO_x emissions during startup, that report did not raise concerns with or otherwise discuss the Permit's monitoring requirements for the selective catalytic reduction devices. *See Id.* attach. at 20-25.

Sierra Club cannot claim that Pima County did not provide notice of the role that monitoring of the selective catalytic reduction devices plays in verifying compliance with the NO_x emissions cap. On its face, the Proposed Permit expressly stated that its requirements for monitoring of selective catalytic reduction devices are an element bearing on verifying compliance with the NO_x emissions cap. Condition II.A.1.b of the Proposed Permit provided that "[c]ompliance with the NO_x emission limit shall be demonstrated by performance [i.e. stack] tests as detailed in Condition II.D, monitoring as detailed in Condition II.B, and recordkeeping as detailed in Conditions II.C." Proposed Permit at Part B § II.A.1.b. And Conditions II.B and II.C on monitoring and recordkeeping, as well as Condition II.A addressing emission limitations, contain multiple requirements pertaining to monitoring of the selective catalytic reduction devices in addition to requirements as to stack tests and calculation of monthly and yearly emissions. *See id.* at Part B § II.A.1 (setting the 170 tons per year NO_x emission limit, requiring installation of selective catalytic reduction devices with continuous NO_x process monitors, and imposing operating requirements on such devices); *id.* at Part B § II.B (requiring monitoring of fuel consumption and startups of the new Units and monitoring of operating parameters – ammonia injection rate and temperature – for selective catalytic reduction devices); *id.* at Part B § II.C (requiring records be kept of the monitoring of fuel consumption, of startups of the engines, and of the operating parameters of the selective catalytic reduction devices; and specifying that monthly and yearly NO_x emissions must be calculated). Thus, the Permit's reliance on monitoring of the selective catalytic reduction devices as a key part of determining compliance with the NO_x emissions cap was reasonably ascertainable at the time of the comment period. Any challenge to the way in which the monitoring of the selective catalytic reduction devices functioned in verifying compliance with the NO_x emissions cap should have been presented to the permit issuer in the first instance.

In any event, even if Sierra Club's challenge to Pima County's reliance on the monitoring of the selective catalytic reduction devices to verify compliance with the NO_x emissions cap was preserved for Board review, Sierra Club's specific challenge (the monitoring results are not "included in the formula to establish the 'NO_x emission factor'") reflects a misunderstanding of how the Permit works. *See* Pet. at 12. In response to Sierra Club's general argument about the lack of practical enforceability of the NO_x emissions cap through reliance on biennial stack tests,

Pima County explained that it was not relying solely on stack tests to verify compliance. In addition to the required stack tests, Pima County pointed to the Permit's requirements to calculate monthly and yearly NO_x emissions and the monitoring of the selective catalytic reduction devices. RTC at 10-13. As to the latter, Pima County explained that monitoring of the selective catalytic reduction devices would assure that the devices were functioning properly "at all times." *Id.* at 10. Pima County's intent was not to obtain data from this monitoring to adjust the emission factors. Instead, the data are required to make sure the selective catalytic reduction devices are working properly at all times. Thus, Sierra Club's argument in its Petition is not responsive to the role of monitoring of the selective catalytic reduction devices as described by Pima County.

2. *Sierra Club Fails to Show Clear Error in Pima County's Determination that the Non-Startup Emission Factors Are Conservative*

In a footnote to its Petition, Sierra Club also takes issue with Pima County's assertion that the methodology for calculating emission factors for non-startup operating periods is conservative. Pet. at 16 n.37. Under Board case law, a determination such as this one by Pima County "requires the sort of quintessential technical expertise the permit issuer possesses." *In re Shell Offshore, Inc.*, 15 E.A.D. 536, 558 (EAB 2012) (upholding a permit issuer's choice of emission factors in a challenge to the practical enforceability of an emissions cap limiting a facility's potential to emit). Sierra Club has not met the "particularly heavy burden" it bears on this technical question. *See Peabody*, 12 E.A.D. at 41.

Sierra Club disputes that calculating non-startup emission factors from the highest emission rate produced during required stack tests will, as Pima County claims, result in an emission factor that "over-calculat[es]" NO_x emissions. Pet. at 16, n.37. Sierra Club maintains that there is no support in the record for this conclusion and no specific calculation of the quantitative extent of the over-calculation. We find no merit in Sierra Club's argument.[9]

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[9] Sierra Club's argument here also appears for the first time in its Petition. However, neither the Proposed Permit nor draft Technical Support Document explained that the conservative nature of the methodology for calculating non-startup emission factors was a consideration bearing on the practical enforceability of the NO_x emissions cap. That explanation appears for the first time in the Response to Comments, RTC at 13, and thus Sierra Club's challenge to that rationale may be raised on appeal. *See In re Pio Pico Energy Ctr.*, 16 E.A.D.56, 102 (EAB 2013) (allowing consideration of an issue not

First, although Pima County does state at one point that the Permit's methodology for calculating emission factors based on stack tests will overstate actual emissions, the record as a whole suggests that Pima County did not design the procedure for establishing emission factors to overstate emissions by a specific quantitative amount but rather to guard against understating emissions. For example, Pima County introduced its emission factor methodology by explaining that "certain elements [of the methodology] * * * will inherently produce a conservative calculation of emissions (i.e., a tendency to over-calculate, rather than under-calculate, engine NO_x emissions)." RTC at 13. Nor does the record show that Pima County relied upon a specific quantitative degree of over-calculation in the emission factors to justify the practical enforceability of the NO_x emissions cap.

Second, the Permit's description of the methodology for establishing an emission factor for non-startup operating periods provides sufficient record support for Pima County's description of emission factors as conservative (i.e., likely to overstate emissions). The emission factor methodology requires Tucson Electric to identify the maximum NO_x emissions that will be emitted across the full range of load levels during non-startup operating periods. To do this, the Permit requires Tucson Electric to conduct each stack test across the full range of non-startup operating load levels. Permit at Part B § II.D.2.b. The methodology then requires that the emission factor be calculated using the maximum emission rate found in that test as the presumed emission rate whenever the engine is operating in non-startup conditions, irrespective of the load level at which it is operating. *Id.* at Part B § II.D.2.c. Given that the methodology requires that the highest measured emission rate from stack tests be used in the calculation of emission factors, it was reasonable for Pima County to conclude that this approach is a conservative one. Sierra Club's "bare assertion" to the contrary is not adequate to support the opposite conclusion. *See Shell Offshore*, 15 E.A.D. at 561 n.28 (the Board refuses to rely on a petitioner's "bare assertion" that stack tests supporting emission factors were too infrequent).[10]

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raised in a public comment "where the permit issuer's reasoning on an issue was not clearly ascertainable from the record at the draft permit stage").

[10] Additionally, Sierra Club ignores that the methodology for calculating emissions during startup operating periods is also designed to conservatively calculate emissions. NO_x emissions differ significantly between "cold" or "warm" startups with cold startups generating approximately three times the NO_x emissions as warm startups. Letter from Conrad Spencer, Tucson Elec. Power, to Rupesh Patel, Pima Cty. Dep't of Envtl. Prot. 6 (Sept. 21, 2017) (A.R. 6) (finding that a cold startup emits 10.3 pounds of NO_x compared

For all the above reasons, Sierra Club fails to substantiate its claim that the record does not support Pima County's determination that the emission factor methodology is likely to overstate, not understate, actual emissions.

3. *Conclusion*

Sierra Club failed to preserve for Board review its ability to challenge Pima County's reliance on monitoring of the selective catalytic reduction devices as a component of the Permit's compliance monitoring program. Sierra Club further did not substantiate its challenge to either the adequacy of that monitoring or the conservative emission factor methodology. Accordingly, the Board concludes that Sierra Club has not carried its burden to show that Pima County clearly erred in its determination that the Permit's NO_x emissions cap is practically enforceable.

B. *Sierra Club Fails to Show Pima County Clearly Erred in Responding to Sierra Club's Comments*

Sierra Club asserts that Pima County's "responses to Sierra Club's comments were inadequate." Pet. at 12. In support of that contention, Sierra Club argues that Pima County did not "otherwise show that the permit relies on sufficient monitoring data to assure accurate and continuous monthly compliance with the NO_x cap," and "did nothing to address the fact that the NO_x cap remains practically unenforceable." *Id.*

The adequacy of a permit issuer's response to comments must be evaluated in the context of the content, specificity, and precision of the submitted comments. The Board has held that "parties submitting comments on draft permits must present their concerns with sufficient precision and specificity to apprise the permitting authorities of the significant issues so that the permit issuer can make timely and appropriate adjustments to its permit determination, or, if no adjustments are made, can explain why none are necessary in its response to comments." *In re Pio Pico Energy Ctr.*, 16 E.A.D. 56, 85 (EAB 2013). Where a comment lacks specificity and precision, the permit issuer's obligation to respond is similarly tempered. It is well settled that "permit issuers need not guess the meaning behind imprecise comments and are under no obligation to speculate about possible concerns that were not articulated in the comments." *In re Scituate Wastewater*

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to a warm startup that emits 3.5 pounds). Nonetheless, the methodology for calculating emissions during startup requires Tucson Electric to assume that all startups are cold startups. Permit at Part B II.C.9.

Treatment Plant, 12 E.A.D. 708, 723 (EAB 2006) (quotations and citations omitted).

Sierra Club's comments on practical enforceability of the NO_x emissions cap focused on the adequacy of biennial stack testing as a form of compliance monitoring and were very general in nature.[11] In its comments, Sierra Club merely stated that "using stack tests once every two years to determine whether the [Units] are in compliance with the permit is woefully inadequate." Sierra Club Comments at 9. The expert report attached to Sierra Club's comments added some detail but not much more. *See id.* attach. at 20-25. The report explained that infrequent stack tests may not be representative of "routine operations" and noted that "EPA itself has stated that annual stack tests are not sufficient to assure compliance with emissions limits." *Id.* attach. at 21-22. The information cited to support this assertion showed that EPA was concerned that annual stack tests may not be adequate to demonstrate compliance throughout the remainder of the year, particularly where the proper functioning of pollution control technology is necessary for the source to meet applicable requirements. *Id.* attach. at 21 n.59. Instead of stack testing, Sierra Club's expert report recommended that the Permit require Continuous Emissions Monitors. *Id.* attach. at 23.

Pima County responded to these comments by first acknowledging that annual stack tests "are insufficient to assure compliance with emission limits." RTC at 10. Pima County then provided a detailed explanation of what other requirements it had included in the Permit to assure sufficient compliance monitoring during all periods of operation. That lengthy explanation touched on the requirements for use of stack test-derived emission factors and manufacturer emission rates to calculate monthly and yearly NO_x emissions, the conservative nature of these emission factors and emission rates, and the required monitoring of the selective catalytic reduction devices. *Id.* at 10-13. This level of detail was more than an adequate response to Sierra Club's comment that the Permit's compliance

[11] As described in Part IV.B, Sierra Club also argued in its comments that the NO_x emissions cap was not practically enforceable because the Proposed Permit lacked a clear statement of the methodology for calculating NO_x emissions from emission factors and because Pima County had not included in the record the manufacturer data on startup emission rates that are required for calculating emissions during startup operating periods. Sierra Club Comments at 2, 9. In response, Pima County amended the Permit to include an equation for calculating NO_x emissions and included in the record the manufacturer data on startup emission rates. RTC at 4, 13. Sierra Club has not suggested these comment responses were inadequate.

monitoring was "woefully inadequate" and the expert report explanation that infrequent stack tests may not be representative of routine operations. As the Board has previously held, if "an issue is raised only generically during the public comment period, the permit issuer is not required to provide more than a generic justification for its decision, and the petitioners cannot raise more specific concerns for the first time on appeal." *Encogen*, 8 E.A.D. at 251 n.12; *see In re Knauf Fiber Glass, GmbH*, 8 E.A.D. 121, 146-47 (EAB 1999) (where commenter submitted comments challenging representativeness of air quality data without supplying reasons, permit issuer's response that the data is conservative was adequate given the generic nature of the comment).

To the extent Sierra Club now raises concerns about any of the specifics of that response, we have addressed those claims in Part V.A, above. Sierra Club provides no further detail to support its claim of an inadequate response to comments. In fact, a substantial portion of Sierra Club's Petition is composed of block quotes from Pima County's explanation in the Response to Comments of its basis for concluding that the NO_x emissions cap is practically enforceable. *See* Pet. at 13-16. But as the Board's regulations make clear, when a permit issuer has addressed a petitioner's comments in the record, the petitioner must do more than insist that the permit issuer's response is incorrect, the petitioner "must * * * explain why the Regional Administrator's response to the comment was clearly erroneous or otherwise warrants review." 40 C.F.R. § 124.19(a)(4)(ii); *see In re Windfall Oil & Gas, Inc.*, 16 E.A.D. 769, 797-98 (EAB 2015) ("Simply disagreeing with the Region and repeating concerns [raised in public comments] in a petition for review * * * does not satisfy the regulatory requirement that petitioners confront the permit issuer's responses and explain why the responses were clearly erroneous."). Accordingly, the Board concludes that Sierra Club has not shown Pima County clearly erred in the manner in which it responded to Sierra Club's comments.

VI. *CONCLUSION*

For the reasons stated above, the Board denies Sierra Club's Petition for Review.

So ordered.

United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

AIR QUALITY CONSTRUCTION PERMIT

Permit Number: **2020-49WION-001**

Issue Date: September 9, 2020 Effective Date: September 9, 2020

In accordance with the provisions of the Clean Air Act and the Federal Minor New Source Review Program in Indian Country, 40 C.F.R. §§ 49.151 – 49.165,

Cintas Corporation

is authorized to construct and operate air emissions units and to conduct other air pollutant emitting activities in accordance with the permit conditions listed in this permit.

This source is authorized to construct in the following location:

Cintas Corporation – Green Bay
800 Isbell Street
Green Bay, WI 54303

Cintas Corporation – Green Bay is located on reservation lands held by the United States government in trust for the Oneida Tribe.

All terms and conditions of the permit are enforceable by the U.S. Environmental Protection Agency and citizens under the Clean Air Act.

Genevieve Damico, Chief
Air Permits Section
Air and Radiation Division
U.S. EPA, Region 5

Date

Abbreviations and Acronyms

BTU	British Thermal Unit
CAA	Clean Air Act
C.F.R	Code of Federal Regulations
CO	Carbon Monoxide
DSCF	Dry Standard Cubic Foot
DSCM	Dry Standard Cubic Meter
EPA	U.S. Environmental Protection Agency
g	gram
hr	Hour
lb	Pound
MMBTU	Millions of BTUs
NAAQS	National Ambient Air Quality Standards
NSPS	New Source Performance Standards
NO_x	Oxides of Nitrogen
PM	Particulate Matter
PM_{10}	PM less than or equal to 10 microns diameter
$PM_{2.5}$	PM less than or equal to 2.5 microns diameter
PTE	Potential to Emit
PSD	Prevention of Significant Deterioration
tpy	Tons per year
VOC	Volatile Organic Compound

Facility Cintas Corporation – Green Bay

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SECTION I FACILITY DESCRIPTION

(A) General Source Information

Owner: Cintas Corporation
27 Whitney Drive
Milford, OH 45150

Facility: Cintas Corporation – Green Bay
800 Isbell Street
Green Bay, WI 54303

County: Brown

Reservation: Oneida Tribe of Wisconsin

SIC Code: 7218, Commercial and Industrial Laundering Facility

NAICS Code: 812332, Industrial Launderers

This permit authorizes Cintas Corporation to take synthetic minor limits for VOC in order to convert from a Part 71 to a Part 49 source at the Cintas Corporation – Green Bay facility located within the exterior boundaries of the Oneida Tribe of Wisconsin. The facility launders (cleans and reconditions) soiled industrial towels, coveralls, uniforms, and other textiles for industrial customers.

The permit establishes federally enforceable potential to emit emission limits for the industrial laundering facility. The Permittee shall not process more than 28,950,000 pounds of soiled shop towels during any 12 consecutive-month period to avoid major source Prevention of Significant Deterioration review. This is an existing facility and no modification, expansion, or change in the method of operation is being taken in this permitting action.

(B) Emission Unit Description

(1) Boiler B01 – 10.46 MMBtu/hr

(2) Process P01 – Industrial Washers, Indoor-vented
   a. Industrial Washing Machine (#3)
   b. Industrial Washing Machine (#4)
   c. Industrial Washing Machine (#5)
   d. Industrial Washing Machine (#6)
   e. Industrial Washing Machine (Unimac #1)

(3) Process P02 – Industrial Washers, Stack-vented
   a. Industrial Washing Machine (Unimac #3)
   b. Industrial Washing Machine (Unimac #2)
   c. Industrial Washing Machine (#1)
   d. Industrial Washing Machine (#2)

(4) Process P03 – Industrial Dryers Burning Natural Gas
   a. Industrial Dryer (Wash Tech), 0.25 MMBtu/hr
   b. Industrial Dryer (Cissell #2), 0.25 MMBtu/hr
   c. Industrial Dryer (#3), 2.75 MMBtu/hr
   d. Industrial Dryer (#4), 2.75 MMBtu/hr
   e. Industrial Dryer (Jensen #1), 2.5 MMBtu/hr
   f. Industrial Dryer (Jensen #2), 2.5 MMBtu/hr

(5) Process P04 – Wastewater Pretreatment System

(6) Insignificant Emission Sources
   a. Steam Tunnel, 3.0 MMBtu/hr
   b. Miscellaneous Natural Gas Combustion Units, Combined 11.6 MMBtu/hr
      i. Space Heating
      ii. Water Heating

SECTION II UNIT-SPECIFIC REQUIREMENTS

(A) Emissions Limitations and Standards

The Permittee shall comply with the following requirements:

(1) The Permittee shall not exceed the following emission limits:

Pollutant	Limit	Time Period/Monitoring/Emission Unit
1. NO_x	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
2. CO	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
3. VOC	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
4. SO_2	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
5. PM	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
6. PM	0.23 grams/DSCM Or 0.1 grains/DSCF	3-hour average for natural gas-fired Boiler
7. PM	0.12 grams/DSCM or 0.05 grains/DSCF	3-hour average for natural gas-fired Industrial Dryers and process vents.
8. PM_{10}	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
9. $PM_{2.5}$	99 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
10. Single HAP	9.9 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.
11. Total HAPs	24.9 tpy	12-month rolling time period as calculated at the end of each calendar month for the facility.

(2) The Permittee shall not operate the facility to process more than 28,950,000 pounds of soiled shop towels per year based on a 12-month rolling time period as determined at the end of each calendar month.

(3) The permittee shall not dry or heat any soiled shop towels in any dryer unless they have first been washed in a washing machine included in Process P01 or Process P02.

(4) The Industrial Dryers may only be fired using natural gas.

(5) The Boiler may only be fired using natural gas.

(6) Lint filters or other particulate capture systems, installed as part of the equipment design, shall be operated at all times that each process is in operation.

(7) All emission units and associated equipment authorized by this permit, must be maintained in good working order and operated properly.

(8) Good Air Pollution Control Practices- At all times, including start-up, shut-down, and malfunction, the permittee shall maintain and operate all sources, including associated air pollution control equipment regulated by this permit in a manner consistent with good air pollution control practices for minimizing emissions. This includes, but is not limited to, operating emission units and the particulate matter control systems in accordance with the manufacturer's guidelines and following the instructions included in the owners' operations manual [40 CFR 49.125(d)(1) and (3)].

(B) Monitoring and Performance Testing [40 C.F.R. § 49.155(a)(3)]

(1) Monitoring

(a) The Permittee shall develop and follow guidelines and procedures for sorting and categorizing soiled materials to be washed and dried during industrial laundry operations. At minimum, these procedures shall document the method of classifying soiled materials as either soiled shop towels or non-VOC containing items.

(b) The Permittee shall develop and follow guidelines and procedures for sorting soiled shop towels to minimize fugitive VOC and HAP emissions in accordance with good work practices. Good work practices include, but are not limited to, storing soiled shop towels in covered containers prior to sorting or washing the towels.

(c) The facility shall sort, categorize, and weigh laundry by type (shop towel, other);

(d) The facility shall conduct daily visual inspections of the lint coup to ensure lint filters (screens) are installed and functioning properly;

(e) The Permittee shall calculate monthly VOC emissions using Equation 1:

(1) $E_M = U \times VOC_{ef} \div 2{,}000$

Where:

E_M is the total monthly VOC emissions from industrial laundry operations, in tons;
U is the total mass of soiled shop towels processed by the facility, in 1000 pounds;
VOC_{ef} is the VOC emission factor for soiled towels processed by the facility, in pounds of VOC per 1000 pounds of soiled shop towels, as applicable

(f) The permittee shall calculate the VOC emissions on a 12-month rolling period using Equation 2:

(2) $E_T = \sum_{i=1}^{12} E_{Mi}$

Where:
E_T is the total emissions of all VOCs during the previous 12 consecutive calendar months, in tons; and
E_{Mi} is the total VOC emissions during each of the previous 12 consecutive calendar months, in tons, as calculated using Equation 1.

(g) The permittee shall calculate monthly Federal HAP emissions using Equation 3:

(3) $E_i = U \times HAP_{ef} \div 2{,}000$

Where:
E_i is the monthly emissions of an individual HAP from industrial laundry operations, in tons;
U is the total mass of shop towels processed by the facility, in 1000 pounds; and
HAP_{ef} is the Federal HAP emission factor for soiled towels processed by the facility, in pounds of an individual HAP per 1000 pounds of soiled shop towels, as applicable.

(h) The permittee shall calculate monthly total of all Federal HAP emissions using Equation 4:

(4) $E_M = \sum_{i=1}^{n} E_i$

Where:
E_M is the monthly total of all federal HAP emissions from industrial laundry operations, in tons;
E_i is the monthly emissions of an individual federal HAP, calculated using Equation 3; and
n is the total number of federal HAPs emitted by the industrial laundry operations.

(i) The permittee shall calculate the emissions of total individual Federal HAP on a 12-month rolling period using Equation 5:

(5) $E_{Tl} = \sum_{i=1}^{12} EM_i$

Where:
E_{Tl} is the total emissions of an individual Federal HAP during the previous 12 consecutive months, in tons;
EM_i is the total of an individual Federal HAP during the previous 12 consecutive calendar months, in tons, as calculated using Equation 4.

(j) The permittee shall calculate the emissions of total Federal HAPs on a 12-month rolling period using Equation 6:

(6) $E_T = \sum_{i=1}^{12} EM_i$

Where:
E_T is the total emissions of all Federal HAPs during the previous 12 consecutive months, in tons;
EM_i is the total of all Federal HAP emissions during the previous 12 consecutive months, in tons, as calculated using Equation 4.

(k) The Permittee shall calculate the monthly and rolling 12-month NO_x, CO, SO_2, VOC, HAP, PM, PM_{10}, $PM_{2.5}$, and Lead emissions from all combustion units at the facility using AP-42 emission factors.

(l) The Permittee shall calculate the monthly and rolling 12-month NO_x, CO, SO_2, VOC, HAP, PM, PM_{10}, $PM_{2.5}$, and Lead emissions from all processes at the facility.

(2) Performance Testing

(a) Reference Test Methods. Upon request, the Permittee shall test for emissions of particulate matter, VOCs, and HAPs in accordance with the methods and procedures specified in Method 5 of 40 C.F.R. Part 60, Appendix A or an alternative method approved by the EPA.

(b) No less than 30 days prior to testing, the Permittee shall submit a complete test plan to the EPA. The EPA must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete test report of the test results to the EPA within 60 days following the last date of the test.

(c) Representative Testing Conditions. Performance tests shall be conducted under such conditions as the EPA shall specify to the facility operator based on representative performance of the affected facility. The permittee shall make available to the EPA such records as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

(d) Operating Conditions for Performance Testing. All performance tests shall be conducted at worst-case operating (non-malfunction) conditions for all emission units for each air pollutant.

(e) Failure to Demonstrate Compliance. Upon the EPA's written notice that the facility has failed to demonstrate compliance with an applicable emission limit, unless an alternative schedule is given in an applicable requirement or compliance document, the permittee shall:

(i) Conduct a retest within 30 days of receipt of the EPA written notice;
(ii) Submit to the EPA written notice of testing and submit a test plan for the retest; and
(iii) Submit a complete report of the results of the retest within 45 days after completion.

(C) Recordkeeping and Reporting [40 C.F.R. § 49.155(a)(4)]

(1) Recordkeeping

(a) The permittee shall maintain a file of all records required by this permit. The permittee shall retain all records required in this permit for at least 5 years. [40 C.F.R. § 49.155(a)(4)(ii)]

(b) The permittee shall retain records of all calibration and maintenance records, and copies of all reports required by the permit. The Permittee shall also maintain the following records of the monitoring required by this permit:

(i) Total weight of soiled towels processed by the facility per month sorted by category (shop towels, other) in 1,000 pounds;
(ii) Amount of natural gas used by the facility each month;
(iii) Total emissions of each individual Federal HAP emitted during each month, in tons;
(iv) Total emissions of each individual Federal HAP emitted during the previous 12 consecutive months, in tons;

(v) Total emissions of all Federal HAPs combined emitted during each month, in tons;
(vi) Total emissions of all Federal HAPs combined emitted during the previous 12 consecutive months, in tons;
(vii) Total emissions of NO_x, CO, SO_2, Lead, PM, PM_{10}, and $PM_{2.5}$ emitted during each month and the previous 12 consecutive months.
(viii) Documentation of the source and development of any Federal HAP emission factor used; and
(ix) Daily records of visual inspection of the lint coup and note the date when the lint coup collection fabric is replaced.

(2) Reporting

(a) Testing Notification. The Permittee shall submit notification of the proposed test date to EPA at least 30 days prior to the planned test date. The Permittee may submit the testing notification at the same time the test protocol is submitted. If there is a delay in conducting the scheduled performance test, the Permittee shall notify EPA as soon as possible, either by providing 7 days prior notice of the rescheduled date of the performance test or by arranging a rescheduled test date with EPA by mutual agreement.

(b) Test Protocol. The Permittee shall submit a test protocol to the EPA at least 30 days prior to testing. The test protocol shall contain, at a minimum, the following information:

(i) Name and address of the facility;
(ii) Emissions units to be tested;
(iii) Proposed operating conditions for each emissions unit to be tested;
(iv) Air pollution control equipment for each emission unit to be tested;
(v) Pollutants to be measured;
(vi) Proposed analytical techniques and test methods;
(vii) Emission points and sampling locations; and
(viii) Expected date of the test, if known.

(c) Test Reports. No later than 45 days following the completion of the initial or periodic performance tests required in Sections II(B)(2)(a) and (b) of this permit, the Permittee shall submit to EPA a written report of the test results obtained from the performance tests.

(d) Deviation Reporting. The Permittee shall promptly report to EPA any deviation from any permit requirements, including those attributable to upset conditions, the probable cause of such deviation, and any corrective

actions or preventative measures taken. "Promptly" shall mean within 30 business days of the deviation. [40 C.F.R. § 49.155(a)(5)(ii)]

(c) Annual Report. The Permittee shall submit an annual report of all required monitoring to assure compliance with the synthetic minor limits established in this permit. This report must include confirmation that the synthetic minor limit was maintained for the previous 12 months and must clearly list all instances of deviations from the permit requirements. The annual reporting period shall end on December 31, and the annual report shall be submitted by March 1. [40 C.F.R. § 49.155(a)(5)(i)] An annual report under this section shall include the following:

(i) The company name and address;
(ii) The beginning and ending dates of the reporting period;
(iii) Copies of records required to be maintained in Section II(C)(1)(b)(i) – (vii) of this permit;
(iv) All instances of deviations from permit requirements whether demonstrated by reference test method, monitoring, or through any other creditable evidence, the date on which each deviation occurred, and either the total duration of deviations indicated by such monitoring or the actual records of deviations.
(v) The name, title, and signature of the responsible official who is certifying the truth, accuracy, and completeness of the report.

SECTION III GENERAL PERMIT REQUIREMENTS

(A) Definitions

Terms and conditions in this permit have the meaning assigned to them in 40 C.F.R. § 49.152 unless other regulations or statutes are referenced or applicable.

(B) Submittals

(1) Unless otherwise directed by EPA or this permit, the Permittee shall submit a copy of all test plans, reports, certifications, notifications, and other information pertaining to compliance with this permit to:

Air Enforcement and Compliance
Assurance Branch (AE-18J)
Enforcement Division
EPA Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

Alternatively, the Permittee may submit the Annual Reports and Deviations Reports required under Section II(C)(2) of this permit through the Compliance and Emissions Data Reporting Interface (CEDRI).

(2) The Permittee shall submit permit applications, applications for permit amendments, MAP and other applicable permit information, which includes but is not limited to applications and information regarding installation of control equipment, replacement of an emissions unit, and requests for changes that contravene permit terms to:

Air Permits Section
Air Programs Branch (AR-18J)
EPA Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604

(C) Severability [40 C.F.R. § 49.155(a)(6)]

The terms and conditions in this permit are distinct and severable. Each permit term and condition is independent of the permit as a whole and remains valid regardless of a challenge to any other part of this permit. If any term or condition in this permit is held invalid, such invalidity shall not affect the validity or application of other terms or conditions.

(D) Compliance with Permit Requirements [40 C.F.R. § 49.155(a)(7)(i)]

The Permittee shall comply with all conditions of this permit, including emission limitations that apply to the affected emissions units at the source. Noncompliance with any permit term or condition is a violation of the permit and may constitute a violation of the Clean Air Act and is grounds for enforcement action and for a permit termination or revocation.

(E) Prohibition on Violation of National Ambient Air Quality Standards and Prevention of Significant Deterioration Increments [40 C.F.R. § 49.155(a)(7)(ii)]

The permitted source shall not cause or contribute to a violation of a National Ambient Air Quality Standard or, in an attainment area, shall not cause or contribute to a Prevention of Significant Deterioration increment violation.

(F) Need to Halt or Reduce Activity Not a Defense [40 C.F.R. § 49.155(a)(7)(iii)]

It is not a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(G) Permit Revision, Reopening, Revocation and Reissuance, or Termination [40 C.F.R. § 49.155(a)(7)(iv)]

This permit may be revised, reopened, revoked and reissued or terminated for cause. The filing of a request by the Permittee for a permit revision, revocation and reissuance or termination or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

(H) Property Rights [40 C.F.R. § 49.155(a)(7)(v)]

This permit does not convey any property rights of any sort or any exclusive privilege.

(I) Duty to Provide Information [40 C.F.R. § 49.155(a)(7)(vi)]

The Permittee shall furnish to the EPA, within a reasonable time, any information that EPA may request in writing to determine whether cause exists for revising, revoking and reissuing, or terminating the permit or to determine compliance with the permit. For any such information claimed to be confidential, the Permittee must also submit a claim of confidentiality in accordance with 40 C.F.R. Part 2, Subpart B.

(J) Entry and Inspection [40 C.F.R. § 49.155(a)(7)(vii)]

Upon presentation of proper credentials, the Permittee shall allow a representative of the EPA to:

(1) Enter upon the premises where a source is located or emissions-related activity is conducted or where records are required to be kept under the conditions of the permit;

(2) Have access to and copy, at reasonable times, any records that are required to be kept under the conditions of the permit;

(3) Inspect, during normal business hours or while the source is in operation, any facilities, equipment (including monitoring and air pollution control equipment), practices or operations regulated or required under the permit;

(4) Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the permit or other applicable requirements; and

(5) Record any inspection by use of written, electronic, magnetic and photographic media.

(K) Permit Invalidation [40 C.F.R. §§ 49.155(a)(1)(i), (b)]

This permit becomes invalid if the Permittee does not commence construction within 18 months after the effective date of this permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. The reviewing authority may extend the 18-month period upon a satisfactory showing that an extension is justified. This provision does not apply to the time period between construction of the approved phases of a phased construction project. The Permittee must commence construction of each phase within 18 months of the projected and approved commencement date.

(L) Construction Without a Permit

If the Permittee constructs or operates any source or modification not in accordance with the terms of any approval to construct, the Permittee shall be subject to appropriate enforcement actions.

(M) Construction Approval

(1) Nothing in this permit shall alter the requirement for the Permittee to obtain a construction permit before commencement of construction or modification of an emission unit.

(2) Approval for construction or installation shall not relieve the Permittee of the responsibility to comply fully with the applicable provisions of any other requirements of federal law or regulation, including Title V of the CAA.

(N) Circumvention

The Permittee shall not build, erect, install, or use any article, machine, equipment, or process, the use of which conceals any emission which would otherwise constitute a violation of an applicable standard.

Appendix F – Cost Spreadsheets for Control Technology Analysis

Data Inputs

Select the type of oxidizer: Regenerative Thermal Oxidizer

Enter the following information for your emission source:

Composition of Inlet Gas Stream				
Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Carbon monoxide	16	125,000	323	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the proposed oxidizer:

Number of operating hours/year	8,760	hours/year	
Inlet volumetric flow rate(Q_{ss}) at 77°F and 1 atm.	62,594	scfm	
Inlet volumetric flow rate(Q_{as}) (actual conditions)	74,592	acfm	
Pressure drop (ΔP)	19	inches of water	* 23 inches of water is the default pressure drop for thermal oxidizers, 19 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known
Motor/Fan Efficiency (ε)	60	percent*	* 60% is a default fan efficiency. User should enter actual value, if known.
Inlet Waste Gas Temperature (T_{wg})	170.5	°F	
Operating Temperature (T_{ti})	1,900	°F	* Note: Default value for Tfi is 2000°F for thermal regenerative oxidizers. Use actual value if known. Tfi for regenerative oxidizers typically between 1800 and 2000°F
Destruction and Removal Efficiency (DRE)	90	percent	
Estimated Equipment Life	20	Years*	* 20 years is the typical equipment life. User should enter actual value, if known.
Heat Loss (η)	1	percent*	* 1 percent is a default value for the heat loss. User should enter actual value, if known. Heat loss is typically between 0.2 and 1.5%.

Percent Energy Recovery (HR) = Regenerative

Enter the cost data:

Desired dollar-year	2022			
CEPCI* for 2022	797.6	Enter the CEPCI value for 2022	541.7	2016 CEPCI
Annual Interest Rate (i)	7	Percent		
Electricity ($Cost_{elect}$)	0.085	$/kWh		
Natural Gas Fuel Cost ($Cost_{fuel}$)	0.00860	$/scf		
Operator Labor Rate	$26.61	per hour		* $26.61 per hour is a default labor rate. User should enter actual value, if known.
Maintenance Labor rate	$27.40	per hour		* $27.40 per hour is a default labor rate. User should enter actual value, if known.
Contingency Factor (CF)	10.0	Percent		* 10 percent is a default value for construction contingencies. User may enter values between 5 and 15 percent.

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable.

R005205

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Composition of Inlet Gas Stream		
Pollutant Name	Concentration in Waste Stream (ppmv) From Data Inputs Tab	Adjusted Concentration with Dilution Air (ppmv)
Carbon monoxide	16	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	16	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0	°F
Density of auxiliary fuel at 77 °F (ρ_{af}) =		0.0408	lb/ft^3
Heat Input of auxiliary fuel ($-\Delta h_{c,af}$) =		21,502	Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739	lb/ft^3 (actual = 0.0486)
Mean Heat Capacity of Air ($C_{p,air}$)	(For thermal oxidizers)	0.255	Btu/lb °F

Parameter	Equation	Calculated Value	Units	Value	Units
Sum of volume fraction of combustible components =	= ($\sum x_i$) =	16	ppmv		
Lower Explosive Limit of waste gas (LEL_{mix})	= $[\sum(x_i/(\sum x_i \times LEL_i))]^{-1}$ =	125,000	ppmv		
	Where x_i is the volume fraction and LEL_i the lower explosive limit for each combustible component in the waste gas.				
$\%LEL_{mix}$	= (Total Combustible Conc. In Mixture/LEL_{mix}) × 100 =	0.01	percent	* Note: Since the LEL of the waste gas stream is below 25%, no dilution air is needed	
Dilution Factor	= (LEL_{mix} × 249)/($\sum x_i$) =	Not applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= (Total Adjusted Conc. With Dilution Air/LEL_{mix}) × 100 =	Not Applicable			
Inlet volumetric flow rate(Qwi) at 77°F and 1 atm.	(From Data Inputs Tab) =	62,594	scfm		
Oxygen Content of gas stream	= 100 - ($\sum x_i$ × 100/10^6) × 0.209 =	20.90	percent		
Fan Power Consumption (FP)	= [(1.17 × 10^{-4}) × Q_{wa} × ΔP]/ε	276.4	kW		
Q_{wa}	= Q_{wi} =	62,594	scfm		
Operating temperature of oxidizer (T_o)	(From Data Inputs Tab)	1,900	°F		
Temperature of waste gas at outlet to preheater (T_{wo})	= Heat Recovery × (T_o - T_w) + T_w =	1,381	°F		
Temperature of flue gas exiting the regenerative oxidizer (T_{fo})	= T_o - 0.95(T_o - T_w) =	257	°F		
Heat Input of waste gas ($-\Delta h_w$)					
	= $\sum(-\Delta h_c)_i x_i$ Where $(-\Delta h_c)_i$ is the heat of combustion and x_i the fraction of component "i" at 77 °F	0.01	Btu/scf	0.1	Btu/lb
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm.	(Calculated using Equation 2.45 in Appendix B)	2.25	scfm		
Auxiliary fuel Energy Input =		1,976	Btu/min		
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × ρ_{fi} × Q_{fi} × $C_{p,wg}$ × (T_o - T_{ref}) =	107,521	Btu/min		
Is the calculated auxiliary fuel sufficient to stabilize combustion?	(Note: If the auxiliary fuel energy input > 5% of Total Energy Input, then the auxiliary fuel is sufficient.)	No		Note: Additional auxiliary fuel equivalent to 5% of total energy input is required to stabilize combustion.	
Auxiliary fuel flow (Qaf) (adjusted for fuel required for combustion stabilization)at 77°F and 1 atm =		123	scfm		
Total Volumetric Throughput (Q_{tot}) at 77 °F and 1 atm =	= Q_{fi} + Q_{wa} + Q_a + Q_{af} = Q_{wi} + Q_{af} =	62,717	scfm		

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i(1+i)^n/[(1+i)^n - 1]$ =	0.0944
	Where n = Equipment Life and i = Interest Rate	

Cost Estimate

Direct Costs

Total Purchased equipment costs (In 2022 dollars)

Incinerator + auxiliary equipment[a] (A) =		
Equipment Costs (EC) for Regenerative Oxidizer	=[2.664 x 100,000 + (13.98 x Qtot)] x (2022 CEPI/2016 CEPCI) =	$1,683,227 in 2022 dollars
Instrumentation[b] =	0.10 × A =	$168,323
Sales taxes =	0.03 × A =	$50,497
Freight =	0.05 × A =	$84,161
	Total Purchased equipment costs (B) =	$1,986,207 in 2022 dollars

Footnotes
a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (In 2022 dollars)

Foundations and Supports =	0.08 × B =	$158,897
Handlong and Errection =	0.14 × B =	$278,069
Electrical =	0.04 × B =	$79,448
Piping =	0.02 × B =	$39,724
Insulation for Ductwork =	0.01 × B =	$19,862
Painting =	0.01 × B =	$19,862
Site Preparation (SP) =		$0
Buildings (Bldg) =		$0
	Total Direct Installaton Costs =	$595,862
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$2,582,070 in 2022 dollars

Total Indirect Installation Costs (In 2022 dollars)

Engineering =	0.10 × B =	$198,621
Construction and field expenses =	0.05 × B =	$99,310
Contractor fees =	0.10 × B =	$198,621
Start-up =	0.02 × B =	$39,724
Performance test =	0.01 × B =	$19,862
	Total Indirect Costs (IC) =	$556,138
Continency Cost (C) =	CF(IC+DC)=	$313,821
Total Capital Investment =	**DC + IC +C =**	**$3,452,028 in 2022 dollars**

Direct Annual Costs

Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$205,780
Annual Fuel Costs for Natural Gas	= $Cost_{fuel}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$553,997
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569
	Supervisor = 15% of Operator	$2,185
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002
	Materials = 100% of maintenance labor	$15,002
Direct Annual Costs (DC) =		**$806,535 in 2022 dollars**

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$28,054
Administrative Charges	= 2% of TCI	$69,041
Property Taxes	= 1% of TCI	$34,520
Insurance	= 1% of TCI	$34,520
Capital Recovery	= CRF(TCI-1.08(cat. Cost))	$325,847
Indirect Annual Costs (IC) =		**$491,983 in 2022 dollars**
Total Annual Cost =	**DC + IC =**	**$1,298,518 in 2022 dollars**

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$1,298,518 per year in 2022 dollars
CO Destroyed =	17.4 tons/year
Cost Effectiveness =	$74,754 per ton of pollutants removed in 2022 dollars

Data Inputs

Select the type of oxidizer: Catalytic Oxidizer - Fixed Bed

Enter the following information for your emission source:

Composition of Inlet Gas Stream				
Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Carbon monoxide	16	125,000	323	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the proposed oxidizer:

Number of operating hours/year	8,760 hours/year	
Inlet volumetric flow rate(Q_{ss}) at 77°F and 1 atm.	62,594 scfm	
Inlet volumetric flow rate(Q_{as}) (actual conditions)	74,592 acfm	
Pressure drop (ΔP)	23 inches of water*	* 23 inches of water is the default pressure drop for thermal oxidizers, 19 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known
Motor/Fan Efficiency (ε)	60 percent*	* 60% is a default fan efficiency. User should enter actual value, if known.
Inlet Waste Gas Temperature (T_{ss})	170.5 °F	
Operating Temperature (T_{ds})	900 °F	* Note: Default value for Tf is 900°F for catalytic oxidizers. Use actual value if known. Tf for catalytic oxidizers is typically between 300 and 900°F
Destruction and Removal Efficiency (DRE)	90 percent	
Estimated Equipment Life	20 Years*	* 20 years is the typical equipment life. User should enter actual value, if known.
Catalyst Data:		
Estimated catalyst life (y)	4 years	* 4 years is a default value. User should enter actual value, if known
Catalyst Unit Cost (CC)	0 $/ft^3	
Space velocity for catalyst (Φ)	30,000 /hour	* 30,000 per hour is a default value. User should enter actual value, if known

Percent Energy Recovery (HR) = percent

Enter the cost data:

Desired dollar-year	2022			
CEPCI* for 2022	797.6	Enter the CEPCI value for 2022	390.6	1999 CEPCI
Annual Interest Rate (i)	7	Percent		
Electricity ($Cost_{elect}$)	0.085	$/kWh		
Natural Gas Fuel Cost ($Cost_{fuel}$)	0.00860	$/scf		
Operator Labor Rate	$26.61	per hour		* $26.61 per hour is a default labor rate. User should enter actual value, if known
Maintenance Labor rate	$27.40	per hour		* $27.40 per hour is a default labor rate. User should enter actual value, if known
Contingency Factor (CF)	10.0	Percent		* 10 percent is a default value for construction contingencies. User may enter values between 5 and 15 percent

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable

R005208

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Composition of Inlet Gas Stream		
Pollutant Name	Concentration in Waste Stream (ppmv) From Data Inputs Tab	Adjusted Concentration with Dilution Air (ppmv)
Carbon monoxide	16	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	16	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0	°F
Density of auxiliary Fuel at 77 °F (ρ_{af}) =		0.0408	lb/ft³
Heat Input of auxiliary fuel ($\Delta h_{c,af}$) =		21,502	Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739	lb/ft³ (actual = 0.0486)
Mean Heat Capacity of Air ($C_{p,wg}$) =	(For catalytic oxidizers)	0	Btu/lb °F

Parameter	Equation	Calculated Value	Units	Value	Units
Sum of volume fraction of combustible components *	= ($\sum x_i$) =	16	ppmv		
Lower Explosive Limit of waste gas (LEL_{wg})	= $\{\sum(x_i)/(\sum x_i \times LEL_i)\}^{-1}$ =	125,000	ppmv		
	Where x_i is the volume fraction and LEL_i the lower explosive limit for each combustible component in the waste gas				
% LEL_{wg}	= (Total Combustible Conc. In Mixture/LEL_{wg}) × 100 =	0.01	percent	* Note: Since the LEL of the waste gas stream is below 25%, no dilution air is needed	
Dilution Factor	= (LEL_{wg} × 0.249)/($\sum x_i$) =	Not applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= (Total Adjusted Conc. With Dilution Air/LEL_{wg}) × 100 =	Not Applicable			
Inlet volumetric flow rate(Qwi) at 77°F and 1 atm.	(From Data Inputs Tab) =	62,594	scfm		
Oxygen Content of gas stream	= 100 - ($\sum x_i$ × 100/10^5) × 0.209 =	20.90	percent		
Fan Power Consumption (FP)	= $\{(1.17 \times 10^{-4}) \times Q_w \times \Delta P\}/\varepsilon$	334.5	kW		
Q_{wg}	= Q_w =	62,594	scfm		
Operating temperature of oxidizer (T_1)	(From Data Inputs Tab)	900	°F		
Temperature of waste gas at outlet to preheater (T_{wg})	= Heat Recovery × (T_1 - T_{af}) - T_{wg} =	535	°F		
Temperature of flue gas exiting the oxidizer (T_{fg})	= T_1 - T_{wg} - T_{af} =	535	°F		
Heat Input of waste gas ($\Delta h_{c,wg}$)	= $\sum$ (Δh_i) =				
	Where (Δh_i) is the heat of combustion and x the fraction of component "i" at 77 °F	0.01	Btu/scf	0.1	Btu/lb
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm.	(Calculated using Equation 2.21 in Chapter 2 of the Cost Manual)	590.38	scfm		
Auxiliary fuel Energy Input =		517,928	Btu/min		
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × p_a × Q_a × $C_{p,wg}$ × (T_1 - T_{ref}) =	47,652	Btu/min		
Is the calculated auxiliary fuel sufficient to stabilize combustion?	(Note: If the auxiliary fuel energy input > 5% of Total Energy Input, then the auxiliary fuel is sufficient.)	Yes			
Auxiliary fuel flow (Qaf) at 77°F and 1 atm. =		590	scfm		
Total Volumetric Throughput (Q_{tp}) at 77 °F and 1 atm	= Q_i + Q_{wg} + Q_a + Q_{af} = Q_w + Q_{af} =	63,185	scfm		
Calculation of Catalyst Volume and Estimated Temperature of Waste Gas Entering the Catalyst Bed					
Volumetric Flow Rate at 60 °F and 1 atm (Q_a)	= Q_{tp} × (519/(77 °F + 460)) =	61,067	scfm		
Catalyst Volume (Vol_{cat})	= Q_a/Θ	122.13	ft³		
Estimated inlet temperature to the catalyst bed (T_{cb}) =	(Calculated using Equation 2.22 in Chapter 2 of the Cost Manual)	900	°F		

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i(1+i)^n/(1+i)^n - 1$ =	0.0944
	Where n = Equipment life and i = Interest Rate	

Cost Estimate

Direct Costs

Total Purchased equipment costs (in 2022 dollars)

Incinerator + auxiliary equipment[a] (A) =			
Equipment Costs (EC) for a Fixed Bed Catalytic Oxidizer	= (1.215 x Qtot^(0.5575)) x (2022 CEPI/1999 CEPCI) =	$1,177,527	in 2022 dollars
Instrumentation[b] =	0.10 × A =	$117,753	
Sales taxes =	0.03 × A =	$35,326	
Freight =	0.05 × A =	$58,876	
	Total Purchased equipment costs (B) =	$1,389,482	in 2022 dollars

Footnotes
a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2022 dollars)

Foundations and Supports =	0.08 × B =	$111,159
Handlong and Errection =	0.14 × B =	$194,528
Electrical =	0.04 × B =	$55,579
Piping =	0.02 × B =	$27,790
Insulation for Ductwork =	0.01 × B =	$13,895
Painting =	0.01 × B =	$13,895
Site Preparation (SP) =		$0
Buildings (Bldg.) =		$0
	Total Direct Installaton Costs =	$416,845
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$1,806,327 in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)

Engineering =	0.10 × B =	$138,948
Construction and field expenses =	0.05 × B =	$69,474
Contractor fees =	0.10 × B =	$138,948
Start-up =	0.02 × B =	$27,790
Performance test =	0.01 × B =	$13,895
	Total Indirect Costs (IC) =	$389,055
Continency Cost (C) =	CF(IC+DC)=	$219,538
Total Capital Investment =	**DC + IC + C =**	**$2,414,920 in 2022 dollars**

Direct Annual Costs

Catalyst Replacement Cost	= 1.08 × CC × Vol_{cat} × FWF Where CC is the $/ft^3 cost for the replacement catalyst; Vol_{cat} is the volume of catalyst required based on the waste gas flow rate (Q_{tr}) and the catalyst space velocity (Φ); and FWF is the future worth factor.	$0
Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$249,102
Annual Fuel Costs for Natural Gas	= $Cost_{fuel}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$2,668,605
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569
	Supervisor = 15% of Operator	$2,185
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002
	Materials = 100% of maintenance labor	$15,002
Direct Annual Costs (DC) =		**$2,964,465 in 2022 dollars**

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$28,054
Administrative Charges	= 2% of TCI	$48,298
Property Taxes	= 1% of TCI	$24,149
Insurance	= 1% of TCI	$24,149
Capital Recovery	= CRF(TCI-1.08(cat. Cost))	$227,951
Indirect Annual Costs (IC) =		**$352,603 in 2022 dollars**
Total Annual Cost =	**DC + IC =**	**$3,317,068 in 2022 dollars**

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$3,317,068	per year in 2022 dollars
CO Destroyed =	17.4	tons/year
Cost Effectiveness =	$190,959	per ton of pollutants removed in 2022 dollars

Data Inputs

Select the type of oxidizer: Regenerative Thermal Oxidizer

Enter the following information for your emission source:

Composition of Inlet Gas Stream				
Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Carbon monoxide	43	125,000	323	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the proposed oxidizer:

Number of operating hours/year	8,760 hours/year	
Inlet volumetric flow rate(Q_{ref}) at 77°F and 1 atm	255,617 scfm	
Inlet volumetric flow rate(Q_{act}) (actual conditions)	282,389 acfm	
Pressure drop (ΔP)	19 inches of water	* 23 inches of water is the default pressure drop for thermal oxidizers, 19 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known
Motor/Fan Efficiency (ε)	60 percent*	* 60% is a default fan efficiency. User should enter actual value, if known
Inlet Waste Gas Temperature (T_{wi})	126.8 °F	
Operating Temperature (T_{ti})	1,900 °F	* Note: Default value for Tti is 2000°F for thermal regenerative oxidizers. Use actual value if known. Tti for regenerative oxidizers typically between 1800 and 2000°F
Destruction and Removal Efficiency (DRE)	90 percent	
Estimated Equipment Life	20 Years*	* 20 years is the typical equipment life. User should enter actual value, if known
Heat Loss (η)	1 percent*	* 1 percent is a default value for the heat loss. User should enter actual value, if known. Heat loss is typically between 0.2 and 1.5%

Percent Energy Recovery (HR) = 70 percent

Enter the cost data:

Desired dollar-year	2022			
CEPCI* for 2022	797.6	Enter the CEPCI value for 2022	541.7	2016 CEPCI
Annual Interest Rate (i)	7 Percent			
Electricity ($Cost_{elect}$)	0.085 $/kWh			
Natural Gas Fuel Cost ($Cost_{fuel}$)	0.00860 $/scf			
Operator Labor Rate	$26.61 per hour			* $26.61 per hour is a default labor rate. User should enter actual value, if known
Maintenance Labor rate	$27.40 per hour			* $27.40 per hour is a default labor rate. User should enter actual value, if known
Contingency Factor (CF)	10.0 Percent			* 10 percent is a default value for construction contingencies. User may enter values between 5 and 15 percent

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable

R005211

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Composition of Inlet Gas Stream		
Pollutant Name	Concentration in Waste Stream (ppmv) From Data Inputs Tab	Adjusted Concentration with Dilution Air (ppmv)
Carbon monoxide	43	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	43	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0 °F
Density of auxiliary Fuel at 77 °F (ρ_{af}) =		0.0408 lb/ft^3
Heat Input of auxiliary fuel ($-\Delta h_{c,af}$) =		21,502 Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739 lb/ft^3 (actual = 0.0486)
Mean Heat Capacity of Air ($C_{pm,a}$)	(For thermal oxidizers)	0.255 Btu/lb °F

Parameter	Equation	Calculated Value	Units	Value	Units
Sum of volume fraction of combustible components =	= ($\sum x_i$) =		43 ppmv		
Lower Explosive Limit of waste gas ($LEL_{m,a}$)	= $[\sum(x_i)/(\sum x_i) \times LEL_i)]^{-1}$ =		125,000 ppmv		
	Where x_i is the volume fraction and LEL_i the lower explosive limit for each combustible component in the waste gas.				
% $LEL_{m,a}$	= (Total Combustible Conc. In Mixture/$LEL_{m,a}$) × 100 =		0.03 percent	* Note: Since the LEL of the waste gas stream is below 25%, no dilution air is needed.	
Dilution Factor	= ($LEL_{m,a}$ × 0.249)/($\sum x_i$) =	Not applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= (Total Adjusted Conc. With Dilution Air/$LEL_{m,a}$) × 100 =	Not Applicable			
Inlet volumetric flow rate(Qw,i) at 77°F and 1 atm.	(From Data Inputs Tab) =		255,617 scfm		
Oxygen Content of gas stream	= 100 - ($\sum x_i \times 100/10^6$) × 0.209 =		20.90 percent		
Fan Power Consumption (FP)	= [(1.17 × 10^{-4}) × Q_{wi} × ΔP]/ϵ		1046.3 kW		
Q_{wg}	= Q_{wi} =		255,617 scfm		
Operating temperature of oxidizer (T_o)	(From Data Inputs Tab)		1,900 °F		
Temperature of waste gas at outlet to preheater (T_{wo})	= Heat Recovery × (T_o - T_{wi}) + T_{wi} =		1,368 °F		
Temperature of flue gas exiting the regenerative oxidizer (T_{fo})	= T_o - 0.95(T_o - T_{wi}) =		215 °F		
Heat Input of waste gas ($-\Delta h_{c,w}$)	= $\sum(-\Delta h_{c_i}) x_i$				
	Where $(-\Delta h_{c_i})$ is the heat of combustion and x_i the fraction of component "i" at 77 °F.		0.01 Btu/scf		0.2 Btu/lb
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm.	(Calculated using Equation 2.45 in Appendix B)		0.70 scfm		
Auxiliary fuel Energy Input =			614 Btu/min		
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × ρ_{af} × Q_{af} × $C_{pm,a}$ × (T_o - T_{af}) =		439,069 Btu/min		
Is the calculated auxiliary fuel sufficient to stabilize combustion?	(Note: If the auxiliary fuel energy input > 5% of Total Energy Input, then the auxiliary fuel is sufficient.)		No	Note: Additional auxiliary fuel equivalent to 5% of total energy input is required to stabilize combustion.	
Auxiliary fuel flow (Qaf) (adjusted for fuel required for combustion stabilization) at 77°F and 1 atm. =			500 scfm		
Total Volumetric Throughput ($Q_{t,w}$) at 77 °F and 1 atm.	= Q_t = Q_{wo} + Q_a + Q_{af} = Q_w + Q_{af} =		256,118 scfm		

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i(1+i)^n/(1+i)^n - 1$ =	0.0944
	Where n = Equipment Life and i= Interest Rate	

Cost Estimate

Direct Costs

Total Purchased equipment costs (In 2022 dollars)

Incinerator + auxiliary equipment[a] (A) =		
Equipment Costs (EC) for Regenerative Oxidizer	=[2.664 x 100,000 + (13.98 x Qtot)] x (2022 CEPI/2016 CEPCI) =	$5,664,224 in 2022 dollars
Instrumentation[b] =	0.10 × A =	$566,422
Sales taxes =	0.03 × A =	$169,927
Freight =	0.05 × A =	$283,211
	Total Purchased equipment costs (B) =	$6,683,784 in 2022 dollars

Footnotes
a - Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b - Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (In 2022 dollars)

Foundations and Supports =	0.08 × B =	$534,703
Handlong and Errection =	0.14 × B =	$935,730
Electrical =	0.04 × B =	$267,351
Piping =	0.02 × B =	$133,676
Insulation for Ductwork =	0.01 × B =	$66,838
Painting =	0.01 × B =	$66,838
Site Preparation (SP) =		$0
Buildings (Bldg) =		$0
	Total Direct Installaton Costs =	$2,005,135
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$8,688,920 in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)

Engineering =	0.10 × B =	$668,378
Construction and field expenses =	0.05 × B =	$334,189
Contractor fees =	0.10 × B =	$668,378
Start-up =	0.02 × B =	$133,676
Performance test =	0.01 × B =	$66,838
	Total Indirect Costs (IC) =	$1,871,460
Contingency Cost (C) =	CF(IC+DC)=	$1,056,038
Total Capital Investment =	**DC + IC +C =**	**$11,616,417 in 2022 dollars**

Direct Annual Costs

Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$779,039
Annual Fuel Costs for Natural Gas	= $Cost_{fuel}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$2,262,287
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569
	Supervisor = 15% of Operator	$2,185
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002
	Materials = 100% of maintenance labor	$15,002
Direct Annual Costs (DC) =		**$3,088,083 in 2022 dollars**

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$28,054
Administrative Charges	= 2% of TCI	$232,328
Property Taxes	= 1% of TCI	$116,164
Insurance	= 1% of TCI	$116,164
Capital Recovery	= CRF[TCI-1.08(cat. Cost)]	$1,096,508
Indirect Annual Costs (IC) =		**$1,589,219 in 2022 dollars**
Total Annual Cost =	**DC + IC =**	**$4,677,302 in 2022 dollars**

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$4,677,302 per year in 2022 dollars
CO Destroyed =	190.4 tons/year
Cost Effectiveness =	$24,563 per ton of pollutants removed in 2022 dollars

Data Inputs

Select the type of oxidizer: Catalytic Oxidizer - Fixed Bed

Enter the following information for your emission source:

Composition of Inlet Gas Stream

Pollutant Name	Concentration (ppmv)	Lower Explosive Limit (LEL) (ppmv)*	Heat of Combustion (Btu/scf)	Molecular Weight
Carbon monoxide	43	125,000	323	28.01

Note: The lower explosion limit (LEL), heat of combustion and molecular weight for some commonly used VOC/HAP are provided in the table below.

Enter the design data for the proposed oxidizer:

Number of operating hours/year	8,760 hours/year	
Inlet volumetric flow rate(Q_{std}) at 77°F and 1 atm.	255,617 scfm	
Inlet volumetric flow rate(Q_{act}) (actual conditions)	282,389 acfm	
Pressure drop (ΔP)	23 inches of water*	* 23 inches of water is the default pressure drop for thermal oxidizers; 19 inches of water is the default pressure drop for catalytic oxidizers. Enter actual value, if known
Motor/Fan Efficiency (ε)	60 percent*	* 60% is a default fan efficiency. User should enter actual value, if known.
Inlet Waste Gas Temperature (T_{wg})	126.8 °F	
Operating Temperature (T_{ti})	900 °F	* Note: Default value for Tti is 900°F for catalytic oxidizers. Use actual value if known. Tti for catalytic oxidizers is typically between 300 and 900°F
Destruction and Removal Efficiency (DRE)	90 percent	
Estimated Equipment Life	20 Years*	* 20 years is the typical equipment life. User should enter actual value, if known.
Catalyst Data:		
Estimated catalyst life (γ)	4 years	* 4 years is a default value. User should enter actual value, if known.
Catalyst Unit Cost (CC)	0 $/ft^3	
Space velocity for catalyst (Φ)	30,000 /hour	* 30,000 per hour is a default value. User should enter actual value, if known.

Percent Energy Recovery (HR) = 0 percent

Enter the cost data:

Desired dollar-year	2022			
CEPCI* for 2022	797.6	Enter the CEPCI value for 2022	390.6	1999 CEPCI
Annual Interest Rate (i)	7	Percent		
Electricity ($Cost_{elect}$)	0.085	$/kWh		
Natural Gas Fuel Cost ($Cost_{fuel}$)	0.00860	$/scf		
Operator Labor Rate	$26.61	per hour		* $26.61 per hour is a default labor rate. User should enter actual value, if known
Maintenance Labor rate	$27.40	per hour		* $27.40 per hour is a default labor rate. User should enter actual value, if known
Contingency Factor (CF)	10.0	Percent		* 10 percent is a default value for construction contingencies. User may enter values between 5 and 15 percent

* CEPCI is the Chemical Engineering Plant Cost Escalation/De-escalation Index. The use of CEPCI in this spreadsheet is not an endorsement of the index for purposes of cost escalation or de-escalation, but is there merely to allow for availability of a well-known cost index to spreadsheet users. Use of other well-known cost indexes (e.g., M&S) is acceptable

R005214

Design Parameters

The following design parameters for the oxidizer were calculated based on the values entered on the *Data Inputs* tab. These values were used to prepare the costs shown on the *Cost Estimate* tab.

Composition of Inlet Gas Stream		
Pollutant Name	Concentration in Waste Stream (ppmv) From Data Inputs Tab	Adjusted Concentration with Dilution Air (ppmv)
Carbon monoxide	43	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
0	0	NA
Total	43	0

Constants used in calculations:

Temperature of auxiliary fuel (T_{af}) =	Reference Temperature (T_{ref}) =	77.0	°F
Density of auxiliary Fuel at 77 °F (ρ_{af}) =		0.0408	lb/ft^3
Heat Input of auxiliary fuel ($-\Delta h_{af}$) =		21,502	Btu/lb
Density of waste gas at 77 °F (ρ_{wg}) =		0.0739	lb/ft^3 (actual = 0.0486)
Mean Heat Capacity of Air (C_{pmair}) =	(For catalytic oxidizers)	0	Btu/lb °F

Parameter	Equation	Calculated Value	Units	Value	Units
Sum of volume fraction of combustible components =	= ($\sum x$) =	43	ppmv		
Lower Explosive limit of waste gas (LEL_{mix})	= $[\sum(x_i)/(\sum x_i / LEL_i)]^1$ =	125,000	ppmv		
	Where x_i is the volume fraction and LEL_i the lower explosive limit for each combustible component in the waste gas				
% LEL_{mix}	= (Total Combustible Conc. in Mixture/LEL_{mix}) × 100 =	0.03	percent	* Note: Since the LEL of the waste gas stream is below 25%, no dilution air is needed.	
Dilution Factor	= (LEL_{mix} × 0.249)/($\sum x$) =	Not applicable			
Lower Explosive Limit (LEL) of waste gas after addition of dilution air	= (Total Adjusted Conc. With Dilution Air/LEL_{mix}) × 100 =	Not Applicable			
Inlet volumetric flow rate(Q_{wi}) at 77°F and 1 atm.	(From Data Inputs Tab) =	255,617	scfm		
Oxygen Content of gas stream	= 100 - ($\sum x_i$ × 100/10^6) × 0.209 =	20.90	percent		
Fan Power Consumption (FP)	= [(1.17 × 10^{-4}) × Q_w × ΔP]/ε	1266.5	kW		
Q_{wo}	= Q_w =	255,617	scfm		
Operating temperature of oxidizer (T_r)	(From Data Inputs Tab)	900	°F		
Temperature of waste gas at outlet to preheater (T_{wo})	= Heat Recovery × (T_r - T_{wi}) + T_{wi} =	513	°F		
Temperature of flue gas exiting the oxidizer (T_{fg})	= T_r - T_{wo} - T_{wi} =	513	°F		
Heat Input of waste gas ($-\Delta h_{wg}$)					
	= $\sum(-\Delta h_{ci})$ =				
	Where $(-\Delta h_{ci})$ is the heat of combustion and x_i the fraction of component "i" at 77 °F.	0.01	Btu/scf	0.2	Btu/lb
Estimated Auxiliary Fuel Flow (Q_{af}) at 77 °F and 1 atm.	(Calculated using Equation 2.21 in Chapter 2 of the Cost Manual)	2,526.25	scfm		
Auxiliary fuel Energy Input =		2,216,233	Btu/min		
Minimum Energy required for combustion stabilization =	= 5% × Total Energy Input = 0.05 × ρ_{af} × Q_{af} × C_{pmair} × (T_r - T_{af}) =	194,683	Btu/min		
Is the calculated auxiliary fuel sufficient to stabilize combustion?	(Note: If the auxiliary fuel energy input > 5% of Total Energy Input, then the auxiliary fuel is sufficient.)	Yes			
Auxiliary fuel flow (Q_{af}) at 77°F and 1 atm. =		2,526	scfm		
Total Volumetric Throughput (Q_{t-o}) at 77 °F and 1 atm.	= Q_{wi} = Q_{wo} + Q_a + Q_{af} = Q_w + Q_{af} =	258,144	scfm		
Calculation of Catalyst Volume and Estimated Temperature of Waste Gas Entering the Catalyst Bed					
Volumetric Flow Rate at 60 °F and 1 atm (Q_m)	= Q_{t-o} × (519)/(77 °F + 460) =	249,491	scfm		
Catalyst Volume (Vol_{cat})	= Q_m/Θ	498.98	ft^3		
Estimated inlet temperature to the catalyst bed (T_{cb}) =	(Calculated using Equation 2.27 in Chapter 2 of the Cost Manual)	899	°F		

Capital Recovery Factor:

Parameter	Equation	Calculated Value
Capital Recovery Factor (CRF) =	$i(1+i)^n/(1+i)^n - 1$ =	0.0944
	Where n = Equipment Life and i = Interest Rate	

Cost Estimate

Direct Costs

Total Purchased equipment costs (in 2022 dollars)

Incinerator + auxiliary equipment[a] (A) =		
Equipment Costs (EC) for a Fixed Bed Catalytic Oxidizer	= (1.21S x Qtot^(0.5575)) x (2022 CEPI/1999 CEPCI) =	$2,580,726 in 2022 dollars
Instrumentation[b] =	0.10 × A =	$258,073
Sales taxes =	0.03 × A =	$77,422
Freight =	0.05 × A =	$129,036
	Total Purchased equipment costs (B) =	$3,045,257 in 2022 dollars

Footnotes
a = Auxiliary equipment includes equipment (e.g., duct work) normally not included with unit furnished by incinerator vendor.
b = Includes the instrumentation and controls furnished by the incinerator vendor.

Direct Installation Costs (in 2022 dollars)

Foundations and Supports =	0.08 × B =	$243,621
Handlong and Errection =	0.14 × B =	$426,336
Electrical =	0.04 × B =	$121,810
Piping =	0.02 × B =	$60,905
Insulation for Ductwork =	0.01 × B =	$30,453
Painting =	0.01 × B =	$30,453
Site Preparation (SP) =		$0
Buildings (Bldg) =		$0
	Total Direct Installaton Costs =	$913,577
Total Direct Costs (DC) =	Total Purchase Equipment Costs (B) + Total Direct Installation Costs =	$3,958,834 in 2022 dollars

Total Indirect Installation Costs (in 2022 dollars)

Engineering =	0.10 × B =	$304,526
Construction and field expenses =	0.05 × B =	$152,263
Contractor fees =	0.10 × B =	$304,526
Start-up =	0.02 × B =	$60,905
Performance test =	0.01 × B =	$30,453
	Total Indirect Costs (IC) =	$852,672
Continency Cost (C) =	CF(IC+DC)=	$481,151
Total Capital Investment =	**DC + IC +C =**	**$5,292,657 in 2022 dollars**

Direct Annual Costs

Catalyst Replacement Cost	= 1.08 × CC × Vol_{cat} × FWF Where CC is the $/ft^3 cost for the replacement catalyst; Vol_{cat} is the volume of catalyst required based on the waste gas flow rate (Q_{tr}) and the catalyst space velocity (Φ); and FWF is the future worth factor.	$0
Annual Electricity Cost	= Fan Power Consumption × Operating Hours/year × Electricity Price =	$943,047
Annual Fuel Costs for Natural Gas	= $Cost_{wd}$ × Fuel Usage Rate × 60 min/hr × Operating hours/year	$11,419,055
Operating Labor	Operator = 0.5hours/shift × Labor Rate × (Operating hours/8 hours/shift)	$14,569
	Supervisor = 15% of Operator	$2,185
Maintenance Costs	Labor = 0.5 hours/shift × Labor Rate × (Operating Hours/8 hours/shift)	$15,002
	Materials = 100% of maintenance labor	$15,002
Direct Annual Costs (DC) =		**$12,408,859 in 2022 dollars**

Indirect Annual Costs

Overhead	= 60% of sum of operating, supervisor, maintenance labor and maintenance materials	$28,054
Administrative Charges	= 2% of TCI	$105,853
Property Taxes	= 1% of TCI	$52,927
Insurance	= 1% of TCI	$52,927
Capital Recovery	= CRF(TCI-1.08(cat. Cost))	$499,589
Indirect Annual Costs (IC) =		**$739,350 in 2022 dollars**
Total Annual Cost =	**DC + IC =**	**$13,148,209 in 2022 dollars**

Cost Effectiveness

Cost Effectiveness = (Total Annual Cost)/(Annual Quantity of VOC/HAP Pollutants Destroyed)

Total Annual Cost (TAC) =	$13,148,209	per year in 2022 dollars
CO Destroyed =	190.4	tons/year
Cost Effectiveness =	$69,049	per ton of pollutants removed in 2022 dollars

Kras, Kim

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Tuesday, October 11, 2022 11:04 AM
To: David Keen
Cc: Colin Campbell; Gurinder (Gary) Saini
Subject: RE: US Steel Granite City Modeling

Hi Dave,

Thank you!

Kind regards,
Sarah

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental
keen@rtpenv.com
(919) 845-1422 x41
(919) 845-1424 fax
(919) 906-6016 mobile

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Kras, Kim

From: Ray, Sarah
Sent: Tuesday, October 11, 2022 11:19 AM
To: Stewart, Tamara
Cc: Rutherford, Cari
Subject: FW: US Steel Granite City Modeling
Attachments: Granite City Model Report (10-10-22).pdf; Granite City SIL CO.zip; Granite City NAAQS CO.zip

Hi Tammy,

I'm forwarding you Dave's email regarding new CO modeling for US Steel Granite City. This is a PSD project that Cari and I originally reviewed back in 2020. Please review these new modeling files and prepare a memorandum summarizing your review.

I've added the files to the path below, along with a copy of the original memo that Cari and I developed as part of the 2020 review:

N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

Please let me know if you have any questions!

Thank you,
Sarah

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental
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CARBON MONOXIDE AIR DISPERSION MODELING FOR A PREVENTION OF SIGNIFICANT DETERIORATION AND CONSTRUCTION PERMIT REVISION FOR UNITED STATES STEEL GRANITE CITY WORKS



Prepared for:
United States Steel Corporation
Granite City Works
20th and State Streets
Granite City, IL 62040

Prepared by:
RTP Environmental Associates, Inc.
304A West Millbrook Road
Raleigh, North Carolina 27609

October 2022

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the United States Steel Corporation, Granite City Works ("US Steel") iron and steel making facility in Granite City, Illinois. The analysis has been conducted by RTP Environmental Associates, Inc. ("RTP Environmental") on behalf of US Steel.

The analysis evaluated the emissions of the criteria pollutant carbon monoxide ("CO") as regulated under the applicable provisions of the Prevention of Significant Deterioration ("PSD") regulations of 40 CFR § 52.21, incorporated by reference in the federally approved Illinois State Implementation Plan at 40 CFR § 52.738(b).[1] The criteria pollutant analysis was conducted to ensure that the proposed revisions to the CO emission limitations in the Prevention of Significant Deterioration ("PSD") and Construction Permit (Permit Number 95010001) ("1996 Construction Permit") do not cause or contribute to violation of a National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR § 52.21(l), the analysis conforms with the modeling procedures outlined in the Guideline on Air Quality Models[1] promulgated by United States Environmental Protection Agency ("USEPA") (the "Guideline" or "Appendix W"). It also conforms to the Illinois Environmental Protection Agency's (IEPA) Prevention of Significant Deterioration Modeling Guidance[2], the modeling protocol submitted to the IEPA on February 3, 2020, and associated USEPA modeling policy and guidance.

[1] All citations to the PSD regulations herein are to the currently applicable provisions of 40 CFR § 52.21. The analysis also is designed to satisfy the parallel requirements of the currently pending Illinois PSD rule, 35 Ill. Adm. Code Part 204.

2.0 PROJECT DESCRIPTION

The 1996 Construction Permit authorized National Steel to increase iron and steel production limitations for the blast furnaces and basic oxygen furnace ("BOF") shop at the existing integrated iron and steel manufacturing facility in Granite City, in Madison County, Illinois. US Steel purchased the assets of National Steel in 2003, including Granite City Works. US Steel is proposing revisions to the 1996 Construction Permit that involve increases in the CO emission limitations that were established per the PSD requirements. Therefore, the proposed increases in the CO rates were evaluated for PSD requirements including compliance with the NAAQS for CO. No physical changes are proposed in conjunction with the requested revisions to the 1996 Construction Permit.

3.0 FACILITY AND SITE DESCRIPTION

The US Steel Granite City Works produces high-quality hot-rolled, cold-rolled and coated sheet steel products to customers in the construction, container, piping and tubing, service center, and automotive industries. Granite City Works has an annual raw steelmaking capability of 3.58 million net tons.

The facility occupies approximately 400 acres and is located approximately 12 miles east of Lambert, St. Louis International Airport. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 749,000m East and 4,287,000m North (NAD83, Zone 15). Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

The US Steel facility is classified under the regulations governing PSD and Title V as a major source. The area of Madison County where US Steel facility is located is classified as attainment or unclassifiable for all regulated pollutants except ozone. St. Louis is classified as marginal nonattainment for the 2015 8-hour ozone standard.

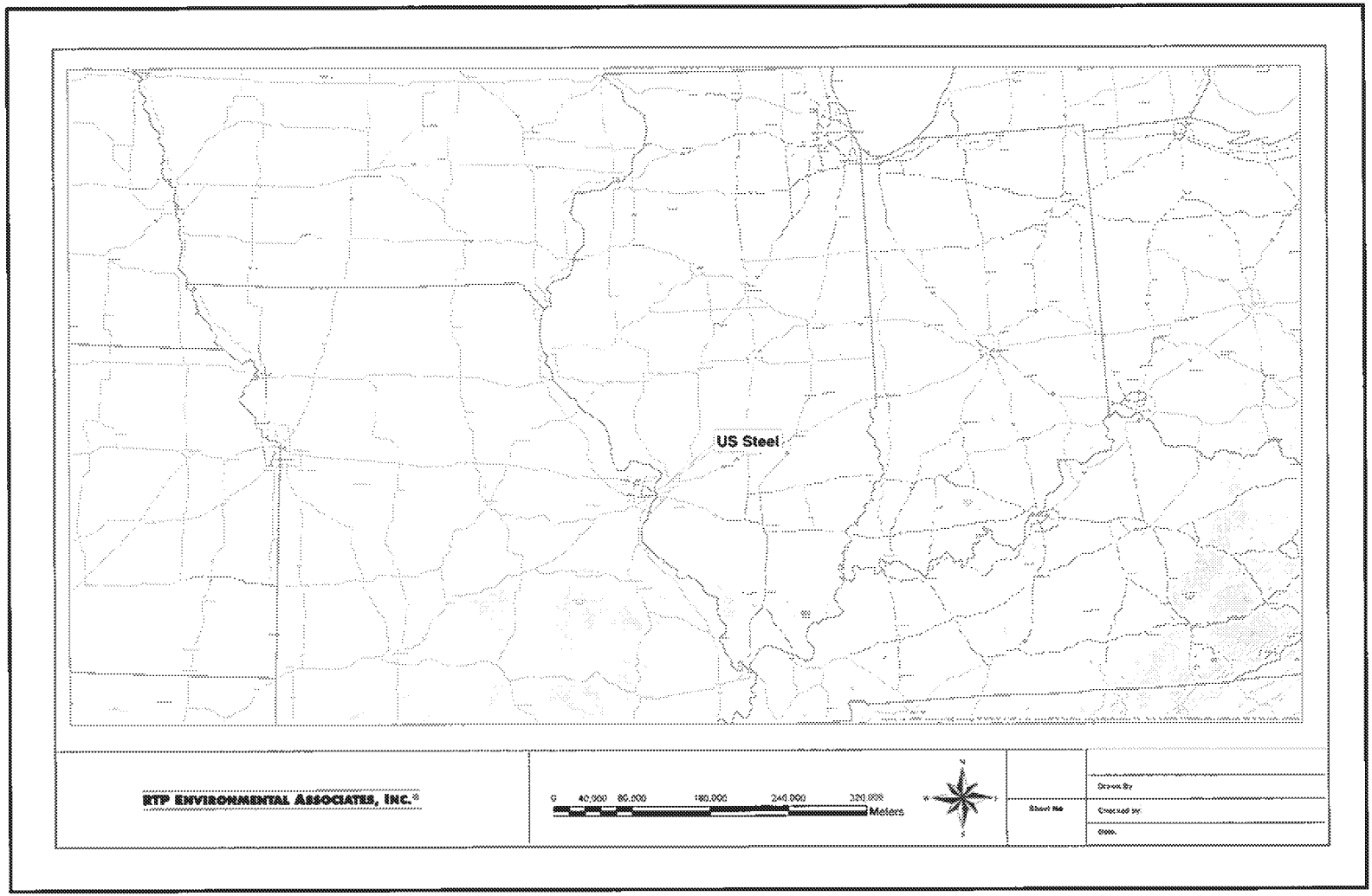


Figure 1. General Location of the US Steel Granite City Works

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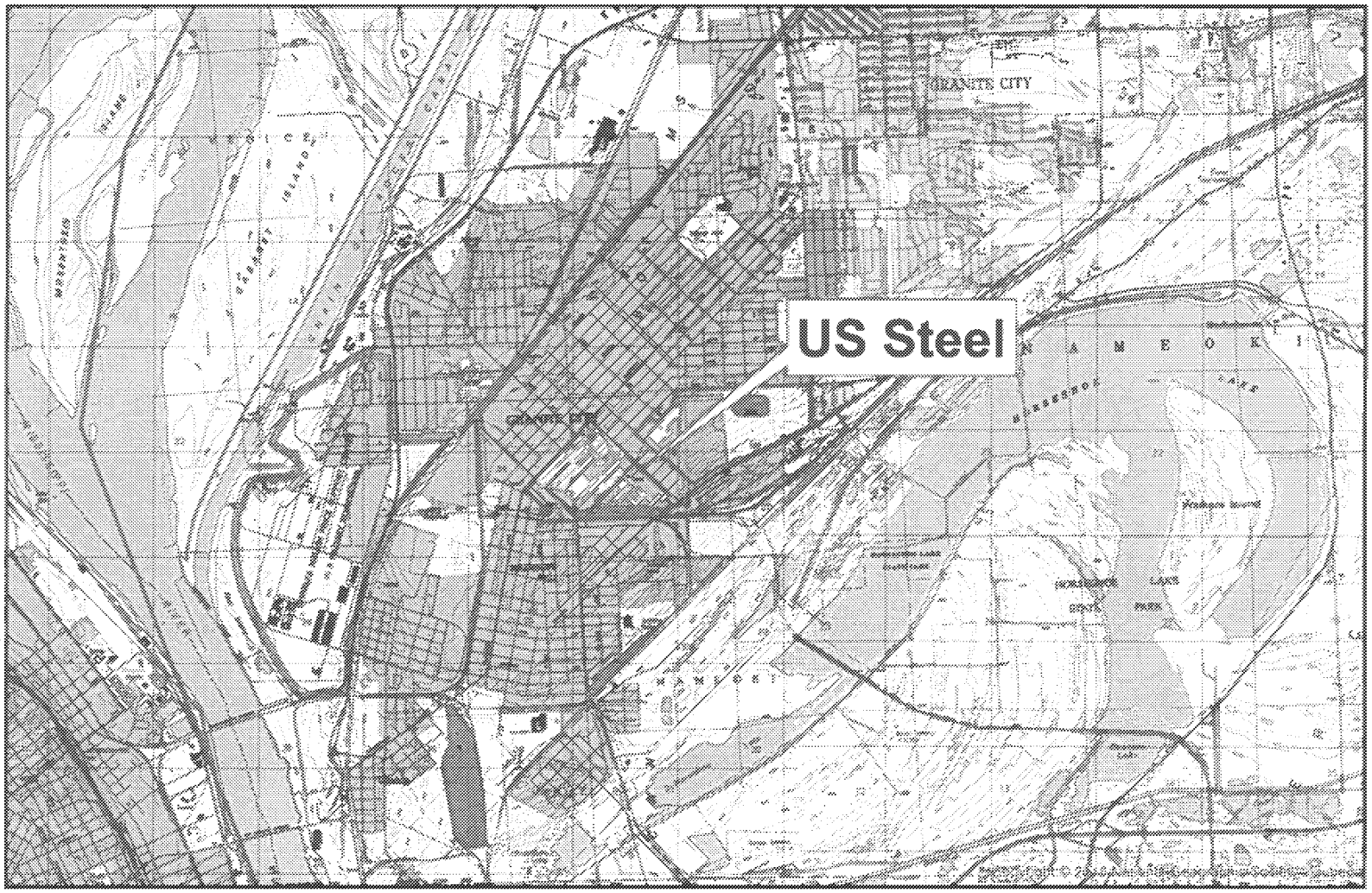


Figure 2. Specific Location of US Steel Granite City Works

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4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 22112) was used to conduct the dispersion modeling analysis. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the required default model for calculating ambient concentrations near the US Steel facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the USEPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W was not warranted.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. These coefficients were used by the Illinois Environmental

Protection Agency ("IEPA") in its evaluation of the facility as part of the 1-hr sulfur dioxide ("SO2") Data Requirements Rule ("DRR").

4.3 Source Data

The modeling input data and modeled CO emission rates can be found in Appendix A of this report.

Source Characterization

The majority of modeled source input parameters were obtained from the IEPA's model conducted for the Data Requirements Rule ("DRR").

Point Sources

Most emission sources at the site vent to stacks with a well defined opening. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well defined opening. These sources were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were provided by the IEPA and were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

Flares

The facility uses blast furnace gas flares to combust excess process gas. Emissions that occur only during periods of malfunction are not required to be modeled per 40 CFR Part 51 Appendix W. Non-malfunction emissions were modeled using the procedures outlined in the AERSCREEN Manual[3]. The effective stack height (H, in meters) was computed by the IEPA as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare stack in caloriesper second:

$$H_{equivalent} = H_{actual} + 4.56x10^{-3} \times Q^{0.478}$$

The effective flare stack diameter (d, in meters) was computed as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88x10^{-4} \times (Q \times 0.45)^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec is assumed.

All source locations were based upon a NAD83, UTM Zone 15 projection.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for any stacks n excess of 65m. Procedures used are in accordance with those described in the USEPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[4]. GEP formula stack height, as defined in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from a facility plot plan. The structure locations and heights were obtained from the IEPA and were input to the USEPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The structures included in the GEP analysis are shown as the green blocks in Figure 3. All stacks and structures that are located near a stack were included in the BPIP runs.

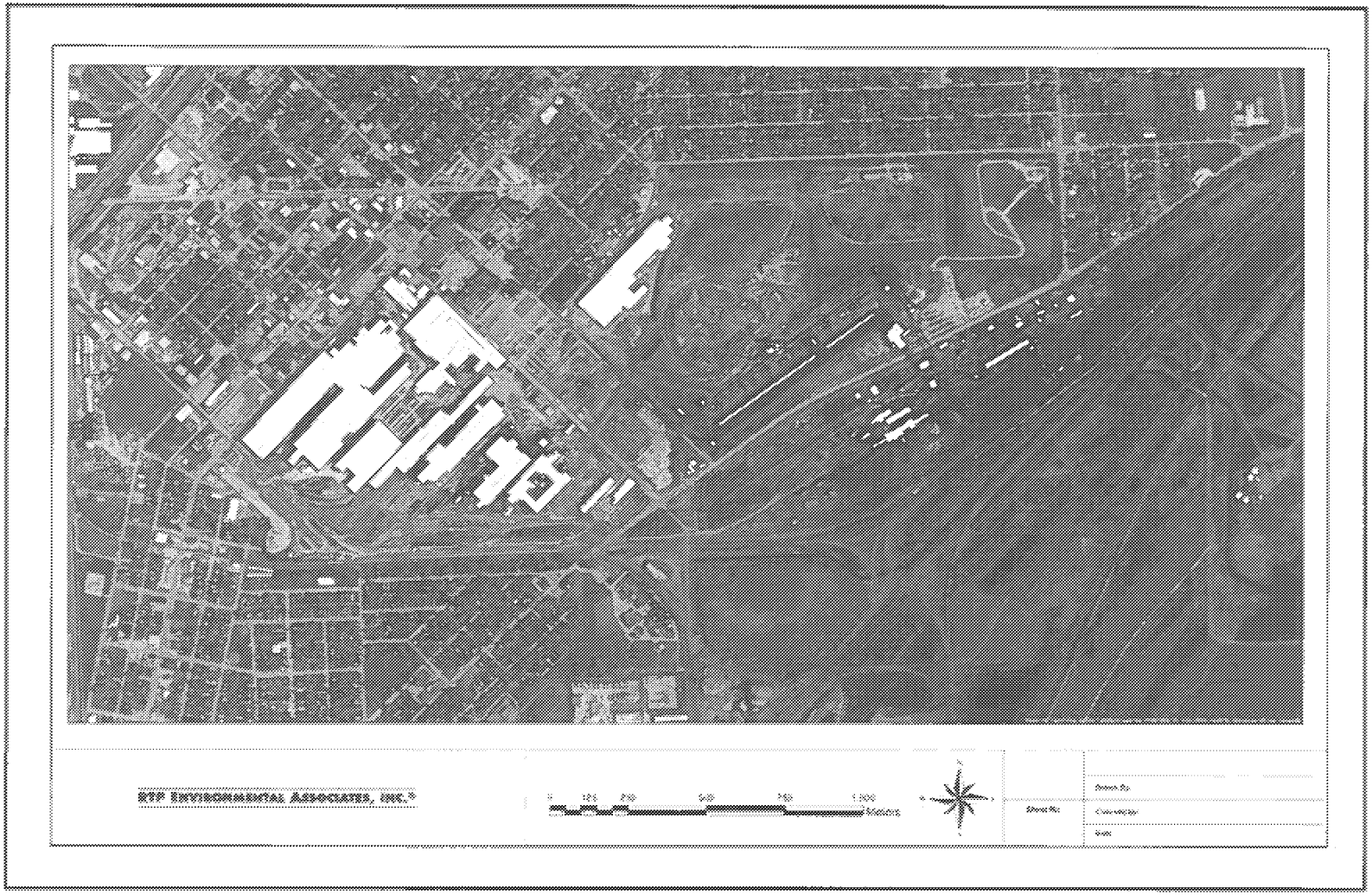


Figure 3. Structures Included in the US Steel GEP Analysis

R005231

4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 40 CFR § 52.21(m), as discussed in Section 5.0herein.

Pursuant to 40 CFR § 52.21(i)(5), requirements for ambient monitoring data may be waived by the permitting authority if projected increases in ambient concentrations due to the project are less than the Significant Monitoring Concentrations. However, in light of the decision of the D.C. Circuit Court of Appeals *Sierra Club v. EPA*,[5] US Steel has elected not to request such a waiver at this time.

The USEPA Monitoring Guidelines[6], other USEPA interpretive guidance, and USEPA administrative decisions clarify that representative, existing air quality monitoring data may be used to fulfill the PSD pre-construction monitoring requirements and establish background concentrations needed for assessing NAAQS compliance, in lieu of monitoring data. USEPA's Monitoring Guidelines suggest specific criteria to determine representativeness of off-site data: *quality of the data, currentness of the data, and monitor location*.

There are many existing ambient CO monitors within 100 miles in the facility (Figure 4). Existing monitoring data have been evaluated in relation to the criteria provided in USEPA's Ambient Monitoring Guidelines as being representative of the US Steel site.

We have used recently available, quality assured data (2016-2018) from the AQS monitor in East St. Louis, IL (AQS Site # 17-163-0010). 2018 is the latest year of complete, available data. The 4th quarter of 2019 is incomplete and data are not



Figure 4. Ambient Air Quality Monitors in the Vicinity of the US Steel Facility

R005233

available for 2020-2021. This monitor best represents background concentrations near the facility as it is the closest monitor with current CO data and is in the vicinity of the site and therefore representative of conditions as the site. The background data are presented in Table 1.

Table 1. Proposed Background Concentrations 2016-2018

Pollutant	Averaging Time	Design Value (ppb)[µg/m³]	Basis	AQS Site No.
CO	1-hour	(2,200) [2,515]	Maximum	17-163-0010 St. Louis
	8-hour	(1,440) [1,646]		

The existing monitoring data satisfy the criteria provided in USEPA's Ambient Monitoring Guidelines[7] as being representative of the site.

Monitor Location

Of the monitors available, the East St. Louis monitor represents background concentrations as it is the closest monitor with data for the pollutants of concern that is not also significantly influenced by the localized source impacts.

Data Quality

The monitor data were collected and quality assured by the IEPA.

Currentness of Data

The data were collected during 2016-2018, which represents the recently available, quality assured data available for use in assessing compliance.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 14,100 receptors were used in the AERMOD significant impacts analysis. The receptor grid consisted of three cartesian grids and receptors located at 50m intervals along the facility fence line.

The first cartesian grid extended to approximately 3.0km from the facility in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region were 250m. A third grid extended to 15km with a spacing of 500m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 2.

Table 2. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Facility (m)
100	3,000
250	5,000
500	15,000

The US Steel facility is located in southern Illinois. Terrain within 10km of the site is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS one arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 15 projection. The near-field receptor grid is presented in Figure 5.

4.6 Meteorological Data

The 2016-2020, 5-year sequential hourly surface meteorological data from the National Weather Service (NWS) at St. Louis Lambert Field (WBAN No. 13994) and upper air data from the NWS station in Lincoln, IL (WBAN No. 04833) were used in the analysis. These data were processed into a "model-ready" format using AERMET version 21112.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption.

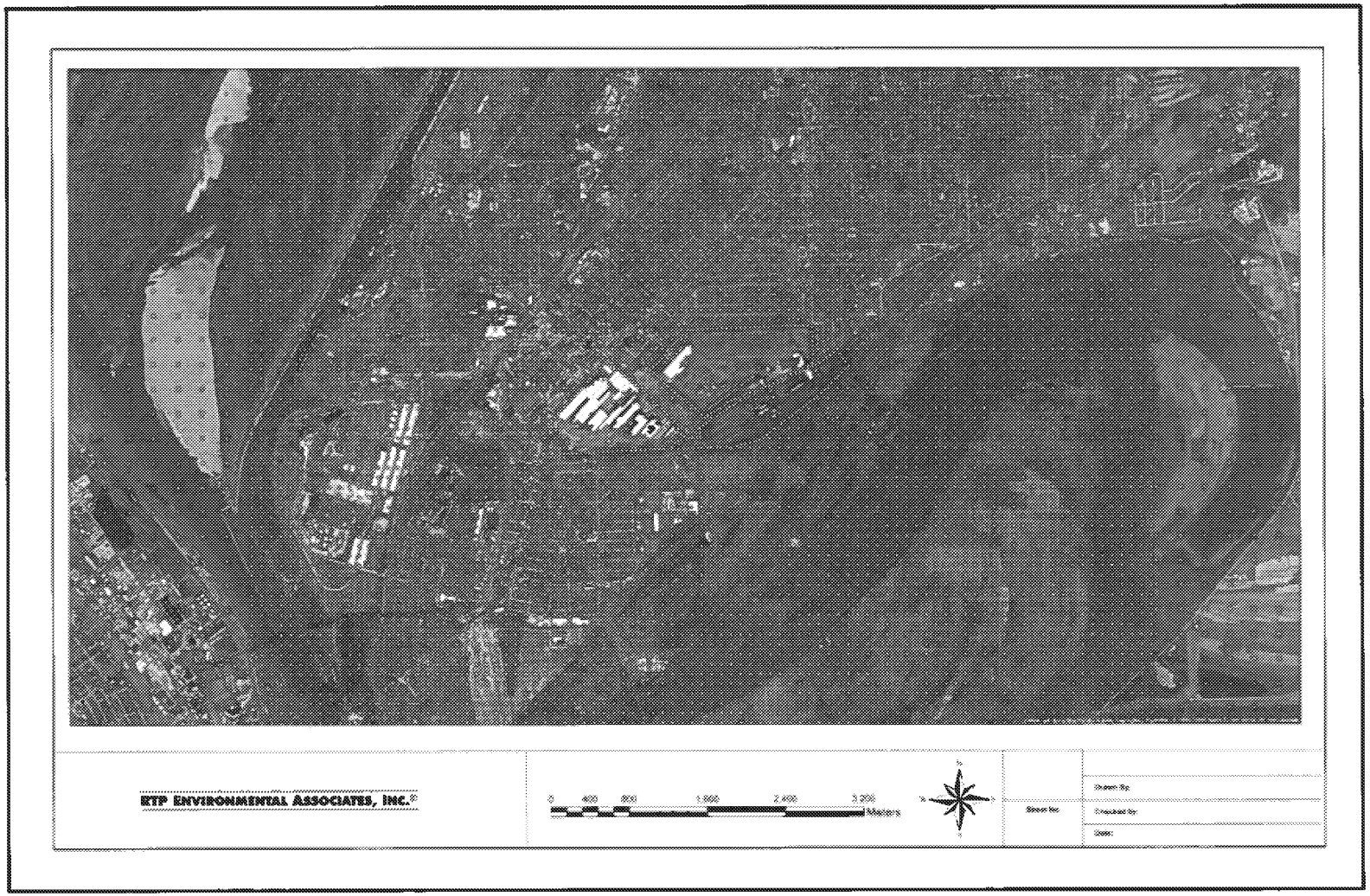


Figure 5. US Steel Facility Near-field Receptor Grid

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The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. Estimates of the surface characteristics were made by the IEPA using USEPA's AERSURFACE program (Version 13016) and provided to RTP Environmental. A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. RTP employed the "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed.

The use of NWS meteorological data for dispersion modeling can often lead to a high incidence of calms and variable wind conditions if the data are collected by Automated Surface Observing Stations ("ASOS"), as are in use at most NWS stations since the mid-1990's. A calm wind is defined as a wind speed less than 3 knots and is assigned a value of 0 knots. In addition, variable wind observations may include wind speeds up to 6 knots, but the wind direction is reported as missing, if the wind direction varies more than 60 degrees during the 2-minute averaging period for the observation. The AERMOD model currently cannot simulate dispersion under calm or missing wind conditions. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations were used to calculate hourly average wind speed and directions, which were used to supplement the standard archive of hourly observed winds processed in AERMET. The USEPA AERMINUTE program (Version 15272) was used for these calculations. A wind rose of the 5-year meteorological dataset is provided in Figure 6.

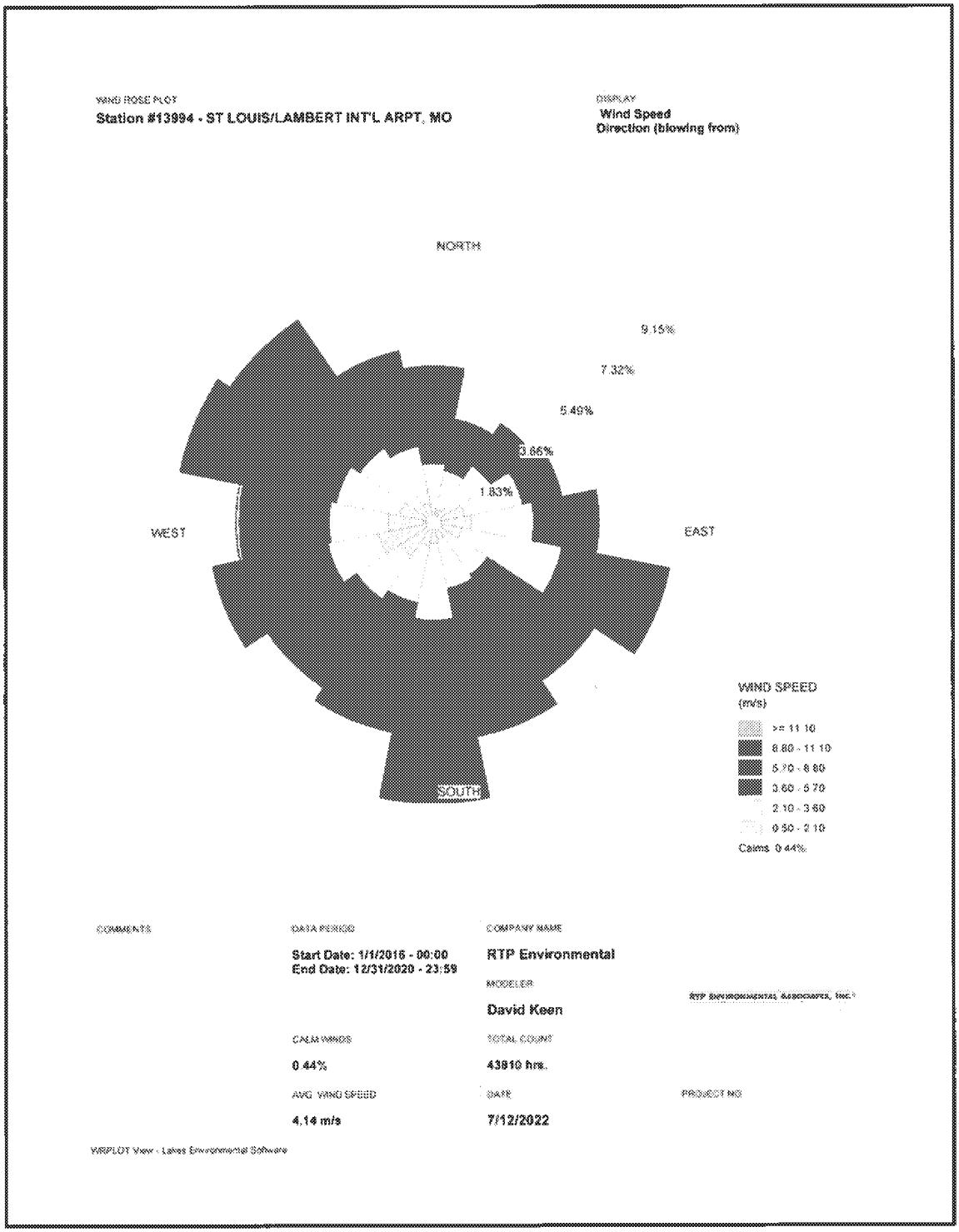


Figure 6. Lambert Field Windrose 2014-2018.

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

USS Steel is proposing changes to the CO emission limitations in the 1996 Construction Permit that were established per the PSD requirements. Therefore, as requested by Illinois EPA, dispersion modeling of CO emissions have been evaluated and compared to the NAAQS.

5.2 Significant Impact Analysis

The air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase NAAQS analysis. In the significant impact analysis, the calculated maximum impacts due to the project were determined for CO.[b] These impacts determined the net change in air quality resulting from the proposed revision to modification permitted under the 1996 Construction Permit. Five years of meteorological data were used in the significant impact analysis. Maximum modeled CO concentrations were compared to the significance levels. The PSD Class II Significant Impact Levels for CO are listed in Table 3.

Table 3. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels (µg/m³)
CO	1-hour	2,000
	8-hour	500

[b] For some of the affected emissions units, in place of project related emissions increases, we conservatively used the potential to emit of CO.

5.3 NAAQS Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the CO NAAQS was conducted. In the NAAQS analysis, impacts from the US Steel facility were added to concentrations calculated from other nearby sources, plus a regional background concentration. The resultant total concentrations were compared to the NAAQS to assess compliance. The receptors modeled in the NAAQS analyses were limited to those showing a significant CO impact. Five years of meteorological data were again used in this analysis.

Nearby Source Inventory

Off-site sources were included in the NAAQS analysis. A 50km radius was used to define the screening area. A list of sources that are located within the screening area has been obtained from the IEPA as well as the Missouri Department of Natural Resources ("MDNR"). Section 8.3.3.b of Appendix W to 40 CFR Part 51 states that the number of nearby sources to be explicitly modeled is expected to be few, except in unusual situations. Appendix W further states that the sources to be included will usually be located within the first 10 to 20km from the source under consideration. In addition, it states that identification of nearby sources calls for the exercise of professional judgment by the appropriate reviewing authority. Further, USEPA's Guidance for PM2.5 Permit Modeling reiterates the Appendix W emphasis on a 10km screening radius for determining which nearby sources to include in the cumulative modeling analysis.

We conservatively included all sources provided by the IEPA and MDNR that are located within 50km of the US Steel facility. Total facility, potential emissions (i.e., all sources at a facility) were used in the NAAQS evaluation.

NAAQS Compliance Assessment

Ambient background concentrations (as discussed in more detail in Section 4.4) were then added to assess NAAQS compliance. The modeled and monitored values shown in Table 4 were used for this assessment.

Table 4. Monitored and Modeled Values Used to Assess NAAQS Compliance

Pollutant	Averaging Time	Monitored Value	Modeled Value
CO	1-hour & 8-hour	Maximum over 3 years	Highest, second high over 5 years

The NAAQS are shown in Table 5.

Table 5. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards ($\mu g/m^3$)	
		Primary	Secondary
CO	1-hour	40,000	--
	8-hour	10,000	--

6.0 RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are included on the enclosed CD.

6.1 Significant Impact Analysis Results

The project results in CO impacts in excess of the 8-hour Significant Impact Level shown in Table 3. The significant impact analysis results are presented in Table 6. Based upon the results of the significant impacts analysis, a cumulative, NAAQS analysis was conducted.

6.2 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the CO NAAQS. The project resulted in insignificant 1-hr CO impacts, as a result the 1-hr average was not included in the NAAQS assessment. All sources located within 50km of the US Steel facility were modeled in conjunction with the US Steel facility in assessing compliance. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the CO short term standards was based upon the maximum of the highest-second-highest values from the five-year meteorological dataset.

The results of the NAAQS analysis are presented in Table 7. As can be seen, the model demonstrates compliance.

Table 6. Significant Impact Analysis Results

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
CO	1-hr	1,157	2,000	N/A	NA
	8-hr	692	500	575	2.2

N/A -- Not applicable, impacts calculated to be insignificant.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Comment
CO	8-hour	2,045	1,646	3,691	10,000	Compliant

R005243

ATTACHMENT A
MODELING INPUT DATA

US Steel Granite City Point Source Model Input (NAD83, Zone 15)
Last Update (10-5-22)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
132833	DEFAULT	Blast Furnace A Stoves	749816.02	4286809.08	416.83	217.0	500.0	49.66	7.0	1604.52	1604.52
132838	DEFAULT	Blast Furnace B Stoves	749665.50	4286719.93	417.16	225.0	500.0	51.05	9.8	1837.76	1837.76
132837	DEFAULT	Blast Furnace Gas Flare #1	749777.33	4286841.02	418.21	221.8	1831.7	65.62	15.4	6280.99	6280.99
240475	DEFAULT	Blast Furnace Gas Flare #2	749865.93	4286920.23	416.24	221.8	1831.7	65.62	15.4	6280.99	0.00
132836	DEFAULT	Casthouse Baghouse	749616.61	4286732.18	417.75	63.0	150.0	63.88	11.0	63.77	21.68
132927	DEFAULT	Blast Furnace A and B Iron Spout Baghouse	749831.35	4286818.73	415.98	43.0	123.0	43.04	7.8	6.43	2.19
238459	DEFAULT	Cogeneration Boiler BFG-fired some NG-firing	749776.38	4287073.85	415.19	197.0	400.1	82.11	6.0	203.08	0.00
132867	DEFAULT	Boiler 11	749865.15	4286883.84	416.24	149.9	335.0	29.82	8.0	90.48	90.48
132872	DEFAULT	Boiler 12	749881.40	4286887.85	416.50	150.0	335.0	26.74	8.0	90.48	90.48
BOF	DEFAULT	BOF ESP	748415.00	4286681.00	416.57	125.0	400.0	50.00	15.0	4121.79	1274.01
BOF2ND	DEFAULT	BOF Secondary Baghouse	748625.57	4286763.99	413.00	160.0	275.0	38.55	17.0	19.69	19.69
132842	DEFAULT	Slab Reheat Furnace #1	747729.70	4286762.02	417.52	56.8	650.1	44.88	8.0	26.52	0.00
172532	DEFAULT	Slab Reheat Furnace #2	747715.25	4286747.05	416.47	56.8	650.1	44.88	8.0	26.52	0.00
172512	DEFAULT	Slab Reheat Furnace #3	747700.79	4286730.52	415.86	56.8	650.1	44.88	8.0	26.52	0.00
172514	DEFAULT	Slab Reheat Furnace #4	747700.27	4286714.00	416.08	146.0	736.1	26.94	13.7	40.76	0.00
132849	DEFAULT	Galvanizing line #8 - fume scrubber	748883.00	4287135.00	416.57	80.0	80.0	41.66	3.0	0.00	0.00
229337	DEFAULT	Galvanizing line #8 - space heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229338	DEFAULT	Galvanizing line #8 - drying oven and storage area heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229339	DEFAULT	Galvanizing line #8 - miscellaneous heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229601	DEFAULT	Emergency Generator (3500 HP)	749641.00	4286863.00	416.17	37.0	442.0	32.80	1.9	0.00	0.00
GTEWY1	DEFAULT	Gateway Energy & Coke Co., LLC - Coking (New Main Stack)	749279.00	4286984.00	415.78	199.9	293.1	48.249	13.0	2.62E+01	0.00
GTEWY2	DEFAULT	Gateway Energy & Coke Co , LLC - Charging - Stack 2 of 6	749549.00	4287055.00	418.18	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY3	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 3 of 6	749433.00	4286972.00	418.93	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY4	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 4 of 6	749357.00	4286918.00	418.84	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY5	DEFAULT	Gateway Energy & Coke Co , LLC - Charging - Stack 5 of 6	749278.00	4286861.00	418.44	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY6	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 6 of 6	749202.00	4286808.00	418.60	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY7	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 1 of 6	749624.00	4287108.00	418.50	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY8	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 1	749199.00	4286809.00	418.60	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY9	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 1 of 6	749620.00	4287113.00	418.11	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY10	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 2	749274.00	4286862.00	418.31	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY11	DEFAULT	Gateway Energy & Coke Co , LLC - Waste heat stack 3	749353.00	4286919.00	418.67	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY12	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 4	749429.00	4286973.00	419.00	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY13	DEFAULT	Gateway Energy & Coke Co , LLC - Waste heat stack 5	749545.00	4287055.00	418.27	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY14	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 6	749620.00	4287109.00	418.34	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY15	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 2 of 6	749545.00	4287060.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY16	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 3 of 6	749429.00	4286977.00	418.93	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY17	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 4 of 6	749352.00	4286923.00	418.57	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY18	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 5 of 6	749274.00	4286866.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY19	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 6 of 6	749198.00	4286813.00	418.77	20.0	400.0	69.602	5.0	1.32E+00	0.00

R005245

US Steel Granite City Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
26070	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748457.20	4286596.40	413.88	169.0	21.6	78.6	1.373	1.373
26080	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748466.60	4286606.00	413.98	169.0	21.6	78.6	1.373	1.373
26090	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748475.40	4286616.10	413.88	169.0	21.6	78.6	1.373	1.373
26100	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748483.60	4286624.10	413.85	169.0	21.6	78.6	1.029	1.029
26110	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748495.20	4286635.90	414.01	169.0	21.6	78.6	1.029	0.000
26120	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748504.10	4286646.00	414.37	169.0	21.6	78.6	1.029	0.000
26130	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748513.90	4286656.70	414.63	169.0	21.6	78.6	1.029	0.000
26570	Galv Line 8	748368.26	4287046.91	420.41	101.7	12.3	48.5	0.254	0.000
26580	Galv Line 8	748374.01	4287041.49	420.11	101.7	12.3	48.5	0.254	0.000
26590	Galv Line 8	748379.56	4287036.28	419.82	101.7	12.3	48.5	0.254	0.000
26600	Galv Line 8	748420.52	4286997.79	419.55	38.0	15.1	38.0	0.254	0.000
26610	Galv Line 8	748428.00	4286990.81	419.95	38.0	15.1	38.0	0.254	0.000
26620	Galv Line 8	748436.60	4286982.91	419.85	38.0	15.1	38.0	0.254	0.000
26630	Galv Line 8	748444.54	4286975.49	419.62	38.0	15.1	38.0	0.254	0.000
26640	Galv Line 8	748451.78	4286968.87	418.50	38.0	15.1	38.0	0.254	0.000
26650	Galv Line 8	748324.79	4287118.60	421.65	38.0	15.6	17.7	0.254	0.000
26660	Galv Line 8	748331.95	4287112.00	421.52	38.0	15.6	17.7	0.254	0.000
26670	Galv Line 8	748340.34	4287104.30	421.39	38.0	15.6	17.7	0.254	0.000
26680	Galv Line 8	748347.69	4287097.51	421.29	38.0	15.6	17.7	0.254	0.000
26690	Galv Line 8	748354.48	4287091.31	421.16	38.0	15.6	17.7	0.254	0.000
26700	Galv Line 8	748362.29	4287084.18	420.87	38.0	15.6	17.7	0.254	0.000
26710	Galv Line 8	748370.46	4287076.71	420.51	38.0	15.6	17.7	0.254	0.000
26720	Galv Line 8	748378.04	4287069.70	420.14	38.0	15.6	17.7	0.254	0.000
26730	Galv Line 8	748385.51	4287062.91	419.52	38.0	15.6	17.7	0.254	0.000
0126A_1	Slag Pit Volume 1	749691.91	4286762.44	418.70	53.0	29.0	17.7	0.000	0.000
0126A_2	Slag Pit Volume 2	749708.01	4286772.50	421.33	53.0	29.0	17.7	0.000	0.000
0126A_3	Slag Pit Volume 3	749724.24	4286782.31	420.44	53.0	29.0	17.7	0.000	0.000
0126A_4	Slag Pit Volume 4	749740.84	4286791.62	419.00	53.0	29.0	17.7	0.000	0.000
0126A_5	Slag Pit Volume 5	749757.20	4286801.31	418.86	53.0	29.0	17.7	0.000	0.000

R005246

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL131772	DEFAULT	Starr Memorial Pet Crematory - Crematory	748240.00	4324486.00	642.44	16.0	850.0	27.585	1.0	2.70E+00	0.00E+00	0.00E+00
IL131841	DEFAULT	Alton Steel Inc. - Electric arc furnaces	747755.00	4307832.00	433.07	100.0	250.1	31.079	24.2	2.25E-02	7.97E+01	7.97E+01
IL131845	DEFAULT	Alton Steel Inc. - 14 inch rolling mill reheat furnace	747645.00	4307692.00	432.64	106.0	200.0	2.394	16.0	2.40E+01	0.00E+00	0.00E+00
IL131945	DEFAULT	Alton Memorial Hospital - 5 Boilers	748364.00	4305470.00	671.36	89.0	389.0	24.108	3.0	0.00E+00	1.28E+01	1.28E+01
IL132052	DEFAULT	Olin Winchester, LLC - Package Boiler (B-4)	750887.00	4308614.00	435.63	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132062	DEFAULT	Olin Winchester, LLC - Package Boiler (B-3)	750891.00	4308619.00	435.89	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132063	DEFAULT	Olin Winchester, LLC - Package Boiler (B-2)	750892.00	4308613.00	435.53	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132064	DEFAULT	Olin Winchester, LLC - Package Boiler (B-1)	750888.00	4308609.00	435.80	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-5)	750883.00	4308610.00	435.27	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132148	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #1 (EF-1)	747122.00	4287625.00	425.26	55.0	250.1	54.087	6.2	7.84E+01	4.07E+00	4.07E+00
IL132149	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #2 (EF-2)	747147.00	4287625.00	425.20	44.0	250.1	42.443	7.0	3.84E+01	4.07E+00	4.07E+00
IL132193	DEFAULT	Velocity Services, LLC. - North American Boiler	748928.00	4286192.00	416.21	27.0	450.1	24.305	2.3	2.36E+00	0.00E+00	0.00E+00
IL132194	DEFAULT	Velocity Services, LLC. - Cleaver Brooks boiler	748926.00	4286197.00	416.21	29.0	440.0	39.590	2.0	2.36E+00	0.00E+00	0.00E+00
IL132215	DEFAULT	Gateway Regional Medical Center - Boiler #3	748587.00	4287448.00	426.05	48.0	600.0	43.131	4.5	1.53E+00	1.28E+01	1.28E+01
IL132226	DEFAULT	Gateway Regional Medical Center - Boilers #1 and 2	748592.00	4287452.00	425.95	48.0	600.0	38.966	4.5	3.07E+00	2.57E+01	2.57E+01
IL132247	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #1	747506.00	4287650.00	424.64	75.0	375.0	30.078	2.5	1.30E-01	0.00E+00	0.00E+00
IL132248	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #2	747505.00	4287550.00	424.64	25.0	375.0	85.010	2.5	2.40E-01	1.19E+00	1.19E+00
IL132324	DEFAULT	Precast Metals - Afterburner AB1 and AB2	749469.00	4295986.00	424.87	34.0	1000.0	84.918	4.0	3.23E+00	0.00E+00	0.00E+00
IL132428	DEFAULT	Highland Electric Light Plant - Engine #C-5	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	2.07E+01	0.00E+00	0.00E+00
IL132429	DEFAULT	Highland Electric Light Plant - Engine #C-7	788126.93	4293320.17	534.65	57.0	734.1	6.265	11.4	2.51E+01	0.00E+00	0.00E+00
IL132496	DEFAULT	ConocoPhillips Co. - Catalytic reformer #1 (STK12-4)	754869.00	4302625.00	442.55	349.9	600.0	56.810	15.0	6.28E+01	9.53E+01	9.53E+01
IL132510	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-FSU1 (STK5-2)	754327.00	4303077.00	444.69	185.0	319.0	21.978	8.0	1.21E+01	0.00E+00	0.00E+00
IL132512	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1 # 302 (STK5-1)	754326.00	4303100.00	444.49	150.0	350.0	11.677	8.5	1.57E+01	5.29E+00	5.29E+00
IL132512	DEFAULT	ConocoPhillips Co. - Steam methane reformer: SMR Heater (HTR-SMR - STK12-8)	754873.00	4302750.00	443.04	199.9	749.9	36.638	12.0	4.75E+01	6.82E+01	6.82E+01
IL132516	DEFAULT	ConocoPhillips Co. - Rectified absorption unit: Reboiler heater (HTR-RAU-DEBUT - STK5-9)	754470.00	4302943.00	444.98	75.0	850.0	34.440	5.0	7.14E+00	0.00E+00	0.00E+00
IL132517	DEFAULT	ConocoPhillips Co. - Recurfied absorption system up RFG	754240.00	4303144.00	443.47	150.0	710.0	26.338	6.0	0.00E+00	1.20E+02	1.20E+02
IL132519	DEFAULT	ConocoPhillips Co. - Cracked absorption unit (HTR-CAU-REBSTILL - STK5-4)	754468.00	4302963.00	445.41	95.0	800.0	22.373	7.2	6.72E+00	0.00E+00	0.00E+00
IL132526	DEFAULT	ConocoPhillips Co. - CCU-1 Startup heater B-1	754240.00	4303144.00	443.47	212.0	500.1	86.953	4.5	0.00E+00	3.55E+01	3.55E+01
IL132535	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #2 (STK6-3)	754848.00	4302896.00	443.27	199.9	175.0	49.954	11.0	4.72E+00	2.17E+03	2.17E+03
IL132551	DEFAULT	ConocoPhillips Co. - Alkylation unit: HTR-ALKY-HM2 (STK6-6)	754930.00	4303043.00	442.59	150.8	475.1	12.398	5.7	4.32E+00	0.00E+00	0.00E+00
IL132556	DEFAULT	ConocoPhillips Co. - Utility boiler #15 (STK12-15)	754859.00	4302776.00	443.44	132.0	425.0	43.165	7.0	2.65E+01	1.62E+01	1.62E+01
IL132557	DEFAULT	ConocoPhillips Co. - Utility boiler #16 (STK12-16)	754875.00	4302778.00	443.21	132.0	425.0	43.165	7.0	2.78E+01	1.41E+01	1.41E+01
IL132558	DEFAULT	ConocoPhillips Co. - Utility boiler 17 (STK12-17)	754902.00	4302784.00	442.91	150.0	317.0	52.218	10.0	5.60E+01	1.82E+01	1.82E+01
IL132559	DEFAULT	ConocoPhillips Co. - Utility boiler 18 (STK6-9)	754919.00	4302809.00	442.52	100.0	325.0	14.465	6.2	3.00E+01	6.61E+00	6.61E+00
IL132561	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #1: Charge heater (HTR-HDU-1 - STK12-1)	755217.00	4302538.00	442.16	150.0	790.1	32.144	5.0	5.60E+00	0.00E+00	0.00E+00
IL132564	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #2: Charge heater (HTR-HDU-2 - STK12-14)	755012.00	4302530.00	442.85	150.0	680.1	31.427	5.8	4.90E+00	0.00E+00	0.00E+00
IL132566	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Stabilizer reboiler (HTR-CR3-H2 - STK12-9)	755014.00	4302580.00	442.62	150.0	950.1	7.019	7.6	4.79E+00	0.00E+00	0.00E+00
IL132567	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: Charge heater (HTR-CR3 -H4)	755019.00	4302571.00	442.66	150.0	905.0	28.766	7.8	1.75E+01	8.04E+00	8.04E+00
IL132568	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: First interreactor heater (HTR-CR3 H5)	755019.00	4302548.00	442.78	150.0	749.9	29.629	7.5	2.11E+01	6.93E+00	6.93E+00
IL132569	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Second interreactor heater (HTR-CR3-H6 - STK12-12)	755019.00	4302559.00	442.72	150.0	749.9	14.006	7.8	6.55E+00	0.00E+00	0.00E+00
IL132594	DEFAULT	ConocoPhillips Co. - Sulfuric acid tank	755114.00	4302829.00	441.93	40.0	180.0	26.273	2.0	1.78E+00	2.35E+00	2.35E+00
IL132598	DEFAULT	ConocoPhillips Co. - CCU-2 Startup heater B-1	754240.00	4303144.00	443.47	16.0	509.1	32.964	3.2	4.40E-01	0.00E+00	0.00E+00
IL132599	DEFAULT	Airgas USA, LLC - Liquified carbon dioxide plant	756314.00	4302509.00	435.93	30.0	70.1	79.573	0.2	4.10E-01	0.00E+00	0.00E+00
IL132701	DEFAULT	Kinder Morgan Liquids Terminals, LLC - New Truck loading rack	752998.00	4303578.00	435.63	20.0	70.1	0.262	2.2	4.87E+00	0.00E+00	0.00E+00
IL132759	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 1 of 2)	750915.00	4300804.00	462.46	34.0	450.1	23.321	3.0	1.69E+00	5.00E+00	5.00E+00
IL132777	DEFAULT	Flint Kettel & Schaaf Funeral Home & Crematory - Crematorium	742098.00	4317210.00	627.20	30.0	1400.1	18.368	1.7	3.00E+00	0.00E+00	0.00E+00
IL132791	DEFAULT	Christ Bros Products, LLC - Baghouse	754150.00	4283243.00	419.46	32.0	240.0	85.706	3.9	5.56E+01	2.46E+01	2.46E+01
IL132928	DEFAULT	Enable Mississippi River Transmission, LLC - Engine SN-02	782556.00	4285336.00	492.28	30.0	1000.0	9.419	2.6	1.96E+01	0.00E+00	0.00E+00
IL133625	DEFAULT	Waterloo City Light Plant - Engine #1	748326.00	4246768.00	640.45	28.0	749.9	13.573	2.3	4.00E+01	1.35E+00	1.35E+00
IL133627	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL133628	DEFAULT	Waterloo City Light Plant - Engine #10	748328.00	4246768.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL135383	DEFAULT	Lakeview Memorial Gardens - Crematory	762896.00	4273894.00	579.89	16.0	899.0	25.866	2.6	8.40E+00	0.00E+00	0.00E+00
IL136017	DEFAULT	Brenntag-Age of IL - Natural gas combustion	756481.00	4277782.00	423.82	38.0	341.0	25.781	2.7	3.94E+00	0.00E+00	0.00E+00
IL136014	DEFAULT	Touchette Regional Hospital - 2 Boilers	751898.00	4279814.00	415.94	59.0	800.0	6.560	3.7	2.26E+00	0.00E+00	0.00E+00
IL136018	DEFAULT	Upchurch Ready Mix Concrete Company - Boiler	749859.00	4276616.00	418.46	30.0	376.1	29.684	3.7	0.00E+00	3.80E-01	3.80E-01

R005247

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL136098	DEFAULT	Safety Kleen Systems, Inc. - Pipe still (heat exchanger)	749786.00	4276425.00	420.28	15.0	170.0	0.295	1.0	0.00E+00	1.38E+00	1.38E+00
IL136125	DEFAULT	Milam Recycling and Disposal Facility - Open flare	750434.00	4282812.00	420.54	42.0	1800.1	10.970	1.0	1.83E+01	6.00E+00	6.00E+00
IL136129	DEFAULT	Village of Freeburg - Engine #6	769352.00	4257578.00	509.42	24.0	749.9	24.239	1.8	3.93E+00	0.00E+00	0.00E+00
IL136130	DEFAULT	Village of Freeburg - Engine #4	769352.00	4257578.00	509.42	25.0	550.0	87.871	1.3	9.60E+00	0.00E+00	0.00E+00
IL136131	DEFAULT	Village of Freeburg - Engine #7	769352.00	4257578.00	509.42	23.0	900.1	18.926	2.7	4.50E+01	4.43E+00	4.43E+00
IL136169	DEFAULT	Darling Ingredients, Inc. - Continuous rendering process	747472.00	4281438.00	414.93	44.0	74.9	84.854	4.9	6.67E+00	1.43E+00	1.43E+00
IL136187	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	772959.00	4275690.00	514.30	33.0	325.0	47.134	4.5	8.48E+01	2.90E+01	2.90E+01
IL136486	DEFAULT	Cerro Flow Products, LLC. - Piercing Mill Furnace #2	746228.00	4276272.00	407.32	25.0	299.9	38.901	2.0	8.65E-01	0.00E+00	0.00E+00
IL136547	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	747162.00	4269805.00	448.72	36.0	315.1	86.592	3.5	1.34E+01	5.91E+00	5.91E+00
IL142809	DEFAULT	Magnesium Elektron North America - Combustion units	746452.00	4285724.00	415.49	60.0	450.1	30.537	2.0	1.02E+01	4.44E+00	4.44E+00
IL143317	DEFAULT	Waterloo City Light Plant - Engine #11	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.90E+01	3.60E+00	3.60E+00
IL143319	DEFAULT	Waterloo City Light Plant - Engine #7	748326.00	4246769.00	640.45	33.0	749.9	84.854	2.0	3.41E+01	0.00E+00	0.00E+00
IL143320	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246769.00	640.45	27.0	680.1	84.230	2.3	1.87E+01	1.36E+00	1.36E+00
IL145809	DEFAULT	ConocoPhillips Co. - Crude heaters (STK5-3)	754415.00	4303016.00	445.93	311.9	530.0	87.970	14.0	7.81E+01	1.98E+01	1.98E+01
IL145820	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #1 (STK3-1)	752928.00	4303077.00	428.41	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145826	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-1	754240.00	4303144.00	443.47	15.0	117.1	20.369	1.5	7.10E-01	1.74E+00	1.74E+00
IL145838	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #2 (STK3-2)	752929.00	4303071.00	428.38	125.0	965.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145850	DEFAULT	ConocoPhillips Co. - Flare for major effluent treatment project	754240.00	4303144.00	443.47	30.0	72.0	14.006	9.2	4.51E+00	0.00E+00	0.00E+00
IL147845	DEFAULT	Mayco Mfg. LLC - Brit kettles combustion stack	747189.00	4286970.00	421.78	34.0	250.1	2.362	1.1	2.00E-01	0.00E+00	0.00E+00
IL147846	DEFAULT	Mayco Mfg. LLC - Mixed metals A-9 dross baghouse discharge stack	747189.00	4286970.00	421.78	30.0	95.1	52.611	5.0	5.77E-01	0.00E+00	0.00E+00
IL148354	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #1 (STK6-2)	754864.00	4302895.00	442.88	199.9	175.0	49.954	11.0	2.92E+01	3.84E+01	3.84E+01
IL149873	DEFAULT	City of Alton - Incinerator	749456.00	4310990.00	446.33	25.0	1400.1	53.038	1.0	1.40E+00	0.00E+00	0.00E+00
IL149908	DEFAULT	Charles E. Mahoney - Drum mix asphalt plant	749517.00	4309892.00	443.14	25.0	295.1	66.289	4.0	5.74E+01	2.56E+01	2.56E+01
IL154190	DEFAULT	Milam Recycling and Disposal Facility - Engine #1	750544.00	4282853.00	411.88	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154191	DEFAULT	Milam Recycling and Disposal Facility - Engine #2	750538.00	4282852.00	412.03	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154192	DEFAULT	Milam Recycling and Disposal Facility - Engine #3	750548.00	4282855.00	411.81	26.0	820.0	86.231	0.8	7.14E+00	1.84E+00	1.84E+00
IL155302	DEFAULT	Alton Steel Inc. - Ladle Furnace	747758.00	4307832.00	433.07	74.0	275.1	87.215	3.0	2.24E+01	1.12E+01	1.12E+01
IL155304	DEFAULT	Precoat Metals - Boiler 81	749469.00	4292538.00	424.97	24.0	700.1	20.730	1.6	8.80E-01	0.00E+00	0.00E+00
IL155305	DEFAULT	Granite City Pickling & Warehousing - Boiler	746973.00	4286890.00	422.41	50.0	331.1	15.449	2.7	7.06E-01	0.00E+00	0.00E+00
IL155307	DEFAULT	Kraft Heinz Co. - Boiler 8	748105.00	4289680.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL155437	DEFAULT	Southwestern Illinois Correctional Center - 2 Boilers	753202.00	4278290.00	421.46	32.0	450.1	15.285	1.5	7.06E-01	0.00E+00	0.00E+00
IL155441	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	772959.00	4275690.00	514.30	33.0	341.0	18.368	3.2	0.00E+00	2.30E+00	2.30E+00
IL156624	DEFAULT	US Air Force/Scott Air Force Base - Boilers and Heaters	774337.00	4270862.00	440.32	30.0	331.1	23.288	2.2	4.81E+00	0.00E+00	0.00E+00
IL156970	DEFAULT	Olin Winchester, LLC - Package Boiler (8-6)	750906.00	4308625.00	436.06	35.0	400.0	84.854	2.0	0.00E+00	4.66E+00	4.66E+00
IL159940	DEFAULT	Alton Chemical Corp. - 258 Sulfonation Stack	746513.00	4276305.00	407.05	158.0	70.1	41.820	1.0	0.00E+00	5.59E+00	5.59E+00
IL159942	DEFAULT	Alton Chemical Corp. - Unit 266: Flare 36-0011/36-0610	746653.00	4276356.00	410.10	100.0	700.1	59.368	0.7	8.55E+00	4.90E+01	4.90E+01
IL159965	DEFAULT	Alton Chemical Corp. - Flare 36-0219	746513.00	4276305.00	407.05	146.0	1000.0	42.837	0.4	3.84E+00	2.74E+01	2.74E+01
IL160741	DEFAULT	Brady McCasland, Inc. - Compaction plant	748518.00	4276987.00	413.75	17.0	1521.1	65.469	1.8	5.20E-01	0.00E+00	0.00E+00
IL160742	DEFAULT	Darling Ingredients, Inc. - Kewanee boiler	747472.00	4281438.00	414.93	35.0	450.1	54.448	2.6	1.96E+00	1.51E+01	1.51E+01
IL160799	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-2	754240.00	4303144.00	443.47	48.0	117.1	20.369	1.5	0.00E+00	1.74E+00	1.74E+00
IL160898	DEFAULT	Alton Chemical Corp. - Boiler 500-15-0110	746653.00	4276489.00	405.22	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL165120	DEFAULT	BFI Waste Systems of North America, Inc. - Flare	758882.00	4264336.00	574.97	35.0	1600.1	23.485	0.8	6.80E+00	0.00E+00	0.00E+00
IL166479	DEFAULT	Union Electric Co. - Turbine CTD2A	745573.00	4283620.00	420.60	30.0	850.0	18.860	13.4	7.73E+01	2.73E+01	2.73E+01
IL166491	DEFAULT	Enable Mississippi River Transmission, LLC - Turbine SM-03	782556.00	4285336.00	492.29	30.0	749.9	86.854	2.5	9.56E+00	0.00E+00	0.00E+00
IL167781	DEFAULT	Amsted Rail Co., Inc. - Pouring and casting (PR/CST-1)	747025.00	4287611.00	424.80	101.0	251.0	34.768	9.7	0.00E+00	6.70E-01	6.70E-01
IL167787	DEFAULT	Amsted Rail Co., Inc. - Ladle Preheater (LDP-1)	747039.00	4287611.00	424.93	82.0	505.0	31.488	6.1	6.50E+00	2.20E-01	2.20E-01
IL167858	DEFAULT	ConocoPhillips Co. - Scot unit	754240.00	4303144.00	443.47	16.0	115.1	15.580	9.0	0.00E+00	1.72E+02	1.72E+02
IL169226	DEFAULT	Messer, LLC - 2 Boilers	752309.00	4301220.00	434.42	15.0	800.0	0.525	1.4	2.82E+00	0.00E+00	0.00E+00
IL172707	DEFAULT	St. Anthony's Hospital - Boiler #4	745097.00	4310364.00	584.58	64.0	400.0	58.614	2.3	0.00E+00	6.02E+00	6.02E+00
IL179611	DEFAULT	Highland Electric Light Plant - Engine IC-1	788126.93	4293320.17	534.65	12.0	656.0	86.920	1.7	1.44E+01	0.00E+00	0.00E+00
IL179671	DEFAULT	Village of Freeburg - Engine #1	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179672	DEFAULT	Village of Freeburg - Engine #2	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179673	DEFAULT	Village of Freeburg - Engine #3a	769352.00	4257578.00	509.42	25.0	500.1	55.170	1.0	5.92E+00	0.00E+00	0.00E+00
IL181173	DEFAULT	ConocoPhillips Co. - Loading rack	752292.00	4299987.00	429.92	40.0	1800.1	87.518	2.0	1.53E+00	0.00E+00	0.00E+00
IL183733	DEFAULT	Veolia ES Technical Solutions, LLC - Hazardous waste incinerator #4 (rotary kiln)	745532.00	4275942.00	414.76	57.0	650.9	32.570	2.8	8.17E+00	1.16E+01	1.16E+01

R005248

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL198069	DEFAULT	US Air Force/Scott Air Force Base - Diesel generators	774337.00	4270882.00	440.57	37.0	407.0	79.389	1.3	5.83E+01	0.00E+00	0.00E+00
IL198090	DEFAULT	Contract Services, LLC - 3 Boilers	748767.00	4275755.00	417.81	40.0	310.0	50.981	4.2	8.53E-00	5.14E+00	5.14E+00
IL192963	DEFAULT	Midwest Metal Coatings, LLC - Chemical coater/infrared oven (CC/ IRO)	748281.00	4290395.00	423.88	34.0	110.0	18.026	3.0	2.90E-01	0.00E+00	0.00E+00
IL192964	DEFAULT	Midwest Metal Coatings, LLC - Afterburner	748281.00	4290395.00	423.88	34.0	900.1	23.780	5.0	8.28E-01	0.00E+00	0.00E+00
IL192967	DEFAULT	Midwest Metal Coatings, LLC - Boiler (B1)	748281.00	4290395.00	423.88	34.0	400.0	67.338	1.5	2.12E+00	0.00E+00	0.00E+00
IL198852	DEFAULT	Chrust Bros Products, LLC - Drum mix asphalt plant	778702.00	4276345.00	439.94	35.0	297.1	62.254	5.8	7.95E+01	1.32E+01	1.32E+01
IL201652	DEFAULT	Ensure Comfort Systems - Stack	763529.00	4286192.00	477.26	25.0	800.0	14.934	1.0	2.69E-00	0.00E+00	0.00E+00
IL204833	DEFAULT	Milam Recycling and Disposal Facility - 3 Passive solar flares	750850.00	4282537.00	594.06	20.0	1800.1	97.538	0.7	4.23E+00	4.38E+00	4.38E+00
IL207740	DEFAULT	Chemtrade Solutions, LLC - Scrubber C007	753339.00	4281567.00	422.21	30.0	70.1	0.994	0.3	0.00E+00	2.00E-01	2.00E-01
IL208343	DEFAULT	Center Point Terminal Co. - Asphalt and polymer modified blend tank (T-9)	746361.00	4289240.00	416.44	33.0	185.1	0.051	1.5	1.00E-01	0.00E+00	0.00E+00
IL209238	DEFAULT	Concrete Supply, LLC - Natural gas combustion	757766.00	4302270.00	464.69	20.0	343.0	25.781	2.7	9.89E-01	0.00E+00	0.00E+00
IL209433	DEFAULT	Alton Water Treatment Facility - Stack	742583.00	4309460.00	488.98	32.0	400.0	85.083	0.7	0.00E+00	5.50E-01	5.50E-01
IL211274	DEFAULT	Kleostra-Illinois, LLC - Natural gas combustion	764550.00	4296987.00	575.95	20.0	343.0	25.781	2.7	7.88E-01	0.00E+00	0.00E+00
IL211772	DEFAULT	Center Point Terminal Co - Incinerator/waste heat boiler	746361.00	4289240.00	416.44	18.0	650.0	7.978	2.0	1.83E-01	1.05E+00	1.05E+00
IL212692	DEFAULT	Chain of Rocks Recycling & Disposal - Open flare	746845.00	4283274.00	431.59	20.0	1400.1	47.265	0.7	8.92E+00	1.06E+00	1.06E+00
IL212881	DEFAULT	Koch Fertilizer, LLC - Ammonia heater	750068.00	4306818.00	428.15	25.0	250.1	42.443	1.0	2.43E-00	5.50E-01	5.50E-01
IL216578	DEFAULT	Illinois Department of Transportation - R and K model 987-1 incinerator	752106.00	4333182.00	623.79	15.0	736.1	30.865	2.8	2.88E+00	0.00E+00	0.00E+00
IL218834	DEFAULT	Darling Ingredients, Inc. - Johnson boiler	747472.00	4281450.00	414.93	33.0	450.1	46.937	2.8	5.96E+00	1.91E+01	1.91E+01
IL213854	DEFAULT	Solvay Fluorides, LLC - Boiler	760245.00	4276115.00	418.72	30.0	361.0	7.314	2.8	1.44E+00	0.00E+00	0.00E+00
IL215313	DEFAULT	Madison County Sand, LLC - Drum mix asphalt plant	758921.00	4289026.00	472.01	32.0	245.0	64.457	4.1	5.63E-01	5.00E-01	5.00E-01
IL217586	DEFAULT	Phillips 66 Pipeline, LLC - Truck loading racks	744935.00	4274152.00	407.25	20.0	70.1	10.594	2.0	1.10E+01	0.00E+00	0.00E+00
IL218530	DEFAULT	ConocoPhillips Co. - North property ground flare (FLR1-2)	754486.00	4303322.00	445.08	195.0	1800.1	2.394	8.0	1.41E+01	0.00E+00	0.00E+00
IL218537	DEFAULT	Custom Steel Processing - Scrubber	746385.00	4286043.00	415.89	55.0	70.1	49.056	4.2	0.00E+00	1.00E-01	1.00E-01
IL218539	DEFAULT	Custom Steel Processing - Sulfuric acid storage tank	746335.00	4286043.00	416.99	35.0	127.0	0.000	2.4	0.00E+00	1.00E-01	1.00E-01
IL218569	DEFAULT	Contract Services, LLC - Boiler #4	746767.00	4275755.00	417.81	40.0	310.0	49.056	3.7	1.30E+01	1.86E+00	1.86E+00
IL218687	DEFAULT	ConocoPhillips Co. - Gas plant sour water stripper	754240.00	4303140.00	443.47	15.0	128.9	11.382	2.9	1.06E+00	0.00E+00	0.00E+00
IL218895	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silos and truck loadout	772959.00	4275690.00	514.30	32.0	86.1	84.654	1.5	1.26E+00	0.00E+00	0.00E+00
IL219420	DEFAULT	Crown Textile Services - Boiler	744287.00	4259382.00	466.40	24.0	450.1	35.227	1.7	1.03E+00	0.00E+00	0.00E+00
IL220766	DEFAULT	American Colloid Co. - Sand drying	746862.00	4287259.00	419.91	72.0	493.1	28.766	3.3	1.28E+00	0.00E+00	0.00E+00
IL220267	DEFAULT	American Colloid Co. - Space Heaters	746862.00	4287259.00	419.91	35.0	109.1	21.484	1.4	2.90E-01	0.00E+00	0.00E+00
IL220618	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	757560.00	4299901.00	441.63	32.0	280.0	68.322	4.3	7.61E+01	3.40E+01	3.40E+01
IL220849	DEFAULT	ConocoPhillips Co. - Alkylation unit flare (FLR6-1)	755685.00	4303081.00	442.55	199.0	1800.1	1.034	2.5	1.85E+01	0.00E+00	0.00E+00
IL222033	DEFAULT	Waterloo City Light Plant - Dual fuel-fired Turbine GT1	748326.00	4246769.00	640.45	38.0	812.1	41.590	4.0	1.77E+01	0.00E+00	0.00E+00
IL222134	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silo loading	757560.00	4299901.00	441.63	26.0	123.0	4.965	1.7	7.00E-01	0.00E+00	0.00E+00
IL222135	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	757560.00	4299901.00	441.63	35.0	361.0	26.896	3.7	0.00E+00	2.80E+00	2.80E+00
IL222988	DEFAULT	Apex Oil Co., Inc. - Thermal oxidizer	752471.00	4302667.00	431.07	18.0	870.0	43.985	2.3	2.28E+00	0.00E+00	0.00E+00
IL228796	DEFAULT	Union Electric Co. - Turbine CT03	745735.00	4282930.00	428.96	38.0	803.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223797	DEFAULT	Union Electric Co. - Turbine CT04	745776.00	4282847.00	421.16	38.0	803.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223798	DEFAULT	Union Electric Co. - Turbine CT05	745538.00	4283620.00	420.90	38.0	803.1	74.948	3.4	6.90E+01	9.00E-01	9.00E-01
IL224187	DEFAULT	Interurban ILAWC - Emergency generator	757265.00	4276109.00	482.38	29.0	880.1	51.463	1.0	1.10E+01	4.60E+00	0.00E+00
IL224416	DEFAULT	Belleville Landfill, Inc. - Flare	760482.00	4284040.00	571.88	35.0	1600.1	8.659	0.8	1.22E+01	0.00E+00	0.00E+00
IL224592	DEFAULT	Chrust Bros Products, LLC - Drum mix asphalt plant	755685.00	4298823.00	431.10	32.0	253.0	63.628	4.1	3.09E+01	1.38E+01	1.38E+01
IL224594	DEFAULT	Chrust Bros Products, LLC - Asphalt tank heaters and boilers	755791.00	4299841.00	427.46	10.0	416.0	42.443	1.0	1.18E+00	2.80E+00	2.80E+00
IL224838	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-01	750039.00	4285426.00	418.47	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224839	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-02	750044.00	4285416.00	418.24	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224840	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-03	750049.00	4285406.00	418.37	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224841	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-04	750054.00	4285397.00	418.30	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224901	DEFAULT	Premcor Refining Group, Inc. - Thermal oxidizer	752175.00	4302414.00	429.95	20.0	342.1	48.462	0.8	7.40E-01	0.00E+00	0.00E+00
IL225166	DEFAULT	Metro Crematory - Crematory	754170.00	4290785.00	417.29	18.0	736.1	84.854	1.0	1.50E+00	0.00E+00	0.00E+00
IL225832	DEFAULT	ConocoPhillips Co. - Startup/malfunction/breakdown	754240.00	4303144.00	443.47	193.0	623.0	21.681	4.6	2.86E+01	1.91E+02	1.91E+02
IL225843	DEFAULT	City of O'Fallon - 400 kW (591 HP) Diesel generator	774613.00	4277280.00	434.42	13.0	500.1	86.592	0.7	3.87E+00	0.00E+00	0.00E+00
IL225844	DEFAULT	City of O'Fallon - 900 kW (1,322 HP) Diesel generator	774612.00	4277280.60	434.42	17.0	500.1	86.592	0.7	7.55E+00	0.00E+00	0.00E+00
IL225960	DEFAULT	Waterloo City Light Plant - Engine #4	748326.00	4246769.00	640.45	37.0	680.1	87.906	1.5	3.32E+01	0.00E+00	0.00E+00
IL226013	DEFAULT	Milam Recycling and Disposal Facility - 325 HP Tub grinder	750550.00	4282537.00	594.06	7.0	627.0	74.030	0.3	2.20E+00	8.00E-01	8.00E-01
IL226014	DEFAULT	Milam Recycling and Disposal Facility - Enclosed flare	750476.00	4282825.00	419.67	55.0	1400.1	8.656	12.0	2.40E+01	6.00E+00	6.00E+00

R005249

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL226015	DEFAULT	Milam Recycling and Disposal Facility - 760 HP Tub grinder	750550.00	4282537.00	594.06	8.0	627.0	70.881	0.7	5.10E+00	1.90E+00	1.90E+00
IL226184	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - 1F Mix melter (MM-3) Low profile turbine (LF-1) and induction form sta	750075.00	4306259.00	482.32	41.0	209.9	36.080	2.1	2.00E+00	0.00E+00	0.00E+00
IL226204	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #4 (SA-4)	750150.00	4308388.00	431.10	90.0	350.0	41.426	1.6	9.33E+01	0.00E+00	0.00E+00
IL226256	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip Anneal #3 (SA-3)	750489.00	4308328.00	433.83	100.0	350.0	62.746	1.3	9.83E+01	0.00E+00	0.00E+00
IL226257	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - #7 Strip Anneal (SA-7)	750222.00	4308335.00	433.26	89.0	850.0	38.671	1.5	1.18E+02	0.00E+00	0.00E+00
IL226352	DEFAULT	Olin Winchester, LLC - Hammermill 1 2 and 3 (HM-1 HM-2 and HM-3)	750495.00	4308287.00	434.42	21.0	160.1	19.647	1.8	8.03E+00	0.00E+00	0.00E+00
IL226812	DEFAULT	Solutia Inc. - Santoflex process: Thermal oxidizer 2770934	746325.00	4275822.00	405.12	112.0	865.0	16.794	12.6	1.50E+01	0.00E+00	0.00E+00
IL226783	DEFAULT	Schildknecht Funeral Home, Inc. - Crematory	769033.00	4275796.00	549.57	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL227030	DEFAULT	ConocoPhillips Co. - #4 Crude unit heater H-24 (STK9-5)	753051.00	4302413.00	428.81	179.9	550.0	26.207	8.5	2.27E+01	0.00E+00	0.00E+00
IL227032	DEFAULT	ConocoPhillips Co. - Hydrogen plant #1 flare (FLR12-2)	755194.00	4302793.00	443.67	130.0	1800.1	7.970	1.7	1.62E+01	0.00E+00	0.00E+00
IL227034	DEFAULT	ConocoPhillips Co. - Sulfur operation	754240.00	4303144.00	443.47	158.0	599.1	37.753	3.4	0.00E+00	3.00E+01	3.00E+01
IL227035	DEFAULT	ConocoPhillips Co. - Process heater HP-1 (STK12-6)	755194.00	4302793.00	443.67	127.0	360.1	27.093	7.5	6.97E+00	0.00E+00	0.00E+00
IL227038	DEFAULT	ConocoPhillips Co. - SZU Charge heater H-3	755219.00	4302667.00	442.29	150.0	567.1	25.518	5.9	5.75E+00	0.00E+00	0.00E+00
IL227333	DEFAULT	Waterloo City Light Plant - Engine SG5	750635.00	4249410.00	628.97	8.0	924.0	61.172	0.7	1.40E+00	0.00E+00	0.00E+00
IL227400	DEFAULT	Collinsville Wastewater Treatment Plant - Emergency diesel generator (2922 HP/2180 kW)	758288.00	4283982.00	419.36	36.0	892.0	67.371	2.0	1.72E+01	1.20E+00	0.00E+00
IL227432	DEFAULT	Total Metal Recycling, Inc. - Safety certification unit	748030.00	4289120.00	422.74	6.0	587.0	8.069	1.2	1.00E-01	0.00E+00	0.00E+00
IL227590	DEFAULT	Illinois Electric Works - 3 Burn off ovens	747872.00	4288124.00	423.20	46.0	250.1	41.230	2.4	1.17E+00	6.90E-02	6.90E-02
IL227679	DEFAULT	Union Electric Co. - Diesel generator	749516.00	4283326.00	430.38	26.0	490.0	60.811	1.4	1.30E+00	1.60E-01	1.60E-01
IL228119	DEFAULT	St. Clair Crematory - Human crematory	773291.00	4275644.00	507.28	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL228260	DEFAULT	Center Ethanol Co. - West boiler	745888.00	4275662.00	412.66	75.0	428.1	43.460	3.0	3.23E+00	0.00E+00	0.00E+00
IL228262	DEFAULT	Center Ethanol Co. - East boiler	745888.00	4275662.00	412.66	75.0	428.1	45.428	3.0	3.23E+00	0.00E+00	0.00E+00
IL228263	DEFAULT	Center Ethanol Co. - RTO	745888.00	4275662.00	412.66	50.0	310.0	70.684	5.5	6.85E+00	0.00E+00	0.00E+00
IL228294	DEFAULT	ConocoPhillips Co. - Distilling west refinery flare (FLR10-1)	753647.00	4302546.00	430.31	197.0	1800.1	6.626	3.0	2.51E+01	0.00E+00	0.00E+00
IL228295	DEFAULT	ConocoPhillips Co. - SZU Regenerator vent	755209.00	4302720.00	442.32	44.0	135.1	32.341	2.0	1.78E+00	2.35E+00	2.35E+00
IL229921	DEFAULT	Christ Bros Products, LLC - 8 Heaters and boilers	754160.00	4283243.00	419.46	37.0	400.0	20.664	1.8	1.18E+00	2.80E+00	2.80E+00
IL229922	DEFAULT	Christ Bros Products, LLC - Silo filling	754160.00	4283243.00	419.46	25.0	74.0	9.262	0.4	5.10E-01	0.00E+00	0.00E+00
IL229923	DEFAULT	Christ Bros Products, LLC - Truck loading	754160.00	4283243.00	419.46	29.0	135.1	48.052	2.0	5.80E-01	0.00E+00	0.00E+00
IL230300	DEFAULT	Afton Chemical Corp. - Flare 36-9090	746478.00	4276293.00	407.28	45.0	1600.1	0.656	8.0	2.20E+00	0.00E+00	0.00E+00
IL230350	DEFAULT	Village of Freeburg - Engine #10	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL230355	DEFAULT	Asphalt Sales & Products Inc. - Truck loadout	757560.00	4299901.00	441.63	38.0	135.1	43.198	3.9	7.90E-01	0.00E+00	0.00E+00
IL231259	DEFAULT	Village of Freeburg - Engine #11	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231260	DEFAULT	Village of Freeburg - Engine #12	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231291	DEFAULT	Kurrus Funeral Home - 2 Crematories	759066.00	4271234.00	547.11	18.0	787.0	13.186	1.1	2.70E+00	0.00E+00	0.00E+00
IL232739	DEFAULT	ConocoPhillips Co. - Benzene extraction unit #3 (STK6-4)	754933.00	4302930.00	442.59	185.0	470.0	16.138	9.7	1.22E+01	0.00E+00	0.00E+00
IL232785	DEFAULT	Roxana Landfill, Inc. - Enclosed flare	759153.00	4301368.00	619.62	35.0	1800.1	20.008	12.0	2.81E+01	1.76E+00	1.76E+00
IL233294	DEFAULT	Gateway Terminals, LLC. - Marine vapor combustion unit (MVCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	1.68E+01	0.00E+00	0.00E+00
IL233295	DEFAULT	Gateway Terminals, LLC. - Truck/Rail vapor destruction unit (TRCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	8.39E+00	0.00E+00	0.00E+00
IL235261	DEFAULT	Gulfstream Aerospace Services Corp. - Make-up air unit 19-3	747629.00	4273560.00	410.10	42.0	577.0	29.356	2.5	1.63E+00	0.00E+00	0.00E+00
IL235939	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #5 (SA-5)	750151.00	4308373.00	430.91	90.0	450.1	54.087	1.4	1.07E+02	0.00E+00	0.00E+00
IL235940	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #6 (SA-6)	750207.00	4308390.00	431.82	110.0	580.0	62.779	1.3	1.07E+02	0.00E+00	0.00E+00
IL236260	DEFAULT	Bunge-SF Grain, LLC. - Grain Dryer	746158.00	4281045.00	417.55	95.0	105.0	87.904	5.2	5.06E+00	1.71E+01	1.71E+01
IL236359	DEFAULT	City of Belleville - 2 Emergency generators (1500 kW each)	763544.00	4265595.00	474.70	28.0	627.0	73.767	1.2	2.57E+01	1.84E+00	0.00E+00
IL236927	DEFAULT	Kraft Heinz Co. - Boiler C	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236928	DEFAULT	Kraft Heinz Co. - Boiler D	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236929	DEFAULT	Kraft Heinz Co. - Boiler E	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236930	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 2 of 2)	750920.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL237099	DEFAULT	Union Electric Co. - Turbine CT02B	749573.00	4283613.00	419.69	30.0	850.0	18.860	11.4	7.74E+01	2.73E+01	2.73E+01
IL237182	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	1.32E+01	0.00E+00	0.00E+00
IL237183	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	2.57E+01	0.00E+00	0.00E+00
IL237340	DEFAULT	Charles E. Mahoney - Asphalt silo filling	749517.00	4309892.00	443.14	25.0	74.0	0.262	0.4	5.30E-01	0.00E+00	0.00E+00
IL237341	DEFAULT	Charles E. Mahoney - Truck loadout	749517.00	4309892.00	443.14	27.0	136.0	42.050	1.9	6.00E-01	0.00E+00	0.00E+00
IL237362	DEFAULT	Charles E. Mahoney - Asphalt heaters and boilers	749517.00	4309892.00	443.14	10.0	350.0	59.995	1.6	1.18E+00	2.80E+00	2.80E+00
IL237659	DEFAULT	Green Plains Madison, LLC - Boiler #1	745256.00	4285477.00	414.14	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL237660	DEFAULT	Green Plains Madison, LLC - Fire Pump back-up Engine (460 HP)	745193.00	4285409.00	413.85	13.0	627.0	86.231	0.8	4.80E-01	9.40E-01	0.00E+00
IL237661	DEFAULT	Green Plains Madison, LLC - Electrical system backup Engine (1495 HP)	745144.00	4285537.00	415.88	28.0	627.0	73.767	1.2	3.54E+00	1.21E+01	0.00E+00

R005250

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
R237679	DEFAULT	Green Plains Madison, LLC - Indirect dryer #1	745191.00	4285468.00	415.12	71.0	387.1	12.136	4.6	7.97E+00	4.10E-01	4.10E-01
R237866	DEFAULT	Amsted Rail Co., Inc. - Curing oven	746913.00	4287625.00	419.23	39.0	258.0	27.978	1.9	2.52E-01	0.00E+00	0.00E+00
R237899	DEFAULT	Center Ethanol Co. - Emergency generator	745888.00	4275662.00	412.66	28.0	827.0	73.767	1.2	3.30E+00	0.00E+00	0.00E+00
R237903	DEFAULT	Center Ethanol Co. - Ethanol loadout Rack	745888.00	4275662.00	412.66	19.0	99.1	7.806	0.7	8.86E-01	0.00E+00	0.00E+00
R238199	DEFAULT	Solutia Inc. - An in-situ soil vapor extraction system	746325.00	4275822.00	405.12	16.0	70.1	73.406	0.2	4.00E-01	0.00E+00	0.00E+00
R238839	DEFAULT	Waterloo City Light Plant - Turbine Generator (GT2)	748326.00	4246769.00	840.45	39.0	965.9	87.937	4.8	1.78E+01	0.00E+00	0.00E+00
R238942	DEFAULT	ConocoPhillips Co. - Rental Boiler #3	754240.00	4303144.00	443.47	20.0	550.0	46.412	4.0	1.65E+00	0.00E+00	0.00E+00
R239395	DEFAULT	Amsted Rail Co., Inc. - Sand dryer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	1.24E+00	0.00E+00	0.00E+00
R239396	DEFAULT	Amsted Rail Co., Inc. - Thermal sand reclaimer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	3.70E-01	0.00E+00	0.00E+00
R239899	DEFAULT	Shell Oil Products US - RTO	753758.00	4303650.00	442.59	19.0	200.0	33.948	2.5	0.00E+00	8.47E-01	8.47E-01
R240053	DEFAULT	Westwood Lands, Inc. - Process heater OPH-1	748864.00	4285684.00	412.99	39.0	284.1	23.157	2.0	8.30E-01	0.00E+00	0.00E+00
R240359	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0210	746660.00	4276488.00	405.74	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
R240360	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0310	746674.00	4276485.00	407.25	45.0	350.0	17.318	7.0	4.91E+00	0.00E+00	0.00E+00
R241300	DEFAULT	ConocoPhillips Co. - VOC Flare (West - FLR4-1)	753428.00	4303073.00	428.81	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
R241301	DEFAULT	ConocoPhillips Co. - VOC Flare (East - FLR4-2)	753441.00	4303073.00	428.77	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
R241302	DEFAULT	ConocoPhillips Co. - Coker north flare (FLR1-3)	754947.00	4303684.00	444.23	139.0	911.0	26.535	5.4	0.00E+00	3.08E+01	3.08E+01
R241303	DEFAULT	ConocoPhillips Co. - VF-5 Heater (H350H4 - STK1-1)	754937.00	4303459.00	444.98	150.0	650.0	26.765	12.0	0.00E+00	1.35E+01	1.35E+01
R241304	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H2 - STK1-2)	754955.00	4303505.00	444.85	150.0	500.1	22.304	10.0	0.00E+00	7.37E+00	7.37E+00
R241305	DEFAULT	ConocoPhillips Co. - Coker north heater (H351H1 - STK1-3)	754986.00	4303306.00	444.82	150.0	500.1	22.304	10.0	0.00E+00	7.38E+00	7.38E+00
R241312	DEFAULT	ConocoPhillips Co. - Heater HP-2 (STK7-1)	755263.00	4302920.00	443.86	118.0	400.0	45.002	10.8	0.00E+00	2.87E+01	2.87E+01
R241405	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #1	756504.00	4295421.00	425.00	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
R241449	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #2	756494.00	4295735.00	424.74	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
R242126	DEFAULT	Center Point Terminals Co. - Tank Heater	746359.00	4289027.00	411.84	49.0	331.1	32.144	2.5	1.03E+00	0.00E+00	0.00E+00
R245579	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #3	756198.00	4295409.00	424.97	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
R245580	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #4	756182.00	4295721.00	424.77	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
R245839	DEFAULT	Milam Recycling and Disposal Facility - Landfill gas conversion plant	750666.00	4282895.00	413.09	55.0	70.1	0.000	4.5	9.80E+00	9.00E-01	9.00E-01
R246759	DEFAULT	Stookey Township WWTP - 2000 kW Emergency generator	756255.00	4289975.00	418.86	28.0	827.0	73.767	1.2	1.54E+01	0.00E+00	0.00E+00
R246761	DEFAULT	Omega Partners Hartford, LLC - Truck Rail Marine racks loadout and VCUs	752232.00	4300866.00	430.74	33.0	68.5	0.328	0.3	6.80E+00	0.00E+00	0.00E+00
R246762	DEFAULT	Omega Partners Hartford, LLC - Boiler 1 and 2	752273.00	4300698.00	430.18	58.0	436.0	27.650	3.4	3.83E+00	0.00E+00	0.00E+00
R248060	DEFAULT	Kraft Heinz Co. - Boiler F	748105.00	4288580.00	423.58	26.0	380.0	34.407	2.0	1.44E+00	0.00E+00	0.00E+00
R248262	DEFAULT	Olin Winchester, LLC - New Rotary retort process (ROR-2)	750495.00	4308287.00	434.42	16.0	119.9	26.634	1.7	9.62E+00	0.00E+00	0.00E+00
R248799	DEFAULT	Gateway Terminals, LLC - 600 HP Boiler	744607.00	4275093.00	422.70	26.0	440.0	39.557	2.2	2.11E+00	0.00E+00	0.00E+00
R249480	DEFAULT	Highland Electric Light Plant - Engine IC-2	788126.93	4293320.17	534.65	57.0	734.1	61.762	13.4	1.44E+01	0.00E+00	0.00E+00
R249481	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	57.0	734.1	61.762	13.4	1.25E+01	0.00E+00	0.00E+00
R249482	DEFAULT	Highland Electric Light Plant - Engine IC-9	788126.93	4293320.17	534.65	57.0	734.1	61.762	13.4	1.50E+01	0.00E+00	0.00E+00
R249483	DEFAULT	Highland Electric Light Plant - Engine IC-10	788126.93	4293320.17	534.65	57.0	734.1	61.762	13.4	1.50E+01	0.00E+00	0.00E+00
R249489	DEFAULT	Roxana Landfill, Inc. - Zink ultra-Low emissions (Zule) Flare	759153.00	4301368.00	619.62	60.0	1800.1	46.888	13.0	1.25E+01	1.55E+01	1.55E+01
R250348	DEFAULT	Mayco Mfg. LLC - Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.74E+00	0.00E+00	0.00E+00
R250892	DEFAULT	ConocoPhillips Co. - Lift station pump (21028)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.90E-01	4.90E-01
R250893	DEFAULT	ConocoPhillips Co. - Lift station pump (21029)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.30E+00	4.60E-01	4.60E-01
R250894	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #1	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
R250895	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #2	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
R250896	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #3	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
R250897	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #4	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
R250898	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #5	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
R250899	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #6	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
R251099	DEFAULT	Amsted Rail Co., Inc. - Annealing Furnace 18	747071.00	4287670.00	426.02	39.0	284.1	23.157	2.0	1.12E+00	1.00E-01	1.00E-01
R251286	DEFAULT	Premcor Refining Group, Inc. - Vapor Combustion Unit	752775.00	4302414.00	429.95	58.0	288.0	24.830	2.9	1.00E+01	0.00E+00	0.00E+00
R251735	DEFAULT	ConocoPhillips Co. - Diesel engine (605 HP)	754240.00	4303144.00	443.47	15.0	68.5	0.328	0.3	3.50E+00	0.00E+00	0.00E+00
R251754	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #1	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
R253107	DEFAULT	Alinex USA, Inc. - Natural gas combustion	749698.00	4278478.00	418.37	58.0	436.0	27.650	3.4	3.76E+00	0.00E+00	0.00E+00
R253166	DEFAULT	Cerro Flow Products, LLC. - Generators	746228.00	4275272.00	407.32	26.0	490.0	60.811	1.4	9.23E-01	2.82E-01	2.82E-01
R253167	DEFAULT	City of Belleville - Emergency diesel generator (1500 kW)	762469.00	4266351.00	468.78	26.0	490.0	60.811	1.4	1.16E+01	0.00E+00	0.00E+00
R253300	DEFAULT	Phillips 66 Pipeline, LLC - Engines (insignificant activities)	744935.00	4274152.00	407.25	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
R253361	DEFAULT	Amsted Rail Co., Inc. - Sand regeneration process (combustion)	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	2.80E-01	2.80E-01	2.80E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL253367	DEFAULT	Green Plains Madison, LLC - Boiler #2	745256.00	4285486.00	414.27	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253368	DEFAULT	Green Plains Madison, LLC - Boiler #3	745260.00	4285491.00	414.24	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253369	DEFAULT	Green Plains Madison, LLC - Boiler #4	745262.00	4285500.00	414.21	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253370	DEFAULT	Green Plains Madison, LLC - Indirect dryer #2	745164.00	4285430.00	414.60	61.0	387.1	8.430	5.5	7.97E+00	4.10E-01	4.10E-01
IL253386	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Engines (insignificant activities)	750423.00	4308352.00	434.28	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253738	DEFAULT	Milam Recycling and Disposal Facility - 2000 scfm Utility Flare	750650.00	4282537.00	594.06	36.0	852.0	18.568	4.6	1.83E+01	7.32E+00	7.32E+00
IL253769	DEFAULT	Veolia ES Technical Solutions, LLC - 2 Emergency generators	745532.00	4275942.00	414.76	26.0	490.0	60.811	1.4	7.41E-01	0.00E+00	0.00E+00
IL254175	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #2	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254176	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #3	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254177	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #4	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254178	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #5	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254179	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #6	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254689	DEFAULT	HSHS St. Elizabeth's Hospital - 2 Emergency generators	767237.00	4275111.00	541.01	28.0	827.6	73.767	1.2	1.93E+01	0.00E+00	0.00E+00
IL255341	DEFAULT	Roxana Landfill, Inc. - New open flare	759153.00	4301368.00	619.62	45.0	1800.1	61.434	1.3	3.77E+01	8.17E+00	8.17E+00
IL255527	DEFAULT	Magnesium Elektron North America - Natural gas combustion	746452.00	4285724.00	415.49	39.0	284.1	23.157	2.0	4.20E-01	0.00E+00	0.00E+00
IL255741	DEFAULT	ConocoPhillips Co. - Utility Boiler #19 (BLR-19)	754755.00	4302798.00	442.16	132.0	304.1	46.281	7.0	0.00E+00	1.54E+01	1.54E+01
IL255816	DEFAULT	Mayco Mfg, LLC - Expansion: Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.94E+00	0.00E+00	0.00E+00
IL255953	DEFAULT	Moore Recycling Concrete & Asphalt, LLC. - Drum mix asphalt plant	762178.00	4246660.00	463.19	35.0	251.0	56.905	4.0	1.32E+01	0.00E+00	0.00E+00
IL256624	DEFAULT	PBT Acquisition, LLC - ASR Dryer	748704.00	4280830.00	418.77	32.0	305.0	19.483	1.5	2.53E+00	0.00E+00	0.00E+00
IL257535	DEFAULT	Marathon Ashland Pipe Line, LLC - Marine vapor combustion unit	751239.00	4302663.00	402.85	51.0	810.1	27.749	7.4	2.71E+01	0.00E+00	0.00E+00
SJEFF1	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	410.0	370.0	54.081	19.0		1.44E+02	1.44E+02
SJEFF2	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	125.0	210.0	59.173	6.6		2.04E-02	2.04E-02
SJEFF3	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	10.0	1100.0	23.333	0.5		1.32E-01	0.00E+00
SJEFF15	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	52.0	260.0	10.666	2.0		5.09E-03	5.09E-03
SJEFF16	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	2.29E-01
SJEFF17	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.40E-03	2.40E-03
SJEFF18	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	0.00E+00
SJEFF19	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.80E-03	1.80E-03
SJEFF20	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.20E-03	1.20E-03
SJEFF21	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		5.40E-04	5.40E-04
SJEFF22	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.80E-04	4.80E-04
SJEFF23	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.20E-04	4.20E-04
SJEFF24	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		3.00E-04	3.00E-04
SJEFF25	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	15.0	1049.0	149.734	0.2		4.80E-04	0.00E+00
SJEFF26	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	20.7		1.73E+03	1.73E+03
SJEFF27	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	29.0		2.50E+03	2.50E+03
SJEFF28	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	30.0	985.0	105.633	1.3		8.52E-06	0.00E+00
SJEFF29	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	240.0	600.0	32.999	7.0		3.54E-03	3.54E-03
SJEFF59	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF60	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF61	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	4.20E-02	3.00E-04	3.00E-04
SJEFF62	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.000	1.7	1.11E-02	7.98E-05	7.98E-05
SJEFF63	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	27.0	1800.0	10.046	1.5	2.86E-02	1.63E-01	1.63E-01
SJEFF65	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.45E-02	4.34E-04	4.34E-04
SJEFF66	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.40E-02	4.20E-04	4.20E-04
SJEFF67	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	8.35E-02	5.97E-04	5.97E-04
SJEFF68	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	3.54E-01	2.53E-03	2.53E-03
SJEFF69	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	-459.7	0.003	2.0	2.51E-01	1.79E-03	1.79E-03
SJEFF70	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF71	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF72	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	3.32E-01	1.02E-01	0.00E+00
SJEFF73	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF74	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF82	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	7.38E-02	3.77E+00	3.77E+00
SJEFF83	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	1.96E-01	6.37E+00	6.37E+00

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SJEFF86	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	20.0	0.0	0.000	0.5	1.26E-01	9.00E-04	9.00E-04
SJEFF92	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	10.0	1100.0	23.333	0.5		2.17E+00	0.00E+00
SJEFF99	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	2.5	170.0	46.499	2.0	5.68E-01	4.25E-02	4.25E-02
SJEFF100	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	2.5	170.0	46.499	2.0	1.60E-01	1.14E-03	1.14E-03
SJEFF125	DEFAULT	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	20.0	250.0	49.249	5.0		5.88E-02	5.88E-02
SJEFF128	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.33E-01	2.33E-01
SJEFF129	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.866	1.0		1.92E-02	1.92E-02
SJEFF130	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		9.62E-03	9.62E-03
SJEFF131	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		3.50E-01	3.50E-01
SJEFF132	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.95E-01	2.95E-01
SJEFF133	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1347.0	16.316	1.0		1.54E-02	1.54E-02
SJEFF134	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		6.01E-03	6.01E-03
SJEFF135	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.666	1.0		1.44E-02	1.44E-02
SJEFF136	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1600.0	18.734	2.0		7.50E-02	7.50E-02
SJEFF137	DEFAULT	JEFFERSON COUNTY CREMATION SERVICES LC PEVELY	728536.07	4239554.88	583.23	10.0	1100.0	23.333	0.5		9.39E-02	9.39E-02
SJEFF138	DEFAULT	SIMPSON CONSTRUCTION MATERIALS PAULINA HILLS SITE	726459.86	4259186.04	426.64	12.0	885.0	42.441	0.5		1.29E-01	1.29E-01
SJEFF144	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	32.0	247.0	0.853	3.7	3.03E+00	1.21E+00	1.21E+00
SJEFF145	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	5.35E-02	3.07E-01	3.07E-01
SJEFF146	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	3.61E-03	9.62E-08	9.62E-08
SSTC1	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	138.7	46.759	23.6		2.32E+02	2.32E+02
SSTC2	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	496.5	136.6	46.844	23.6		2.89E+02	2.89E+02
SSTC3	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	217.0	325.0	50.000	4.5		8.90E-04	8.90E-04
SSTC4	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.61	445.64	25.0	1100.0	23.333	1.0		1.42E+00	0.00E+00
SSTC9	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC10	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC11	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC12	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC13	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.23E-04	2.23E-04
SSTC14	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC15	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	40.515	0.4		3.59E-01	0.00E+00
SSTC16	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC17	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.06E+00	0.00E+00
SSTC18	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	56.732	0.4		3.66E-01	2.38E-04
SSTC28	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC29	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.999	10.0		7.21E+02	7.21E+02
SSTC30	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	250.0	365.0	12.998	10.0		2.16E+01	2.16E+01
SSTC31	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	622.57	53.0	520.0	58.989	1.8		1.33E-01	1.33E-01
SSTC45	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.31E+00	2.31E+00
SSTC46	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.66E-02	2.66E-02
SSTC47	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	10.0	1100.0	23.333	0.5		1.52E+00	0.00E+00
SSTC48	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		1.50E-03	1.50E-03
SSTC57	DEFAULT	BLASTCO INC	690213.84	4297755.23	543.44	20.0	0.0	0.000	0.5		3.96E-04	3.96E-04
SSTC63	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	65.0	16.499	1.5		4.20E-03	4.20E-03
SSTC64	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	17.0	450.0	27.631	1.3		4.09E-03	4.09E-03
SSTC65	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	20.0	0.0	0.000	0.5		4.10E-03	4.10E-03
SSTC66	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		1.56E-03	1.56E-03
SSTC67	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		8.40E-04	8.40E-04
SSTC68	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	450.0	39.418	1.5		1.44E-03	1.44E-03
SSTC69	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	400.0	29.708	1.0		1.74E-03	1.74E-03
SSTC70	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	450.0	24.803	1.2		4.68E-03	4.68E-03
SSTC71	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	475.0	1.667	0.5		0.00E+00	0.00E+00
SSTC72	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	450.0	27.500	2.3		0.00E+00	0.00E+00
SSTC73	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	10.0	1100.0	23.333	0.5		3.07E+00	0.00E+00
SSTC87	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	2.10E-02	6.31E-04	6.31E-04
SSTC88	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	3.14E-02	1.73E-04	1.73E-04

R005253

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTC89	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4296189.47	585.40	20.0	0.0	0.000	0.5	1.20E+00	3.65E-01	3.65E-01
SSTC98	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC99	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC100	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC101	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC102	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC103	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC104	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC105	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC106	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC107	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTL1	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.28E-02	2.28E-02
SSTL2	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	13.0		2.20E-02	2.20E-02
SSTL3	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	345.0	135.400	14.0		2.97E+02	2.97E+02
SSTL4	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	374.0	123.284	16.0		4.69E+02	4.69E+02
SSTL5	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	40.0	642.0	38.100	1.0		5.46E-03	5.46E-03
SSTL6	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL7	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.96E+00	1.96E+00
SSTL8	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL9	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		2.01E-02	2.01E-02
SSTL10	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL11	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.10E-02	1.10E-02
SSTL14	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	9.84E-01	1.42E+00	1.42E+00
SSTL15	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	1.06E-02	7.55E-05	7.55E-05
SSTL16	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	10.0	1100.0	23.333	0.5	5.03E+00	1.53E+00	0.00E+00
SSTL17	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	2.91E+00	4.19E+00	4.19E+00
SSTL18	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	9.59E-02	6.85E-04	6.85E-04
SSTL19	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.95E-05	2.95E-05
SSTL20	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.24E-02	2.24E-02
SSTL21	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		1.06E+00	0.00E+00
SSTL22	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		5.74E-04	0.00E+00
SSTL23	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.57E+01	2.57E+01
SSTL24	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		6.69E-03	6.69E-03
SSTL25	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.66E-02	2.66E-02
SSTL26	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	110.0	70.0	0.003	2.7		1.39E-02	1.39E-02
SSTL27	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.11E+01	1.11E+01
SSTL28	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.95E-02	1.95E-02
SSTL29	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		3.08E-05	3.08E-05
SSTL30	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		2.36E-02	2.36E-02
SSTL31	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.34E-01	0.00E+00
SSTL32	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-03	0.00E+00
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		3.77E+00	0.00E+00
SSTL37	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	0.00E+00	0.00E+00	0.00E+00
SSTL38	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	2.24E+00	1.60E-02	1.60E-02
SSTL39	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	0.00E+00	0.00E+00	0.00E+00
SSTL40	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	6.04E-01	4.31E-03	4.31E-03
SSTL41	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.39E+01	2.54E-03	0.00E+00
SSTL42	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	2.12E+01	3.78E-02	0.00E+00
SSTL43	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.59E+01	4.87E+00	0.00E+00
SSTL44	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.13E-02	2.37E+01	2.37E+01
SSTL45	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.02E-02	4.11E+01	4.11E+01
SSTL46	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	1.05E-01	1.48E+01	1.48E+01
SSTL47	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	2.86E-01	2.62E+01	2.62E+01
SSTL48	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7		2.04E-03	2.04E-03
SSTL66	DEFAULT	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	20.0	230.5	31.309	5.1		3.27E-01	3.27E-01

R005254

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL70	DEFAULT	FRED WEBER, INC. ANTIRE	711291.07	4264547.49	448.49	30 0	250.0	58.950	4.0		1.27E+00	1.27E+00
SSTL76	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	5.58E+00	8.24E+00	8.24E+00
SSTL77	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45 0	400.0	44.167	2.5	1.38E+00	9.87E-03	9.87E-03
SSTL78	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	3.02E+00	4.47E+00	4.47E+00
SSTL79	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38 0	400.0	25.968	2.0	1.06E+00	7.57E-03	7.57E-03
SSTL80	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	34.616	3.0	2.99E+00	4.36E+00	4.36E+00
SSTL81	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	34.616	3.0	7.02E-01	5.01E-03	5.01E-03
SSTL82	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	1 0	100.0	17.733	0.1	1.66E+00	1.19E-02	1.19E-02
SSTL83	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	15.0	955 0	19.800	0.7	2.52E+01	4.48E-02	0.00E+00
SSTL84	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	7.0	960.0	113.382	0.8	2.50E+01	7.68E+00	0.00E+00
SSTL85	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	30.0	965.0	31.234	5.0	2.03E-01	1.04E-02	1.04E-02
SSTL86	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	17 0	72.0	29.882	2.8		5.58E-03	5.58E-03
SSTL88	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	28.0	1400.0	25.486	1.0		1.01E+00	1.01E+00
SSTL89	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38 3	1400.0	21.568	12.0		7.77E-01	7.77E-01
SSTL90	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291144.98	571.46	38.0	1400.0	21.568	12.0		6.35E-01	6.35E-01
SSTL92	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40 0	1200.0	61.381	1.1		1.86E-02	1.86E-02
SSTL93	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		6.98E-02	6.98E-02
SSTL94	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45 0	1200.0	50.226	1.3		1.70E+01	1.70E+01
SSTL95	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1200.0	50 226	1.3		5.43E+01	5.43E+01
SSTL96	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	35.0	1200.0	53.051	1.0		1.22E-01	1.22E-01
SSTL97	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584 0	1450.0	21 923	4.7		1 08E-03	1.08E-03
SSTL98	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.07E-03	1.07E-03
SSTL100	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500.0	25 000	3.0		9.06E+00	9.06E+00
SSTL101	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	17.2	500 0	25.000	3.0		7.14E-03	7.14E-03
SSTL102	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	601.67	130 0	1008.0	53.156	1.0		2.56E+00	0.00E+00
SSTL106	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		6.63E-02	6.63E-02
SSTL107	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	21.932	3.0		1.15E-02	1.15E-02
SSTL108	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	12.0	900.0	38.100	1.2		8.33E+00	0.00E+00
SSTL109	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450 0	21.932	3.0		1.37E-03	1.37E-03
SSTL111	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	3.02E+00	4.35E+00	4.35E+00
SSTL112	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.17E-01	2.98E-03	2.98E-03
SSTL113	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	4.40E-03	6.49E-03	6.49E-03
SSTL114	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	45.0	425.0	1.667	2.0	6.81E-01	4.86E-03	4.86E-03
SSTL115	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4264089.51	508.83	10.0	1100.0	23.333	0.5	1.02E+02	3.11E+01	0.00E+00
SSTL116	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	1.45E-01	6.26E-03	6.26E-03
SSTL117	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	35.0	270.0	10.000	4.0	9.17E-01	6.55E-03	6.55E-03
SSTL118	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	565.65	15.0	-459.7	0.003	1.0	3.28E+01	3.00E-01	0.00E+00
SSTL120	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	15.0	65 0	7.165	2 2		3.20E-03	3.20E-03
SSTL121	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	16.0	75.0	26 949	1 1		8.96E-03	8.96E-03
SSTL122	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	600.0	14.167	2 5		4.83E-01	4.83E-01
SSTL123	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	30.0	365.0	12.001	1 2		4.48E-01	4.48E-01
SSTL124	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	360.0	25.499	0 7		1.63E-01	1.63E-01
SSTL126	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	20.0	0 0	0.000	0 5		1.23E-02	1.23E-02
SSTL127	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650.0	11 998	1.3		3.60E-03	3.60E-03
SSTL128	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	30.0	650 0	11.998	1.3		1.79E+01	1.79E+01
SSTL129	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650.0	13.264	2.0		2.26E-03	2.26E-03
SSTL130	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	26.0	650 0	13.264	2.0		1.44E+01	1.44E+01
SSTL131	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	54.0	1800.0	17.218	2.3		1.21E-03	1.21E-03
SSTL132	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100.0	23 333	0.5		9.83E-01	9.83E-01
SSTL133	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4269850.38	422.90	10.0	1100 0	23.333	0.5		9.83E-01	9.83E-01
SSTL141	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495.0	4.068	2.5		3.40E+00	3.40E+00
SSTL142	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	25.0	495 0	4.068	2 5		8.76E-04	8.76E-04
SSTL143	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	30.0	450.0	0.003	1.5		5.59E-04	5.59E-04
SSTL144	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4265428.04	633.14	10 0	1100.0	23 333	0 5		4.66E-02	0.00E+00
SSTL147	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550 0	1.181	0 7	9 18E-01	8.00E-01	8.00E 01

R005255

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTL148	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	1.58E+00	5.47E-03	5.47E-03
SSTL149	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	4.42E-01	2.28E-01	2.28E-01
SSTL150	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	9.14E-02	4.81E-03	4.81E-03
SSTL151	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	16.0	77.0	4.774	2.0	2.46E+00	4.74E-01	4.74E-01
SSTL152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	42.0	300.0	38.494	4.2	2.49E+01	5.49E+00	5.49E+00
SSTL153	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	3.84E-03	1.20E-04	1.20E-04
SSTL154	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	4.60E-02	1.44E-03	1.44E-03
SSTL162	DEFAULT	MACLAN INDUSTRIES	742056.49	4291436.76	495.44	14.0	190.0	0.003	0.2		2.29E-01	2.29E-01
SSTL165	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	22.0	871.0	24.016	0.8		1.02E-01	1.02E-01
SSTL166	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	10.0	871.0	24.016	0.8		2.38E-01	2.38E-01
SSTL169	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	1.79E-01	1.28E-03	1.28E-03
SSTL170	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	25.0	-459.7	0.003	0.8	2.33E+01	3.69E-03	3.69E-03
SSTL171	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	18.0	-459.7	0.003	4.0	1.61E+00	6.69E-02	6.69E-02
SSTL172	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	15.0	-459.7	0.003	2.0	1.20E-02	8.60E-05	8.60E-05
SSTL173	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	16.0	-459.7	0.003	0.5	9.34E-01	2.85E-01	2.85E-01
SSTL174	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL175	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL198	DEFAULT	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	7.7	25.0	11.788	0.9	3.02E+00	1.28E-01	1.28E-01
SSTL199	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		1.59E-01	1.59E-01
SSTL200	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		7.25E-01	7.25E-01
SSTL209	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728994.88	4300010.04	461.78	15.0	896.0	0.000	14.0		9.51E+00	9.51E+00
SSTL214	DEFAULT	THE HARPER COMPANY	731184.93	4292013.86	588.35	10.0	1100.0	23.333	0.5		2.75E-01	0.00E+00
SCITY1	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	330.0	21.217	10.0		2.38E-02	2.38E-02
SCITY2	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	100.0	350.0	47.149	3.0		5.80E-02	5.80E-02
SCITY3	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.67E+01	1.67E+01
SCITY4	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.78E-02	1.78E-02
SCITY5	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.53E+01	2.53E+01
SCITY6	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.15E-02	2.15E-02
SCITY7	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	135.0	950.0	19.367	1.5		1.75E+01	1.75E+01
SCITY8	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	20.0	90.0	70.000	1.0		1.69E+00	1.69E+00
SCITY9	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	1.33E+00	9.51E-03	9.51E-03
SCITY10	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	2.13E+00	1.52E-02	1.52E-02
SCITY11	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	2.53E+00	1.81E-02	1.81E-02
SCITY12	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	3.20E-01	2.29E-03	2.29E-03
SCITY13	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	13.0	200.0	0.335	1.0	3.77E+00	1.15E+00	0.00E+00
SCITY14	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.55E-02	1.07E-03	1.07E-03
SCITY15	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.07E-02	9.22E-04	9.22E-04
SCITY16	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	69.751	1.7	3.07E-02	9.22E-04	9.22E-04
SCITY17	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	16.0	77.0	24.600	0.2		1.41E-03	1.41E-03
SCITY18	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	3.0	800.0	0.335	0.5	1.63E-01	4.98E-02	0.00E+00
SCITY22	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	0.0	0.000	0.5	5.72E-03	1.72E-04	1.72E-04
SCITY23	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	6.00E-02	1.80E-02	0.00E+00
SCITY24	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.8	2.11E+00	6.44E-01	0.00E+00
SCITY25	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.8	8.12E-03	4.79E-03	0.00E+00
SCITY26	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	1.73E-02	5.29E-03	0.00E+00
SCITY27	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	42.0	77.0	9.734	0.2	4.35E-02	1.33E-02	0.00E+00
SCITY28	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	200.0	0.335	1.0	1.98E-01	6.04E-02	0.00E+00
SCITY29	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.07E-01	3.27E-02	0.00E+00
SCITY30	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.09E-04	3.32E-05	0.00E+00
SCITY31	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	22.0	212.0	1.296	1.0	5.28E-01	1.61E-01	0.00E+00
SCITY32	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	90.0	77.0	33.215	2.2	1.09E-04	3.32E-05	0.00E+00
SCITY33	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	3.65E-02	1.12E-02	0.00E+00
SCITY34	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.98E-01	6.04E-02	0.00E+00
SCITY48	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.58E-01	2.58E-01
SCITY49	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.42E-02	2.42E-02

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY50	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.20E+00	1.20E+00
SCITY51	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.51E-01	1.51E-01
SCITY52	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY53	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		6.91E-03	6.91E-03
SCITY54	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY55	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		7.87E-03	7.87E-03
SCITY56	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	30.0	975.0	237.684	0.8		3.10E-02	0.00E+00
SCITY57	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		2.59E+01	2.59E+01
SCITY58	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		5.09E+00	5.09E+00
SCITY59	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		3.48E-02	3.48E-02
SCITY60	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	3.97E-01	3.97E-01
SCITY61	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	5.32E-02	5.32E-02
SCITY62	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY63	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.30E+00	2.36E-02	2.36E-02
SCITY64	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.20E+00	2.29E-02	2.29E-02
SCITY66	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	20.0	0.0	0.000	0.5	4.42E+01	1.33E+00	1.33E+00
SCITY67	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	4.15E+00	4.64E+00	4.64E+00
SCITY68	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	6.11E-01	5.15E-03	5.15E-03
SCITY69	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.04E+00	4.48E+00	4.48E+00
SCITY70	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	1.14E+00	8.17E-03	8.17E-03
SCITY71	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	2.98E-03	4.70E-07	0.00E+00
SCITY72	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	7.05E+00	2.15E+00	0.00E+00
SCITY83	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		1.14E-04	1.14E-04
SCITY84	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.07E-03	8.07E-03
SCITY85	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.40E-03	8.40E-03
SCITY86	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY87	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY88	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY89	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY90	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	10.0	1100.0	23.333	0.5		2.47E+00	0.00E+00
SCITY110	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	32.0	120.0	13.453	2.0		2.08E-02	2.08E-02
SCITY111	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	481.0	200.0	8.437	3.0		5.70E-03	5.70E-03
SCITY112	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	400.0	15.922	4.0		6.81E+01	6.81E+01
SCITY113	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	400.0	15.922	4.0		3.75E-02	3.75E-02
SCITY114	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	45.0	122.0	161.818	2.0		1.14E-02	1.14E-02
SCITY115	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	80.0	171.0	69.682	2.0		5.14E-03	5.14E-03
SCITY116	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	78.0	176.0	88.484	1.2		1.43E-03	1.43E-03
SCITY117	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	10.0	1100.0	23.333	0.5		1.91E-03	1.91E-03
SCITY121	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		9.43E+01	9.43E+01
SCITY122	DEFAULT	ICI, SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		5.31E-02	5.31E-02
SCITY123	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		6.41E+00	6.41E+00
SCITY124	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		7.35E-03	7.35E-03
SCITY125	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		1.86E-02	1.86E-02
SCITY126	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		5.89E-04	5.89E-04
SCITY127	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	30.0	140.0	0.125	2.0		1.44E-03	1.44E-03
SCITY128	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	15.4	752.2	32.451	1.0		7.85E-03	0.00E+00
SCITY129	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY132	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	6.916	3.3		1.72E-02	1.72E-02
SCITY133	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	36.601	2.0		3.72E-03	3.72E-03
SCITY136	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1800.0	8.301	3.7		8.58E-03	8.58E-03
SCITY137	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	42.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY140	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY141	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	200.0	39.649	2.8		5.16E-03	5.16E-03

R005257

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY143	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY144	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY145	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY146	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY147	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	25.0	300.0	14.865	2.0		1.14E-02	1.14E-02
SCITY148	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	20.0	0.0	0.000	0.5		3.30E-03	3.30E-03
SCITY149	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	37.0	600.0	38.983	1.2		1.98E-03	1.98E-03
SCITY156	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY157	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.20E-02	1.20E-02
SCITY158	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY159	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	14.0	490.0	60.200	0.5		7.80E-01	0.00E+00
SCITY160	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	12.6	200.0	205.400	0.5		7.80E-01	0.00E+00
SCITY162	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	2.69E+00	1.16E-01	1.16E-01
SCITY163	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	6.20E+00	4.43E-02	4.43E-02
SCITY164	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.20E+00	9.30E-03	0.00E+00
SCITY165	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.18E+00	9.20E-03	0.00E+00
SCITY166	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.77E+00	8.30E-03	0.00E+00
SCITY167	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.12E+00	9.10E-03	0.00E+00
SCITY168	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.01E+00	1.23E+00	0.00E+00
SCITY169	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.15E+00	1.80E-02	0.00E+00
SCITY170	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.90E+00	1.08E-02	0.00E+00
SCITY171	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.52E+00	1.88E-02	0.00E+00
SCITY172	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	4.71E+00	2.04E-01	2.04E-01
SCITY173	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	1.09E+01	7.76E-02	7.76E-02
SCITY174	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	2.50E+00	1.08E-01	1.08E-01
SCITY175	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	6.01E+00	4.29E-02	4.29E-02
SCITY176	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	6.24E+00	1.38E-02	0.00E+00
SCITY177	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	5.17E+00	1.14E-02	0.00E+00
SCITY178	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	9.14E+00	2.02E-02	0.00E+00
SCITY179	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.31E+00	9.64E-01	0.00E+00
SCITY180	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.98E+00	8.40E-03	0.00E+00
SCITY181	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	3.53E-03	3.53E-03
SCITY183	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	2.41E-03	2.41E-03
SCITY185	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.24E-02	5.89E-04	5.89E-04
SCITY187	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.36E-01	1.69E-03	1.69E-03
SCITY189	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	1.37E+00	4.85E-01	0.00E+00
SCITY190	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.35E-02	2.31E-03	2.31E-03
SCITY191	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.00E-01	3.57E-03	3.57E-03
SCITY192	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.69E+01	6.78E-02	0.00E+00
SCITY193	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.48E+00	1.56E-02	0.00E+00
SCITY194	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.09E+01	4.41E-02	0.00E+00
SCITY227	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0		2.54E-03	2.54E-03
SCITY228	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0		1.20E+00	1.20E+00
SCITY229	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	25.0	0.0	0.000	1.0		2.19E-04	2.19E-04
SCITY242	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	250.0	71.667	1.7		2.39E-03	2.39E-03
SCITY243	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	400.0	19.833	1.5		4.37E-03	4.37E-03
SCITY244	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		1.37E-04	1.37E-04
SCITY245	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	55.0	750.0	11.168	4.2		8.16E-03	8.16E-03
SCITY246	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	45.0	500.0	7.467	2.5		7.33E-05	7.33E-05
SCITY247	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		3.46E-04	3.46E-04
SCITY248	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	35.0	375.0	1.716	2.0		2.48E-03	2.48E-03
SCITY266	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	24.0	1139.0	15.515	1.7		1.10E-02	1.10E-02
SCITY267	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	28.0	1800.0	15.584	2.0		6.76E-01	6.76E-01
SCITY275	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		2.33E+01	2.33E+01
SCITY276	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		4.99E-03	4.99E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY277	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	28.5	800.0	0.003	0.5	7.11E-01	1.28E-05	0.00E+00
SCITY278	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	28.5	250.0	0.003	1.3	5.05E-01	1.28E-04	1.28E-04
SCITY279	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	20.5	250.0	0.003	1.3	6.87E-01	4.91E-03	4.91E-03
SCITY280	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	20.5	250.0	0.003	1.3	3.05E-02	1.28E-05	1.28E-05
SCITY281	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	20.5	250.0	0.003	1.3	6.89E-01	4.92E-03	4.92E-03
SCITY282	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	22.0	250.0	0.003	1.0	1.22E-01	5.27E-03	5.27E-03
SCITY283	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	22.0	250.0	0.003	1.0	2.73E-01	1.95E-03	1.95E-03
SCITY284	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	22.5	250.0	0.003	2.0	6.10E-01	2.56E-04	2.56E-04
SCITY285	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	22.5	250.0	0.003	2.0	1.38E+00	9.84E-03	9.84E-03
SCITY286	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	20.5	800.0	0.003	1.5	3.65E-01	1.56E-05	0.00E+00
SCITY287	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	20.5	800.0	0.003	1.5	7.84E+00	1.38E-04	0.00E+00
SCITY288	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	488.30	20.5	800.0	0.003	1.5	7.84E+00	1.38E-04	0.00E+00
SCITY289	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	80.535	2.0		3.28E-03	2.26E-03
SCITY290	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	80.535	2.0		2.91E+01	2.91E+01
SCITY291	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	80.535	2.0		1.63E-03	1.63E-03
SCITY292	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		1.28E+01	1.28E+01
SCITY293	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		9.47E+00	9.47E+00
SCITY295	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY296	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.81E+00	1.29E-02	1.29E-02
SCITY297	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	8.93E-01	2.57E+01	2.57E+01
SCITY298	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	6.63E+00	4.73E-02	4.73E-02
SCITY299	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.38E+00	5.45E+01	5.45E+01
SCITY300	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	7.92E+00	5.66E-02	5.66E-02
SCITY301	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY302	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.04E+00	7.40E-03	7.40E-03
SCITY303	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	9.62E+00	6.88E+00	0.00E+00
SCITY304	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740357.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	5.11E+00	6.08E+00	0.00E+00
SCITY315	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	8.50E+00	1.98E+00	0.00E+00
SCITY316	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY317	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	10.0	1100.0	23.333	0.5	9.62E-01	3.00E-01	3.00E-01
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	2.00E-02	6.00E-04	6.00E-04
SCITY320	DEFAULT	J S ALBERICI CONSTRUCTION	736723.60	4285287.44	575.43	20.0	0.0	0.000	0.5	1.26E-02	3.70E-04	3.70E-04
SCITY321	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	8.99E-01	3.86E-02	3.86E-02
SCITY322	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.0	4.60E-01	3.28E-03	3.28E-03
SCITY323	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	1.40E-02	3.05E-05	0.00E+00
SCITY324	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	7.00E-04	1.54E-06	0.00E+00
SCITY325	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	5.78E-03	1.22E-05	0.00E+00
SCITY326	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.71E-02	3.76E-03	3.76E-03
SCITY327	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	8.80E-01	6.93E-03	6.93E-03
SCITY328	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	7.48E-01	3.22E-02	3.22E-02
SCITY329	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.0	9.04E-01	6.46E-03	6.46E-03
SCITY330	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	1007.0	51.050	0.7	4.68E-01	1.03E-03	0.00E+00
SCITY331	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	4.06E+00	1.24E+00	0.00E+00
SCITY332	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	1.02E-01	1.44E-03	1.44E-03
SCITY333	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	6.6	1157.0	35.000	0.3	8.24E+00	2.52E+00	0.00E+00
SCITY334	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	8.0	1076.0	151.667	0.5	2.56E+00	7.82E-01	0.00E+00
SCITY335	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	8.9	813.0	37.685	0.8	6.13E-01	1.55E-03	0.00E+00
SCITY344	DEFAULT	PAULO PRODUCTS COMPANY	738097.70	4279776.67	501.12	32.0	200.0	2.933	1.2		5.04E-03	5.04E-03
SCITY353	DEFAULT	CHRISTY REFRACTORIES CO L.L.C	738228.57	4278219.85	483.66	1.0	325.0	0.003	1.0		9.60E-02	9.60E-02
SCITY355	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	280.0	481.0	79.216	2.0		9.54E-01	9.54E-01
SCITY356	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	280.0	455.0	79.216	2.0		9.54E-01	9.54E-01
SCITY357	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	280.0	423.0	79.216	2.0		9.54E-01	9.54E-01
SCITY358	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	73.035	0.7		3.05E-01	3.05E-01
SCITY359	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01

R005259

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (°F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY360	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.039	0.7		3.05E-01	3.05E-01
SCITY361	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		1.09E-03	1.09E-03
SCITY362	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		4.92E-03	4.92E-03
SCITY363	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY364	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY365	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		1.19E+00	1.19E+00
SCITY366	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		5.13E+00	5.13E+00
SCITY367	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY368	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY380	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	25.0	450.0	20.000	2.5		2.46E-03	2.46E-03
SCITY381	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	12.0	150.0	8.333	1.0		1.63E-01	1.63E-01
SCITY394	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5		2.06E+00	0.00E+00
SCITY395	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		9.53E-03	9.53E-03
SCITY396	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		1.71E-03	1.71E-03
SCITY401	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		9.30E-05	9.30E-05
SCITY402	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		4.97E-03	4.97E-03
SCITY403	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		5.07E-05	5.07E-05
SCITY404	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		2.48E-03	2.48E-03
SCITY405	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	10.0	1100.0	23.333	0.5		1.83E-02	0.00E+00
SCITY406	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.55E+00	2.55E+00
SCITY407	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.87E-02	2.87E-02
CJEFF34	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	35.6	77.0	20.500	1.8	2.68E-02		
CJEFF35	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	350.0	40.000	2.0	2.90E-01		
CJEFF36	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	2.07E-01		
CJEFF37	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	20.0	0.0	0.000	0.5	9.13E-03		
CJEFF43	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	56.0	378.0	33.333	2.5	1.01E-01		
CJEFF44	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	8.66E-01		
CJEFF45	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	112.999	2.5	9.97E-02		
CJEFF46	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	20.600	2.5	2.58E-01		
CSTLC55	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.68E-02		
CSTLC56	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.27E+00		
CSTLC57	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	1.66E-02		
CSTLC58	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	8.85E-01		
CSTLC59	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	20.0	250.0	2.083	1.0	7.72E-02		
CSTLC60	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	3.28E+00		
CSTLC61	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	1.29E-01		
CSTLC62	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	9.99E-05		
CSTLC63	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	19.0	425.0	7.047	1.7	6.01E-01		
CSTLC64	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	24.0	270.0	105.951	2.0	3.24E+00		
CSTLC152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	43.0	-459.7	3.225	1.0	1.38E-01		
CSTLC155	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	37.0	230.0	51.250	4.2	2.57E+01		
CSTLC156	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	12.0	355.0	0.804	1.3	4.03E-01		
CSTLC157	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	31.0	230.0	80.499	4.2	8.93E+01		
CSTLC158	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	20.0	300.0	16.667	1.1	2.29E-01		
CSTLC207	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0	1.61E+02		
CCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	100.0	350.0	29.984	1.3	3.08E-02		
CCITY203	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0	3.56E-01		
CCITY204	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0	1.68E+02		
CCITY344	DEFAULT	GP RECYCLING, LLC	743830.86	4284034.28	422.18	20.0	0.0	0.000	0.5	1.72E-02		
CCITY368	DEFAULT	GP RECYCLING, LLC	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5	6.73E+00		
CCITY369	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	1.33E+00		
CCITY370	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	5.69E-02		

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF84	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	16.4	3.8	15.3	1.78E-02	9.13E-05	9.13E-05
SJEFF84	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	4.68E-03	4.68E-03
SJEFF85	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	7.06E-03	7.06E-03
SJEFF87	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	16.4	3.8	15.3	2.29E-01	1.44E-03	1.44E-03
SJEFF88	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	3.91E-03	3.91E-03
SJEFF89	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.47E-03	1.47E-03
SJEFF90	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		2.29E-01	2.29E-01
SJEFF91	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		6.88E-03	6.88E-03
SJEFF93	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.38E-03	1.38E-03
SJEFF101	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	4.81E-01	2.40E-02	2.40E-02
SJEFF102	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	6.41E-01	1.42E-02	1.42E-02
SJEFF103	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	5.24E-01	6.09E-03	6.09E-03
SJEFF104	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	1.51E-01	3.75E-03	3.75E-03
SJEFF105	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.08E-03	1.08E-03
SJEFF106	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.14E-03	1.14E-03
SJEFF107	AERO METAL FINISHING	718099.61	4263747.23	613.55	8.2	2.3	7.6		2.43E-01	2.43E-01
SJEFF126	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	8.2	2.3	7.6		3.08E+00	3.08E+00
SSTC56	BLASTCO INC	690213.84	4297755.23	543.44	8.2	2.3	7.6		1.47E-01	1.47E-01
SSTL67	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		5.88E-04	5.88E-04
SSTL68	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		1.02E+00	1.02E+00
SSTL125	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	8.2	2.3	7.6		7.18E-03	7.18E-03
SSTL197	FRED WEBER, INC. FT. SELLE	739499.97	4302900.13	443.27	8.2	2.3	7.6		1.80E-01	1.80E-01
SCITY19	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	8.24E-02	2.47E-02	2.47E-02
SCITY20	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	4.44E-03	7.73E-01	7.73E-01
SCITY21	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	2.59E+00	7.94E-01	7.94E-01
SCITY44	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		6.22E-04	6.22E-04
SCITY45	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		2.76E-02	2.76E-02
SCITY118	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		7.50E-05	7.50E-05
SCITY119	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		4.00E-01	4.00E-01
SCITY120	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	8.2	2.3	7.6		2.61E-01	2.61E-01
SCITY130	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY131	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY134	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY135	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY138	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY139	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY182	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY184	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	6.59E-02	4.71E-04	4.71E-04
SCITY186	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY188	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	4.95E-02	3.53E-04	3.53E-04
SCITY195	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	8.2	2.3	7.6	8.40E-02	6.00E-04	6.00E-04
SCITY241	PQ CORPORATION -THE	739053.43	4285317.19	495.80	8.2	2.3	7.6		2.66E-02	2.66E-02
SCITY340	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		3.60E-04	3.60E-04
SCITY341	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.13E-03	1.13E-03
SCITY342	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-03	1.20E-03
SCITY343	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-02	1.20E-02
CJEFF33	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.49E-01		
CJEFF38	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.71E-03		
CJEFF39	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.22E-03		

R005261

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr)		
								CO	SOx	SO2 (1-hour)
CJEFF40	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.01E-01		
CJEFF41	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.10E-03		
CJEFF42	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.18E-04		
CJEFF47	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.55E-02		
CJEFF48	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.56E-06		
CJEFF49	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.09E-04		
CJEFF50	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.48E-04		
CJEFF51	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	5.28E-02		
CJEFF52	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.46E-03		
CJEFF53	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.53E-01		
CJEFF54	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.56E-02		
CJEFF55	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.16E-01		
CJEFF56	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.45E-03		
CJEFF57	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.42E-01		
CJEFF58	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.74E-03		
CJEFF59	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.92E-01		
CJEFF60	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.36E-02		
CSTLC92	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	8.2	2.3	7.6	2.25E-01		
CSTLC151	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	13.5	1.4	0.7	1.58E-01		
CSTLC195	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	13.5	1.4	0.7	5.97E-01		
CCITY343	GP RECYCLING, LLC	743830.86	4284034.28	422.18	8.2	2.3	7.6	5.57E-02		

R005262

ATTACHMENT B
MODEL SUMMARY OUTPUT

18-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	1-HR	ALL	1ST	1157.328	746400	4286400	128.82	132.35		0 19020109	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	1-HR	ALL	1ST	1094.348	750800	4288100	127.44	127.44		0 16121910	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	1-HR	ALL	1ST	1036.463	745200	4287400	129.9	134.11		0 18112209	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	1-HR	ALL	1ST	997.1573	746700	4287100	126.89	126.89		0 20010610	STL_LCN20	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	1-HR	ALL	1ST	982.0781	748434.9	4287033	127.16	127.16		0 17051502	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2019_CO.SUM	CO	8-HR	ALL	1ST	691.6775	748481.6	4286378	126.67	126.67		0 19041908	STL_LCN19	13	1	14098
AERMOD 22112	Granite City SIL_2018_CO.SUM	CO	8-HR	ALL	1ST	669.2078	748481.6	4286378	126.67	126.67		0 18111224	STL_LCN18	13	1	14098
AERMOD 22112	Granite City SIL_2017_CO.SUM	CO	8-HR	ALL	1ST	651.0973	750472	4287091	125.7	125.7		0 17060416	STL_LCN17	13	1	14098
AERMOD 22112	Granite City SIL_2016_CO.SUM	CO	8-HR	ALL	1ST	645.9934	748434.9	4287033	127.16	127.16		0 16110308	STL_LCN16	13	1	14098
AERMOD 22112	Granite City SIL_2020_CO.SUM	CO	8-HR	ALL	1ST	638.4866	748434.9	4287033	127.16	127.16		0 20041308	STL_LCN20	13	1	14098

18-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1157.3	2,000	58%
CO	8-HR	ALL	1ST	691.7	500	138%

18-5-22 US Steel CO NAAQS Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City NAAQS_2016_CO.SUM	CO	8-HR	ALL	2ND	1856.677	748434.9	4287033	127.16	127.16		0 16032208	STL_LCN16	584	1	306
AERMOD 22112	Granite City NAAQS_2017_CO.SUM	CO	8-HR	ALL	2ND	1941.224	748434.9	4287033	127.16	127.16		0 17121624	STL_LCN17	584	1	306
AERMOD 22112	Granite City NAAQS_2018_CO.SUM	CO	8-HR	ALL	2ND	1726.885	748470.1	4287036	126.94	126.94		0 18092424	STL_LCN18	584	1	306
AERMOD 22112	Granite City NAAQS_2019_CO.SUM	CO	8-HR	ALL	2ND	2045.17	748434.9	4287033	127.16	127.16		0 19110908	STL_LCN19	584	1	306
AERMOD 22112	Granite City NAAQS_2020_CO.SUM	CO	8-HR	ALL	2ND	1966.717	748434.9	4287033	127.16	127.16		0 20092408	STL_LCN20	584	1	306

18-5-22 US Steel CO NAAQS Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	% Standard
CO	8-HR	ALL	2ND	2045.2	1646	3691.2	10,000	37%

Background data from East St. Louis monitor (AQS No. 85-510-029), high second high value from 2016-2018.

R005264

REFERENCES

1. Guidelines on Air Quality Models, (Revised). Appendix W of 40 CFR Part 51, 82 FR 5182, January 17, 2017.

2 . Prevention of Significant Deterioration, The Art and Science of PSD Air Quality Analysis, The Modeling Perspective, Illinois Environmental Protection Agency, Modeling Unit, February 27, 2014..

3. AERSCREEN User's Guide, EPA-454/B-15-005, July 2015.

4. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for Stack Height Regulations (Revised). EPA-450/4-80-023R, U.S. Environmental Protection Agency, June 1985.

5. *Sierra Club v. EPA*, No. 10-1413, 2013 WL 216018 (Jan. 22, 2013).

6. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

7. Ambient Monitor Guidelines for Prevention of Significant Deterioration, EPA-450/4-87-007, USEPA, May 1987.

Kras, Kim

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Wednesday, October 12, 2022 11:29 AM
To: Ray, Sarah
Subject: US Steel Granite City Modeling

I'm reviewing the reports right now. My initial question, RTP is running AERMOD 22112 but using AERMET 21112 according to their report that's the information they were provided. Is that ok?

Tamara (Tammy) Stewart

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Kras, Kim

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Wednesday, October 12, 2022 11:33 AM
To: Stewart, Tamara
Subject: RE: US Steel Granite City Modeling

Thanks!

In the grand scheme of things, it's probably not a big deal – but when you run the reports, make sure that you're using AERMOD 22112 for both.

Also, this came up on a separate project where the same consultant forgot to run AERMINUTE when processing the meteorology data files. This led to our short-term results being way different than his results. If you get huge discrepancies between your 1-hr CO and 8-hr CO modeling runs and his, it may be worth requesting updated modeling with re-processed meteorology data.

From: Stewart, Tamara <Tamara.Stewart@illinois.gov>
Sent: Wednesday, October 12, 2022 11:29 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Subject: US Steel Granite City Modeling

I'm reviewing the reports right now. My initial question, RTP is running AERMOD 22112 but using AERMET 21112 according to their report that's the information they were provided. Is that ok?

Tamara (Tammy) Stewart

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Pritchett, Jacob A.

From: Romaine, Chris
Sent: Wednesday, October 15, 2014 2:49 PM
To: Carter, Sally
Subject: Accepted: USS - Quarterly Call

Pritchett, Jacob A.

Subject:	USS- Call if Questions
Location:	Douglas
Start:	Mon 10/19/2015 11:00 AM
End:	Mon 10/19/2015 12:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Carter, Sally
Required Attendees:	Schnepp, Jason; Romaine, Chris

Pritchett, Jacob A.

From: Romaine, Chris
Sent: Tuesday, October 19, 2021 9:11 AM
To: 'LaDonna Driver'
Subject: Accepted: USS & IEPA Conference call

Pritchett, Jacob A.

Subject:	Meeting Forward Notification: USS & IEPA Conference call
Start:	Tue 10/19/2021 9:30 AM
End:	Tue 10/19/2021 10:00 AM
Recurrence:	(none)
Organizer:	Romaine, Chris

Your meeting was forwarded

Romaine, Chris has forwarded your meeting request to additional people.

Meeting

USS & IEPA Conference call

Meeting Time

Thursday, October 28, 2021 12:00 PM - Thursday, October 28, 2021 2:00 PM

Recipients

Carter, Sally

All times listed are in the following time zone: (UTC-06:00) Central Time (US & Canada)

Pritchett, Jacob A.

Subject:	[External] Conference call- USS & IEPA
Start:	Mon 10/21/2019 2:30 PM
End:	Mon 10/21/2019 6:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Organizer:	LaDonna Driver

7263.116825

Call-in Number: (877) 417-9468

Conference code: 386 254 3585#



HeplerBroom LLC
Lisa M. Fortner
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Pritchett, Jacob A.

Subject:	USS
Location:	3 South
Start:	Mon 10/21/2019 2:30 PM
End:	Mon 10/21/2019 6:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Carter, Sally
Required Attendees:	Chris Romaine; Minesh Patel; Kras, Kim

Kim,

I think I had reserved 3 south for this meeting. I just noticed that I somehow had this set for a Sunday!!! Can you confirm that I am still good to go on location for the Monday?

Thanks

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Pritchett, Jacob A.

From:	Carter, Sally
Sent:	Monday, October 22, 2018 9:49 AM
To:	Romaine, Chris; Patel, Minesh
Subject:	FW: United States Steel - First Deliverable to State
Attachments:	B. Burlingham ltr - First Deliverable 10.19.18.PDF; 7K79953-Caster Final Report - Attachment 1 to B. Burlingham ltr 10.19.18.PDF; 7K77615-TRC Report - Attachment 2- B. Burlingham ltr 10.19.18.PDF

From: Katie J. Ginest <Katie.Ginest@heplerbroom.com>
Sent: Friday, October 19, 2018 5:06 PM
To: Burlingham, Rebecca <RBurlingham@atg.state.il.us>
Cc: Carter, Sally <Sally.Carter@Illinois.gov>; Joshua J. Houser <Joshua.Houser@heplerbroom.com>; Katherine D. Hodge <Katherine.Hodge@heplerbroom.com>
Subject: [External] United States Steel - First Deliverable to State

Per Josh Houser, please see the attached.

Thank you,

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Phone: 217-993-6079 Fax: 217-528-3964
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October 19, 2018

CONFIDENTIAL:
FOR SETTLEMENT PURPOSES ONLY

VIA ELECTRONIC MAIL

Rebecca Burlingham, Esq.
Supervising Attorney
Illinois Attorney General's Office
Environmental Bureau
69 West Washington Street, 18th Floor
Chicago, IL 60602

Re: First Deliverable to State
United States Steel Corporation
Illinois Pollution Control Board
PCB 2013-53 and PCB 2013-62

Dear Becky:

This letter is in follow up to our recent meeting with you and the Illinois Environmental Protection Agency ("Illinois EPA") on September 19, 2018, regarding the above-referenced pending air permit appeals for United States Steel Corporation's ("USS") Granite City Works ("GCW"), i.e., *United States Steel Corporation v. Illinois Environmental Protection Agency,* PCB 2013-053, and *United States Steel Corporation v. Illinois Environmental Protection Agency,* PCB 2013-062. Again, thank you for the opportunity to meet and discuss the path forward for resolving these appeals.

Both USS and Illinois EPA have invested significant resources in attempting to resolve the many and complex issues associated with these appeals, especially as to the emission factors that were incorporated from the Construction Permit/Prevention of Significant Deterioration ("PSD") Approval No. 95010001 ("PSD Permit"), issued to National Steel Corporation, the prior owner and operator of GCW, by Illinois EPA on January 25, 1996 (and subsequently revised and reissued on several occasions), and USS's need for practically enforceable emission limits that allow for operational flexibility due to GCW's inherent and dynamic variability in operations. As discussed, due to such operational flexibility requirements at GCW, it is technologically infeasible and economically unreasonable for USS to accept the emission factors, which in many cases are published emission factors that are averages from data sources other than GCW with varying reliability.

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As you know, during the September 19th meeting, USS and Illinois EPA agreed on a schedule for USS to submit certain information, i.e. deliverables, with the first round of information being due by today, October 19, 2018. Specifically, this first round of information is to address whether USS agrees with Illinois EPA's understandings expressed during the September 19th meeting as to certain prior agreements regarding specific conditions in USS's Clean Air Act Permit Program permit ("CAAPP Permit") on appeal in PCB 2013-053. In addition, Illinois EPA had specific questions regarding certain emission units, and this first round of information from USS is to provide responses to these questions. Listed below are the specific conditions at issue, Illinois EPA's expressed understanding and/or question as to each of these conditions, and USS's responses to same.

As set forth below, USS continues to disagree with Illinois EPA's position that the emission factors in the PSD Permit should be carried over to the CAAPP Permit (and baghouse construction permit) as enforceable emission limits. As previously discussed with Illinois EPA, AP-42 emission factors are "generally assumed to be representative of long-term averages for all facilities in the source category." USEPA, Emission Factors & AP-42, Compilation of Air Pollutant Emission Factors, *available at* https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors#5thed (last visited Sept. 17, 2018). Thus, such emission factors are useful for determining long term emission values, but they are not appropriate for use as short term limits. Further, during the September 17th meeting, USS reiterated its concerns that the use of lb/ton limits is inappropriate and does not allow for the operational flexibility required at GCW. However, USS does agree that emission factors may be used to develop enforceable emission limits that allow for the necessary operational flexibility at GCW.[1] As discussed, additional review and evaluation by USS, as well as consultation between the parties, will be necessary to actually develop and reach agreement on such enforceable emission limits. USS reserves the right to refine these responses, as may be necessary, based upon its review/evaluation of additional information moving forward with the future rounds of information to be submitted and working towards resolution of these pending permit appeals. Additionally, as agreed during the September 17th meeting, USS's second round of information is due to you by November 16, 2018.[2] More information will be available to USS at that time and, thus, this second round of information will provide further discussion of operational variability at GCW, USS's need for practically enforceable emission limits that allow for operational flexibility due to GCW's inherent and dynamic variability in operations, and proposals for how emission factors and operational flexibility concepts should be used to develop enforceable emission limits.

---

[1] In addition, to be consistent with USEPA's corresponding emission factors being based on filterable only and not condensable, USS will use emission factors and propose emission limits that will also be based on filterable only. See USEPA Webfire for SCC 30300821, *available at* https://cfpub.epa.gov/webfire/index.cfm?action=fire.SearchEmissionFactors (last visited Oct. 18, 2018).

[2] USS's deadlines to submit its third and fourth rounds of information are December 31, 2018, and January 31, 2019, respectively.

Condition 7.1.6(b)(iv) – Iron Pellet Screen

Illinois EPA's Understanding: The PM emission factor will be revised to 0.00368 lb/ton iron, and the PM10 emission factor will be revised to 0.00174 lb/ton iron.

USS's Response: USS agrees that these emission factors need to be revised. However, based upon AP-42 uncontrolled emission factors for material screening (as opposed to material handling) with an 85% control efficiency, the PM emission factor should be revised to 0.00375 lb/ton pellets and the PM10 emission factor should be revised to 0.00131 lb/ton pellets. *See* AP-42, Ch. 11.19.2, Table 11.19.2-2. USS does not agree to using these emission factors as enforceable emission limits. Rather, USS agrees to use these emission factors to develop enforceable emission limits that allow for the necessary operational flexibility at GCW.

Condition 7.4.6(d) – Blast Furnace Charging

Illinois EPA's Understanding: No revisions to the PM and PM10 emission factors.

USS's Response: USS agrees that the PM emission factor can stay the same. However, pending further discussion with Illinois EPA, the PM10 emission factor should be revised to 0.0012 lb/ton pellets. USS does not agree to using these emission factors as enforceable emission limits. Rather, USS agrees to use these emission factors to develop enforceable emission limits that allow for the necessary operational flexibility at GCW.

Condition 7.4.6(e) – Slag Pits

Illinois EPA's Understanding: No revisions to the PM and PM10 emission factors.

USS's Response: USS agrees that the PM10 emission factor can stay the same. However, pending further discussion with Illinois EPA, the PM emission factor should be revised to 0.006 lb/ton iron. USS applied the same methodology in AP-42 that was used for the PM10 emission factor, which results in 0.006 lb/ton iron for PM. USS does not agree to using these emission factors as enforceable emission limits. Rather, USS agrees to use these emission factors to develop enforceable emission limits that allow for the necessary operational flexibility at GCW.

Condition 7.6.6(b) – Continuous Casting Caster Molds – Casting

Illinois EPA's Understanding: The NOx emission factor and maximum emissions limit will be removed, as there are no NOx emissions from this emission unit.

USS's Response: USS agrees with the removal of the NOx emission factor and maximum emissions limit for this emission unit.

Condition 7.6.6(d) – Continuous Casting Slab Cut-off

Illinois EPA's Understanding: No revisions to the PM and PM10 emission factors, but will reduce the specificity of the numbers, i.e., reduce the number of significant digits.

USS's Response: Since USS's previous discussions with Illinois EPA, USS has not been able to determine the basis for the existing emission factors for the Continuous Casting Slab Cut-off emission unit. Thus, USS has formulated a basis for an emission factor that results in a more representative quantity of PM/PM10 emissions from this emission unit and will be used to develop enforceable emission limits that allow for the necessary operational flexibility at GCW. Specifically, an emission factor of 0.037 grams/inch cut will be used for PM/PM10. *See* USEPA, Section 313 Reporting: Issue Paper, Clarification and Guidance for the Metal Fabrication Industry, at 16 (Jan. 1990). USS does not agree to using these emission factors as enforceable emission limits. Rather, USS agrees to use these emission factors to develop enforceable emission limits that allow for the necessary operational flexibility at GCW. Regarding the number of significant digits, the significant digits can remain the same for the emission factors, but the number of significant digits for the proposed emission limits should be reduced to two significant digits.

Condition 7.6.6(e) – Continuous Casting Slab Ripping

Illinois EPA's Understanding: No revisions to the PM and PM10 emission factors, but will reduce the specificity of the numbers, i.e., reduce the number of significant digits.

USS's Response: See response above for Condition 7.6.6(d) – Continuous Casting Slab Cut-off.

Condition 7.6.6(c) – Continuous Casting Caster Spray Chambers

Illinois EPA's Understanding and Question: USS previously indicated that it has test data for this emission unit from June 2014 showing the unit had passed, but USS's letter dated September 17, 2018[3], indicated that USS has no data for this emission unit. Which is correct?

USS's Response: USS has stack test data for this emission unit from June 2014. A copy of this test report is attached as Attachment 1 to this letter. Based upon the results of this single stack test, the emission factors in this Condition 7.6.6(c) are reasonable estimates of typical emissions from this emission unit. USS does not agree to using these emission factors as enforceable emission limits. Rather, USS agrees to use these emission factors to develop enforceable emission limits that allow for the necessary operational flexibility at GCW.

[3] *See* Letter from Katherine D. Hodge, HeplerBroom LLC, to Rebecca Burlingham, Illinois Attorney General's Office (Sept. 17, 2018) ("9/17/2018 Letter").

Condition 7.1.6(b)(iii) – Flux Conveyor and Transfer Points (Bin Floor Baghouse)

Illinois EPA's Understanding and Question: USS indicated that it had previously tested this emission unit in June 2014, but USS's 9/17/2018 Letter indicated that USS has no data for this emission unit. Which is correct?

USS's Response: A bin floor baghouse test was completed in August 2013. A copy of this test report is attached as Attachment 2 to this letter. Based upon the results of this single stack test, USS will develop proposed enforceable emission limits that allow for the necessary operational flexibility at GCW. However, such limits may need to be revised/updated if new data becomes available in the future.

Condition 7.1.6(b)(ii) – BOF Additive System (Trackhopper Baghouse)

Illinois EPA's Question: USS's CAAPP Permit requires that one of three emission units (trackhopper baghouse, bin floor baghouse, or baghouse #1) be tested (see Condition 7.1.7(b)). Has USS ever tested any of these emission units yet? And if USS has tested one or more of these emission units, then agreement must be reached on what values will be used going forward for the emission limits for these emission units.

USS's Response: Prior to the September 17th meeting, USS addressed this question in correspondence to Illinois EPA. *See* response above and Letter from Joseph E. Hanning, USS, to Kent Mohr, Illinois EPA (Sept. 6, 2018) ("A test of the Bin Floor Baghouse was completed on August 29 and August 30, 2013; therefore, testing has been completed per condition 7.1.7(b) and within 30 months of the effective date of the CAAPP permit."). The Bin Floor Baghouse test cannot be considered representative of the Trackhopper Baghouse nor the Continuous Casting Deslagging Station and Associated Material Handling System Baghouse. Therefore, USS proposes further discussion on the Trackhopper and Continuous Casting Deslagging Station and Associated Material Handling System. USS notes general disagreement with the form of the emission factor for the Trackhopper Baghouse in lb PM/ton of *steel*. There is no direct correlation between the raw materials processed through the material handling system of the Trackhopper Baghouse and the tons of steel produced at the BOP Shop *during a testing period*. Therefore, it is inappropriate to have the PM emission factor be in lb/ton of steel produced. USS will update Illinois EPA with a proposed path forward on this item in its next deliverable due on November 16, 2018.

Condition 7.6.6(a) – Continuous Casting Deslagging Station and Associated Material Handling System

Illinois EPA's Understanding: Illinois EPA and USS had discussed combining this emission unit with other emission units, but values for the emission limits are still needed.

USS's Response: The Bin Floor Baghouse test cannot be considered representative of the Trackhopper Baghouse nor the Continuous Casting Deslagging Station and Associated

Material Handling System Baghouse. Therefore, USS proposes further discussion on the Trackhopper and Continuous Casting Deslagging Station and Associated Material Handling System. USS will update Illinois EPA with a proposed path forward on this item in its next deliverable due on November 16, 2018.

Condition 7.1.6(b)(i) – Blast Furnace and Steel Making

Illinois EPA's Question: Will the material handling emission factor limits in Condition 7.1.6(b)(i) be combined, and if so, what value is proposed?

USS's Response: USS is working on acquiring the additional data needed to make this determination and will further respond in future deliverables as such information becomes available.

Conclusion

USS is continuing to review and evaluate historic test data and production data for the emission units in the above-listed permit conditions. USS is also continuing to develop information on the variability of both production and operating scenarios for many of the above-listed emission units and activities, along with the need for alternative methods for ensuring compliance, i.e., methods other than merely replacing the lbs/ton emission factors with lbs/hr enforceable emission limits. USS cannot accept Illinois EPA's position that the emission factors in the PSD Permit should be carried over to the CAAPP Permit (and baghouse construction permit) as enforceable emission limits. However, USS does agree that emission factors may be used to develop enforceable emission limits that allow for the necessary operational flexibility at GCW. In addition, regarding the number of significant digits used in emission factors and enforceable emission limits throughout the CAAPP Permit, the significant digits can remain the same for the emission factors, but the number of significant digits for the proposed emission limits should be reduced to two significant digits. We have previously discussed this issue with the Illinois EPA, and kindly remind Illinois EPA that the proper use of significant figures must be used in developing limits.

USS believes the information presented in this submittal demonstrates that significant progress toward reaching resolution of the pending air permit appeals. While we agree much more work needs to be done, when the information in this deliverable is considered in combination with the information to be included in the next deliverable on November 16, 2018, USS believes the path forward on these issues will start coming together. We look forward to hearing from you after you and Illinois EPA representatives have reviewed the information presented in this letter and to be included in the next deliverable due on November 16, 2018

related to operational variability. We appreciate the time and consideration that the Illinois EPA and you have committed to in resolving this matter. Please let us know if you have any questions.

Sincerely,

Joshua J. Houser

KDH:JJH:kjg
attachments
pc: Sally Carter, Esq. (via electronic mail, w/attachments)
David Hacker, Esq. (via electronic mail, w/attachments)

CONFIDENTIAL:FOR SETTLEMENT PURPOSES ONLY

ATTACHMENT 1

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PARTICULATE EMISSIONS COMPLIANCE TEST

Performed At
United States Steel Corporation
Granite City Works
Caster 2 Stack
Granite City, Illinois

Test Date
June 5, 2014

Report No.
TRC Environmental Corporation Report 216216

Report Submittal Date
July 2, 2014

TRC Environmental Corporation
7521 Brush Hill Road
Burr Ridge, Illinois 60527
USA

T 312-533-2042
F 312-533-2070

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Report Certification

I certify that to the best of my knowledge:

- Testing data and all corresponding information have been checked for accuracy and completeness.
- Sampling and analysis have been conducted in accordance with the approved protocol and applicable reference methods (as applicable).
- All deviations, method modifications, or sampling and analytical anomalies are summarized in the appropriate report narrative(s).

Justin Merryman
Field Manager

July 2, 2014
Date

TRC was operating in conformance with the requirements of ASTM D7036-04 during this test program.

Jeffrey W. Burdette
TRC Air Measurements Technical Director

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PARTICULATE EMISSIONS COMPLIANCE TEST

1.0 INTRODUCTION

TRC Environmental Corporation (TRC) performed a particulate emissions compliance test program on the Caster 2 Stack at the Granite City Works of United States Steel Corporation in Granite City, Illinois on June 5, 2014. The tests were authorized by and performed for United States Steel Corporation.

The purpose of this test program was to determine filterable particulate emissions rates during specified operating conditions.

1.1 Project Contact Information

Participants		
Test Facility	United States Steel Corporation Granite City Works 20th and State Streets Granite City, Illinois 62040	Ms. Stefanie Boehme Wolf Environmental Engineer 618-451-3812 (phone) 618-451-2020 (fax) smboehme@uss.com
Air Emissions Testing Body (AETB)	TRC Environmental Corporation 7521 Brush Hill Road Burr Ridge, Illinois 60527	Mr. Justin Merryman Field Manager 219-617-4077 (phone) 312-533-2070 (fax) jmerryman@trcsolutions.com

Paul Powell and Justin Merryman of TRC conducted the testing. Documentation of the on-site ASTM D7036-04 Qualified Individual(s) (QI) can be located in the appendix to this report.

2.0 SUMMARY OF RESULTS

The results of this test program are summarized in the table below. Detailed individual run results are presented in Section 6.0.

Unit ID	Pollutant Tested		Measured Emissions	Permit Emissions Limit
Caster 2 Stack	PM/PM_{10}	gr/scf	0.0024	0.01
		lb/ton	0.0049	0.00852

The table below summarizes the test methods used, as well as the number and duration of each at each test location:

Unit ID/ Sample Location	Parameter Measured	Test Method	No. of Runs	Run Duration
Caster 2 Stack	Volumetric Flowrate	USEPA 1-4	3	60 min
	Filterable Particulate	USEPA 5	3	60 min

3.0 DISCUSSION OF RESULTS

The caster test location has been relocated to provide measurements more representative of actual emissions. The test ports have been moved further up the stack towards the point of exit. The new test location meets minimum acceptance criteria as described in USEPA Method 1. TRC has documented location specifics (upstream and downstream distances) and performed measurements to demonstrate the absence of cyclonic flow.

No problems were encountered with the testing equipment during the test program. Source operation appeared normal during the entire test program. Unit operating data was recorded and retained by plant personnel.

4.0 SAMPLING AND ANALYSIS PROCEDURES

All testing, sampling, analytical, and calibration procedures used for this test program were performed in accordance with the methods presented in the following sections. Where applicable, the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods, USEPA 600/R-94/038c, September 1994 was used to supplement procedures.

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4.1 Determination of Sample Point Locations by USEPA Method 1

This method is applicable to gas streams flowing in ducts, stacks, and flues and is designed to aid in the representative measurement of pollutant emissions and/or total volumetric flow rates from stationary sources. In order to qualify as an acceptable sample location, it must be located at a position at least two stack or duct equivalent diameters downstream and a half equivalent diameter upstream from any flow disturbance.

The cross-section of the measurement site was divided into a number of equal areas, and the traverse points were then located in the center of these areas. The minimum number of points were determined from either Figure 1-1 (particulate) or Figure 1-2 (non-particulate) of USEPA Method 1.

4.2 Volumetric Flow Rate Determination by USEPA Method 2

This method is applicable for the determination of the average velocity and the volumetric flow rate of a gas stream.

The gas velocity head (ΔP) and temperature were measured at a single point. The velocity head was measured with a Type S (Stausscheibe or reverse type) pitot tube and oil-filled manometer; and the gas temperature was measured with a Type K thermocouple. The average gas velocity in the flue was calculated based on: the gas density (as determined by USEPA Methods 3 and 4); the flue gas pressure; the average of the square root of the velocity heads at the traverse point, and the average flue gas temperature.

4.3 CO_2 and O_2 Determination by USEPA Method 3

This method is applicable for the determination of CO_2 and O_2 concentrations and dry molecular weight of a sample from an effluent gas stream of a fossil-fuel combustion process or other process.

An integrated gas sample was extracted from the stack. The gas sample was analyzed for percent CO_2 and percent O_2 using a Fyrite gas analyzer.

4.4 Filterable PM Determination by USEPA Method 5

This method is applicable for the determination of PM emissions from stationary sources. USEPA Methods 2-4 were performed concurrently with, and as an integral part of, these determinations.

Flue gas was withdrawn isokinetically from the source at traverse points determined per USEPA Method 1, and PM was collected in the nozzle, probe liner,

and on a glass fiber filter. The probe liner and filter were maintained at a temperature of 120 ± 14°C (248 ± 25°F) or such other temperature as specified by an applicable subpart of the standards or approved by the Administrator for a particular application. The PM mass, which included any material that condensed at or above the filtration temperature, was determined gravimetrically after the removal of uncombined water.

5.0 QUALITY ASSURANCE PROCEDURES

TRC integrates our Quality Management System (QMS) into every aspect of our testing service. We follow the procedures specified in current published versions of the test Method(s) referenced in this report. Any modifications or deviations are specifically identified in the body of the report. We routinely participate in independent, third party audits of our activities, and maintain:

- Louisiana Environmental Lab Accreditation Program (LELAP) accreditation;
- Interim accreditation from the Stack Testing Accreditation Council (STAC) that our operations conform with the requirements of ASTM D 7036-04

These accreditations demonstrate that our systems for training, equipment maintenance and calibration, document control and project management will fully ensure that project objectives are achieved in a timely and efficient manner with a strict commitment to quality.

All calibrations are performed in accordance with the test Method(s) identified in this report. If a Method allows for more than one calibration approach, or if approved alternatives are available, the calibration documentation in the appendices specifies which approach was used. All measurement devices are calibrated or verified at set intervals against standards traceable to the National Institute of Standards and Technology (NIST). NIST traceability information is available upon request.

6.0 TEST RESULTS SUMMARY

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METHOD 5 PARTICULATE TEST RESULTS SUMMARY

Company: United States Steel
Plant: Granite City Works
Unit: Caster 2
Location: Stack

Test Run Number	1	2	3	Average
Source Condition	Normal	Normal	Normal	
Date	6/5/2014	6/5/2014	6/5/2014	
Start Time	9:10	11:20	13:20	
End Time	10:20	12:30	18:57	
Sample Duration (min):	60.0	60.0	60.0	60.0
Average Gas Temp (°F):	127.6	129.3	125.4	127.4
Fractional Gas Moisture Content:	0.138	0.139	0.134	0.137
Gas CO_2 Content (%vol):	0.0	0.0	0.0	0.0
Gas O_2 Content (%vol):	20.9	20.9	20.9	20.9
Gas Wet MW (lb/lbmole-mole):	27.34	27.33	27.38	27.35
Average Gas Vel (ft/sec):	40.62	41.13	41.75	41.16
Measured Volumetric Flow Rate				
Q (actual ft^3/min):	98,318	99,555	101,052	99,642
Q_{std} (std ft^3/min):	87,139	87,986	89,907	88,344
$Q_{std(dry)}$ (dry std ft^3/min):	75,129	75,791	77,815	76,245
Process Rate (tons/hr):	320	320	320	320
Sample Volume (dry std ft^3):	53.621	53.389	54.919	53.976
Sample Volume (std. m^3):	1.518	1.512	1.555	1.528
PM Collected (mg):				
Filterable	8.228	7.655	9.248	8.377
PM Concentration (gr/scf):				
Filterable	0.0024	0.0022	0.0026	0.0024
PM Emission Rate (lb/hr based on measured volumetric flow rate):				
Filterable:	1.525	1.437	1.733	1.565
PM Emission Rate (lb/tons):				
Filterable:	0.0048	0.0045	0.0054	0.0049
Isokinetic Variance	99.1	97.8	98.0	98.3

APPENDIX

AETB and QI Information Summary

Facility Name:	United States Steel Corporation
Location:	Granite City Works – Caster 2 Stack
Test Date:	June 5, 2014

Test Parameters:	1, 2, 3 and 5	----	----
QI Last Name:	Merryman	----	----
QI First Name:	Justin	----	----
QI Middle Initial:	----	----	----
AETB Name:	TRC Environmental Corporation	TRC Environmental Corporation	TRC Environmental Corporation
AETB Phone No:	219-617-4077	----	----
AETB Email:	jmerryman@trcsolutions.com	----	----
Group 1 Exam Date:	01/14/2013	----	----
Provider Name:	Source Evaluation Society	Source Evaluation Society	Source Evaluation Society
Provider Email:	qstiprogram@gmail.com	qstiprogram@gmail.com	qstiprogram@gmail.com
Group 2 Exam Date:	----	----	----
Provider Name:	Source Evaluation Society	Source Evaluation Society	Source Evaluation Society
Provider Email:	qstiprogram@gmail.com	qstiprogram@gmail.com	qstiprogram@gmail.com
Group 3 Exam Date:	----	----	----
Provider Name:	Source Evaluation Society	Source Evaluation Society	Source Evaluation Society
Provider Email:	qstiprogram@gmail.com	qstiprogram@gmail.com	qstiprogram@gmail.com
Group 5 Exam Date:	----	----	----
Provider Name:	Source Evaluation Society	Source Evaluation Society	Source Evaluation Society
Provider Email:	qstiprogram@gmail.com	qstiprogram@gmail.com	qstiprogram@gmail.com

This is to Certify that:

Justin Merryman

Is a Qualified Individual as defined in Section 8.3 of ASTM D7036-04 for the following test methods:

EPA Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 2H, 3, 3B, 4, 5, 5A, 5B, 5E, 5F, 5i, 17, 19, 201A, and 202.

The individual has met the minimum experience requirements defined in Section 8.3.4.2 of ASTM D7036-04 and has successfully passed an internal comprehensive examination for the test methods designated above.

This certification is effective until: **01-14-2018**

Date of Issue: 02-13-2013

Certificate Number: 00509

Edward J MacKinnon

Air Measurements Practice Quality Director

TRC

This is to Certify that:

Paul G. Powell

Is a Qualified Individual as defined in Section 8.3 of ASTM D7036-04 for the following test methods:

EPA Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 2H, 3, 3B, 4, 5, 5A, 5B, 5E, 5F, 5i, 17, 19, 201A, and 202.

The individual has met the minimum experience requirements defined in Section 8.3.4.2 of ASTM D7036-04 and has successfully passed an internal comprehensive examination for the test methods designated above.

This certification is effective until: 10-28-2016

Date of Issue: 02-14-2013

Certificate Number: 00530

Edward J MacKinnon

Air Measurements Practice Quality Director

TRC

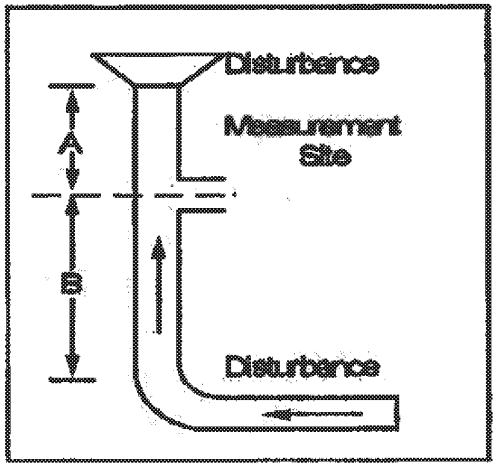
TRC

Sample Location Information for Isokinetic Sampling - Round Ducts

Project #: 216216
Company: United States Steel
Plant: Granite City Works
Unit ID: Caster 2
Sample Location: Stack

Distance A: 5.00 Feet, 0.70 Duct diameters
Distance B: 120.00 Feet, 16.74 Duct diameters
Meets Method 1 criteria

Duct Diameter: 7.17 feet
# of Ports Used: 2
# of Points/Diameter: 12
Sample Plane: Horizontal
Port Type: Nipple
Port Length: 6.3 inches
Port Inside Diameter: 6.0 inches



Traverse Point Locations

Point	% of diameter	Inches from wall	Inches from port edge
1	2.1	1.8	8.1
2	6.7	5.8	12.1
3	11.8	10.1	16.4
4	17.7	15.2	21.6
5	25.0	21.5	27.8
6	35.6	30.6	36.9
7	64.4	55.4	61.7
8	75.0	64.5	70.8
9	82.3	70.8	77.1
10	88.2	75.9	82.2
11	93.3	80.2	86.5
12	97.9	84.2	90.5

Pre-cyclonic flow check conducted? Yes

Pre-Test Cyclonic Flow Check Data

	Port:			Port:			Port:			Port:		
	ΔP	Ts	a	ΔP	Ts	a	ΔP	Ts	a	ΔP	Ts	a
Point #	("H2O)	(°F)	(°)	("H2O)	(°F)	(°)	("H2O)	(°F)	(°)	("H2O)	(°F)	(°)
1	0.51	128	0	0.52	128	0	-	-	-	-	-	-
2	0.45	128	0	0.52	129	0	-	-	-	-	-	-
3	0.48	128	5	0.48	128	5	-	-	-	-	-	-
4	0.47	128	5	0.55	128	5	-	-	-	-	-	-
5	0.47	128	0	0.43	129	10	-	-	-	-	-	-
6	0.48	128	5	0.38	128	10	-	-	-	-	-	-
7	0.5	126	10	0.44	128	25	-	-	-	-	-	-
8	0.55	127	15	0.43	128	15	-	-	-	-	-	-
9	0.51	128	10	0.46	128	10	-	-	-	-	-	-
10	0.51	128	0	0.43	128	5	-	-	-	-	-	-
11	0.52	126	0	0.38	128	0	-	-	-	-	-	-
12	0.48	128	0	0.34	128	0	-	-	-	-	-	-

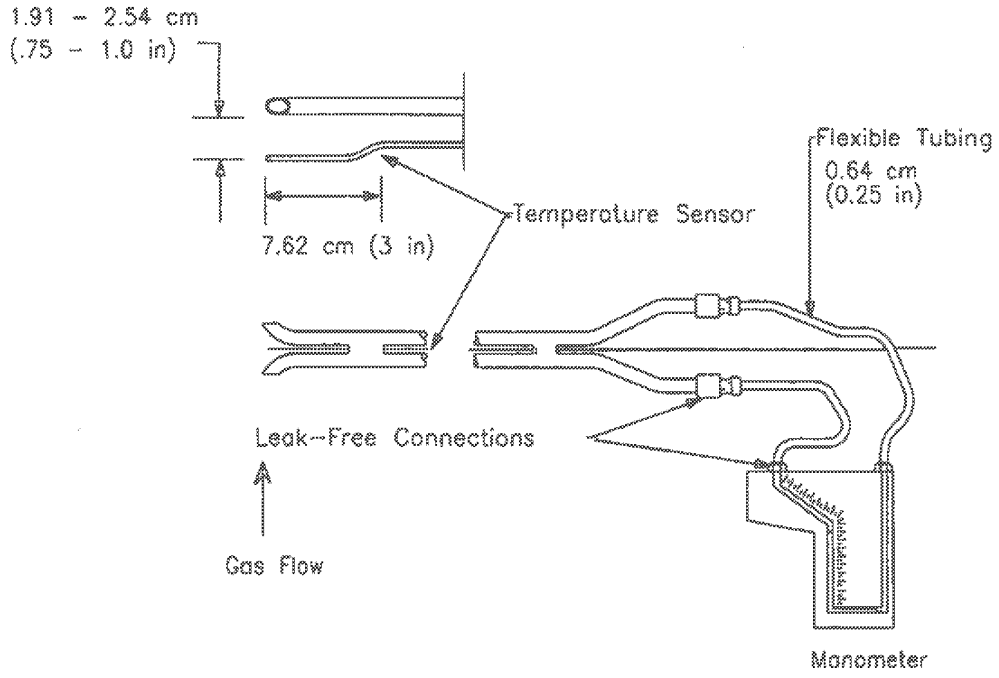
Average a: 5.6 (°) Average Ts: 127.88 (°F) Average ΔP: 0.470417 ("H2O)
Status: Pass Avg of sqrt ΔP: 0.684754

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Determination of Stack Gas Velocity and Volumetric Flow Rate

USEPA Promulgated Test Method 2

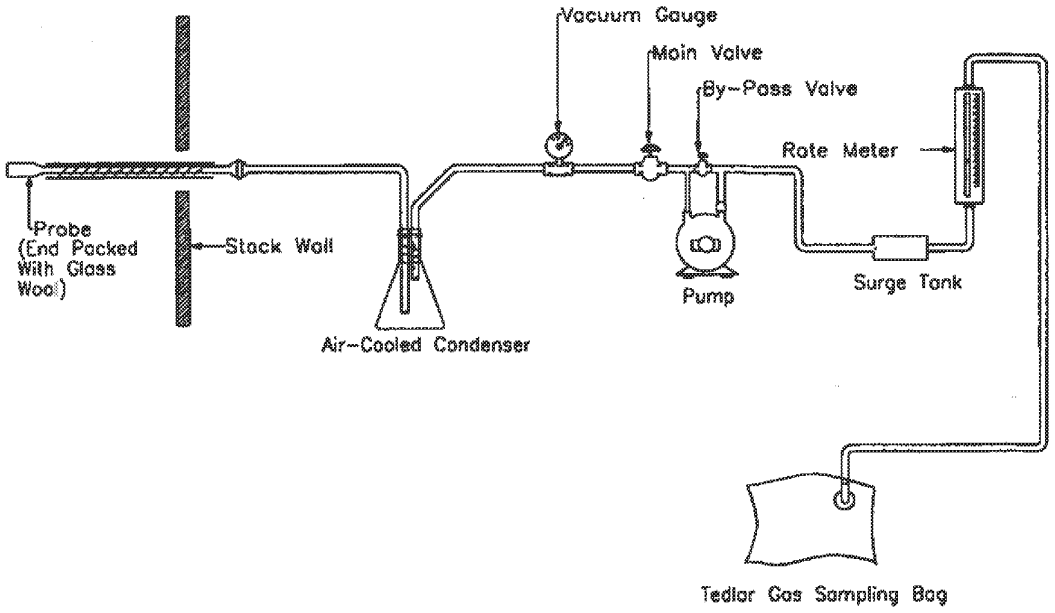


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Gas Analysis for the Determination of Dry Molecular Weight

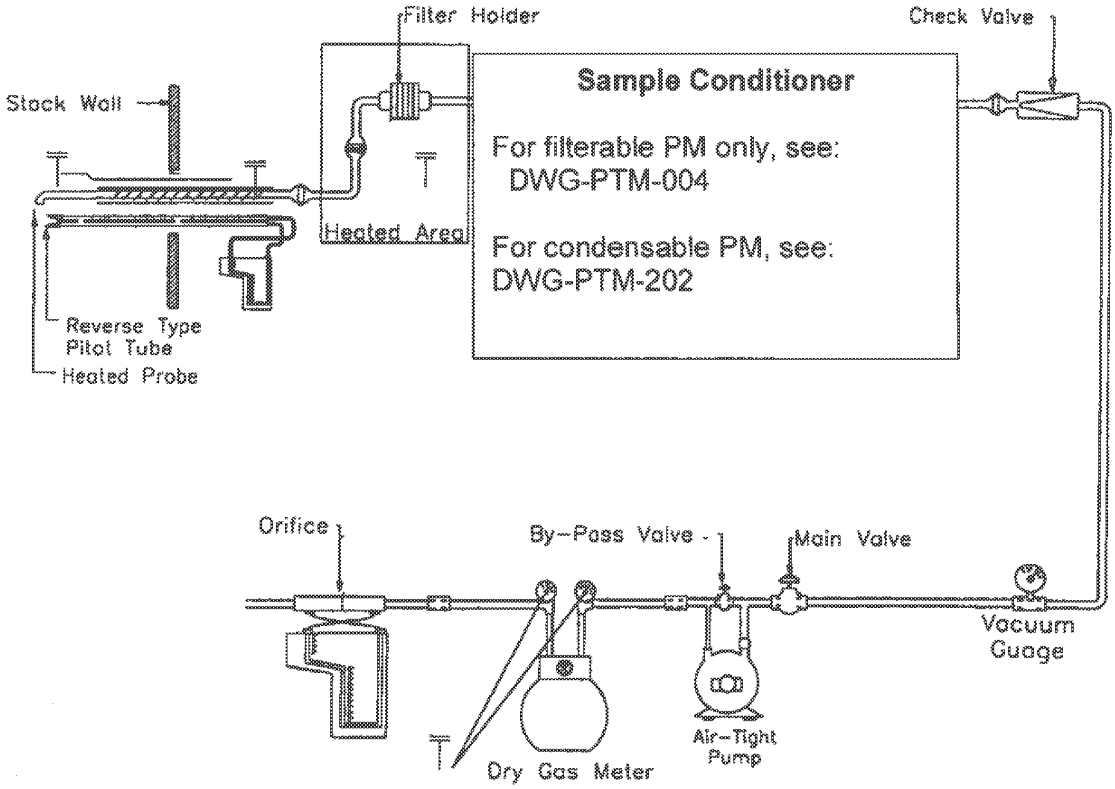
USEPA Promulgated Method 3



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Determination of Particulate Emissions From Stationary Sources

USEPA Promulgated Method 5



TRC

Filterable Particulate Sample Analysis Summary

Project#: 216216
Company: United States Steel
Plant: Granite City Works

Unit ID: Caster 2
Location: Stack
Test Date(s): 06/05/14

Front-Half PM	Run 1	Run 2	Run 3	Run 4	Blank
Total filter weight gain (grams):	0.00370	0.00560	0.00540	-	-
Front-half acetone rinse volume (ml):	70	44	51	-	195
Front-half acetone rinse weight gain (grams):	0.00460	0.00210	0.00390	-	0.00020
Net front-half acetone rinse mass (grams):	0.00453	0.00205	0.00385	-	-
Net front-half PM (grams):	**0.00823**	**0.00765**	**0.00925**	-	-

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Project / Project Number: US STEEL/216216

Date: 6/13/2014 *Analyst:* GS

USEPA 40CFR60 Appendix A, Method 6

Description:		Initial Weight (g)	Final Weight (g)	Net Weight (g)
Granite City Works Caster 2				
21601 -21602				
Test 1				
Filter #	8791	0.9508	0.9545	0.0037
Acetone Wash # / Volume (mL):	3191-95 70	8.3949	8.3995	0.0046
21603 -21604				
Test 2				
Filter #:	8797	0.9251	0.9307	0.0056
Acetone Wash # / Volume (mL):	3195-00 44	8.4397	8.4418	0.0021
21605 - 21606				
Test 3				
Filter #:	8796	0.9237	0.9291	0.0054
Acetone Wash # / Volume (mL):	3201-05 51	8.4360	8.4399	0.0039
Blank				
Acetone # / Volume (mL):	3206-10 195	8.4586	8.4587	0.0002

Initial and final weights are obtained by drying in an oven at 104 °C for 2 hours, cooling in a desiccator and weighing once.

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Chain of Custody Record

Project Name: USS	TRC Contact: Justin Merryman	T: 219-617-2044	Analyses Required
Site Name: Granite City Works	Email: jmerryman@trcsolutions.com		
Project No.: 216216	Sampling System Prepared by: Justin Merryman		
	Samples Recovered by: Justin Merryman		

TRC Report 216216 add'g

Sub Lab ID	Sample ID Number	Sample Description* (Unit-Location-Method-Run-Container Number)	Date Sampled	Run Time (Optional)	**No. of Containers	Method 5					Comments:
	21601	Caster 2-Stack-M5-R1-C1	6/5/2014		1	X					Filter
	21602	Caster 2-Stack-M5-R1-C2	6/5/2014		1	X					Acetone Probe Wash
	21603	Caster 2-Stack-M5-R2-C1	6/5/2014		1	X					Filter
	21604	Caster 2-Stack-M5-R2-C2	6/5/2014		1	X					Acetone Probe Wash
	21605	Caster 2-Stack-M5-R3-C1	6/5/2014		1	X					Filter
	21606	Caster 2-Stack-M5-R3-C2	6/5/2014		1	X					Acetone Probe Wash
	21607	Caster 2-Stack-M5-Blank-C5	6/5/2014		1	X					Acetone Blank

General Instructions: This form documents all changes in custody. The name and dated signature for each person associated with the release or receipt of the listed samples must be recorded.

TAT: Standard Need By Date:	Project Remarks:	Relinquished by: (Sign & Print)	Date/Time	Received by: (Sign & Print)	Date/Time
Shipped by: Shipped On:		Justin Merryman	6/9/14 7:50	Kayle Swanson	6/9/14 7:55
Ship To Attn:					
Lab:					
Address:					
Phone:					

Special Instructions:

SUBCONTRACTOR LABORATORY MUST CONTACT THE CITED TRC CONTACT TO ENSURE A PO IS IN PLACE.

TRC Environmental Corporation
7521 Brush Hill Road
Burr Ridge, Illinois 60527 USA
T: (312) 533-2042 F: (312)533-2070

R005302

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Company:	United States Steel	Run:	1
Plant:	Granite City Works	Test Date:	6/5/2014
Unit:	Caster 2		
Test Location:	Stack		

X-Factor Isokinetic Sampling Coefficient (based on pre-test data)

$$\text{X-Factor} = 846.72 \times (Dn)^4 \times \Delta H_{@f} \times C_p^2 \times (1-B_{ws})^2 \times \frac{(Md \times Tm \times Ps)}{(Ms \times Ts \times (Pbar + (\Delta H@/13.6)))} \times Ts/Tm$$

Where:

T_s = Temperature of effluent gas (°R)

T_m = Average dry test meter temperature (°R)

D_n = Nozzle Diameter (in.)

$\Delta H_{@f}$ = Orifice pressure drop corresponding to 0.75 cfm meter flow rate (in. H_20)

C_p = Pitot Tube Coefficient (dimensionless)

B_{ws} = Effluent gas fractional moisture content (dimensionless)

M_d = Dry molecular weight of exhaust (lb/lb-mole)

M_s = Molecular weight of exhaust, wet basis (lb/lb-mole)

P_s = Absolute flue gas pressure ("Hg)

P_{bar} = Ambient barometric pressure at sample elevation ("Hg)

D_n =	0.298	in.	P_s =	29.51	in. Hg abs.
$\Delta H@f$ =	1.77	in. H_20	M_s =	27.81	lb/lb-mole
C_p =	0.84	(dimensionless)	T_s =	588	°R
M_d =	28.84	lb/lb-mole	P_{bar} =	29.52	in. Hg
T_m =	535	°R	B_{ws} =	0.095	(dimensionless)

X-Factor = 7.089

Dry Molecular Weight

$$Md = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

Where:

Md = Effluent gas molecular weight (lb/lb-mole, dry basis)

$\%CO_2$ = Effluent gas Carbon Dioxide Content (% volume, dry basis)

$\%O_2$ = Effluent gas Oxygen Content (% volume, dry basis)

$\%N_2$ = Effluent gas Nitrogen Dioxide Content (% volume, dry basis)

$\%CO_2$ =	0.0	%vol dry	$\%N_2$ =	79.1	%vol dry
$\%O_2$ =	20.9	%vol dry			

Md = 28.84 lb/lb-mole

Wet Molecular Weight

$$Ms = Md \times (1-Bws) + (18.0 \times Bws)$$

Where:

Ms = Effluent gas molecular weight (lb/lb-mole, wet basis)

Bws = Effluent gas fractional moisture content (dimensionless)

Md =	28.84	lb/lb-mole	*Bws* =	0.138	

Ms = 27.34 lb/lb-mole

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TRC

Company:	United States Steel	Run:	1
Plant:	Granite City Works	Test Date:	6/5/2014
Unit:	Caster 2		
Test Location:	Stack		

Effluent Gas Pressure

$$P_s = P_{bar} + (P_g/13.6)$$

Where:

P_s = flue gas pressure ("Hg)

P_{bar} = Ambient barometric pressure at sample elevation ("Hg)

P_g = Flue gas gauge pressure ("H_2O)

P_{bar} = 29.52 "Hg P_g = -0.10 "H_2O

Ps = 29.51 "Hg

Average Meter Temperature

$$T_m = \frac{\sum_{i=1}^{n} (T_{min} + T_{mout})/2}{n}$$

Where:

T_m = Average dry test meter temperature (°R)

T_{min} = Temperature of gas entering dry test meter (°R)

T_{mout} = Temperature of gas leaving dry test meter (°R)

Avg T_{min} = 541.2 °R Avg T_{mout} = 536.1 °R

T_m = 538.6 °R

ΔH at Sample Point - Example Point 1-2

$$\Delta Hi = X \times \Delta Pi \times (T_m/T_s)$$

Where:

ΔH = Pressure drop across calibrated orifice ("H_2O)

ΔP = Pressure drop across pitot ("H_2O)

T_s = Temperature of effluent gas (°R)

X = 6.872 ΔPi = 0.20 "H_2O

T_m = 536.5 °R T_{si} = 589.0 °R

ΔHi = 1.25 "H_2O

Sample Volume at Standard Conditions

$$V_{m(std)} = (T_{std}/29.92) \times Y \times V_m \times (P_{bar} + \Delta H/13.6)/T_m$$

Where:

$V_{m(std)}$ = Sample volume collected corrected to 29.92 in. Hg and 528(°R) (ft3, dry basis)

Y = Dry test meter calibration coefficient (dimensionless)

V_m = V_m = Sample volume collected at actual conditions (ft³, dry basis)

T_{std} = Standard Temperature 528(°R)

Y = 1.006 V_m = 54.730 cf

P_{bar} = 29.52 "Hg ΔH = 2.61 "H_2O

T_m = 538.6 °R T_{std} = 528 °R

$V_{m(std)}$ = 53.621 dscf

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TRC

Company:	United States Steel	Run:	1
Plant:	Granite City Works	Test Date:	6/5/2014
Unit:	Caster 2		
Test Location:	Stack		

Volume of Water Vapor Condensed

$$V_{wc(std)} = 0.04715 \times (Tstd / 528) \times M_{H2O}$$

Where:

$V_{wc(std)}$ = Volume of water vapor collected at 29.92"Hg and 528°R (ft^3)

M_{H2O} = Net weight gain of impingers (grams)

M_{H2O} = 181.8 grams

$V_{wc(std)}$ = **8.572** **wscf**

Moisture Content

$$Bws = \frac{V_{wc(std)}}{V_{wc(std)} + V_{m(std)}}$$

$V_{wc(std)}$ = 8.572 dscf $V_{m(std)}$ = 53.621 wscf

Bws = **0.138**

Average Duct Velocity

$$V_s = 85.49 \times Cp \times Sqrt\ \Delta P\ (avg) \times (Ts/(Ps \times Ms))^{1/2}$$

Where:

V_s = Average velocity of effluent gas (ft/sec)

C_p = Pitot calibration coefficient (dimensionless)

Sqrt ΔP (avg) = Average of the square roots of DP's at all traverse points

C_p = 0.840 Sqrt ΔP (avg) = 0.663

T_s = 587.6 °R Ps = 29.51 "Hg

Ms = 27.34 lb/lb-mole

Vs = **40.62** **ft/sec**

Method 2 Volumetric Flow Rate (Actual Basis)

$$Q = V_s \times A \times 60$$

Where:

Q = Effluent gas volumetric flow rate at actual conditions (ft^3/min)

A = Cross-sectional area of duct at sample location (ft^2)

Vs = 40.62 ft/sec A = 40.343 ft^2

Q = **98,318** cfm

Method 2 Volumetric Flow Rate (Standard Basis)

$$Q_{std} = \frac{T_{std} \times Q \times P_s}{T_s \times 29.92}$$

Where:

Q_{std} = Effluent gas volumetric flow rate corrected to 29.92 in. Hg and 528°R (ft3/min)

Q = 98318 cfm Ps = 29.51 "Hg

Ts = 587.6 °R

Qstd = **87,139** **scfm**

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TRC

Company:	United States Steel	**Run:**	1
Plant:	Granite City Works	**Test Date:**	6/5/2014
Unit:	Caster 2		
Test Location:	Stack		

Method 2 Volumetric Flow Rate (Standard Dry Basis)

$$Q_{std(dry)} = Q_{std} \times (1\text{-}Bws)$$

Where:

$Q_{std(dry)}$ = Effluent gas volumetric flow rate corrected to 29.92 in. Hg and 528°R (ft3/min, dry basis)

Qstd = 87139 scfm Bws = 0.138

Qstd(dry) = 75,129 dscfm

Isokinetic Variation:

$$I = \frac{0.0945 \times T_s \times V_{m(std)} \times 528}{V_s \times \theta \times A_n \times P_s \times (1\text{-}Bws) \times T_{std}}$$

Where:

I = Percent of isokinetic sampling (dimensionless)

θ = Total sample collection time (min)

A_n = Cross-sectional area of nozzle (ft^2)

Ts = 587.6 °R Vm(std) = 53.621 dscf

Vs = 40.618 ft/sec θ = 60.0 min

Ps = 29.51 "Hg An = 0.000484 ft^2 Bws = 0.138

I = 99.1 %

PM Concentration - example for filterable only:

$$C_o = \frac{m \times 0.01543}{V_{m(std)}}$$

Where:

C_o = Particulate matter concentration (grains/dry standard ft^3)

m = Net mass of particulate matter collected (mg)

m = 8.2 mg Vm(std) = 53.621 dscf

Co = 0.00237 gr/dscf

PM Emission Rate Based on Method 2 Volumetric Flow Rate

$$ER_{M2} = \frac{C_o \times Q_{std(dry)} \times 60}{7000}$$

Where:

ER_{M2} = Particulate matter emission rate calculated using Method 2 volumetric flow rate (lb/hr)

Co = 0.0024 gr/dscf Qstd(dry) = 75129 dscf/min

ER_{M2} = 1.52 lb/hr

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Isokinetic Test Support Data

Company:	United States Steel	Project#:	216216
Plant:	Granite City Works	Test Method(s):	Method 5
Unit ID:	Caster 2	Test Run #:	1
Location:	Stack	Test Date(s):	6/5/2014

Console Operator:	J. Merryman	Unit Operating Mode:	Normal
Console ID:	E73	Duct Shape/Area:	Round / 40.34 ft^2
Meter Y:	1.008	Fuel Type:	
Orifice DH@i:	1.770	Fd Factor:	dscf/MMBtu
Pitot Tube ID:	797B	Fc Factor:	scf/MMBtu
Cal. coefficient (Cp):	0.84	Fuel heat content:	Btu /
Probe Liner Material:	SS	Process/fuel flow rate:	320 tons / hr
Nozzle Material:	SS	Soot blown?	
Nozzle Diameter:	0.298 in	Duration:	min

Sample collection time

Total # of points:	24		
Target Sample time/point:	2.5 min		
Target run duration:	60.0 min		
Barometric Pressure (P_{bar}):	29.52 in Hg		
Flue Static Pressure (P_g):	-0.10 in H2O		
Flue Pressure (P_s):	29.51 in Hg		

Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
1	H20	100.0	230.0
2	H20	100.0	140.0
3	MT	0.0	0.0
4	SIGel	226.9	238.7
		Net:	181.8

Leak Checks

Pre-Test Train Leak Check:	0.000 CFM @ 12 "Hg		
Pre-Test Pitot Leak Check:	Pass (Pass or Fail)	Fixed Gas Analysis:	
Post-Test Train Leak Rate:	0.000 CFM @ 15 "Hg	CO_2:	0.0 %vol
Post-Test Pitot Leak Check:	Pass (Pass or Fail)	O_2:	20.9 %vol
Pump/Orifice Leak Check:	Pass (Pass or Fail)	N_2:	79.1 %vol
Filter/Thimble ID:	8791		
Tare Weight:	0.9508 grams		

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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Isokinetic Test - Processed Traverse Data

Company:	United States Steel	Project #:	216216	Test Date:	6/5/2014
Plant:	Granite City Works	Method(s):	Method 5	X-Factor:	6.872
Unit:	Caster 2	Run #:	1	Minutes/pt:	2.5
Location:	Stack	Traverse Sheet:	1 of 1		

Port & Point ID	Clock Time	Meter Volume ft^3	ΔP ("H_2O)	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice ΔH ("H_2O)	Sample Vacuum ("Hg)
1-1	9:10:00	528.370	0.51	125	75	73	3.20	4.0
1-2	9:12:30	530.660	0.20	129	78	75	1.30	5.0
1-3	9:15:00	532.560	0.19	129	79	74	1.20	5.0
1-4	9:17:30	534.080	0.47	128	78	72	2.90	5.0
1-5	9:20:00	536.340	0.47	128	78	72	2.90	6.0
1-6	9:22:30	538.570	0.48	128	80	73	3.00	6.0
1-7	9:25:00	541.000	0.50	129	81	73	3.10	6.0
1-8	9:27:30	543.620	0.55	129	81	73	3.50	6.0
1-9	9:30:00	545.830	0.51	128	81	74	3.20	7.0
1-10	9:32:30	548.350	0.51	126	81	74	3.20	7.0
1-11	9:35:00	550.770	0.52	128	85	74	3.30	7.0
1-12	9:37:30	553.250	0.46	128	85	74	3.00	7.0
	9:40:00	555.705						
2-1	9:50:00	555.705	0.52	128	81	77	3.30	7.0
2-2	9:52:30	558.080	0.52	129	79	76	3.30	7.0
2-3	9:55:00	560.500	0.48	126	80	76	3.00	7.0
2-4	9:57:30	562.860	0.55	126	80	76	3.50	7.0
2-5	10:00:00	565.360	0.43	129	84	80	2.70	7.0
2-6	10:02:30	567.610	0.38	128	84	80	2.40	7.0
2-7	10:05:00	569.850	0.37	126	84	80	2.40	7.0
2-8	10:07:30	572.190	0.42	127	83	80	2.70	7.0
2-9	10:10:00	574.240	0.46	127	83	80	2.90	7.0
2-10	10:12:30	576.560	0.43	128	83	80	2.70	7.0
2-11	10:15:00	578.950	0.38	126	83	80	2.40	7.0
2-12	10:17:30	581.020	0.36	128	83	80	2.30	7.0
	10:20:00	583.100						

Comments/Notes:

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TRC

Isokinetic Test Support Data

Company:	United States Steel	Project#:	216216
Plant:	Granite City Works	Test Method(s):	Method 5
Unit ID:	Caster 2	Test Run #:	2
Location:	Stack	Test Date(s):	6/5/2014

Console Operator:	J. Merryman	Unit Operating Mode:	Normal
Console ID:	E73	Duct Shape/Area:	Round / 40.34 ft^2
Meter Y:	1.006	Fuel Type:	
Orifice DH@:	1.770	Fd Factor:	dscf/MMBtu
Pitot Tube ID:	797B	Fc Factor:	scf/MMBtu
Cal. coefficient (Cp):	0.84	Fuel heat content:	Btu /
Probe Liner Material:	SS	Process/fuel flow rate:	320 tons / hr
Nozzle Material:	SS	Soot blown?	
Nozzle Diameter:	0.288 in	Duration:	min

Sample collection time

Total # of points:	24	Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
Target Sample time/point:	2.5 min	1	H20	100.0	220.0
Target run duration:	60.0 min	2	H20	100.0	150.0
		3	MT	0.0	0.0
Barometric Pressure (P_{bar}):	29.62 In Hg	4	SIGel	234.5	246.7
Flue Static Pressure (P_g):	-0.10 In H2O				
Flue Pressure (P_s):	29.61 In Hg				
Leak Checks				Net:	182.2
Pre-Test Train Leak Check:	0.000 CFM @ 14 "Hg				
Pre-Test Pitot Leak Check:	Pass (Pass or Fail)	Fixed Gas Analysis:			
Post-Test Train Leak Rate:	0.000 CFM @ 14 "Hg	CO_2:	0.0 %vol		
Post-Test Pitot Leak Check:	Pass (Pass or Fail)	O_2:	20.9 %vol		
Pump/Orifice Leak Check:	Pass (Pass or Fail)	N_2:	79.1 %vol		
Filter/Thimble ID:	8797				
Tare Weight:	0.9251 grams				

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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TRC

Isokinetic Test - Processed Traverse Data

Company: United States Steel
Plant: Granite City Works
Unit: Caster 2
Location: Stack

Project #: 216216
Method(s): Method 5
Run #: 2
Traverse Sheet: 1 of 1

Test Date: 6/5/2014
X-Factor: 6.872
Minutes/pt: 2.5

Port & Point ID	Clock Time	Meter Volume ft^3	ΔP ($"H_2O$)	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice ΔH ($"H_2O$)	Sample Vacuum ("Hg)
1-1	11:20:00	583.587	0.41	128	79	77	2.60	6.0
1-2	11:22:30	585.860	0.36	128	79	77	2.30	6.0
1-3	11:25:00	587.960	0.44	130	82	78	2.80	6.0
1-4	11:27:30	590.220	0.42	132	83	78	2.60	6.0
1-5	11:30:00	592.430	0.36	131	85	80	2.30	7.0
1-6	11:32:30	594.490	0.44	128	84	78	2.80	7.0
1-7	11:35:00	596.710	0.51	131	85	78	3.20	7.0
1-8	11:37:30	599.240	0.48	130	86	79	3.00	7.0
1-9	11:40:00	601.450	0.52	129	85	79	3.30	7.0
1-10	11:42:30	603.860	0.51	131	86	79	3.20	7.0
1-11	11:45:00	606.310	0.44	131	86	79	2.80	7.0
1-12	11:47:30	608.580	0.41	131	87	80	2.60	7.0
	11:50:00	610.760						
2-1	12:00:00	610.760	0.52	131	86	82	3.30	7.0
2-2	12:02:30	613.210	0.48	128	85	81	3.10	7.0
2-3	12:05:00	615.650	0.49	128	85	80	3.10	7.0
2-4	12:07:30	617.960	0.51	128	85	80	3.20	7.0
2-5	12:10:00	620.340	0.51	128	85	80	3.20	7.0
2-6	12:12:30	622.720	0.55	131	87	81	3.50	7.0
2-7	12:15:00	625.200	0.48	128	87	80	3.10	7.0
2-8	12:17:30	627.610	0.42	128	88	81	2.70	7.0
2-9	12:20:00	629.830	0.42	129	88	81	2.70	7.0
2-10	12:22:30	632.140	0.40	128	88	81	2.60	7.0
2-11	12:25:00	634.250	0.38	128	88	81	2.40	7.0
2-12	12:27:30	636.380	0.36	128	88	81	2.30	7.0
	12:30:00	638.456						

Comments/Notes:

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Isokinetic Test Support Data

Company:	United States Steel	Project#:	216216
Plant:	Granite City Works	Test Method(s):	Method 5
Unit ID:	Caster 2	Test Run #:	3
Location:	Stack	Test Date(s):	6/5/2014

Console Operator:	J. Merryman	Unit Operating Mode:	Normal
Console ID:	E73	Duct Shape/Area:	Round / 40.34 ft²
Meter Y:	1.006	Fuel Type:	
Orifice DH@i:	1.770	Fd Factor:	dscf/MMBtu
Pitot Tube ID:	797B	Fc Factor:	scf/MMBtu
Cal. coefficient (Cp):	0.84	Fuel heat content:	Btu /
Probe Liner Material:	SS	Process/fuel flow rate:	320 tons / hr
Nozzle Material:	SS	Soot blown?	
Nozzle Diameter:	0.288 in	Duration:	min

Sample collection time				Tare wt.	Final wt:
Total # of points:	24	Imp #	Contents	(grams)	(grams)
Target Sample time/point:	2.5 min	1	H20	100.0	210.0
Target run duration:	60.0 min	2	H20	100.0	160.0
		3	MT	0.0	0.0
Barometric Pressure (P_{bar}):	29.62 in Hg	4	SiGel	242.4	253.4
Flue Static Pressure (P_g):	-0.10 in H2O				
Flue Pressure (P_s):	29.61 in Hg				
Leak Checks				Net:	181.0
Pre-Test Train Leak Check:	0.000 CFM @ 13 "Hg				
Pre-Test Pitot Leak Check:	Pass (Pass or Fail)	Fixed Gas Analysis:			
Post-Test Train Leak Rate:	0.000 CFM @ 15 "Hg	CO_2:	0.0 %vol		
Post-Test Pitot Leak Check:	Pass (Pass or Fail)	O_2:	20.9 %vol		
Pump/Orifice Leak Check:	Pass (Pass or Fail)	N_2:	79.1 %vol		
Filter/Thimble ID:	8796				
Tare Weight:	0.9237 grams				

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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Isokinetic Test - Processed Traverse Data

Company: United States Steel
Plant: Granite City Works
Unit: Caster 2
Location: Stack

Project #: 216216
Method(s): Method 5
Run #: 3
Traverse Sheet: 1 of 1

Test Date: 6/5/2014
X-Factor: 6.872
Minutes/pt: 2.5

Port & Point ID	Clock Time	Meter Volume ft^3	ΔP ("H_2O)	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice ΔH ("H_2O)	Sample Vacuum ("Hg)
1-1	13:20:00	638.860	0.48	128	84	82	3.10	6.0
1-2	13:22:30	641.320	0.46	128	83	81	2.90	6.0
1-3	13:25:00	643.650	0.48	128	84	81	3.00	7.0
1-4	13:27:30	645.960	0.44	131	84	81	2.80	7.0
1-5	13:30:00	648.240	0.44	129	86	81	2.80	7.0
1-6	13:32:30	650.530	0.50	128	86	81	3.20	7.0
1-7	13:35:00	652.920	0.51	128	86	81	3.20	7.0
1-8	13:37:30	655.290	0.46	131	88	81	2.90	7.0
1-9	13:40:00	658.010	0.48	128	88	81	3.10	7.0
1-10	13:42:30	660.120	0.44	128	88	81	2.80	7.0
1-11	13:45:00	662.340	0.51	128	88	81	3.30	7.0
1-12	13:47:30	664.740	0.44	128	88	81	2.80	7.0
	13:50:00	667.050						
2-1	14:00:00	667.050	0.50	128	85	82	3.20	7.0
2-2	14:02:30	669.580	0.48	126	86	84	3.10	7.0
2-3	14:05:00	672.000	0.46	126	88	82	3.00	7.0
	14:07:30	674.404						
2-4	18:35:00	674.690	0.48	120	82	80	3.10	7.0
2-5	18:37:30	677.140	0.48	121	84	80	3.10	7.0
2-6	18:40:00	679.450	0.46	120	84	80	3.00	7.0
2-7	18:42:30	681.810	0.50	119	84	80	3.20	7.0
2-8	18:45:00	684.200	0.51	120	84	80	3.30	7.0
2-9	18:47:30	686.640	0.48	122	84	80	3.10	7.0
2-10	18:50:00	689.050	0.42	121	84	80	2.70	7.0
2-11	18:52:30	691.290	0.42	121	84	80	2.70	7.0
2-12	18:55:00	693.470	0.38	122	84	80	2.40	7.0
	18:57:30	695.635						

Comments/Notes:

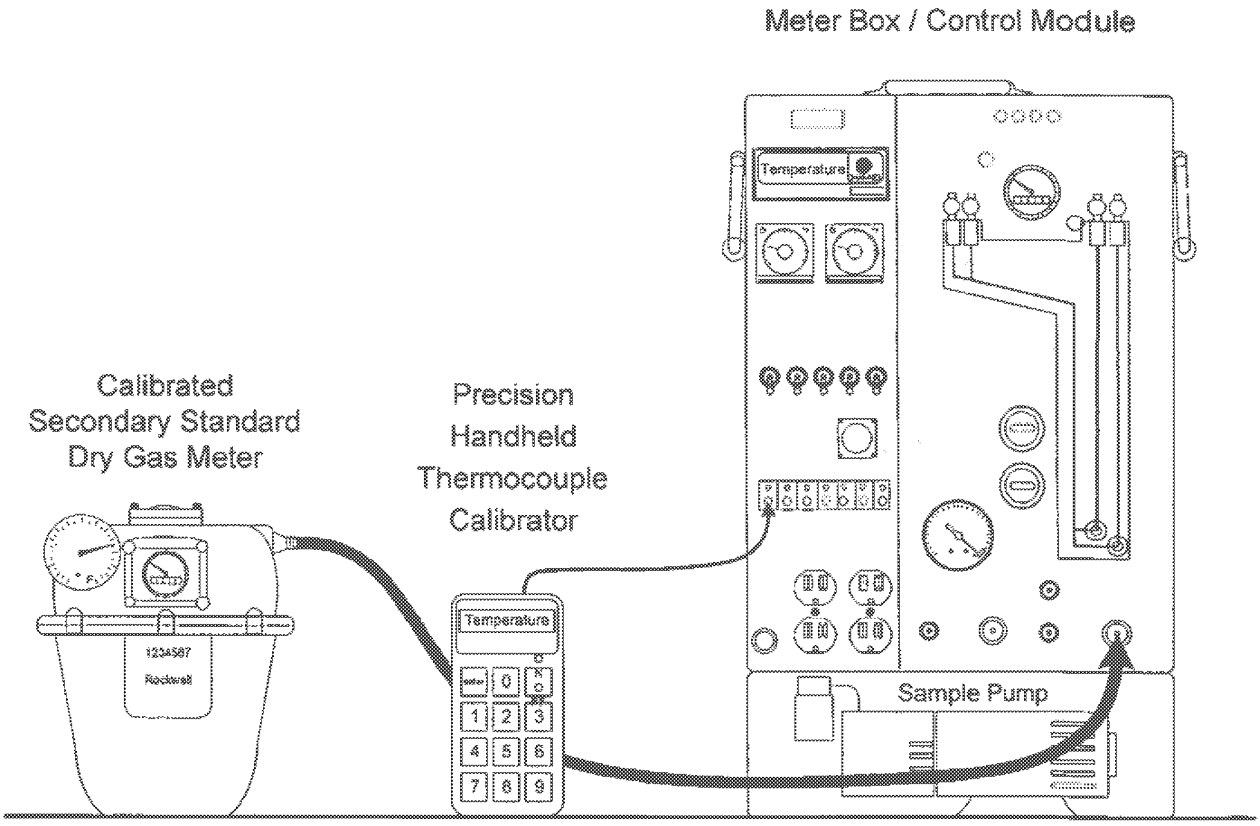
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TRC
Results you can rely on

Equipment Configuration for Meter Box Calibration

USEPA Promulgated Method 5



Pre Test DGM Calibration
(before use, as left data)

Control Module I.D. No.	E73	System Leak Check:	Stable @ 9.5" w.c.	Date:	9-20-2012
Standard Meter I.D. No.:	3623853	Standard Meter Calibration Date	10-24-2011	Calibrated By:	L Campo
Standard Meter (Y_{std}):	0.9897	Standard Meter Calibration Due Date:	10-24-2012	Barometric Pressure:	29.13

Run Number	Orifice Setting $in.H_2O$	Meter Pressure $in.H_2O$	Standard Meter Volume Vr	Control Module DGM Volume Vd	Standard Meter Temp. F Tr	Dry Gas Meter Inlet Temp. F Tdi	Dry Gas Meter Outlet Temp. F Tdo	Dry Gas Meter Avg. Temp. F Td	Time Min.	Time Sec.	Gamma Correction Coef. Y	Pressure equal to 0.75 cfm @ STP (ΔH@)	Flow Rate (Q) scfm
Initial			266.575	346.697	73	75	75						
Final			276.607	356.987	73	76	76						
Difference 1	0.35	0.35	10.032	9.890	73	76	76	76	28	12	1.008	1.606	0.34
Initial			255.045	335.322	73	74	74						
Final			266.401	346.501	73	75	75						
Difference 2	0.85	0.85	11.356	11.179	73	75	75	75	21	4	1.006	1.707	0.51
Initial			276.825	355.816	73	76	76						
Final			287.727	367.579	73	76	76						
Difference 3	2.00	2.00	10.902	10.763	73	76	76	76	13	44	1.003	1.841	0.76
											Pre Test Calibration Factor (Y_{avg})	1.006	1.716

Specifications: CFR 40, Part 60, Appendix A, Method 5, section 10.3 3. Calibration Before Use.

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R005314

CAL-04
Rev. No. 8
Rev. Date: 02-28-2012
Owner: Leonard Compo

Pre Test Temperature Indicator Calibration

(For K-Type Thermocouples)

Date: 9-20-2012

Name: L. Compo

Control Module Number: E73

Ambient Temperature: 73 °F

Reference std. thermocouple calibrator: Omega Engineering, Inc. Model No. CL23A*
Reference std. thermocouple calibrator serial number: T236796
Date of reference std. calibration verification: 1/23/2012
Due date of reference std. calibration verification: 1/23/2013

Reference Thermometer (°F)	Thermometer Under Test (°F)	Temperature Difference (%)
0	1	0.2
600	601	0.1
1200	1200	0.0

$$\text{Temperature Difference, \%} = \frac{\text{Ref. std. temp. (°F + 460)} - \text{Therm. under test temp. (°F + 460)}}{\text{Reference std temp. (°F + 460)}} \times 100 \leq 1.5\ \%$$

** Reference std. is directly traceable to NIST (National Institute of Standards and Technology)*

TRC

Post Meter Calibration Verification

Project Number: 216216

Last Test Run: 6/5/2014 Operator(s): J. Merryman

	Run 1	Run 2	Run 3	Average
Console/Meter ID:	E73	E73	E73	N/A
Run Time (min):	60	60	60	
V_m (cf):	54.73	54.869	56.489	
T_m (°R):	538.65	542.44	543.06	
P_{bar} ("Hg):	29.52	29.52	29.52	
DH_{avg} ("H_2O):	2.81	2.86	2.99	
Md:	28.84	28.84	28.84	
Orifice DH@I:	1.77	1.77	1.77	
Meter Yi:	1.006	1.006	1.006	1.006
Yqa:	1.053	1.064	1.057	1.058

Calibration Status: Fail, perform 3-point check in shop

Specifications: USEPA Emissions Measurement Center Approved Alternative Method (ALT-009)
Alternative Method 5 Post-Test Calibration (SOP GFM-11)

Post Test Leak Checks

Train Leak Check:	Pass	Pass	Pass
Pump/Orifice Leak Check:	Pass	Pass	Pass

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Analyst:	Justin Merryman
Date:	6/3/2014
Project Number:	216216
Client:	United States Steel
Test Location:	Caster 2

Calibration Tools: Include all of the tools from the field calibration kit that you will be using on this project.

Item	ID#	S/N	Calibration Due Date
Tape Measure	TM012		4/1/2015
Digital Caliper	DC012		4/1/2015
Thermometer	TH012	91221457	4/1/2015
Barometer	BA012	91056365	4/1/2015
Ring Gauge	RG012		4/1/2015
Plug Gauge	PG012		4/1/2015
Calibration Weight, 100 g	W100-012	8149	4/1/2015
Calibration Weight A, 500 g	W500-012A	5087	4/1/2015
Calibration Weight B, 500 g	W500-012B	8451	4/1/2015
Type A Angle Finder	AF012		4/1/2015
Plastic/Magnetic Torpedo Level	TL012		4/1/2015

		Status
Confirm caliper was checked against the reference gauges		Confirmed
Confirm tools are in good working order		Confirmed

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Pre-test Thermocouple Calibration Checks

Analyst:	**Justin Merryman**
Date:	**6/3/14**
Project Number:	**216216**
Client:	**United States Steel**
Test Location:	**Caster 2**

(See SOP GFM - 09 for instructions)

Console/Meter Box ID #	E73
Probe ID#	797
Test Location/Measurement Point Info:	Caster 2 Stack
NIST Thermometer ID #	TH012

Procedure 1: Calibrate thermocouple against a reference thermometer.

After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacture, using a reference thermometer (either NIST reference)

Procedure 2: Check the response of the thermocouple to a change in temperature.

Check the "continuity" of the thermocouple by subjecting it to a change in temperature (e.g., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections.

Measurement	T/C Temp, °F	NIST Thermometer Temp, °F	Difference, °F (± 2)	Continuity Check	Overall Status
Stack	84	85	1.0	Pass	Pass
Filter	84	84	0.0	Pass	Pass
Impinger Exit	83	84	1.0	Pass	Pass
Meter In	85	86	1.0	Pass	Pass
Meter Out	86	87	1.0	Pass	Pass
Probe	86	86	0.0	Pass	Pass
Other	-	-	-	-	-
Other	-	-	-	-	-

Notes:

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TRC

Post Test Thermocouple Calibration Checks

Analyst:	**Justin Merryman**
Date:	**6/5/14**
Project Number:	**216216**
Client:	**United States Steel**
Test Location:	**Caster 2**

(See SOP GFM - 09 for instructions)

Console/Meter Box ID #	E73
Probe ID#	797
Test Location/Measurement Point Info:	Caster 2 Stack
NIST Thermometer ID #	TH012

Procedure 1: Calibrate thermocouple against a reference thermometer.

After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacture, using a reference thermometer (either NIST reference)

Procedure 2: Check the response of the thermocouple to a change in temperature.

Check the "continuity" of the thermocouple by subjecting it to a change in temperature (e.g., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections.

Measurement	T/C Temp, °F	NIST Thermometer Temp, °F	Difference, °F (± 2)	Continuity Check	Overall Status
Stack	84	85	1.0	Pass	Pass
Filter	84	85	1.0	Pass	Pass
Impinger Exit	84	85	1.0	Pass	Pass
Meter In	85	86	1.0	Pass	Pass
Meter Out	87	86	1.0	Pass	Pass
Probe	-	-	-	-	-
Other	-	-	-	-	-
Other	-	-	-	-	-

Notes:

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PRE-TEST TYPE S PITOT TUBE INSPECTION

(See SOP GFM - 10 for instructions)

Pitot Tube No.: 797 Date: 6/3/2014 Analyst: Justin Merryman

Project Number: 216216 Client: United States Steel Test Location: Caster 2

Digital Caliper ID: DC012 Level ID: TL012 Angle Finder ID: AF012

Pitot tube assembly level? X yes _____ no

Pitot tube openings damaged? _____ yes (explain below) X no

α_1 = 0 ° (<10°), α_2 = 1 ° (<10°) z = A sin γ = 0.000 (in.); (<0.125 in.)

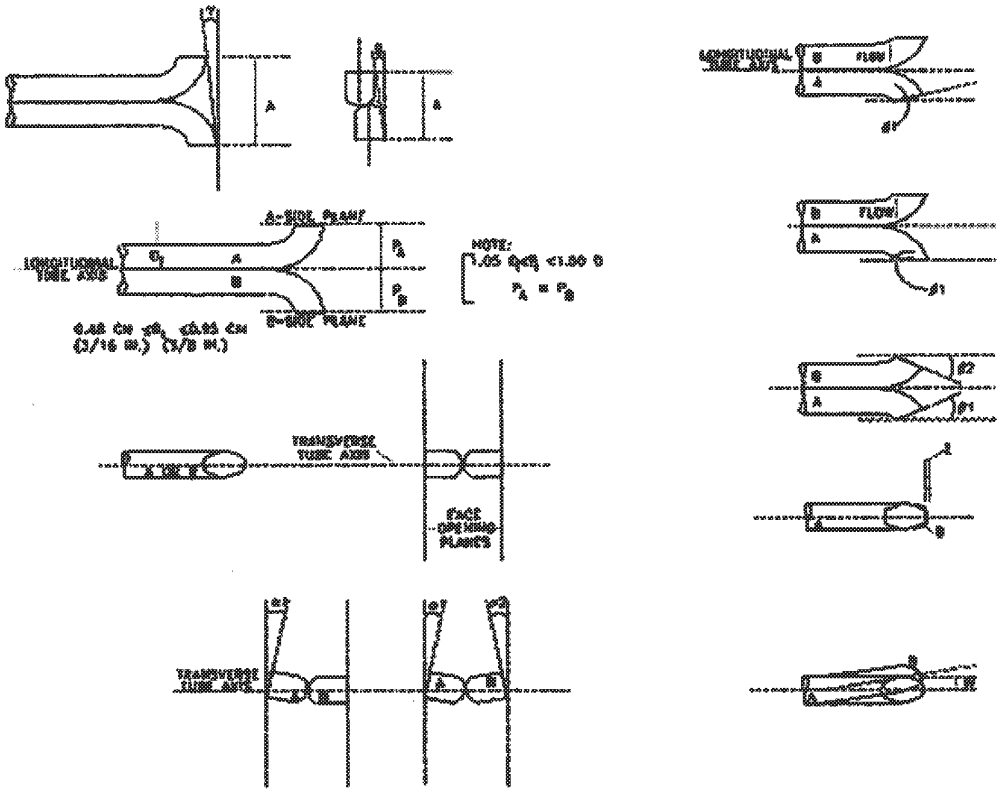
β_1 = 0 ° (<5°), β_2 = 0 ° (<5°) w = A sin θ = 0.000 (in.); (<0.03125 in.)

γ = 0 °, θ = 0 °, A = 0.700 (in.) P_A = 0.350 (in.), P_B = 0.350 (in.), D_t* = 0.250 (in.)

Comments: _____

Note: *D_t = Recommended nominal pitot tube diameter of 0.250 (in.) or 0.375 (in.).

Calibration required? _____ yes X no



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POST TEST TYPE S PITOT TUBE INSPECTION

(See SOP QFM - 10 for instructions)

Pilot Tube No. : 797 Date: 6/5/2014 Analyst: Justin Merryman

Project Number: 216216 Client: United States Steel Test Location: Caster 2

Digital Caliper ID: DC012 Level ID: TL012 Angle Finder ID: AF012

Pilot tube assembly level? X yes _____ no

Pilot tube openings damaged? _____ yes (explain below) X no

α_1 = 0 ° (<10°), α_2 = 0 ° (<10°) z = A sin γ = 0.000 (in.); (<0.125 in.)

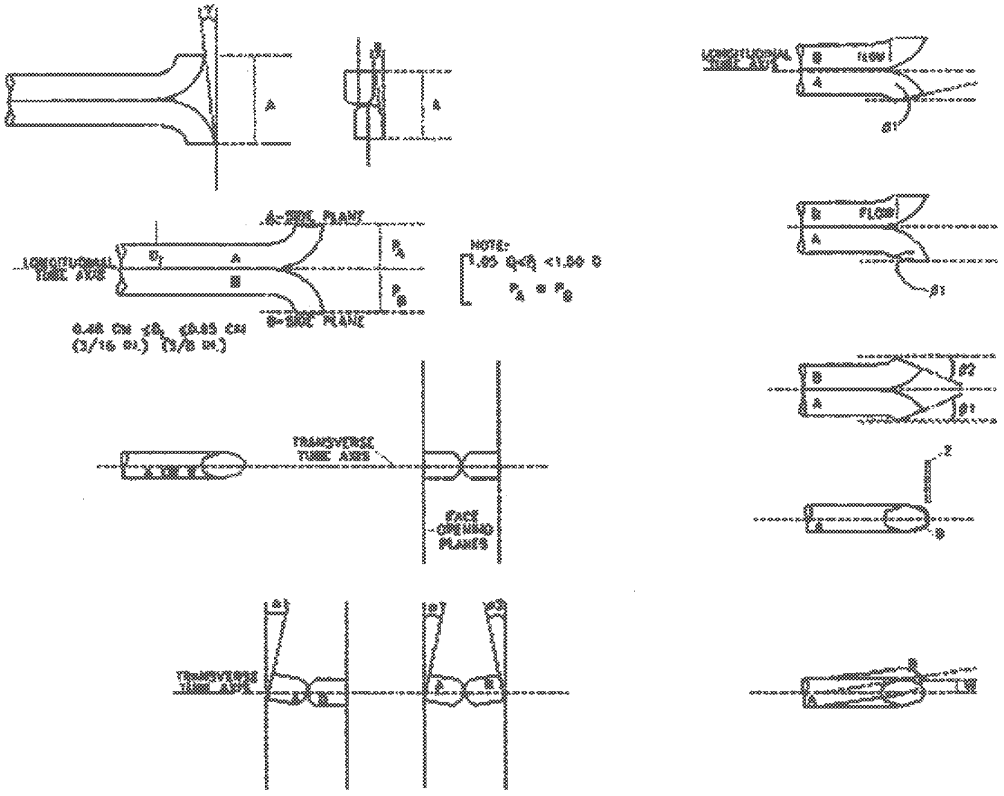
β_1 = 0 ° (<5°), β_2 = 0 ° (<5°) w = A sin θ = 0.000 (in.); (<0.03125 in.)

γ = 0 °, θ = 0 °, A = 0.700 (in.) P_A = 0.350 (in.), P_B = 0.350 (in.), D_t* = 0.250 (in.)

Comments: _____

Note: *D_t = Recommended nominal pilot tube diameter of 0.250 (in.) or 0.375 (in.).

Calibration required? _____ yes X no



TRC

Digital Caliper Accuracy Verification Check

Analyst:	**Justin Merryman**
Date:	**6/3/14**
Project Number:	**216216**
Client:	**United States Steel**
Test Location:	**Caster 2**

(See SOP CM-18 for Instructions)

Digital Caliper ID#	DC012	**Nominal Value***
Pin Gage ID#	RG012	**0.3750**
Ring Gage ID#	PG012	**0.3660**

*Ring Gage and Pin Gage nominal values can be found on the ID card attached (If no value is listed, then the nominal value is 0.3750 +/- 0.0005")

Tolerance +/- **0.001** **Inches**

Pin Gage		**Ring Gage**	
Trial	**0.3750**	**Trial**	**0.3660**
1	**0.3760**	**1**	**0.3660**
2	**0.3755**	**2**	**0.3660**
3	**0.3750**	**3**	**0.3660**
Average	**0.3755**	**Average**	**0.3660**
+/-	**0.0005**	**+/-**	**0.0000**
In Tolerance	**Yes**	**In Tolerance**	**Yes**

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PITOT TUBE ASSEMBLY INSPECTION

Analyst:	Justin Merryman
Date:	6/3/14
Project Number:	216216
Test Location:	Caster 2
EPA Probe Configuration:	Method 5

(See SOP GFM - 16 for instructions)

A B

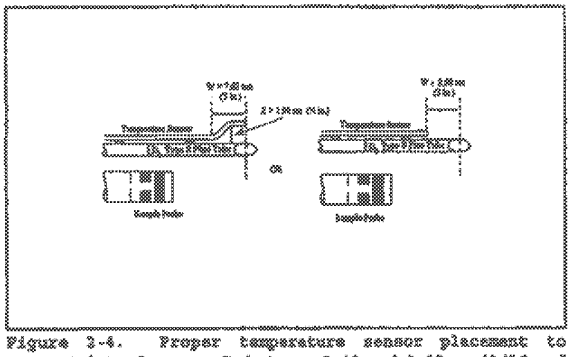


Figure 2-4. Proper temperature sensor placement to prevent interference; D, between 0.48 and 0.95 cm (3/16 and 3/8 in).

Configuration (A, B or NA): NA

Tube diameter (Da), inch: 0.25

Distance "W", inch: 3.25

Distance "Z" inch: 1

Correct configuration? Yes

NA - Temperature sensor not mounted on pitot tube
Configuration A - W >3 inches, Z> 0.75 inches
Configuration B - W at least 2 inches

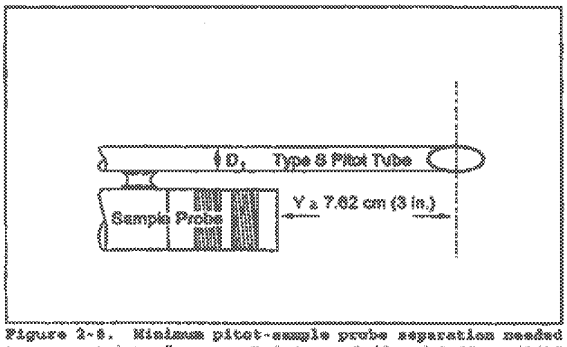


Figure 2-5. Minimum pitot-sample probe separation needed to prevent interference; D, between 0.48 and 0.95 cm (3/16 and 3/8 in).

Distance "Y" : 4.5 (inch)

Correct configuration? Yes

Y must be at least 3 inches

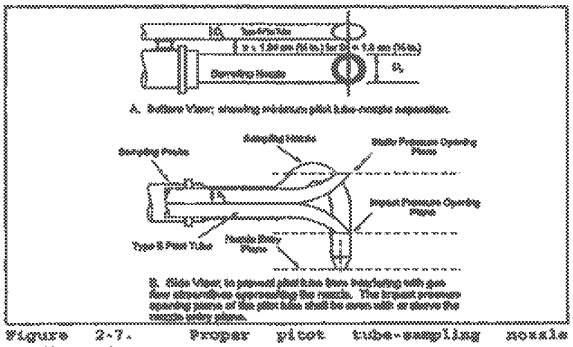


Figure 2-7. Proper pitot tube-sampling nozzle configuration.

Distance "X" : 0.78 (inch)

Must be > 0.5 inches

Correct configuration? Yes

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Top Loading Field Balance Check

Analyst:	**Justin Merryman**
Date:	**6/3/14**
Project Number:	**216216**
Client:	**United States Steel**
Test Location:	**Caster 2**

(See SOP GFM - 01 for instructions)

Type of Scale	Lab Top-loading Scale
Scale ID#	7122490615

Tolerance = +/- 0.5

Individual Weight	Reference Weight Serial Number	Nominal Weight Value	Weight Found	Difference	Pass
W100	8149	100.0	100.0	0.0	YES
W500A	5087	500.0	500.0	0.0	YES
Combination Weights (Use whichever one corresponds to the scale's capacity)					
W100 + W500A	8149 5087	600.0	600.0	0.0	YES
W500A + W500B	5087 8451	1000.0	1000.0	0.0	YES

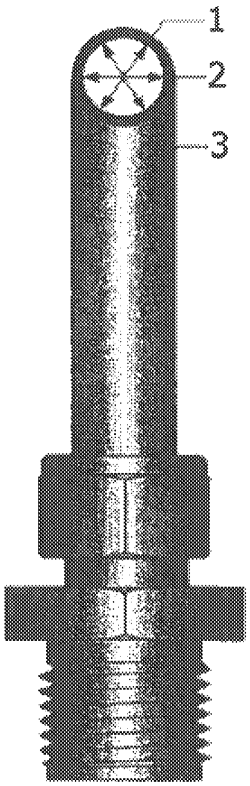
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TRC

Nozzle Calibration

Analyst:	Justin Merryman
Date:	6/3/14
Project Number:	216216
Client:	United States Steel
Test Location:	Caster 2

(See SOP GFM - 10 for Instructions)



Nozzle ID No.: N/A

Maximum - Minimum ≤ 0.004 inches

Pre Test

0.298	1
0.298	2
0.298	3

PASS - measurements meet specifications.

Average
0.298

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Isokinetic Test Support Data

Company: USS
Plant: Granite City Works
Unit ID: Caster 2
Location: Stack

FSR#: 216216
Test Method(s): M5
Test Run #: 1
Test Date(s): 6/5/14

Console Operator: J. Merryman
Console ID: 673
Meter Y: 1.006
Orifice DH@: 1.770
Pitot Tube ID: 797B
Cal. coefficient (Cp): 0.840
Probe Liner Material: SS
Nozzle Material: SS
Nozzle Diameter: 0.298 in

Unit Operating Mode: Normal
Duct Shape/Area: Round / 40.34 ft²
Fuel Type: _____
Fd Factor: _____ dscf/MMBtu
Fc Factor: _____ scf/MMBtu
Fuel heat content: _____ Btu / _____
Process/fuel flow rate: _____ _____ / hr
Soot blown? _____
Duration: _____ min

Sample collection time
Total # of points: 24
Target Sample time/point: 2.5 min
Target run duration: 60.0 min

Barometric Pressure (P_{bar}): 29.52 in Hg
Flue Static Pressure (P_g): -0.10 in H2O
Flue Pressure (P_s): 29.51 in Hg

Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
1	H_2O	100	230.0
2	H_2O	100	140.0
3	Empty	0.0	0.0
4	Silica	226.9	238.7
		Net:	181.8

6/16/14 KEM

Leak Checks
Pre-Test Train Leak Check: 0.000 CFM @ 12 "Hg
Pre-Test Pitot Leak Check: PASS (Pass or Fail)
Post-Test Train Leak Rate: 0.000 CFM @ 15 "Hg
Post-Test Pitot Leak Check: PASS (Pass or Fail)
Pump/Orifice Leak Check: PASS (Pass or Fail)
Filter/Thimble ID: 8791
Tare Weight: 0.9508 grams

Fixed Gas Analysis:
CO_2: 0.0 %vol
O_2: 20.9 %vol
N_2: 79.1 %vol

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

TRC

Company: USS
Plant: Granite City Works
Unit: Caster 2
Location: Stack

Job #: 216216
Methods: M5
Run #: 1
Traverse Sheet: 1 of 1

Test Date: 6/5/14
X-Factor: ~~6.796~~ Jim 6/9/14 6.872
Minutes/pt: 2.5

					Dry Gas Meter			This data not entered in Excel				
Port & Point ID	Clock Time	Meter Volume ft^3	DP in. H_2O	Stack °F	Inlet °F	Outlet °F	Orifice DH in. H_2O	Probe Liner °F	Filter Outlet °F	Impinger Train Outlet °F	Impinger Train CPM Filter °F	Pump Vacuum in. Hg
1-1	9:10	528.370	0.51	125	75	73	~~3.5~~ 3.2	252	244	59	N/A	4
2	9 12:30	530.86	0.20	129	78	75	1.3	257	244	59		5
3	9 15	532.96	0.19	129	79	74	1.2	256	243	59		5
4	9 17:30	534.08	0.47	128	78	72	2.9	254	246	58		5
5	9 20	536.34	0.47	128	78	72	2.9	252	251	57		6
6	9 22:30	538.57	0.48	128	80	73	3.0	255	251	57		6
7	9 25	541.00	0.50	129	81	73	3.1	252	250	58		6
8	9 27:30	543.62	0.55	129	81	73	3.5	252	251	59		6
9	9 30	545.83	0.51	128	81	74	3.2	252	251	60		7
10	9 32:30	548.35	0.51	126	81	74	3.2	252	251	60		7
11	9 35	550.77	0.52	128	85	74	3.3	251	251	60		7
12	9 37:30	563.25	0.48	124	85	74	3.0	251	252	60		7
	9 40	555.705										
2-1	9 50	565.705	0.52	128	81	77	3.3	256	251	57		7
2	9 52:30	558.08	0.52	129	79	76	3.3	255	252	58		7
3	9 55	560.50	0.48	126	80	76	3.0	255	249	58		7
4	9 57:30	562.86	0.55	126	80	76	3.5	251	251	59		7
5	1000	565.36	0.43	129	84	80	2.7	253	249	60		7
6	1002:30	567.61	0.38	128	84	80	2.4	252	247	60		7
7	1005	569.85	0.37	126	84	80	2.4	252	247	60		7
8	1007:30	572.19	0.42	127	83	80	2.7	252	249	60		7
9	1010	574.24	0.46	127	83	80	2.9	252	249	60		7
10	1012:30	576.56	0.43	128	83	80	2.7	252	249	61		7
11	1015	578.95	0.38	126	83	80	2.4	252	248	62		7
12	1017:30	581.62	0.36	128	83	80	2.3	252	249	62		7
	1020	583.100										

Comments/notes:

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AM-EMT-15 33
Revised 05/01/2014

R005327

TRC

Isokinetic Test Support Data

Company: USS
Plant: Granite City Works
Unit ID: Caster 2
Location: Strand

FSR#: 216216
Test Method(s): M5
Test Run #: 2
Test Date(s): 6/5/14

Console Operator: J. Merryman
Console ID: E73
Meter Y: 1.006
Orifice DH@: 1.770
Pitot Tube ID: 7978
Cal. coefficient (Cp): 0.840
Probe Liner Material: S.S.
Nozzle Material: S.S.
Nozzle Diameter: 0.298 in

Unit Operating Mode: Normal
Duct Shape/Area: Round / 40.34 ft²
Fuel Type:
Fd Factor: dscf/MMBtu
Fc Factor: scf/MMBtu
Fuel heat content: Btu /
Process/fuel flow rate: / hr
Soot blown?
Duration: min

Sample collection time
Total # of points: 24
Target Sample time/point: 2.5 min
Target run duration: 60 min

Barometric Pressure (P_{bar}): 29.52 in Hg
Flue Static Pressure (P_g): -0.10 in H2O
Flue Pressure (P_s): 29.51 in Hg

Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
1	H_2O	100	220.0
2	H_2O	100	150.0
3	Empty	0.0	0.0
4	Silica	234.5	246.7
		Net:	182.2

6/16/14 KEM on all

Leak Checks
Pre-Test Train Leak Check: 0.000 CFM @ 14 "Hg
Pre-Test Pitot Leak Check: PASS (Pass or Fail)
Post-Test Train Leak Rate: 0.000 CFM @ 14 "Hg
Post-Test Pitot Leak Check: PASS (Pass or Fail)
Pump/Orifice Leak Check: PASS (Pass or Fail)
Filter/Thimble ID: E797
Tare Weight: ~~0.4234~~ 0.9251 grams

Fixed Gas Analysis:
CO_2: 0.0 %vol
O_2: 20.9 %vol
N_2: 79.1 %vol

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

TRC

Company: USS
Plant: Granite City Works
Unit: Caster 2
Location: Stack

Job #: 216216
Methods: M5
Run #: #2
Traverse Sheet: 1 of 1

Test Date: 6/5/14
X-Factor: 6.872
Minutes/pt: 2.5

								This data not entered in Excel				
Port & Point ID	Clock Time	Meter Volume ft³	DP in. H_2O	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH in. H_2O	Probe Liner °F	Filter Outlet °F	Impinger Train Outlet °F	Impinger Train CPM Filter °F	Pump Vacuum in. Hg
1-1	11 20	583.587	0.41	128	79	77	2.6	248	248	55	N/A	6
2	11 22:30	585.86	0.36	128	79	77	2.3	247	248	54		6
3	11 25	587.96	0.44	130	82	78	2.8	248	249	54		6
4	11 27:30	590.22	0.42	132	83	78	2.6	249	245	56		6
5	11 30	592.43	0.36	131	85	80	2.3	247	246	56		7
6	11 32:30	594.49	0.44	128	84	78	2.8	249	254	57		7
7	11 35	596.71	0.51	131	86	78	3.2	248	250	57		7
8	11 37:30	599.24	0.48	130	85	79	3.0	246	253	58		7
9	11 40	601.45	0.52	129	85	79	3.3	248	252	58		7
10	11 42:30	603.86	0.51	131	86	79	3.2	247	250	59		7
11	11 45	606.31	0.44	131	86	79	2.8	248	252	59		7
12	11 47:30	608.58	0.41	131	87	80	2.6	249	251	59		7
	11 50	610.760										
2-1	1200	610.760	0.52	131	86	82	3.3	248	253	54		7
2	1202:30	613.21	0.48	128	85	81	3.1	248	249	53		7
3	1205	615.65	0.49	128	85	80	3.1	246	251	54		7
4	1207:30	617.96	0.51	128	85	80	3.2	246	255	55		7
5	1210	620.34	0.51	128	85	80	3.2	246	255	56		7
6	1212:30	622.72	0.55	131	87	81	3.5	246	250	57		7
7	1215	625.20	0.48	128	87	80	3.1	247	252	58		7
8	1217:30	627.61	0.42	128	88	81	2.7	248	252	59		7
9	1220	629.83	0.42	129	88	81	2.7	249	251	59		7
10	1222:30	632.14	0.40	128	88	81	2.6	249	251	59		7
11	1225	634.25	0.38	128	88	81	2.4	249	250	59		7
12	1227:30	636.38	0.36	128	88	81	2.3	249	250	59		7
	1230	638.456										

Comments/notes.

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TRC

Isokinetic Test Support Data

Company: USS
Plant: Granite City Works
Unit ID: Caster 2
Location: Stack

FSR#: 216216
Test Method(s): MM5
Test Run #: 3
Test Date(s): 6/5/14

Console Operator: J. Menyna
Console ID: E73
Meter Y: 1.006
Orifice DH@: 1.770
Pitot Tube ID: 797B
Cal. coefficient (Cp): 0.840
Probe Liner Material: S.S.
Nozzle Material: S.S.
Nozzle Diameter: 0.298 in

Unit Operating Mode: Normal
Duct Shape/Area: Round / 40.34 ft²
Fuel Type:
Fd Factor: dscf/MMBtu
Fc Factor: scf/MMBtu
Fuel heat content: Btu /
Process/fuel flow rate: / hr
Soot blown?
Duration: min

Sample collection time
Total # of points: 24
Target Sample time/point: 2.5 min
Target run duration: 60 min

Barometric Pressure (P_{bar}): 29.52 in Hg
Flue Static Pressure (P_g): -0.10 in H2O
Flue Pressure (P_s): 29.51 in Hg

Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
1	H_2O	100	210.0
2	H_2O	100	160.0
3	Empty	0.0	0.0
4	Silica	242.4	243.4
	Net:		181.0

6/16/14 KEM

Leak Checks
Pre-Test Train Leak Check: 0.000 CFM @ 13 "Hg
Pre-Test Pitot Leak Check: PASS (Pass or Fail)
Post-Test Train Leak Rate: 0.000 CFM @ 15 "Hg
Post-Test Pitot Leak Check: PASS (Pass or Fail)
Pump/Orifice Leak Check: PASS (Pass or Fail)
Filter/Thimble ID: 8796
Tare Weight: 09237 grams

Fixed Gas Analysis:
CO_2: 0.0 %vol
O_2: 20.9 %vol
N_2: 79.1 %vol

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

TRC

Company: USS
Plant: Granite City Works
Unit: Caster 2
Location: Steel

Job #: 216216
Methods: M5
Run #: #3
Traverse Sheet: 1 of 1

Test Date: 6/5/14
X-Factor: 6.872
Minutes/pt: 2.5

Port & Point ID	Clock Time	Meter Volume ft³	DP in. H_2O	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH in. H_2O	This data not entered in Excel: Probe Liner °F	Filter Outlet °F	Impinger Train Outlet °F	Impinger Train CPM Filter °F	Pump Vacuum in. Hg
1-1	1320	638.860	0.46	128	84	82	3.1	251	245	46	N/A	6
2	1322:30	641.32	0.46	128	83	81	2.9	251	252	48		6
3	1325	643.65	0.48	128	84	81	3.0	250	250	49		7
4	1327:30	645.96	0.44	131	84	81	2.8	250	251	49		7
5	1330	648.24	0.44	129	86	81	2.8	249	249	52		7
6	1332:30	650.53	0.50	128	86	81	3.2	249	249	53		7
7	1335	652.92	0.51	128	86	81	3.2	248	249	53		7
8	1337:30	655.29	0.46	131	88	81	2.9	249	252	54		7
9	1340	658.01	0.48	128	85	81	3.1	247	250	54		7
10	1342:30	660.12	0.44	128	85	81	2.8	247	250	55		7
11	1345	662.34	0.51	128	85	81	3.3	249	250	56		7
12	1347:30	664.74	0.44	128	85	81	2.8	249	251	57		7
	1350	667.050										
2-1	1400	667.050	0.50	128	85	82	3.2	254	256	54		7
2	1402:30	669.58	0.48	126	86	84	3.1	252	254	55		7
3	1405	672.00	0.46	126	85	82	3.0	250	252	56		7
*	1407:30	674.404										
* 4	18:35	674.690	0.48	120	82	80	3.1	252	248	54		7
5	18 37:30	677.14	0.48	121	84	80	3.1	252	249	55		7
6	1840	679.45	0.46	120	84	80	3.0	251	248	55		7
7	1842:30	681.81	0.50	119	84	80	3.2	250	248	55		7
8	1845	684.20	0.51	120	84	80	3.3	249	250	56		7
9	1847:30	686.64	0.48	122	84	80	3.1	250	250	56		7
10	1850	689.05	0.42	121	84	80	2.7	250	252	58		7
11	1852:30	691.29	0.42	121	84	80	2.7	249	250	58		7
12	1855	693.47	0.38	122	84	80	2.4	250	250	59		7
	1857:30	695.635	0.36	122	84	80	2.3	250	249	60		7

Comments/notes: * Leak Check 0.000 @ 13" * Pre-Leak Check 0.000 @ 15"

6/5/14

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AM-EMT-15 33
Revised 05/01/2014

R005331

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ATTACHMENT 2

PARTICULATE EMISSIONS COMPLIANCE STUDY

Performed At The
United States Steel Corporation
Granite City Works
Bin Floor Baghouse
Granite City, Illinois

Test Dates
August 29 and 30, 2013

Report No.
TRC Environmental Corporation Report 202094

Report Submittal Date
October 2, 2013

TRC Environmental Corporation
7521 Brush Hill Road
Burr Ridge, Illinois 60527
USA

T 312-533-2042
F 312-533-2070

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CERTIFICATION SHEET

On January 18, 2013, TRC Environmental Corporation (TRC) acquired the assets of the GEII Emissions Testing business. All work performed prior to this date was completed under the auspices of GEII. It is TRC's intent to merge the acquired emission testing groups with TRC's Air Measurements Practice as quickly as possible. However, we will continue to operate in parallel (i.e., under existing Quality Management Systems) until we confirm that procedures are harmonized.

I certify that TRC and its subcontractors (if any) operated in conformance with the requirements of ASTM D 7036-04 during this test project. The validity of any data not generated by TRC or its subcontractors is the responsibility of the organization that provided said data.

TRC Environmental Corporation

Anthony Sakellariou
Project Manager

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PARTICULATE EMISSIONS COMPLIANCE STUDY

1.0 INTRODUCTION

TRC Environmental Corporation (TRC) performed a particulate emission compliance test program on the Bin Floor Baghouse at the Granite City Works of United States Steel Corporation (US Steel) in Granite City, Illinois on August 29 and 30, 2013. The tests were authorized by and performed for US Steel.

The purpose of this test program was to determine particulate matter (PM) emission rates during normal operating conditions.

1.1 Project Contact Information

Participants		
Test Facility	United States Steel Corporation Granite City Works 20th & State Streets Granite City, Illinois 62040	Ms. Stefanie Boehme Environmental Engineer 618-451-3812 (phone) 618-451-2020 (fax) smboehme@uss.com
Air Emissions Testing Body (AETB)	TRC Environmental Corporation 7521 Brush Hill Road Burr Ridge, Illinois 60527	Mr. Anthony Sakellariou Project Manager 312-533-2035 (phone) 312-533-2070 (fax) asakellariou@trcsolutions.com

The tests were conducted by Paul Powell and Anthony Sakellariou of TRC. Paul Powell and Anthony Sakellariou were the ASTM D7036-04 Qualified Individuals on-site for these tests. Documentation of these qualifications can be located in the appendix to this report.

2.0 SUMMARY OF RESULTS

The results of this test program are summarized in the table below. Detailed individual run results are presented in Section 6.0.

Unit ID	Pollutant Tested	Measured Emissions	Units
Bin Floor Baghouse	PM/PM10	0.0027	gr/dscf
		0.14	lb/hr
		0.0004	lb/ton of steel

The table below summarizes the test methods used, as well as the number and duration of each at each test location:

Unit ID/ Sample Location	Parameter Measured	Test Method	No. of Runs	Run Duration
Bin Floor Baghouse Stack	Volumetric Flow rate	USEPA 1-4	3	60 min
	Filterable Particulate	USEPA 5	3	60 min

3.0 DISCUSSION OF RESULTS

No problems were encountered with the testing equipment during the test program. Source operation appeared normal during the entire test program.

4.0 SAMPLING AND ANALYSIS PROCEDURES

All testing, sampling, analytical, and calibration procedures used for this test program were performed in accordance with the methods presented in the following sections. Where applicable, the *Quality Assurance Handbook for Air Pollution Measurement Systems*, Volume III, Stationary Source Specific Methods, USEPA 600/R-94/038c, September 1994 was used to supplement procedures.

4.1 Determination of Sample Point Locations by USEPA Method 1

This method is applicable to gas streams flowing in ducts, stacks, and flues and is designed to aid in the representative measurement of pollutant emissions and/or total volumetric flow rates from stationary sources. In order to qualify as an acceptable sample location, it must be located at a position at least two stack or duct equivalent diameters downstream and a half equivalent diameter upstream from any flow disturbance.

The cross-section of the measurement site was divided into a number of equal areas, and the traverse points were then located in the center of these areas. The minimum number of points were determined from either Figure 1-1 (particulate) or Figure 1-2 (non-particulate) of USEPA Method 1.

4.2 Volumetric Flow Rate Determination by USEPA Method 2

This method is applicable for the determination of the average velocity and the volumetric flow rate of a gas stream.

The gas velocity head (ΔP) and temperature were measured at traverse points defined by USEPA Method 1. The velocity head was measured with a Type S (Stausscheibe or reverse type) pitot tube and oil-filled manometer; and the gas temperature was measured with a Type K thermocouple. The average gas velocity in the flue was calculated based on: the gas density (as determined by USEPA Methods 3 and 4); the flue gas pressure; the average of the square roots of the velocity heads at each traverse point, and the average flue gas temperature.

4.3 CO_2 and O_2 Determination by USEPA Method 3

This method is applicable for the determination of CO_2 and O_2 concentrations and dry molecular weight of a sample from an effluent gas stream of a fossil-fuel combustion process or other process.

A gas sample was extracted from a stack by one of the following methods: (1) single-point, grab sampling; (2) single-point, integrated sampling; or (3) multi-point, integrated sampling. The gas sample was analyzed for percent CO_2 and percent O_2 using a Fyrite.

4.4 Filterable PM Determination by USEPA Method 5

This method is applicable for the determination of PM emissions from stationary sources. USEPA Methods 2-4 were performed concurrently with, and as an integral part of, these determinations.

Flue gas was withdrawn isokinetically from the source at traverse points determined per USEPA Method 1, and PM was collected in the nozzle, probe liner, and on a glass fiber filter. The probe liner and filter were maintained at a temperature of 120 ± 14°C (248 ± 25°F) or such other temperature as specified by an applicable subpart of the standards or approved by the Administrator for a particular application. The PM mass, which included any material that condensed at or above the filtration temperature, was determined gravimetrically after the removal of uncombined water.

5.0 QUALITY ASSURANCE PROCEDURES

TRC integrates our Quality Management System (QMS) into every aspect of our testing service. We follow the procedures specified in current published versions of the test Method(s) referenced in this report. Any modifications or deviations are specifically identified in the body of the report. We routinely participate in independent, third party audits of our activities, and maintain:

- Louisiana Environmental Lab Accreditation Program (LELAP) accreditation;
- Interim accreditation from the Stack Testing Accreditation Council (STAC) that our operations conform with the requirements of ASTM D 7036-04

These accreditations demonstrate that our systems for training, equipment maintenance and calibration, document control and project management will fully ensure that project objectives are achieved in a timely and efficient manner with a strict commitment to quality.

All calibrations are performed in accordance with the test Method(s) identified in this report. If a Method allows for more than one calibration approach, or if approved alternatives are available, the calibration documentation in the appendices specifies which approach was used. All measurement devices are calibrated or verified at set intervals against standards traceable to the National Institute of Standards and Technology (NIST). NIST traceability information is available upon request.

6.0 TEST RESULTS SUMMARY

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PARTICULATE TEST RESULTS SUMMARY

Company: United States Steel Corporation
Plant: Granite City Works
Unit: Bin Floor Baghouse
Location: Stack

Test Run Number	1	2	3	Average
Source Condition	Normal	Normal	Normal	
Date	8/29/2013	8/30/2013	8/30/2013	
Start Time	10:20	5:38	7:41	
End Time	11:21	7:17	8:50	
Sample Duration (min):	60.0	65.0	60.0	61.7
Average Gas Temp (^{o}F):	120.3	115.7	114.8	117.0
Fractional Gas Moisture Content:	0.03	0.02	0.03	0.03
Gas CO_2 Content (%vol):	0.0	0.0	0.0	0.0
Gas O_2 Content (%vol):	21.0	20.9	20.9	20.9
Gas Wet MW (lb/lbmole-mole):	28.55	28.59	28.54	28.56
Average Gas Vel (ft/sec):	52.72	51.03	51.55	51.77
Measured Volumetric Flow Rate				
Q (actual ft^3/min):	6,895	6,675	6,742	6,771
Q_{std} (std ft^3/min):	6,155	6,067	6,138	6,120
$Q_{std(dry)}$ (dry std ft^3/min):	5,990	5,931	5,968	5,963
Process Rate (ton/hr):	223.4	414.7	482.1	335.9
Sample Volume (dry std ft^3):	55.645	58.356	56.465	56.822
PM Collected (mg):				
Filterable	11.6050	10.9300	7.4530	9.9960
PM Concentration (gr/dscf):				
Filterable	0.0032	0.0029	0.0020	0.0027
PM Emission Rate (lb/hr based on measured volumetric flow rate):				
Filterable:	0.17	0.15	0.10	0.14
PM Emission Rate (lb/ton):				
Filterable:	0.0007	0.0004	0.0002	0.0004
Isokinetic Variance	101.5	99.2	103.4	101.4

APPENDIX

Bin Floor Baghouse

Date	Test	Start	Stop	Minutes	Tons of Liquid Steel
08/29/13	1	10:20	11:22	62	230.855
08/30/13	2	5:38	6:17	39	463.05
		6:50	7:18	28	
08/30/13	3	7:41	8:11	30	482.1
		8:17	8:27	10	
		8:30	8:50	20	

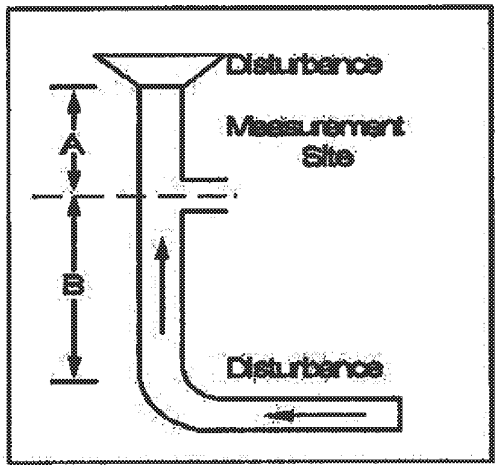
EMT-15 Rev. 30.1
5/22/2013 Alex Miller

Sample Location Information for Isokinetic Sampling - Round Ducts

FSR #: 202094
Company: United States Steel Corporation
Plant: Granite City Works
Unit ID: Bin Floor Baghouse
Sample Location: Stack

Distance A: 1.80 Feet, 1.08 Duct diameters
Distance B: 3.75 Feet, 2.25 Duct diameters
Meets Method 1 criteria

Duct Diameter: 1.67 feet
# of Ports Used: 2
# of Points/Diameter: 12
Sample Plane: Horizontal
Port Type: Flange
Port Length: 6.0 inches
Port Inside Diameter: 4.0 inches



Traverse Point Locations

Below values in red have been relocated per EPA M1

Point	% of diameter	Inches from wall	Inches from port edge
1	2.1	0.5	6.5
2	6.7	1.3	7.3
3	11.8	2.4	8.4
4	17.7	3.5	9.5
5	25.0	5.0	11.0
6	35.6	7.1	13.1
7	64.4	12.9	18.9
8	76.0	15.0	21.0
9	82.3	16.5	22.5
10	88.2	17.6	23.6
11	93.3	18.7	24.7
12	97.9	19.5	25.5

Pre-cyclonic flow check conducted? Yes

Pre-Test Cyclonic Flow Check Data

	Port:			Port:			Port:			Port:		
	DP	Ts	a	DP	Ts	a	DP	Ts	a	DP	Ts	a
Point #	("H2O)	(°F)	(°)	("H2O)	(°F)	(°)	("H2O)	(°F)	(°)	("H2O)	(°F)	(°)
1	1.10	114	10	0.78	114	17	-	-	-	-	-	-
2	1.10	114	7	0.86	114	12	-	-	-	-	-	-
3	0.95	114	5	0.82	114	7	-	-	-	-	-	-
4	0.84	114	5	0.80	114	0	-	-	-	-	-	-
5	0.75	114	-5	0.76	114	0	-	-	-	-	-	-
6	0.68	115	-5	0.77	114	-7	-	-	-	-	-	-
7	0.72	115	7	0.69	114	-10	-	-	-	-	-	-
8	0.73	115	7	0.59	114	-10	-	-	-	-	-	-
9	0.66	115	10	0.65	114	-10	-	-	-	-	-	-
10	0.58	114	10	0.67	114	-10	-	-	-	-	-	-
11	0.54	114	10	0.6	114	-10	-	-	-	-	-	-
12	0.45	113	15	0.68	114	-7	-	-	-	-	-	-

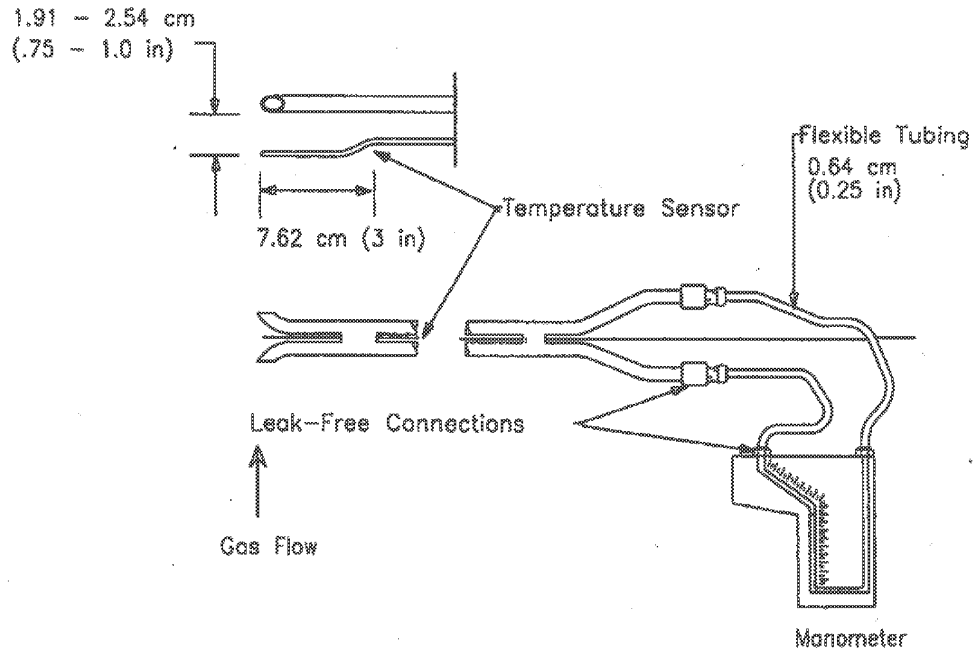
Average a: 8.2 (°) Average Ts: 114.13 (°F) Average DP: 0.7363 ("H2O)
Status: Pass Avg of sqrt DP: 0.8534

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Determination of Stack Gas Velocity and Volumetric Flow Rate

USEPA Promulgated Test Method 2

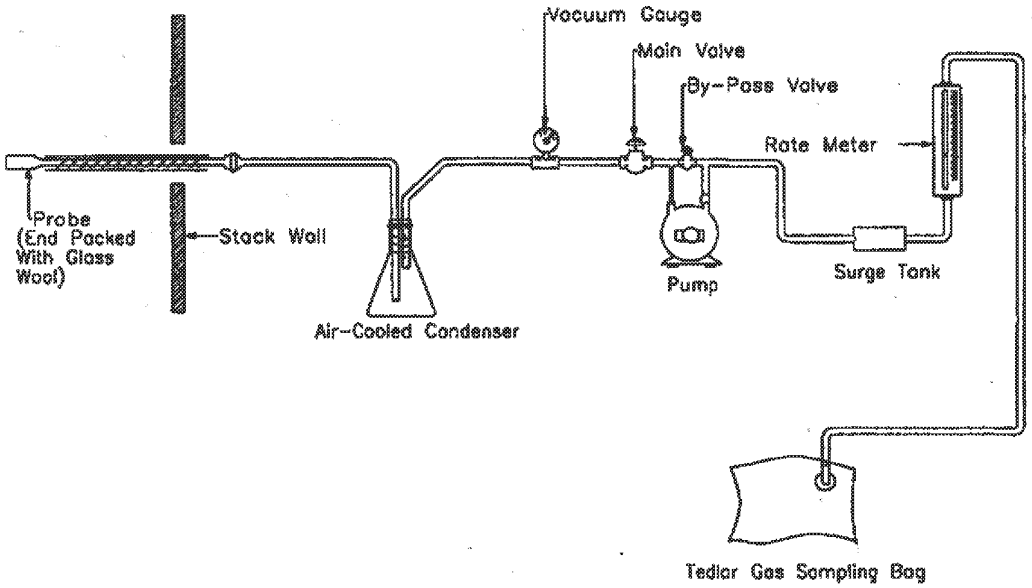


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Gas Analysis for the Determination of Dry Molecular Weight

USEPA Promulgated Method 3

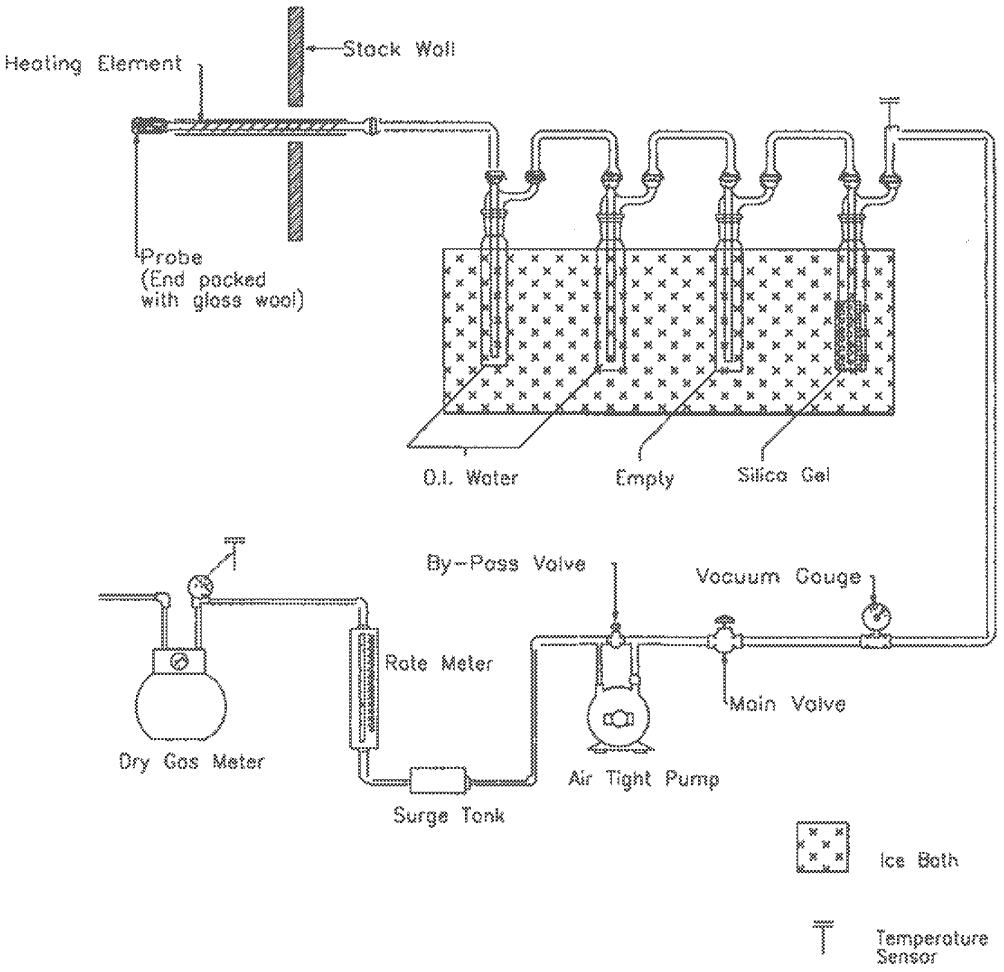


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Determination of Moisture Content in Stack Gases

USEPA Promulgated Method 4

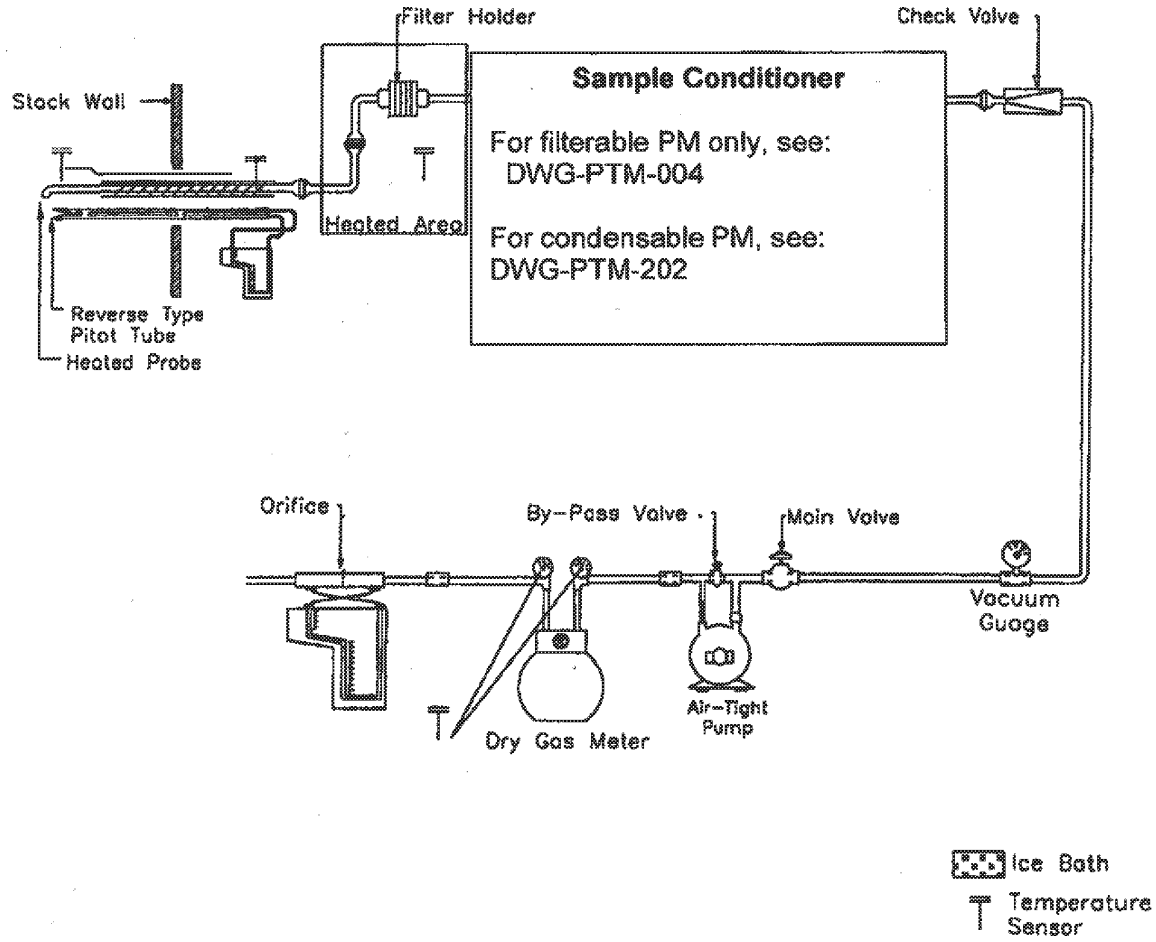


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Determination of Particulate Emissions From Stationary Sources

USEPA Promulgated Method 5



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Filterable Particulate Sample Analysis Summary

FSR#: 202094
Company: United States Steel Corporation
Plant: Granite City Works

Unit ID: Bin Floor Baghouse
Location: Stack
Test Date(s): 8/29/2013

Front-Half PM	Run 1	Run 2	Run 3	Blank
Total filter weight gain (grams):	0.00550	0.00530	0.00360	-
Front-half acetone rinse volume (ml):	85.0	110.0	121.0	100.0
Front-half acetone rinse weight gain (grams):	0.00670	0.00640	0.00470	0.00070
Net front-half acetone rinse mass (grams):	0.00611	0.00563	0.00385	-
Net front-half PM (grams):	**0.01161**	**0.01093**	**0.00745**	-

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ELT-07
Revison: 2
Revised: 1/30/13
Owner: EAP

Project / Project Number: US Steel/202094

Date: 9/5/2013 *Analyst:* GS

USEPA 40CFR60 Appendix A, Method 5

Description:		Initial Weight (g)	Final Weight (g)	Net Weight (g)
Granite City Works Bin Floor				
Sampled 8/29/2013				
Test 1				
Filter #:	8509	0.9583	0.9638	0.0055
Acetone Wash # / Volume (mL):	1491-95 85	8.2563	8.2630	0.0067
Sampled 8/30/2013				
Test 2				
Filter #:	8510	0.9589	0.9642	0.0053
Acetone Wash # / Volume (mL):	1496-00 110	8.2066	8.2130	0.0064
Test 3				
Filter #:	8511	0.9598	0.9634	0.0036
Acetone Wash # / Volume (mL):	1501-05 121	8.2369	8.2416	0.0047
Blank				
Acetone # / Volume (mL):	1506-10 100	8.1789	8.1796	0.0007

Initial and final weights are obtained by drying in an oven at 104 °C for 2 hours, cooling in a desiccator and weighing once.

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Project / Project Number: **US Steel/202094**

Date: 9/5/2013 GS

GEK Field Reagent Blanks

Description:				Initial Weight (g)	Final Weight (g)	Net Weight (g)
Field Reagent Blanks*	Run					
Acetone # / Volume (mL)	1	1256	150	63.5581	63.5584	0.0003

* Field Reagent Blanks are collected and analyzed for each test from the wash bottle of reagent that is used in the field for sample recovery.

From GEK-28172m, B.H.12.m: "One reagent blank (from the recovery wash bottle into a sample jar) shall be performed after every run."

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Chain of Custody Record

Project Name: US Steel	TRC Contact: Anthony Sakellariou	T: 847-340-0609	Analyses Required
	Email: asakellariou@trcsolutions.com		
Site Name: Granite City Works	Sampling System Prepared by: Anthony Sakellariou		
Project No.: 202094	Samples Recovered by: Anthony Sakellariou		

Sub Lab ID	Sample ID Number	Sample Description* (Unit-Location-Method-Run-Container Number)	Date Sampled	Run Time (Optional)	**No. of Containers	Method 5 (Gravimetric)					Comments:
	94001	Bin Floor-M5-R1-C1	8/29/2013		1	x					Filter
	94002	Bin Floor-M5-R1-C2	8/29/2013		1	x					Acetone Probe Rinse
	94003	Bin Floor-M5-R2-C1	8/30/2013		1	x					Filter
	94004	Bin Floor-M5-R2-C2	8/30/2013		1	x					Acetone Probe Rinse
	94005	Bin Floor-M5-R3-C1	8/30/2013		1	x					Filter
	94006	Bin Floor-M5-R3-C2	8/30/2013		1	x					Acetone Probe Rinse
	94007	Bin Floor-M5-C5	8/30/2013		1	x					Acetone Blank

General Instructions: This form documents all changes in custody. The name and dated signature for each person associated with the release or receipt of the listed samples must be recorded.

TAT: Standard Need By Date:	Project Remarks:	Relinquished by: (Sign & Print)	Date/Time	Received by: (Sign & Print)	Date/Time
Shipped by: Shipped On:			8/30/13		9/3/13 9:10
Ship To Attn:		ANTHONY SAKELLARIOU	18:30		
Lab:					
Address:					
Phone:					

Special Instructions:

SUBCONTRACTOR LABORATORY MUST CONTACT THE CITED TRC CONTACT TO ENSURE A PO IS IN PLACE.

TRC Environmental Corporation
7521 Brush Hill Road
Burr Ridge, Illinois 60527 USA
T: (312) 533-2042 F: (312)533-2070

17

R005351

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EMT-15 Rev. 30.1
5/22/2013 Alex Miller

Company:	United States Steel Corporation	**Run:**	1
Plant:	Granite City Works Bin Floor	**Test Date:**	8/29/2013
Unit:	Baghouse		
Test Location:	Stack		

X-Factor Isokinetic Correction Factor (based on pre-test data

$$X = 846.72 \times (Dn)^4 \times \Delta H_{@} \times (C_p)^2 \times (1 - B_{ws})^2 \times \left[\frac{(M_d \times T_m \times P_s)}{\left(M_s \times T_s \times \left(P_{bar} + \left(\Delta H_{@} / 13.6 \right) \right) \right)} \right] \times \left(\frac{T_s}{T_m} \right)$$

Where:

T_s = Temperature of effluent gas (°R)

T_m = Average dry test meter temperature (°R)

D_n = Nozzle Diameter (in.)

$DH_{@}$ = Orifice pressure drop corresponding to 0.75 cfm meter flow rate (in. H20)

C_p = Pitot Tube Coefficient (dimensionless)

B_{ws} = Effluent gas fractional moisture content (dimensionless)

M_d = Dry molecular weight of exhaust (lb/lb-mole)

M_s = Molecular weight of exhaust, wet basis (lb/lb-mole)

P_s = Absolute flue gas pressure ("Hg)

P_{bar} = Ambient barometric pressure at sample elevation ("Hg)

D_n =	0.247	in.	P_s =	29.35	in. Hg abs.
$DH_{@}$ =	1.91	in. Hg	M_s =	28.51	lb/lb-mole
Cp =	0.84	(dimensionless)	T_s =	100	°F
M_d =	28.84	lb/lb-mole	P_{bar} =	29.38	in. Hg
T_m =	560	°R	B_{ws} =	0.030	(dimensionless)

X = 4.028

Dry Molecular Weight

$$Md = 0.44 \times (\%CO_2) + 0.32 \times (\%O_2) + 0.28 \times \%N_2$$

Where:

Md = Effluent gas molecular weight (lb/lb-mole, dry basis)

$\%CO_2$ = Effluent gas Carbon Dioxide Content (% volume, dry basis)

$\%O_2$ = Effluent gas Oxygen Content (% volume, dry basis)

$\%N_2$ = Effluent gas Nitrogen Dioxide Content (% volume, dry basis)

$\%CO_2$ =	0.0	%vol dry	$\%N_2$ =	79.0	%vol dry
$\%O_2$ =	21.0	%vol dry			

Md = 28.84 lb/lb-mole

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Wet Molecular Weight

$$Ms = Md \times (1-Bws) + (18.0 \times Bws)$$

Where:
Ms = Effluent gas molecular weight (lb/lb-mole, wet basis)
Bws = Effluent gas fractional moisture content (dimensionless)

Md = 28.84 lb/lb-mole *Bws* = 0.027

Ms = 28.55 lb/lb-mole

Effluent Gas Pressure

$$P_s = P_{bar} + (P_g/13.6)$$

Where:
P_s = flue gas pressure ("Hg)
P_{bar} = Ambient barometric pressure at sample elevation ("Hg)
P_g = Flue gas gauge pressure ("H_2O)

P_{bar} = 29.38 "Hg P_g = -0.35 "H_2O

Ps = 29.35 "Hg

Average Meter Temperature

$$T_m = \frac{\sum_{i=1}^{n} (T_{mini} + T_{mouti})/2}{n}$$

Where:
T_m = Average dry test meter temperature (°R)
T_{min} = Temperature of gas entering dry test meter (°R)
T_{mout} = Temperature of gas leaving dry test meter (°R)

Avg T_{min} = 558.8 °R Avg T_{mout} = 556.2 °R

T_m = 557.5 °R

DH at Sample Point - Example Point -2

$$DHi = X \times DPi \times (T_{mi}/T_{si})$$

Where:
DH = Pressure drop across calibrated orifice ("H_2O)
DP = Pressure drop across pitot ("H_2O)
T_s = Temperature of effluent gas (°R)

X = 4.028 DPi = 1.30 "H_2O
T_{mi} = 549.5 °R T_{si} = 581.0 °R

DHi = 4.95 "H_2O

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Sample Volume at Standard Conditions

$$V_{m(std)} = (T_{std}/29.92) \times Y \times V_m \times (P_{bar} + DH/13.6)/T_m$$

Where:

$V_{m(std)}$ = Sample volume collected corrected to 29.92 in. Hg and 528(°R) (ft3, dry basis)
Y = Dry test meter calibration coefficient (dimensionless)
V_m = V_m = Sample volume collected at actual conditions (ft°, dry basis)
T_{std} = Standard Temperature 528(°R)

Y =	0.991	V_m =	59.924 cf
P_{bar} =	29.38 "Hg	DH =	3.03 "H_2O
T_m =	557.5 °R	T_{std} =	528 °R

$V_{m(std)}$ = 55.645 dscf

Volume of Water Vapor Condensed

$$V_{wc(std)} = 0.04715 \times M_{H2O}$$

Where:

$V_{wc(std)}$ = Volume of water vapor collected at 29.92"Hg and 528°R (ft^3)
M_{H2O} = Net weight gain of impingers (grams)

M_{H2O} = 32.6 grams

$V_{w(std)}$ = 1.537 wscf

Moisture Content

$$Bws = \frac{V_{wc(std)}}{V_{wc(std)} + V_{m(std)}}$$

$V_{wc(std)}$ = 1.537 dscf $V_{m(std)}$ = 55.645 wscf

***Bws* = 0.027**

Average Duct Velocity

$$V_s = 85.49 \times Cp \times \text{Sqrt DP (avg)} \times (Ts/(Ps \times Ms))^{1/2}$$

Where:

V_s = Average velocity of effluent gas (ft/sec)
C_p = Pitot calibration coefficient (dimensionless)
Sqrt DP (avg) = Average of the square roots of DP's at all traverse points

C_p =	0.840	Sqrt DP (avg) =	0.882
T_s =	580.3 °R	Ps =	29.35 "Hg
Ms =	28.55 lb/lb-mole		

Vs = 52.72 ft/sec

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Method 2 Volumetric Flow Rate (Actual Basis)

$$Q = V_s \times A \times 60$$

Where:

Q = Effluent gas volumetric flow rate at actual conditions (ft^3/min)

A = Cross-sectional area of duct at sample location (ft^2)

Vs = 52.72 ft/sec A = 2.180 ft^2

Q = 6,895 cfm

Method 2 Volumetric Flow Rate (Standard Basis)

$$Q_{std} = \frac{528 \times Q \times P_s}{T_s \times 29.92}$$

Where:

Q_{std} = Effluent gas volumetric flow rate corrected to 29.92"Hg and 528°R (ft^3/min)

Q = 6895 cfm Ps = 29.35 "Hg

Ts = 580.3 °R

Qstd = 6,155 scfm

Method 2 Volumetric Flow Rate (Standard Dry Basis)

$$Q_{std(dry)} = Q_{std} \times (1\text{-}Bws)$$

Where:

$Q_{std(dry)}$ = Effluent gas volumetric flow rate corrected to 29.92"Hg and 528°R (ft^3/min, dry basis)

Qstd = 6155 scfm *Bws* = 0.027

Qstd(dry) = 5,990 dscfm

Method 2 Volumetric Flow Rate (Actual Basis in Metric Units)

$$Q_m = Q \times 0.028317$$

Where:

Q_m = Effluent gas volumetric flow rate at actual conditions (m^3/min)

Q = 6,895 cfm

Q_m = 195.26 m^3/min

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Method 2 Volumetric Flow Rate (Standard Basis in Metric Units)

$$Q_{stdm} = \frac{273 \times Q \times P_s}{T_{sm} \times 29.92}$$

Where:

Q_{stdm} = Effluent gas volumetric flow rate corrected to 29.92"Hg and 492°R (M^3/hr)

T_{sm} = Temperature of effluent gas (°K)

T_{sm} = 322.1 °K

Q_{stdm} = 162 std. m^3/hr

Isokinetic Variation:

$$I = \frac{0.0945 \times T_s \times V_{m(std)}}{V_s \times \theta \times A_n \times P_s \times (1-Bws)}$$

Where:

I = Percent of isokinetic sampling (dimensionless)

θ = Total sample collection time (min)

A_n = Cross-sectional area of nozzle (ft^2)

Ts = 580.3 °R Vm(std) = 55.645 dscf

Vs = 52.720 ft/sec θ = 60.0 min

Ps = 29.35 "Hg An = 0.000333 ft^2 Bws = 0.027

I = 101.6 %

PM Concentration:

$$C_o = \frac{m \times 0.01543}{V_{m(std)}}$$

Where:

C_o = Particulate matter concentration (grains/dry standard ft^3)

m = Net mass of particulate matter collected (mg)

m = 11.6 mg Vm(std) = 55.645 dscf

Co = 0.00322 gr/dscf

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PM Concentration in Metric Units:

$$C_{om} = \frac{m}{V_{m(metric)}}$$

Where:

C_{om} = Particulate matter concentration (milligrams/normal meter^3)

$V_{mmetric}$ = Sample volume collected corrected to 29.92"Hg and 492°R (m^3, dry basis)

m = 11.6 mg $V_{m(metric)}$ = 1.468 Nm^3

C_{om} = 7.90 mg/Nm^3

PM Emission Rate Based on Method 2 Volumetric Flow Rate

$$ER_{M2} = \frac{C_o \times Q_{std(dry)} \times 60}{7000}$$

Where:

ER_{M2} = Particulate matter emission rate calculated using Method 2 volumetric flow rate (lb/hr)

$$Co = ER_{ts} = \frac{C_o}{7000} \times F_d \times \left(\frac{20.9}{20.9 - \%O_2}\right) Qstd(dry) = 5990 \text{ dscf/min}$$

ER_{M2} = 0.17 lb/hr

PM Emission Rate Based on Fuel Consumption-Based Volumetric Flow Rate

$$ER_{cfc} = \frac{C_o \times Q_{cfc} \times 60}{7000}$$

Where:

ER_{cfc} = Particulate matter emission rate calculated using fuel consumption-based volumetric flow rate (lb/hr)

Co = 0.0032 gr/dscf Qcfc = 0 dscfm

ER_{cfc} = 0.00 lb/hr

PM Emission Rate Metric:

$$ER_{metric} = ER_{(M2 \text{ or } cfc)} \times 0.4535$$

Where:

ER_{metric} = Particulate matter emission rate (kg/hr)

ERmetric = 0.07 kg/hr

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EMT-15 Rev. 30.1
5/22/2013 Alex Miller

Isokinetic Test Support Data

Company: United States Steel Corporation
Plant: Granite City Works
Unit ID: Bin Floor Baghouse
Location: Stack

FSR#: 202094
Test Method(s): 5
Test Run #: 1
Test Date(s): 8/29/2013

Console Operator: PPOW
Console ID: E51
Meter Y: 0.991
Orifice DH@i: 1.914
Pitot Tube ID: 890A
Cal. coefficient (Cp): 0.84
Probe Liner Material: Glass
Nozzle Material: Stainless Steel
Nozzle Diameter: 0.247 in

Unit Operating Mode: Normal
Duct Shape/Area: Round / 2.18 ft^2
Fuel Type:
Fd Factor: dscf/MMBtu
Fc Factor: scf/MMBtu
Fuel heat content: Btu /
Process/fuel flow rate: 223.4 ton / hr
Soot blown?
Duration: min

Sample collection time
Total # of points: 24
Target Sample time/point: 2.5 min
Target run duration: 60.0 min

Barometric Pressure (P_{bar}): 29.38 in Hg
Flue Static Pressure (P_g): -0.35 in H2O
Flue Pressure (P_s): 29.35 in Hg

Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
1	DI Water	749.0	754.3
2	DI Water	741.1	751.4
3	Blank	600.0	602.3
4	Silica Gel	783.3	798.0
		Net:	32.6

Leak Checks
Pre-Test Train Leak Check: 0.000 CFM @ 15 "Hg
Pre-Test Pitot Leak Check: Pass (Pass or Fail)
Post-Test Train Leak Rate: 0.000 CFM @ 10 "Hg
Post-Test Pitot Leak Check: Pass (Pass or Fail)
Pump/Orifice Leak Check: Pass (Pass or Fail)
Filter/Thimble ID: 8509
Tare Weight: 0.9583 grams

Fixed Gas Analysis:
CO_2: 0.0 %vol
O_2: 21.0 %vol
N_2: 79.0 %vol

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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5/22/2013 Alex Miller

Isokinetic Test - Processed Traverse Data

Company:	United States Steel Corporation	**Job #:**	202094	**Test Date:**	8/29/2013
Plant:	Granite City Works	**Method(s):**	5	**X-Factor:**	4.028
Unit:	Bin Floor Baghouse	**Run #:**	1	**Minutes/pt:**	2.5
Location:	Stack	**Traverse Sheet:**	1 of 1		

Port & Point ID	Clock Time	Meter Volume ft^3	DP ("H_2O)	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH ("H_2O)	Sample Vacuum ("Hg)
1-1	10:20:00	95.708	1.30	121	90	89	5.01	8.0
-2	10:22:30	99.04	1.30	121	90	89	5.01	8.0
-3	10:25:00	102.14	1.10	121	91	90	4.20	8.0
-4	10:27:30	104.87	1.10	121	93	92	4.20	8.0
-5	10:30:00	107.71	0.89	120	93	93	3.40	8.0
-6	10:32:30	110.26	0.82	120	94	93	3.10	8.0
-7	10:35:00	112.83	0.79	120	96	93	3.00	8.0
-8	10:37:30	115.33	0.76	121	97	93	2.90	8.0
-9	10:40:00	117.7	0.65	121	97	94	2.50	8.0
-10	10:42:30	119.96	0.56	121	98	96	2.10	8.0
-11	10:45:00	121.97	0.56	120	99	97	2.10	8.0
-12	10:47:30	124.2	0.50	120	101	99	1.90	8.0
	10:50:00	126.143						
2-1	10:51:30	126.143	0.93	118	101	97	3.60	7.0
-2	10:54:00	129.68	0.90	118	101	97	3.50	7.0
-3	10:56:30	131.24	0.84	120	101	98	3.20	7.0
-4	10:59:00	134.17	0.81	120	102	98	3.10	7.0
-5	11:01:30	136.76	0.81	120	102	99	3.10	7.0
-6	11:04:00	139.16	0.81	121	102	100	3.10	7.0
-7	11:06:30	141.76	0.60	121	102	100	2.30	7.0
-8	11:09:00	144.52	0.60	121	102	100	2.30	7.0
-9	11:11:30	146.13	0.57	121	105	100	2.20	7.0
-10	11:14:00	148.59	0.57	120	105	100	2.20	7.0
-11	11:16:30	150.27	0.63	120	105	101	2.40	7.0
-12	11:19:00	153.18	0.63	120	105	101	2.40	7.0
	11:21:30	155.632						
		Net Volume		Averages				Avg. $\sqrt{\Delta P}$

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Isokinetic Test Support Data

Company:	United States Steel Corporation	FSR#:	202094
Plant:	Granite City Works	Test Method(s):	5
Unit ID:	Bin Floor Baghouse	Test Run #:	2
Location:	Stack	Test Date(s):	8/30/2013

Console Operator:	PPOW	Unit Operating Mode:	Normal
Console ID:	E51	Duct Shape/Area:	Round / 2.18 ft^2
Meter Y:	0.991	Fuel Type:	
Orifice DH@i:	1.914	Fd Factor:	dscf/MMBtu
Pitot Tube ID:	890A	Fc Factor:	scf/MMBtu
Cal. coefficient (Cp):	0.84	Fuel heat content:	Btu /
Probe Liner Material:	Glass	Process/fuel flow rate:	414.7 ton / hr
Nozzle Material:	Stainless Steel	Soot blown?	
Nozzle Diameter:	0.247 in	Duration:	min

Sample collection time

Total # of points:	24	Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
Target Sample time/point:	2.5 min	1	DI Water	652.4	662.8
Target run duration:	60.0 min	2	DI Water	718.3	725.1
		3	Blank	653.8	654.2
Barometric Pressure (P_{bar}):	29.68 in Hg	4	Silica Gel	797.6	808.3
Flue Static Pressure (P_g):	-0.35 in H2O				
Flue Pressure (P_s):	29.65 in Hg				
Leak Checks				Net:	28.3
Pre-Test Train Leak Check:	0.000 CFM @ 15 "Hg				
Pre-Test Pitot Leak Check:	Pass (Pass or Fail)	Fixed Gas Analysis:			
Post-Test Train Leak Rate:	0.000 CFM @ 10 "Hg	CO_2:	0.0 %vol		
Post-Test Pitot Leak Check:	Pass (Pass or Fail)	O_2:	20.9 %vol		
Pump/Orifice Leak Check:	Pass (Pass or Fail)	N_2:	79.1 %vol		
Filter/Thimble ID:	8510				
Tare Weight:	0.9589 grams				

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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5/22/2013 Alex Miller

Isokinetic Test - Processed Traverse Data

Company:	United States Steel Corporation	Job #:	202094.00	Test Date:	8/30/2013
Plant:	Granite City Works	Method(s):	5	X-Factor:	4.028
Unit:	Bin Floor Baghouse	Run #:	2	Minutes/pt:	2.5
Location:	Stack	Traverse Sheet:	1 of 1		

Port & Point ID	Clock Time	Meter Volume ft^3	DP ("H_2O)	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH ("H_2O)	Sample Vacuum ("Hg)
1-1	5:38:00	56.475	1.10	115	95	95	4.30	8.0
-2	5:40:30	58.65	1.00	115	97	95	3.90	8.0
-3	5:43:00	61.52	0.98	115	97	95	3.80	8.0
-4	5:45:30	64.32	0.86	116	97	95	3.30	8.0
-5	5:48:00	66.94	0.73	116	97	95	3.80	8.0
-6	5:50:30	69.24	0.82	116	97	95	3.20	8.0
-7	5:53:00	71.82	0.80	115	98	95	3.10	8.0
-8	5:55:30	74.39	0.80	115	98	96	3.10	8.0
-9	5:58:00	76.84	0.69	115	99	96	2.70	8.0
-10	6:00:30	79.13	0.63	115	99	96	2.50	8.0
-11	6:03:00	81.36	0.58	116	99	96	2.20	6.0
-12	6:05:30	83.54	0.58	116	99	96	2.20	6.0
	6:08:00	85.758						
2-1	6:09:30	85.758	0.93	116	98	94	3.60	7.0
-2	6:12:00	88.24	0.91	116	98	95	3.50	7.0
-3	6:14:30	90.95	0.80	116	99	96	3.10	7.0
	6:17:00	93.321						
-4	6:50:00	93.321	0.75	116	98	96	2.90	7.0
-5	6:52:30	95.84	0.75	116	98	96	2.90	7.0
-6	6:55:00	98.26	0.75	115	99	96	2.90	7.0
-7	6:57:30	100.48	0.59	115	99	96	2.30	6.0
-8	7:00:00	102.85	0.55	116	99	97	2.10	6.0
-9	7:02:30	105.38	0.65	116	99	97	2.50	6.0
-10	7:05:00	107.47	0.75	116	100	97	2.80	6.0
-11	7:07:30	109.54	0.65	116	100	97	2.50	6.0
-12	7:10:00	111.86	0.60	117	100	97	2.50	6.0
-12	7:12:30	114.18	0.60	117	100	97	2.50	6.0
-11	7:15:00	116.41	0.66	116	100	97	2.50	6.0
	7:17:30	118.66						
		Net Volume		Averages				Avg. √ΔP

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Isokinetic Test Support Data

Company:	United States Steel Corporation	FSR#:	282094
Plant:	Granite City Works	Test Method(s):	5
Unit ID:	Bin Floor Baghouse	Test Run #:	3
Location:	Stack	Test Date(s):	8/30/2013

Console Operator:	PPOW	Unit Operating Mode:	Normal
Console ID:	E51	Duct Shape/Area:	Round / 2.18 ft^2
Meter Y:	0.991	Fuel Type:	
Orifice DH@i:	1.914	Fd Factor:	dscf/MMBtu
Pitot Tube ID:	890A	Fc Factor:	scf/MMBtu
Cal. coefficient (Cp):	0.84	Fuel heat content:	Btu /
Probe Liner Material:	Glass	Process/fuel flow rate:	482.1 ton / hr
Nozzle Material:	Stainless Steel	Soot blown?	
Nozzle Diameter:	0.247 in	Duration:	min

Sample collection time

Total # of points:	24	Imp #	Contents	Tare wt. (grams)	Final wt: (grams)
Target Sample time/point:	2.5 min	1	DI Water	662.8	679.5
Target run duration:	60.0 min	2	DI Water	725.1	730.9
		3	Blank	654.2	656.9
Barometric Pressure (P_{bar}):	29.68 in Hg	4	Silica Gel	808.3	817.2
Flue Static Pressure (P_g):	-0.35 in H2O				
Flue Pressure (P_s):	29.65 in Hg				
				Net:	34.1

Leak Checks		Fixed Gas Analysis:		
Pre-Test Train Leak Check:	0.000 CFM @ 15 "Hg			
Pre-Test Pitot Leak Check:	Pass (Pass or Fail)			
Post-Test Train Leak Rate:	0.000 CFM @ 10 "Hg	CO_2:	0.0	%vol
Post-Test Pitot Leak Check:	Pass (Pass or Fail)	O_2:	20.9	%vol
Pump/Orifice Leak Check:	Pass (Pass or Fail)	N_2:	79.1	%vol
Filter/Thimble ID:	8511			
Tare Weight:	0.9598 grams			

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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Isokinetic Test - Processed Traverse Data

Company:	United States Steel Corporation	**Job #:**	202094.00	**Test Date:**	8/30/2013
Plant:	Granite City Works	**Method(s):**	5	**X-Factor:**	4.028
Unit:	Bin Floor Baghouse	**Run #:**	3	**Minutes/pt:**	2.5
Location:	Stack	**Traverse Sheet:**	1 of 1		

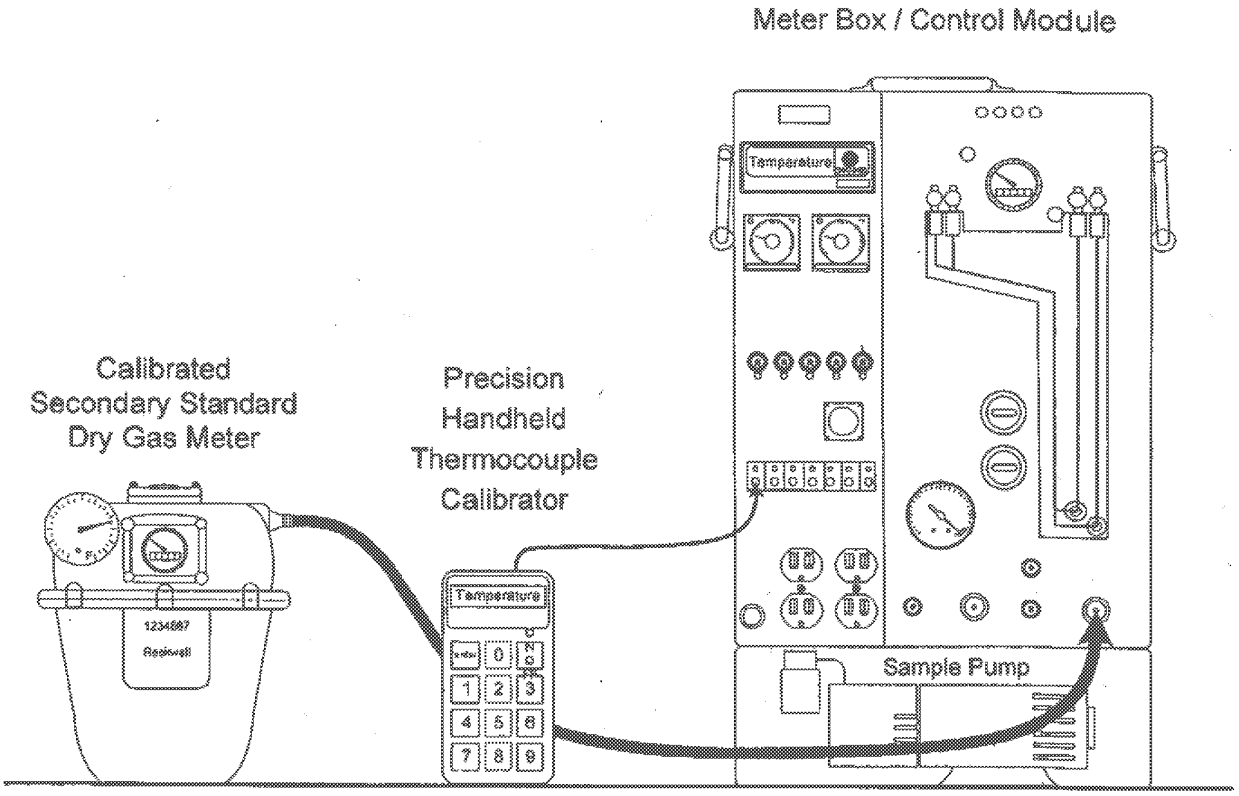
Port & Point ID	Clock Time	Meter Volume ft^3	DP ("H_2O)	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH ("H_2O)	Sample Vacuum ("Hg)
1-1	7:41:00	19.035	1.30	113	99	95	5.00	8.0
-2	7:43:30	21.92	1.10	113	99	96	4.30	8.0
-3	7:46:00	24.89	1.00	113	99	96	3.90	8.0
-4	7:48:30	27.79	0.94	113	100	96	3.70	9.0
-5	7:51:00	30.52	0.92	113	100	96	3.60	9.0
-6	7:53:30	33.28	0.80	113	100	96	3.10	9.0
-7	7:56:00	35.95	0.70	114	100	97	2.70	8.0
-8	7:58:30	38.75	0.67	114	101	97	2.60	7.0
-9	8:01:00	40.85	0.61	113	101	97	2.40	7.0
-10	8:03:30	42.95	0.54	115	101	97	2.10	7.0
-11	8:06:00	45.28	0.50	115	101	97	1.90	7.0
-12	8:08:30	47.33	0.50	115	101	97	1.90	7.0
	8:11:00	49.736						
2-1	8:17:00	49.736	0.79	114	100	97	3.10	7.0
-2	8:19:30	52.28	0.75	115	102	99	2.90	7.0
-3	8:22:00	54.99	1.00	115	102	99	3.90	7.0
-4	8:24:30	57.72	0.90	116	102	99	3.50	6.0
	8:27:00	60.416						
-5	8:30:00	60.416	0.87	117	101	100	3.40	7.0
-6	8:32:30	63.01	0.87	117	101	100	3.40	6.0
-7	8:35:00	65.7	0.66	117	101	100	2.60	6.0
-8	8:37:30	68.13	0.62	116	101	100	2.40	6.0
-9	8:40:00	70.35	0.68	116	103	100	2.70	6.0
-10	8:42:30	72.86	0.62	116	103	101	2.40	6.0
-11	8:45:00	74.95	0.58	116	103	101	2.30	6.0
-12	8:47:30	77.16	0.58	117	103	101	2.30	6.0
	8:50:00	79.455						
		Net Volume		Averages				Avg. √ΔP

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TRC
Results you can rely on

Equipment Configuration for Meter Box Calibration

USEPA Promulgated Method 5



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Post Meter Calibration Verification

Project Number: 202094
Last Test Run: 8/30/2013 Operator(s): PPOW

	Run 1	Run 2	Run 3	Average
Console/Meter ID:	E51	E51	E51	
Run Time (min):	60	65	60	
V_m (cf):	59.924	62.185	60.42	
T_m (°R):	557.52	557.15	559.54	N/A
P_{bar} ("Hg):	29.38	29.68	29.68	
DH_{avg} ("H_2O):	3.03	2.95	3.00	
Md:	28.84	28.84	28.84	
Orifice DH@I:	1.914	1.914	1.914	
Meter Yi:	0.991	0.991	0.991	0.991
Yqa:	0.980	1.003	0.964	0.982

Calibration Status: Pass

Specifications: USEPA Emissions Measurement Center Approved Alternative Method (ALT-009)
Alternative Method 5 Post-Test Calibration (SOP GFM-11)

Post Test Leak Checks

Train Leak Check:	Pass	Pass	Pass
Pump/Orifice Leak Check:	Pass	Pass	Pass

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Analyst:	PPOW
Date:	8/27/2013
Project Number:	202094
Client:	US Steel
Test Location:	Bin Floor Baghouse

Calibration Tools: Include all of the tools from the field calibration kit that you will be using on this project.

Item	ID#	S/N	Calibration Due Date
Tape Measure	TM-014		1/22/2014
Digital Caliper	DC-014		1/22/2014
Thermometer	TH-014	91221455	1/22/2014
Barometer	BA-014	111941028	1/22/2014
Ring Gauge	RG-014		1/22/2014
Plug Gauge	PG-014		1/22/2014
Calibration Weight, 100 g	W100-014	2341	1/22/2014
Calibration Weight A, 500 g	W500-014A	6444	1/22/2014
Calibration Weight B, 500 g	W500-014B	5094	1/22/2014
Type A Angle Finder	AF-014		1/22/2014
Plastic/Magnetic Torpedo Level	TL-014		1/22/2014

		Status
Confirm caliper was checked against the reference gauges		Confirmed
Confirm tools are in good working order		Confirmed

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Pre-test Thermocouple Calibration Checks

Analyst:	**PPOW**
Date:	**8/27/13**
Project Number:	**202094**
Client:	**US Steel**
Test Location:	**Bin Floor Baghouse**

(See SOP GFM - 09 for Instructions)

Console/Meter Box ID #	E51
Probe ID#	890
Test Location/Measurement Point Info:	Bin Floor Baghouse
NIST Thermometer ID #	TH-014

Procedure 1: Calibrate thermocouple against a reference thermometer.

After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacture, using a reference thermometer (either NIST reference)

Procedure 2: Check the response of the thermocouple to a change in temperature.

Check the "continuity" of the thermocouple by subjecting it to a change in temperature (e.g., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections.

Measurement	T/C Temp, °F	NIST Thermometer Temp, °F	Difference, °F (± 2)	Continuity Check	Overall Status
Stack	100	100	0.0	Pass	Pass
Filter	101	100	1.0	Pass	Pass
Impinger Exit	101	100	1.0	Pass	Pass
Meter In	101	102	1.0	Pass	Pass
Meter Out	101	102	1.0	Pass	Pass
Probe	101	101	0.0	Pass	Pass
Other	-	-	-	-	-
Other	-	-	-	-	-

Notes:

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Post Test Thermocouple Calibration Checks

Analyst:	PPOW
Date:	8/30/13
Project Number:	202094
Client:	US Steel
Test Location:	Bin Floor Baghouse

(See SOP GFM - 09 for instructions)

Console/Meter Box ID #	E51
Probe ID#	890
Test Location/Measurement Point Info:	Bin Floor Baghouse
NIST Thermometer ID #	TH-014

Procedure 1: Calibrate thermocouple against a reference thermometer.

After each test run series, check the accuracy (and, hence, the calibration) of each thermocouple system at ambient temperature, or any other temperature, within the range specified by the manufacture, using a reference thermometer (either NIST reference)

Procedure 2: Check the response of the thermocouple to a change in temperature.

Check the "continuity" of the thermocouple by subjecting it to a change in temperature (e.g., removing it from the stack or touching an ice cube). This step will also check for loose connections and reversed connections.

Measurement	T/C Temp, °F	NIST Thermometer Temp, °F	Difference, °F (± 2)	Continuity Check	Overall Status
Stack	103	104	1.0	Pass	Pass
Filter	103	104	1.0	Pass	Pass
Impinger Exit	105	105	0.0	Pass	Pass
Meter In	102	103	1.0	Pass	Pass
Meter Out	102	103	1.0	Pass	Pass
Probe	103	103	0.0	Pass	Pass
Other	-	-	-	-	-
Other	-	-	-	-	-

Notes:

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EMT-52
Revision No: 6.1
Revision Date: 3/6/13
Owner: Jeff Daniels

PRE-TEST TYPE S PITOT TUBE INSPECTION

(See SOP GFM - 10 for Instructions)

Pitot Tube No. : 890 Date: 8/27/2013 Analyst: PPOW

Project Number: 202094 Client: US Steel Test Location: Bin Floor Baghouse

Digital Caliper ID: DC-014 Level ID: TL-014 Angle Finder ID: AF-014

Pitot tube assembly level? x yes _____ no

Pitot tube openings damaged? _____ yes (explain below) x no

α_1 = 2 ° (<10°), α_2 = 0 ° (<10°) z = A sin γ = 0.048 (in.); (<0.125 in.)

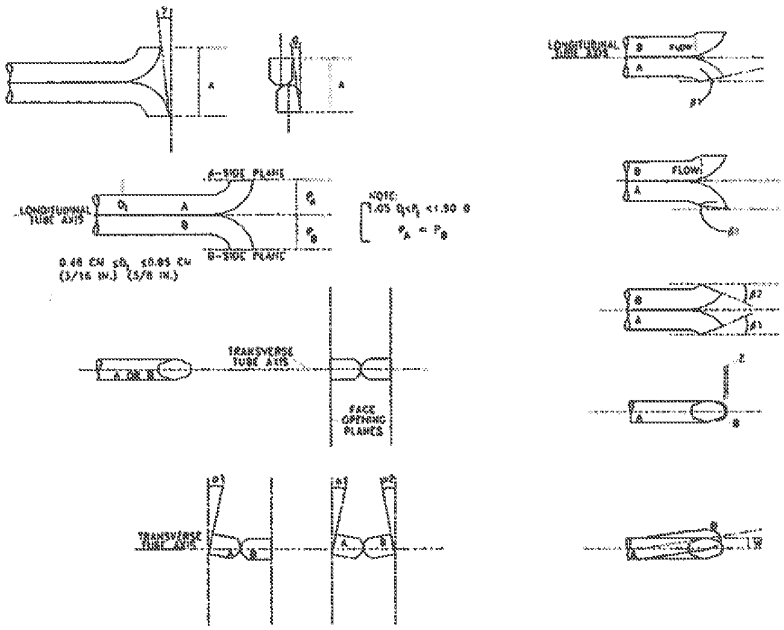
β_1 = 2 ° (<5°), β_2 = 1 ° (<5°) w = A sin θ = 0.000 (in.); (<0.03125 in.)

γ = 4 °, θ = 0 °, A = 0.892 (in.) P_A = 0.346 (in.), P_B = 0.346 (in.), D_t* = 0.250 (in.)

Comments: _____

Note: *D_t = Recommended nominal pitot tube diameter of 0.250 (in.) or 0.375 (in.).

Calibration required? _____ yes X no



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POST TEST TYPE S PITOT TUBE INSPECTION

(See SOP GFM - 10 for Instructions)

Pitot Tube No. : 890 Date: 8/30/2013 Analyst: PPOW

Project Number: 202094 Client: US Steel Test Location: Binfloor Baghouse

Digital Caliper ID: DC-014 Level ID: TL-014 Angle Finder ID: AF-014

Pitot tube assembly level? x yes _____ no

Pitot tube openings damaged? _____ yes (explain below) x no

α_1 = 2 ° (<10°). α_1 = 1 ° (<10°) z = A sin γ = 0.036 (in.); (<0.125 in.)

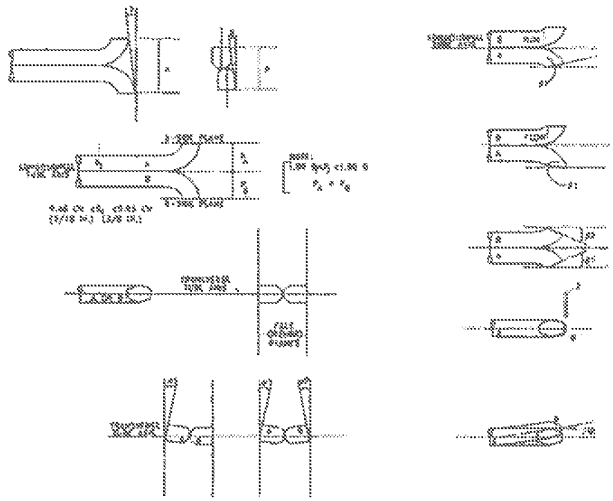
β_1 = 2 ° (<5°). β_1 = 1 ° (<5°) w = A sin θ = 0.000 (in.); (<0.03125 in.)

γ = 3 °, θ = 0 °, A = 0.693 (in.) P_A = 0.347 (in.), P_B = 0.347 (in.), D_t* = 0.250 (in.)

Comments: _____

Note: *D_t = Recommended nominal pitot tube diameter of 0.250 (in.) or 0.375 (in.).

Calibration required? _____ yes X no



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Digital Caliper Accuracy Verification Check

Analyst:	**PPOW**
Date:	**8/27/13**
Project Number:	**202094**
Client:	**US Steel**
Test Location:	**Bin Floor Baghouse**

(See SOP CM-18 for instructions)

Digital Caliper ID#	DC-014	**Nominal Value***
Pin Gage ID#	RG-014	**0.3760**
Ring Gage ID#	PG-014	**0.3735**

*Ring Gage and Pin Gage nominal values can be found on the ID card attached (If no value is listed, then the nominal value is 0.3750 +/- 0.0005")

Tolerance +/- 0.001 Inches

Pin Gage		**Ring Gage**	
Trial	**0.3750**	**Trial**	**0.3735**
1	**0.3750**	**1**	**0.3730**
2	**0.3750**	**2**	**0.3735**
3	**0.3750**	**3**	**0.3735**
Average	**0.3750**	**Average**	**0.3733**
+/-	**0.0000**	**+/-**	**0.0002**
In Tolerance	**Yes**	**In Tolerance**	**Yes**

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PITOT TUBE ASSEMBLY INSPECTION

Analyst:	PPOW
Date:	8/27/13
Project Number:	202094
Test Location:	Bin Floor Baghouse
EPA Probe Configuration:	Method 5

(See SOP GFM - 19 for instructions)

A B

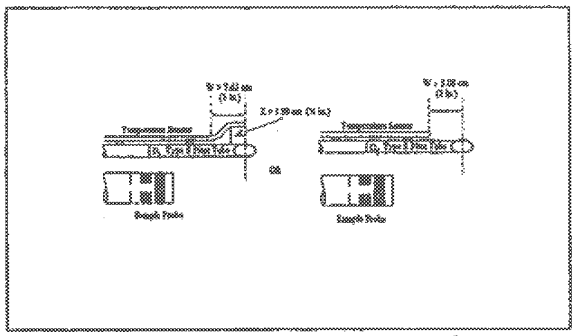


Figure 2-6. Proper temperature sensor placement to prevent interference; D_s between 0.48 and 0.95 cm (3/16 and 3/8 in).

Configuration (A or B): NA

Tube diameter (D_s), inch: 0.25

Distance "W", inch: NA

Distance "Z" inch: NA

Correct configuration? NA

NA - Temperature sensor not mounted on pitot tube
Configuration A - W >3 inches, Z> 0.75 inches
Configuration B - W at least 2 inches

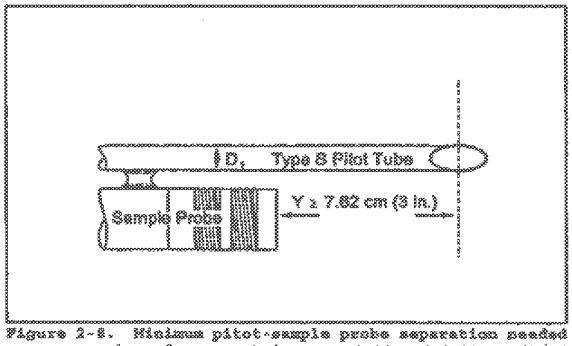


Figure 2-5. Minimum pitot-sample probe separation needed to prevent interference; D_s between 0.48 and 0.95 cm (3/16 and 3/8 in).

Distance "Y" : 4.75 (inch)

Correct configuration? Yes

Y must be at least 3 inches

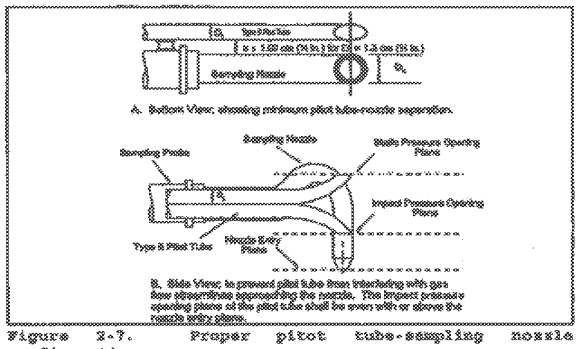


Figure 2-7. Proper pitot tube-sampling nozzle configuration.

Distance "X" : 1.5 (inch)

Must be > 0.5 inches

Correct configuration? Yes

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Top Loading Field Balance Check

Analyst:	**PPOW**
Date:	**8/27/13**
Project Number:	**202094**
Client:	**US Steel**
Test Location:	**Bin Floor Baghouse**

(See SOP GFM - 01 for instructions)

Type of Scale	Pocket Scale
Scale ID#	Indiana scale #4

Tolerance = +/- 0.5

Individual Weight	Reference Weight Serial Number	Nominal Weight Value	Weight Found	Difference	Pass
W100	2341	100.0	100.0	0.0	YES
W500A	8444	500.0	500.1	0.1	YES
Combination Weights (Use whichever one corresponds to the scale's capacity)					
W100 + W500A	2341 8444	600.0	599.9	-0.1	YES
W500A + W500B	8444 5094	1000.0	1000.2	0.2	YES

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Barometric Pressure Determination

Analyst:	**PPOW**
Date:	**8/27/13**
Project Number:	**202094**
Client:	**US Steel**
Test Location:	**Bin Floor Baghouse**

(See SOP GFM - 08 for Instructions)

Procedure: Use a NIST traceable field barometer for all field measurements. Bring the field barometer to the test location and allow 15 minutes for the instrument to stabilize. Take a measurement before and after each series of tests.

Date:	8/29/2013
Barometer Serial Number:	**111941028**
Barometer Pressure Prior to Testing:	29.38
Barometer Pressure After Testing:	29.38
Average Barometric Pressure:	**29.38**

Add Day? Yes

Date:	8/30/2013
Barometer Serial Number:	**111941028**
Barometer Pressure Prior to Testing:	29.68
Barometer Pressure After Testing:	29.68
Average Barometric Pressure:	**29.68**

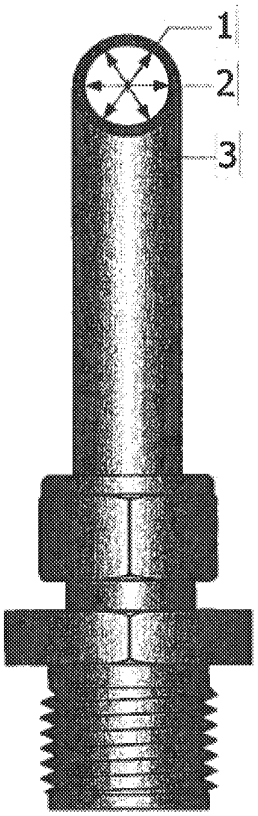
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EMT-52
Revision No: 6
Revision Date: 1/25/13
Owner: Jeff Daniels

Nozzle Calibration

Analyst:	PPOW
Date:	8/27/13
Project Number:	202094
Client:	US Steel
Test Location:	Bin Floor Baghouse

(See SOP GFM - 10 for Instructions)



Nozzle ID No.: N/A

Maximum - Minimum ≤ 0.004 inches

Pre Test

0.247	1
0.247	2
0.247	3

PASS - measurements meet specifications.

Average
0.247

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TRC

Isokinetic Test Support Data

Company: US Steel
Plant: Granite City
Unit ID: Dirt floor Bag House
Location: Stack

FSR#: 202094 9-9-13 sag
Test Method(s): M5
Test Run #: 1
Test Date(s): 8/27/13

Console Operator: PRJ
Console ID: ES1
Meter Y: .991
Orifice DH@: 1.914
Pitot Tube ID: BS24
Cal. coefficient (Cp): .840
Probe Liner Material: Glass
Nozzle Material: S.S.
Nozzle Diameter: .247 in

Unit Operating Mode: Normal
Duct Shape/Area: Round / ft²
Fuel Type:
Fd Factor: dscf/MMBtu
Fc Factor: scf/MMBtu
Fuel heat content: Btu /
Process/fuel flow rate: / hr
Soot blown?
Duration: min

Sample collection time
Total # of points: 24
Target Sample time/point: 2.5 min
Target run duration: 60 min

Barometric Pressure (P_{bar}): 29.38 in Hg
Flue Static Pressure (P_g): -.35 in H2O
Flue Pressure (P_s): 29.35 in Hg

Imp #	Contents	9.9.13	Tare wt. (grams)	Final wt: (grams)
1	DI WATER	sag	249.0	254.3
2	DI WATER		241.1	251.4
3	Blank		600.0	602.2
4	Silica Gel		705.3	728.0
			Net:	

Leak Checks
Pre-Test Train Leak Check: 0.002 CFM @ 15 "Hg
Pre-Test Pitot Leak Check: Pass (Pass or Fail)
Post-Test Train Leak Rate: 0.002 CFM @ 17 "Hg
Post-Test Pitot Leak Check: Pass (Pass or Fail)
Pump/Orifice Leak Check: Pass (Pass or Fail)
Filter/Thimble ID: BS09
Tare Weight: .2583 grams
9-9-13 sag

Fixed Gas Analysis:
CO_2: 0 %vol
O_2: 20.9 %vol
N_2: %vol

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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TRC

Company: U.S. Steel
Plant: Granite City, IL
Unit: Dry Flour Baghouse
Location: Stack

Job #: 202094 9-9-13
Methods: M5
Run #: 1
Traverse Sheet: 1 of 1

Test Date: 8/29/13
X-Factor: 0.025
Minutes/pt: 2.5

Port & Point ID	Clock Time	Meter Volume	DP in. H_2O	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH in. H_2O	This data not entered in Excel: Probe Liner °F	Filter Outlet °F	Impinger Train Outlet °F	Impinger Train CPM Filter °F	Pump Vacuum in. Hg
1-1	10:20	95.688	1.3	124	90	89	5.01	246	248	64		8
-2	22:30	99.04	1.3	121	90	89	5.01	247	248	64		8
-3	25:00	102.14	1.1	121	90	90	4.2	246	249	65		8
-4	27:30	104.87	1.1	121	93	92	4.2	246	247	65		8
-5	30:00	107.71	.89	120	95	95	3.4	247	248	62		8
-6	32:30	110.26	.82	120	94	93	3.1	244	248	62		8
-7	35:00	112.83	.79	120	96	93	3.0	247	248	61		8
-8	37:30	115.33	.76	121	97	93	2.9	246	248	61		8
-9	40:00	117.78	.65	124	97	94	2.5	246	247	61		8
-10	42:30	119.96	.58	121	98	96	2.1	247	248	61		8
-11	45:00	121.97	.56	120	99	97	2.1	246	249	62		8
-12	47:30	124.20	.50	120	101	99	1.9	247	248	63		8
	10:50	120.143										
2-1	10:55:30	120.143	.93	118	101	97	3.6	246	247	64		7
-2	58	129.68	.90	118	101	97	3.5	247	248	64		7
-3	56:30	132.24	.84	120	101	98	3.2	246	249	63		7
-4	59:00	134.13	.81	120	102	98	3.1	247	248	63		7
-5	11:01:30	136.76	.81	120	102	99	3.1	246	248	63		7
-6	04:00	139.16	.81	121	102	100	3.1	247	246	63		7
-7	06:30	141.76	.60	121	102	100	2.3	247	247	63		7
-8	09:00	144.52	.60	121	102	100	2.3	246	248	64		7
-9	11:30	146.13	.57	121	105	100	2.2	246	248	64		7
-10	14:00	148.59	.57	120	105	100	2.2	247	248	65		7
-11	16:30	150.27	.63	120	105	101	2.4	246	248	63		7
-12	19:00	153.10	.63	120	105	101	2.4	246	248	64		7
	11:21:30	155.632										

Comments/notes:

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R005377

TRC

Isokinetic Test Support Data

Company: US Steel
Plant: Granite City
Unit ID: 3m Flow Dilution
Location: Stack

FSR#: 202094 9-9-13 sdy
Test Method(s): 5
Test Run #: 1
Test Date(s): 6/30/13

Console Operator: PPW
Console ID: ES1
Meter Y: .991
Orifice DH@: 1.984
Pitot Tube ID: PHD4
Cal. coefficient (Cp): .840
Probe Liner Material: Glass
Nozzle Material: S.S.
Nozzle Diameter: .320 in

Unit Operating Mode: Normal
Duct Shape/Area: Round / 2.18 ft²
Fuel Type:
Fd Factor: dscf/MMBtu
Fc Factor: scf/MMBtu
Fuel heat content: Btu /
Process/fuel flow rate: / hr
Soot blown?
Duration: min

Sample collection time
Total # of points: 24
Target Sample time/point: 2.5 min
Target run duration: 60.0 min

Barometric Pressure (P_{bar}): 29.68 in Hg
Flue Static Pressure (P_g): -.35 in H2O
Flue Pressure (P_s): 29.65 in Hg

Imp #	Contents		Tare wt. (grams)	Final wt: (grams)
1	DI Water	9-9-13 sdy	652.4	662.8
2	DI Water		718.3	725.1
3	Blank		653.0	654.2
4	Silica Gel		729.6	805.3
			Net:	28.3

Leak Checks
Pre-Test Train Leak Check: 0.010 CFM @ 15 "Hg
Pre-Test Pitot Leak Check: Pass (Pass or Fail)
Post-Test Train Leak Rate: Pass CFM @ 10 "Hg
Post-Test Pitot Leak Check: Pass (Pass or Fail)
Pump/Orifice Leak Check: OK (Pass or Fail)
Filter/Thimble ID: 9510
Tare Weight: .9585 grams
9-9-13 sdy

Fixed Gas Analysis:
CO_2: 0 %vol
O_2: 20.9 %vol
N_2: 79.1 %vol

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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TRC

9-9-13

Company: US Steel
Plant: Granite City
Unit: 55in Floor Baghouse
Location: Stack

Job #: 202094
Methods: M5
Run #: 2
Traverse Sheet: 1 of 1

Test Date: 8/30/13
X-Factor: 4.028
Minutes/pt: 2.5

This data not entered in Excel

Port & Point ID	Clock Time	Meter Volume ft³	DP in. H₂O	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH in. H₂O	Probe Liner °F	Filter Outlet °F	Impinger Train Outlet °F	Impinger Train CPM Filter °F	Pump Vacuum in. Hg
1-1	15:38	54.405	1.1	115	95	95	4.3	248	246	60	~4	7
-2	40:30	58.65	1.0	115	97	95	3.9	249	244	60		5
-3	45:00	61.57	.98	115	97	95	3.8	247	243	58		6
-4	45:30	64.82	.86	116	97	95	3.3	248	247	58		8
-5	46:00	66.94	.73	116	97	95	2.8	248	246	55		6
-6	50:30	69.24	.62	116	97	95	3.2	249	247	57		8
-7	55:00	71.82	.60	115	98	95	3.1	250	247	61		8
-8	55:30	74.39	.80	115	98	96	3.1	250	246	61		8
-9	56:00	76.84	.69	115	99	96	2.7	248	246	61		8
-10	0:00:30	79.13	.63	115	99	96	2.5	248	245	62		6
-11	05:00	81.36	.58	116	99	96	2.2	247	246	63		6
-12	05:30	83.54	.58	116	99	96	2.2	246	245	63		6
	6:06:00	85.758										
2-1	6:09:30	88.256	.93	116	98	94	3.6	246	245	62		7
-2	12:00	90.24	.91	116	98	95	3.5	246	246	62		7
-3	19:30	90.95	.80	116	99	96	3.1	247	245	62		7
-4	17:00	93.321										
-5	17:30:00	93.321	.75	116	98	96	2.9	248	247	63		5
-6	52:30	95.84	.75	116	98	96	2.9	248	247	63		7
-7	55:00	98.20	.75	115	98	96	2.9	249	247	64		7
-8	57:30	100.43	.59	115	99	96	2.3	249	247	64		4
-9	18:00:00	102.85	.55	116	99	97	2.1	250	248	64		4
-10	02:30	105.38	.65	116	99	97	2.5	250	247	65		6
-11	05:00	107.49	.75	116	100	97	2.8	249	248	63		6
-12	07:30	109.54	.65	116	100	97	2.5	248	247	62		6
-13	10:00	111.56	.60	117	100	97	2.3	248	248	62		6
-14	12:30	114.18	.60	117	100	97	2.3	249	248	62		6
-15	15:00	116.41	.66	116	100	97	2.5	248	248	61		6
	17:30	118.600										

Comments/notes.

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R0053779

TRC

Isokinetic Test Support Data

Company: [illegible] US Alloy
Plant: Bronx Ch
Unit ID: Blast Furnace Baghouse
Location: Stack

FSR#: 202094 9-3-13 SDP
Test Method(s): M5
Test Run #: 3
Test Date(s): 9/3/13

Console Operator: PDJ
Console ID: ES1
Meter Y: .991
Orifice DH@: 1.914
Pitot Tube ID: 81017
Cal. coefficient (Cp): .840
Probe Liner Material: Glass
Nozzle Material: SS
Nozzle Diameter: .247 in

Unit Operating Mode: Normal
Duct Shape/Area: Round / 2.18 ft²
Fuel Type:
Fd Factor: dscf/MMBtu
Fc Factor: scf/MMBtu
Fuel heat content: Btu /
Process/fuel flow rate: / hr
Soot blown?
Duration: min

Sample collection time
Total # of points: 24
Target Sample time/point: 2.5 min
Target run duration: 100 min

Barometric Pressure (P_{bar}): 29.88 in Hg
Flue Static Pressure (P_g): -.35 in H2O
Flue Pressure (P_s): 29.65 in Hg

Imp #	Contents	9-4-13 SDP	Tare wt. (grams)	Final wt: (grams)
1	DI Water		662.8	675
2	DI Water		285.1	330
3	Blank		654.2	658.7
4	Silica Gel		809.3	811.2
		Net:		34.1

Leak Checks
Pre-Test Train Leak Check: 0.000 CFM @ 15 "Hg
Pre-Test Pitot Leak Check: Pass (Pass or Fail)
Post-Test Train Leak Rate: 0.000 CFM @ 10 "Hg
Post-Test Pitot Leak Check: Pass (Pass or Fail)
Pump/Orifice Leak Check: Pass (Pass or Fail)
Filter/Thimble ID: 0511
Tare Weight: 19508 grams

Fixed Gas Analysis:
CO_2: 0.0 %vol
O_2: 20.9 %vol
N_2: 79.1 %vol
9-3-13 SDP

Description of Filter and Front Half Rinses:

Description of Impinger liquid:

General Comments:

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TRC

Company: US Steel
Plant: Blast Furnace
Unit: DH Floor Casthouse
Location: Stack

Job #: 202094 2013 Sep
Methods: M5
Run #: R3
Traverse Sheet: 1 of 1

Test Date: 8/30/13
X-Factor: 4.228
Minutes/pt: 2.5

Port & Point ID	Clock Time	Meter Volume ft³	DP in. H_2O	Stack °F	Dry Gas Meter Inlet °F	Dry Gas Meter Outlet °F	Orifice DH in. H_2O	This data not entered in Excel: Probe Liner °F	Filter Outlet °F	Impinger Train Outlet °F	Impinger Train CPM Filter °F	Pump Vacuum in. Hg
1-1	2:41	19.035	1.3	113	99	95	5.0	246	248	61	74	8
-2	2:43:30	21.92	1.3	113	99	96	4.3	247	249	58		8
-3	46:00	24.89	1.0	113	99	96	3.9	247	249	58		8
-4	4830	27.75	.94	113	100	96	3.7	248	250	55		9
-5	51:00	30.52	.92	113	100	96	3.6	246	250	59		9
-6	53:30	33.36	.80	112	100	96	3.1	248	247	61		9
-7	56:00	35.95	.70	114	100	97	2.7	249	246	63		8
-8	58:30	38.75	.67	114	101	97	2.6	247	248	63		7
-9	8:01:00	40.35	.61	113	101	97	2.4	246	249	63		7
-10	03:30	42.95	.54	115	101	97	2.1	247	249	64		7
-11	06:00	45.28	.50	115	101	97	1.9	247	248	64		7
-12	08:30	47.32	.50	115	101	97	1.9	246	246	64		7
	8:11:00	49.236										
2-1	8:17	49.336	.29	114	100	97	3.1	246	246	63		7
-2	19:30	52.28	.75	115	102	99	2.9	248	246	62		7
-3	22:00	54:99	1.0	115	102	99	3.9	246	247	62		7
-4	24:30	57.72	.90	116	102	99	3.5	247	247	61		6
[redacted]	8:27:00	60.410										
[redacted]	[redacted]	[redacted]										
-5	8:30	~~62.80~~ 60.416	.87	117	101	100	3.4	246	246	60		7
-6	32:30	~~65.2~~ 63.00	.87	117	101	100	3.4	249	246	60		6
-7	35:00	~~68.13~~ 65.70	.66	117	101	100	2.6	249	247	60		6
-8	37:30	~~70.96~~ 68.13	.62	116	101	100	2.4	249	247	61		6
-9	40:00	70.35	.48	116	103	100	2.1	249	248	61		6
-10	42:30	72.86	.62	116	103	101	2.4	246	248	61		6
-11	45:00	74.96	.58	116	103	101	2.3	247	248	62		6
-12	47:30	77.16	.58	117	103	101	2.3	247	248	63		6
	8:50:00	79.455										

Comments/notes:

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R005381

TRC

Method 2 Velocity Traverse Data

Project No.:	27094	Test Date:	8/29/13	P_{bar} ("Hg):	29.38
Company:	US Steel	Operating Level:	Normal	P_g - Static ("H_2O):	-.15
Plant:	Granite City	Recorded by:	MBS	P_s ("Hg):	29.37
Unit ID:	DR Rear Baghouse	Pitot ID:	B40 A	% CO_2:	0
Sample Location:	Stack	Pitot Coefficient Cp:	.840	% O_2:	20.9
Duct Dimensions:	1.67	Duct Area (ft^2):	2.18		

Run No: 1 Time: _____

Port-Point	Δp "H_2O	Ts (°F)	α
1-1	1.1	114	10°
-2	1.1	114	10°
-3	.95	114	5
-4	.64	114	5
-5	.75	114	-5
-6	.68	115	-5
-7	.52	115	5
-8	.72	115	5
-9	.66	115	10
-10	.58	114	10
-11	.54	114	10
-12	.45	113	15
2-1	.78	114	10
-2	.80	114	10
-3	.82	114	5
-4	.80	114	0
-5	.76	114	0
-6	.72	114	-5
-7	.69	114	-10
-8	.59	114	-10
-9	.65	114	-10
-10	.62	114	-10
-11	.60	114	-10
-12	.56	114	-5
Avg.			

Leak Check Pre: _____ Post: _____

Run No: _____ Time: _____

Port-Point	Δp "H_2O	Ts (°F)	α

This is to Certify that:

Anthony Sakellariou

Is a Qualified Individual as defined in Section 8.3 of ASTM D7036-04 for the following test methods:

EPA Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 2H, 3, 3B, 4, 5, 5A, 5B, 5E, 5F, 5i, 17, 19, 201A, and 202.

The individual has met the minimum experience requirements defined in Section 8.3.4.2 of ASTM D7036-04 and has successfully passed an internal comprehensive examination for the test methods designated above.

This certification is effective until: **03-05-2015**

Date of Issue: 02-13-2013

Certificate Number: 00485

Edward J MacKinnon

Air Measurements Practice Quality Director

TRC

R005383

This is to Certify that:

Paul G. Powell

Is a Qualified Individual as defined in Section 8.3 of ASTM D7036-04 for the following test methods:

EPA Methods 1, 1A, 2, 2A, 2C, 2D, 2F, 2G, 2H, 3, 3B, 4, 5, 5A, 5B, 5E, 5F, 5i, 17, 19, 201A, and 202.

The individual has met the minimum experience requirements defined in Section 8.3.4.2 of ASTM D7036-04 and has successfully passed an internal comprehensive examination for the test methods designated above.

This certification is effective until: **10-28-2016**

Date of Issue: 02-14-2013

Certificate Number: 00530

Edward J MacKinnon

Air Measurements Practice Quality Director

TRC

R005384

Pritchett, Jacob A.

Subject:	Canceled: Meet with USS this week
Start:	Mon 10/23/2017 8:00 AM
End:	Mon 10/23/2017 8:30 AM
Show Time As:	Free
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Carter, Sally
Required Attendees:	Romaine, Chris; Patel, Minesh
Importance:	High

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Pritchett, Jacob A.

Subject:	Canceled: USS
Start:	Tue 10/26/2021 11:00 AM
End:	Tue 10/26/2021 1:00 PM
Show Time As:	Free
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Carter, Sally
Required Attendees:	Minesh Patel; Chris Romaine
Importance:	High

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Pritchett, Jacob A.

Subject:	[External] Canceled: USS & IEPA Conference Call
Start:	Tue 10/26/2021 11:00 AM
End:	Tue 10/26/2021 1:00 PM
Show Time As:	Free
Recurrence:	(none)
Organizer:	LaDonna Driver
Importance:	High

HEPLERBROOM LLC
Lisa M. Fortner
Legal Secretary
Lisa.Fortner@heplerbroom.com
Phone: 217-993-7153
4340 Acer Grove Drive, Springfield, IL 62711
www.HeplerBroom.com | vCard

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Email communication is not a secure method of communication. Please contact me immediately if you want future communications to be sent via a different medium.

Kras, Kim

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Wednesday, October 26, 2022 2:39 PM
To: Ray, Sarah
Subject: RE: US Steel Granite City Modeling

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N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

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Robertson, Laurie L.

From: Ray, Sarah
Sent: Thursday, October 27, 2022 10:24 AM
To: Stewart, Tamara
Cc: King, Steven
Subject: RE: US Steel Granite City Modeling

Okay. Thank you for doing that!

This is a particularly complex issue as the distribution between rural and urban land use categories are so close and because certain types of land use categories may negate the effects expected within an urban environment. I looked at the AERMOD Implementation Guide, specifically Section 5: aermod_implementation_guide.pdf (epa.gov). It notes that:

"For most applications, the Land Use Procedure described in Section 7.2.3(c) is sufficient for determining the urban/rural status. However, there may be sources located within an urban area, but located close enough to a body of water or to other non-urban land use categories to result in a predominately rural land use classification within 3 kilometers of the source following that procedure."

"Another aspect of the urban/rural determination that may require special consideration on a case-by-case basis relates to tall stacks located within or adjacent to small to moderate size urban areas. In such cases, the stack height or effective plume height for very buoyant plumes, may extend above the urban boundary layer height."

Google Earth shows that the facility is fairly close to water and your Auer's analysis confirms it (6.1% open water). So, this may potentially offset the Auer's analysis identification of the area as urban. I'm less certain about the height of the stacks at the facility relative to the surrounding area.

I spoke with Steve and think the next step is to run the model internally first using the urban option and compare output with the results you and the consultant each generated without the urban option. Historically, the urban option has been less conservative. If that's the case here as well, then you can add a note to the memo that indicates that you took this additional step and that modeled results were lower than those without the urban option. If modeled results with the urban option turn out to be higher, then I think we should reach out to the consultant to communicate that and to request updated modeling runs that use the urban option.

For information about how to set up the urban mode in AERMOD, see Section 5.2 of the AERMOD Implementation Guide. My thought is that you can likely start with published census data to estimate population for the area. You don't need to worry about the urban roughness length described in Section 5.3. You can just use the default value of 1.

Thank you for all of your work on this!

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Pritchett, Jacob A.

Subject:	(External) USS & IEPA Conference call
Location:	https://secure-web.cisco.com/1M5Nk35_mhlWr9l32qVfk-QsS70lhsaaHOnO_2ojczohat4Aikg-LycbmleZXPZDtlEwZ0YgCacjlq9klXAkRRjFkPLh1_OxHZ8Ktk6PnHBcDxjtOon6A9kAfl3_npphnzNNxBB8Rpj5VFFv5Lxe5QMocSEN_-DbMp1hnRUSx_XZijVilP8FagrYfvl0GlCycr6YMOVfNn4Srs6pDkKi9Lg4P3fDfF_a2b
Start:	Thu 10/28/2021 12:00 PM
End:	Thu 10/28/2021 2:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Organizer:	LaDonna Driver

Hi there,

LaDonna Driver is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting

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Meeting ID: 857 8439 0048

Password: 225781

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Meeting ID: 857 8439 0048

Password:225781

International numbers

HEPLERBROOM LLC
Lisa M. Fortner
Legal Secretary
Lisa.Fortner@heplerbroom.com
Phone: 217-993-7153
4340 Acer Grove Drive, Springfield, IL 62711
www.HeplerBroom.com | vCard

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Pritchett, Jacob A.

Subject: FW: USS & IEPA Conference call
Location: https://secure-web.cisco.com/1M5Nk35_mhlWr9I32qVfk-QsS70IhsaaHOnO_2ojczohat4Aikg-LycbmleZXPZDtIEwZ0YgCacjlq9klXAkRRjFkPLh1_OxHZ8Ktk6PnHBcDxjtOon6A9kAfI3_npphnzNNxBB8Rpj5VFFv5Lxe5QMocSEN_-DbMp1hnRUSx_XZijVilP8FagrYfvI0GlCycr6YMOVfNn4Srs6pDkKi9Lg4P3fDfF_a2b

Start: Thu 10/28/2021 12:00 PM
End: Thu 10/28/2021 2:00 PM
Show Time As: Tentative

Recurrence: (none)

Meeting Status: Not yet responded

Organizer: LaDonna Driver

I have accepted this call.

-----Original Appointment-----
From: LaDonna Driver <LaDonna.Driver@heplerbroom.com>
Sent: Friday, September 17, 2021 10:54 AM
To: LaDonna Driver; 'Hacker, David W'; 'KDArmentrout@uss.com'; 'CWHardin@uss.com'; 'APiscitelli@uss.com'; 'saini@rtpenv.com'; 'campbell@rtpenv.com'; 'BJTunno@uss.com'; 'amespy@uss.com'; Carter, Sally; Romaine, Chris; Patel, Minesh
Subject: USS & IEPA Conference call
When: Thursday, October 28, 2021 12:00 PM-2:00 PM (UTC-06:00) Central Time (US & Canada).
Where: https://secure-web.cisco.com/1M5Nk35_mhlWr9I32qVfk-QsS70IhsaaHOnO_2ojczohat4Aikg-LycbmleZXPZDtIEwZ0YgCacjlq9klXAkRRjFkPLh1_OxHZ8Ktk6PnHBcDxjtOon6A9kAfI3_npphnzNNxBB8Rpj5VFFv5Lxe5QMocSEN_-DbMp1hnRUSx_XZijVilP8FagrYfvI0GlCycr6YMOVfNn4Srs6pDkKi9Lg4P3fDfF_a2b

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Pritchett, Jacob A.

Subject:	USS
Location:	Bowling Alley
Start:	Wed 11/1/2017 10:00 AM
End:	Wed 11/1/2017 2:00 PM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	Carter, Sally
Required Attendees:	Patel, Minesh; Romaine, Chris; Kras, Kim

Kim,

Can you see about getting the Bowling Alley conference room?

Thanks.

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

Robertson, Laurie L.

From: Stewart, Tamara
Sent: Tuesday, November 1, 2022 9:43 AM
To: Ray, Sarah
Cc: King, Steven
Subject: RE: US Steel Granite City Modeling
Attachments: ModelingResults OUTPUT Data Comparison.xlsx

Good morning,
I have run the Urban option, it was higher on a few occasions. Higher than what was modeled by IEPA and RTP. The high correspond with the highs calculated by RTP and I for SIL calcs. The 1-hour high for 2017 and 2020 were higher than the rural calculations for 1-hr calculated by RTP and IEPA. The NAAQS Urban run values were less than what was calculated by RTP and IEPA see attached. I feel the highs correspond the highs from the RTP and IEPA runs. But I don't understand the highs for 2017 and 2020 for the 1-hr readings. I think the use of the rural option is okay, what are your thoughts. Modeling results attached. I will also re run the years where the high value for the 1-hr was observed.

Thanks

Tammy

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Thursday, October 27, 2022 10:24 AM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Cc: King, Steven <Steven.King@Illinois.gov>
Subject: RE: US Steel Granite City Modeling

Okay. Thank you for doing that!

This is a particularly complex issue as the distribution between rural and urban land use categories are so close and because certain types of land use categories may negate the effects expected within an urban environment. I looked at the AERMOD Implementation Guide, specifically Section 5: aermod_implementation_guide.pdf (epa.gov). It notes that:

"For most applications, the Land Use Procedure described in Section 7.2.3(c) is sufficient for determining the urban/rural status. However, there may be sources located within an urban area, but located close enough to a body of water or to other non-urban land use categories to result in a predominately rural land use classification within 3 kilometers of the source following that procedure."

"Another aspect of the urban/rural determination that may require special consideration on a case-by-case basis relates to tall stacks located within or adjacent to small to moderate size urban areas. In such cases, the stack height or effective plume height for very buoyant plumes, may extend above the urban boundary layer height."

Google Earth shows that the facility is fairly close to water and your Auer's analysis confirms it (6.1% open water). So, this may potentially offset the Auer's analysis identification of the area as urban. I'm less certain about the height of the stacks at the facility relative to the surrounding area.

I spoke with Steve and think the next step is to run the model internally first using the urban option and compare output with the results you and the consultant each generated without the urban option. Historically, the urban option has been less conservative. If that's the case here as well, then you can add a note to the memo that indicates that you took this additional step and that modeled results were lower than those without the urban option. If modeled results with

the urban option turn out to be higher, then I think we should reach out to the consultant to communicate that and to request updated modeling runs that use the urban option.

For information about how to set up the urban mode in AERMOD, see Section 5.2 of the AERMOD Implementation Guide. My thought is that you can likely start with published census data to estimate population for the area. You don't need to worry about the urban roughness length described in Section 5.3. You can just use the default value of 1.

Thank you for all of your work on this!

Kind regards,
Sarah

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
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To: Ray, Sarah <Sarah.Ray@illinois.gov>
Subject: RE: US Steel Granite City Modeling

They did not provide the 1-hour NAAQS file, I will redo the Auer's with 2016 info and ask Steve King that question. When I ran NLCD 2016 its clearly rural, when I run NLCD 2019 lightly urban. Steve King said you have info on next steps. Sounds interesting.

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Wednesday, October 26, 2022 4:07 PM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Subject: RE: US Steel Granite City Modeling

Perfect! Thank you for taking this on!

I looked through the write up and tracked my changes. Mostly, I just changed mentions of "AQPS" to "Modeling Unit." I responded to your comments as well. My thought is that, since your Auer's analysis showed that the area was slightly more urban than rural, that the urban option should be used. However, like I said in my comment, it may be worth talking to Steve King, to get a second opinion about it.

I'm not sure if you've had a chance to speak with him or not, but he worked in the Modeling Unit for a number of years and is usually my go to when I'm uncertain about an approach.

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Wednesday, October 26, 2022 2:39 PM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Subject: RE: US Steel Granite City Modeling

I have prepared the memo, basically updated what was already there. It is in the folder. I put a few comments with questions I had. Also files and data comparison spread sheets. I will clean up the AERMOD just to include the necessary files.

N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Tuesday, October 11, 2022 11:19 AM

To: Stewart, Tamara <Tamara.Stewart@illinois.gov>
Cc: Rutherford, Cari <Cari.Rutherford@illinois.gov>
Subject: FW: US Steel Granite City Modeling

Hi Tammy,

I'm forwarding you Dave's email regarding new CO modeling for US Steel Granite City. This is a PSD project that Cari and I originally reviewed back in 2020. Please review these new modeling files and prepare a memorandum summarizing your review.

I've added the files to the path below, along with a copy of the original memo that Cari and I developed as part of the 2020 review:

N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

Please let me know if you have any questions!

Thank you,
Sarah

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental
keen@rtpenv.com
(919) 845-1422 x41
(919) 845-1424 fax
(919) 906-6016 mobile

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R005407

RTP NAAQS 8-HR EVALUATION

	2016 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
2nd HIGH	1856.67702	16032208	748434.90	4287032.80	127.16	127.16	
	2017 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
2nd HIGH	1941.2243	17121624	748434.90	4287032.80	127.16	127.16	
	2018 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
2nd HIGH	1726.88521	18092424	748470.10	4287000.40	126.94	126.94	
	2019 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
2nd HIGH	2045.17009	19110908	748434.90	4287032.80	127.16	127.16	
	2020 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
2nd HIGH	1966.71667	20092408	748434.90	4287032.80	127.16	127.16	

RTP SIL

	2016 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
1hr							
1st HIGH	1094.34776	16121910	750800.00	4288100.00	127.44	127.44	
8hr							
1st HIGH	645.99335	16110108	748434.90	4287032.80	127.16	127.16	
	2017 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
1-hr							
1st HIGH	982.07813	17051502	748434.90	4287032.80	127.16	127.16	
8 hr							
1st HIGH	651.09728	17090416	750472.00	4287090.50	125.70	125.70	
	2018 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
1-hr							
1st HIGH	1036.46317	18112209	745200.00	4287400.00	129.90	134.11	
8-hr							
1st HIGH	669.20777	18111224	748481.60	4286378.20	126.67	126.67	DC
	2019 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
1-hr							
1st HIGH	1157.32754	19020109	746400.00	4286400.00	128.82	132.25	DC
8-hr							
1st HIGH	691.67751	19041908	748481.60	4286378.20	126.67	126.67	DC
	2020 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill	
1-hr							
1st HIGH	997.15732	20010610	746700.00	4287100.00	126.89	126.89	DC
8-hr							
1st HIGH	618.48656	20041108	748434.90	4287032.80	127.16	127.16	DC

IEPA NAAQS 8-HR

	2016 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1859.2701	16032208	748434.90	4287032.80	128.10	128.10
	2017 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1954.27323	17121624	748434.90	4287032.80	128.10	128.10
	2018 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1743.8751	18092424	748470.10	4287000.40	127.98	127.98
	2019 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	2047.00418	19110908	748434.90	4287032.80	128.10	128.10
	2020 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1968.80913	20092408	748434.90	4287032.80	128.10	128.10

IEPA SIL

	2016 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1095.30468	16121910	750700.00	4288000.00	128.05	128.05
8-hr						
ALL	650.82038	16110108	748434.90	4287032.80	128.10	128.10
	2017 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	992.81756	17051502	748434.90	4287032.80	128.10	128.10
8-hr						
ALL	648.00737	17090416	750472.00	4287090.50	126.26	126.26
	2018 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1078.75334	18091908	751400.00	4287200.00	121.74	125.18
8-hr						
ALL	655.5254	18111224	748481.60	4286378.20	126.50	126.50
	2019 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1158.37078	19020109	746400.00	4286400.00	127.06	127.06
8-hr						
ALL	694.08062	19041908	748481.60	4286378.20	126.50	126.50
	2020 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	997.72794	20010610	746700.00	4287100.00	126.37	126.37
8-hr						
ALL	618.48866	20041108	748434.90	4287032.80	128.10	128.10

IEPA NAAQS URBAN 8-HR

	2016 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1777.15428	16032208	748869.90	4286536.40	126.50	126.50
	2017 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1812.31993	17121624	748434.90	4287032.80	128.10	128.10
	2018 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1676.27897	18082424	748434.90	4287000.40	127.98	127.98
	2019 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1758.62678	19011924	748528.80	4286380.50	126.50	126.50
	2020 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
2nd HIGH	1672.24895	20051424	748434.90	4287032.80	128.10	128.10

IEPA SIL URBAN

	2016 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1095.30468	16121910	750700.00	4288000.00	128.05	128.05
8-hr						
ALL	594.61688	16092816	748481.60	4287032.80	126.50	126.50
	2017 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1273.04198	17060206	746200.00	4285500.00	126.68	126.68
8-hr						
ALL	648.00737	17090416	750472.00	4287090.50	126.26	126.26
	2018 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1078.17228	18091107	751100.00	4287600.00	126.34	126.34
8-hr						
ALL	676.92028	18111224	748481.60	4286378.20	126.50	126.50
	2019 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1315.65983	19020109	746400.00	4286400.00	127.06	127.06
8-hr						
ALL	710.46747	19041908	748481.60	4286378.20	126.50	126.50
	2020 Conc/Dep	Time	East (X)	North (Y)	Elev	Hill
1-hr						
ALL	1282.18416	20061606	751200.00	4287500.00	126.34	126.34
8-hr						
ALL	587.74818	20090316	750438.00	4287055.70	126.34	126.34

Kras, Kim

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Tuesday, November 1, 2022 9:56 AM
To: Stewart, Tamara
Cc: King, Steven
Subject: RE: US Steel Granite City Modeling

Hi Tammy,

I looked over your results, and I tend to agree with you that the use of the rural option is okay.

As your spreadsheet shows, the maximum modeled concentrations for the 1-hour and 8-hr SIL analyses are higher with the urban option. However, the 8-hour NAAQS concentration is lower.

I tend to think of the SILs as more of a screening metric. So, my personal opinion is that the concentrations associated with the SILs are less important than the results associated with the cumulative modeling.

Provided that Steve also agrees, I think that we are safe to proceed without seeking updated modeling from the consultant.

Thanks,
Sarah

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Tuesday, November 1, 2022 9:43 AM
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Good morning,
I have run the Urban option, it was higher on a few occasions. Higher than what was modeled by IEPA and RTP. The high correspond with the highs calculated by RTP and I for SIL calcs. The 1-hour high for 2017 and 2020 were higher than the rural calculations for 1-hr calculated by RTP and IEPA. The NAAQS Urban run values were less than what was calculated by RTP and IEPA see attached. I feel the highs correspond the highs from the RTP and IEPA runs. But I don't understand the highs for 2017 and 2020 for the 1-hr readings. I think the use of the rural option is okay, what are your thoughts. Modeling results attached. I will also re run the years where the high value for the 1-hr was observed.

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Okay. Thank you for doing that!

This is a particularly complex issue as the distribution between rural and urban land use categories are so close and because certain types of land use categories may negate the effects expected within an urban environment. I looked at the AERMOD Implementation Guide, specifically Section 5: aermod_implementation_guide.pdf (epa.gov). It notes that:

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"Another aspect of the urban/rural determination that may require special consideration on a case-by-case basis relates to tall stacks located within or adjacent to small to moderate size urban areas. In such cases, the stack height or effective plume height for very buoyant plumes, may extend above the urban boundary layer height."

Google Earth shows that the facility is fairly close to water and your Auer's analysis confirms it (6.1% open water). So, this may potentially offset the Auer's analysis identification of the area as urban. I'm less certain about the height of the stacks at the facility relative to the surrounding area.

I spoke with Steve and think the next step is to run the model internally first using the urban option and compare output with the results you and the consultant each generated without the urban option. Historically, the urban option has been less conservative. If that's the case here as well, then you can add a note to the memo that indicates that you took this additional step and that modeled results were lower than those without the urban option. If modeled results with the urban option turn out to be higher, then I think we should reach out to the consultant to communicate that and to request updated modeling runs that use the urban option.

For information about how to set up the urban mode in AERMOD, see Section 5.2 of the AERMOD Implementation Guide. My thought is that you can likely start with published census data to estimate population for the area. You don't need to worry about the urban roughness length described in Section 5.3. You can just use the default value of 1.

Thank you for all of your work on this!

Kind regards,
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Subject: RE: US Steel Granite City Modeling

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I have prepared the memo, basically updated what was already there. It is in the folder. I put a few comments with questions I had. Also files and data comparison spread sheets. I will clean up the AERMOD just to include the necessary files.

N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Tuesday, October 11, 2022 11:19 AM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Cc: Rutherford, Cari <Cari.Rutherford@Illinois.gov>
Subject: FW: US Steel Granite City Modeling

Hi Tammy,

I'm forwarding you Dave's email regarding new CO modeling for US Steel Granite City. This is a PSD project that Cari and I originally reviewed back in 2020. Please review these new modeling files and prepare a memorandum summarizing your review.

I've added the files to the path below, along with a copy of the original memo that Cari and I developed as part of the 2020 review:

N:\BOA\aqp\Air Modeling Central\Granite City US Steel - CO\2022

Please let me know if you have any questions!

Thank you,
Sarah

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental
keen@rtpenv.com
(919) 845-1422 x41
(919) 845-1424 fax
(919) 906-6016 mobile

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Robertson, Laurie L.

From: David Keen <keen@rtpenv.com>
Sent: Wednesday, November 2, 2022 1:06 PM
To: Stewart, Tamara
Cc: David Keen
Subject: [External] RE: US Steel Granite City Modeling

Oh, we showed insignificant 1-hr CO impacts in the SIL runs, so I didn't run 1-hr for NAAQS.

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1157.3	2,000	58%
CO	8-HR	ALL	1ST	691.7	500	138%

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Wednesday, November 2, 2022 1:42 PM
To: David Keen <keen@rtpenv.com>
Subject: RE: US Steel Granite City Modeling

Hello Dave,

The NAAQS you provided are for 8 hours. CO AVERTIME 8, were there any runs done for 1 hour for CO NAAQS?

Thanks,

Tammy

From: David Keen <keen@rtpenv.com>
Sent: Wednesday, November 2, 2022 10:44 AM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Cc: David Keen <keen@rtpenv.com>
Subject: [External] RE: US Steel Granite City Modeling

Sure, sorry, I somehow read 1-hr NO2. The CO files are attached. Just let me know if you need anything else.

Thanks
Dave

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Wednesday, November 2, 2022 11:36 AM
To: David Keen <keen@rtpenv.com>
Subject: RE: US Steel Granite City Modeling

The CO 1-hour NAAQS

From: David Keen <keen@rtpenv.com>
Sent: Wednesday, November 2, 2022 10:34 AM
To: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Cc: David Keen <keen@rtpenv.com>
Subject: [External] RE: US Steel Granite City Modeling

Hi Tammy,

Do you mean the CO files? We didn't model for NO2 at US Steel. If you mean the NO2 modeling for the Alto facility in Pekin, we are still working on that.

Thanks
Dave

From: Stewart, Tamara <Tamara.Stewart@Illinois.gov>
Sent: Wednesday, November 2, 2022 11:30 AM
To: David Keen <keen@rtpenv.com>
Subject: US Steel Granite City Modeling

Hello Dave,

I'm finishing up the IEPA review of the files you sent. Is it possible to get the 1-hour NAAQS files for our records?

Thanks

Tamara (Tammy) Stewart

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Kras, Kim

From: Ray, Sarah <Sarah.Ray@illinois.gov>
Sent: Friday, November 4, 2022 2:16 PM
To: Schnepp, Jason
Subject: FW: US Steel Granite City Modeling
Attachments: Granite City Model Report (10-10-22).pdf; Granite City SIL CO.zip; Granite City NAAQS CO.zip

FYI.

From: David Keen <keen@rtpenv.com>
Sent: Monday, October 10, 2022 10:46 AM
To: Ray, Sarah <Sarah.Ray@illinois.gov>
Cc: Colin Campbell <campbell@rtpenv.com>; Gurinder (Gary) Saini <saini@rtpenv.com>; David Keen <keen@rtpenv.com>
Subject: [External] US Steel Granite City Modeling

Sarah,

Please find attached the latest iteration of the US Steel Granite City CO modeling. This analysis was originally submitted in 2020. The model has been revised based upon recent discussions with IEPA (Chris Romaine).

Please let me know if you have any questions or need additional information.

Thanks,
Dave

David Keen
RTP Environmental
keen@rtpenv.com
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(919) 845-1424 fax
(919) 906-6016 mobile

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CARBON MONOXIDE AIR DISPERSION MODELING FOR A PREVENTION OF SIGNIFICANT DETERIORATION AND CONSTRUCTION PERMIT REVISION FOR UNITED STATES STEEL GRANITE CITY WORKS



Prepared for:
United States Steel Corporation
Granite City Works
20th and State Streets
Granite City, IL 62040

Prepared by:
RTP Environmental Associates, Inc.
304A West Millbrook Road
Raleigh, North Carolina 27609

October 2022

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1.0 INTRODUCTION

This document presents the results of the air quality dispersion modeling analysis conducted for the United States Steel Corporation, Granite City Works ("US Steel") iron and steel making facility in Granite City, Illinois. The analysis has been conducted by RTP Environmental Associates, Inc. ("RTP Environmental") on behalf of US Steel.

The analysis evaluated the emissions of the criteria pollutant carbon monoxide ("CO") as regulated under the applicable provisions of the Prevention of Significant Deterioration ("PSD") regulations of 40 CFR § 52.21, incorporated by reference in the federally approved Illinois State Implementation Plan at 40 CFR § 52.738(b).[1] The criteria pollutant analysis was conducted to ensure that the proposed revisions to the CO emission limitations in the Prevention of Significant Deterioration ("PSD") and Construction Permit (Permit Number 95010001) ("1996 Construction Permit") do not cause or contribute to violation of a National Ambient Air Quality Standard (NAAQS).

As required by 40 CFR § 52.21(l), the analysis conforms with the modeling procedures outlined in the Guideline on Air Quality Models[1] promulgated by United States Environmental Protection Agency ("USEPA") (the "Guideline" or "Appendix W"). It also conforms to the Illinois Environmental Protection Agency's (IEPA) Prevention of Significant Deterioration Modeling Guidance[2], the modeling protocol submitted to the IEPA on February 3, 2020, and associated USEPA modeling policy and guidance.

[1] All citations to the PSD regulations herein are to the currently applicable provisions of 40 CFR § 52.21. The analysis also is designed to satisfy the parallel requirements of the currently pending Illinois PSD rule, 35 Ill. Adm. Code Part 204.

2.0 PROJECT DESCRIPTION

The 1996 Construction Permit authorized National Steel to increase iron and steel production limitations for the blast furnaces and basic oxygen furnace ("BOF") shop at the existing integrated iron and steel manufacturing facility in Granite City, in Madison County, Illinois. US Steel purchased the assets of National Steel in 2003, including Granite City Works. US Steel is proposing revisions to the 1996 Construction Permit that involve increases in the CO emission limitations that were established per the PSD requirements. Therefore, the proposed increases in the CO rates were evaluated for PSD requirements including compliance with the NAAQS for CO. No physical changes are proposed in conjunction with the requested revisions to the 1996 Construction Permit.

3.0 FACILITY AND SITE DESCRIPTION

The US Steel Granite City Works produces high-quality hot-rolled, cold-rolled and coated sheet steel products to customers in the construction, container, piping and tubing, service center, and automotive industries. Granite City Works has an annual raw steelmaking capability of 3.58 million net tons.

The facility occupies approximately 400 acres and is located approximately 12 miles east of Lambert, St. Louis International Airport. The approximate Universal Transverse Mercator (UTM) coordinates of the facility are 749,000m East and 4,287,000m North (NAD83, Zone 15). Figure 1 shows the general location of the facility. Figure 2 shows the specific facility location on a 7.5-minute U.S. Geological Survey ("USGS") topographic map.

The US Steel facility is classified under the regulations governing PSD and Title V as a major source. The area of Madison County where US Steel facility is located is classified as attainment or unclassifiable for all regulated pollutants except ozone. St. Louis is classified as marginal nonattainment for the 2015 8-hour ozone standard.

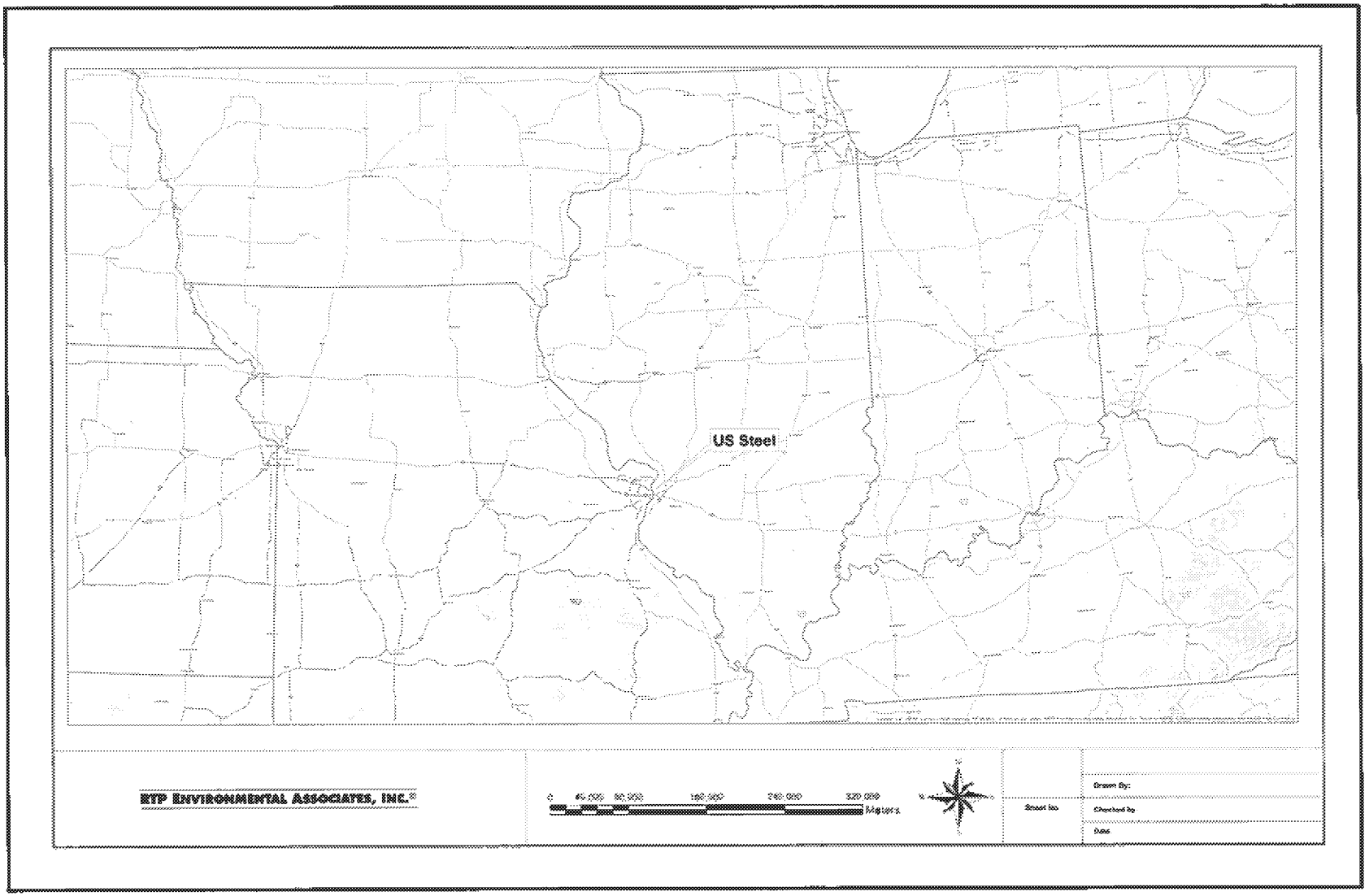


Figure 1. General Location of the US Steel Granite City Works

R005420

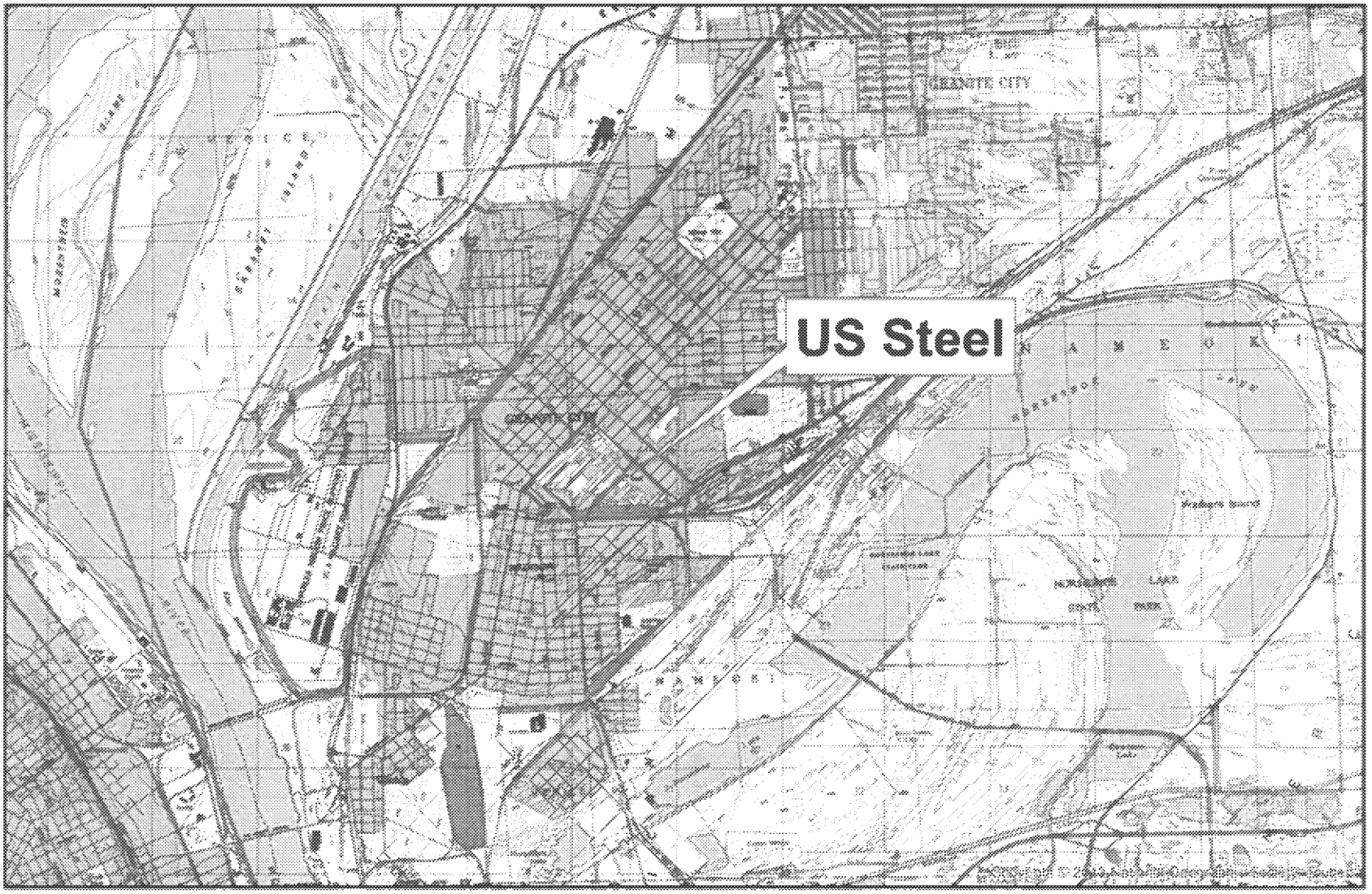


Figure 2. Specific Location of US Steel Granite City Works

R005421

4.0 MODEL SELECTION AND MODEL INPUT

4.1 Model Selection

The latest version of the AMS/EPA Regulatory Model (AERMOD, Version 22112) was used to conduct the dispersion modeling analysis. AERMOD is a Gaussian plume dispersion model that is based on planetary boundary layer principals for characterizing atmospheric stability. The model evaluates the non-Gaussian vertical behavior of plumes during convective conditions with the probability density function and the superposition of several Gaussian plumes. AERMOD is a modeling system with three components: AERMAP is the terrain preprocessor program, AERMET is the meteorological data preprocessor and AERMOD includes the dispersion modeling algorithms.

AERMOD is the required default model for calculating ambient concentrations near the US Steel facility based on the model's ability to incorporate multiple sources and source types. The model can also account for convective updrafts and downdrafts and meteorological data throughout the plume depth. The model also provides parameters required for use with up to date planetary boundary layer parameterization. The model also has the ability to incorporate building wake effects and to calculate concentrations within the cavity recirculation zone. All model options were selected as recommended in the USEPA Guideline on Air Quality Models.

Oris Solution's BEEST Graphical User Interface ("GUI") was used to run AERMOD. The GUI uses an altered version of the AERMOD code to allow for flexibility in the file naming convention. The dispersion algorithms of AERMOD are not altered. Therefore, a model equivalency evaluation pursuant to Section 3.2 of 40 CFR 51, Appendix W was not warranted.

4.2 Model Control Options and Land Use

AERMOD was run in the regulatory default mode for all pollutants with the default rural dispersion coefficients. These coefficients were used by the Illinois Environmental

Protection Agency ("IEPA") in its evaluation of the facility as part of the 1-hr sulfur dioxide ("SO2") Data Requirements Rule ("DRR").

4.3 Source Data

The modeling input data and modeled CO emission rates can be found in Appendix A of this report.

Source Characterization

The majority of modeled source input parameters were obtained from the IEPA's model conducted for the Data Requirements Rule ("DRR").

Point Sources

Most emission sources at the site vent to stacks with a well defined opening. These sources were modeled as point sources in AERMOD. Several other types of sources such as fugitive emissions also required evaluation.

Fugitive Emissions

Fugitive emissions are those that are not emitted from a well defined opening. These sources were modeled as volume sources. The initial dispersion coefficients (sigma y and sigma z) were provided by the IEPA and were calculated based upon the dimensions of the area of release and the equations contained in Table 3-1 of the AERMOD User's Guide.

Flares

The facility uses blast furnace gas flares to combust excess process gas. Emissions that occur only during periods of malfunction are not required to be modeled per 40 CFR Part 51 Appendix W. Non-malfunction emissions were modeled using the procedures outlined in the AERSCREEN Manual[3]. The effective stack height (H, in meters) was computed by the IEPA as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare stack in caloriesper second:

$$H_{equivalent} = H_{actual} + 4.56x10^{-3} \times Q^{0.478}$$

The effective flare stack diameter (d, in meters) was computed as a function of heat release rate according to the following equation, where Q is the heat release rate of the flare in calories per second:

$$d_{equivalent} = 9.88x10^{-4} \times (Q \times 0.45)^{0.5}$$

An exit temperature of 1273K and velocity of 20 m/sec is assumed.

All source locations were based upon a NAD83, UTM Zone 15 projection.

Good Engineering Practice Stack Height Analysis

A Good Engineering Practice ("GEP") stack height evaluation was conducted to determine appropriate building dimensions to include in the model and to calculate the GEP formula stack height used to justify stack height credit for any stacks n excess of 65m. Procedures used are in accordance with those described in the USEPA Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations-Revised)[4]. GEP formula stack height, as defined in 40 CFR 51, is expressed as GEP = H_b + 1.5L, where H_b is the building height and L is the lesser of the building height or maximum projected width. Building/structure locations were determined from a facility plot plan. The structure locations and heights were obtained from the IEPA and were input to the USEPA's Building Profile Input Program (BPIP-PRIME) computer program to calculate the direction-specific building dimensions needed for AERMOD. The structures included in the GEP analysis are shown as the green blocks in Figure 3. All stacks and structures that are located near a stack were included in the BPIP runs.

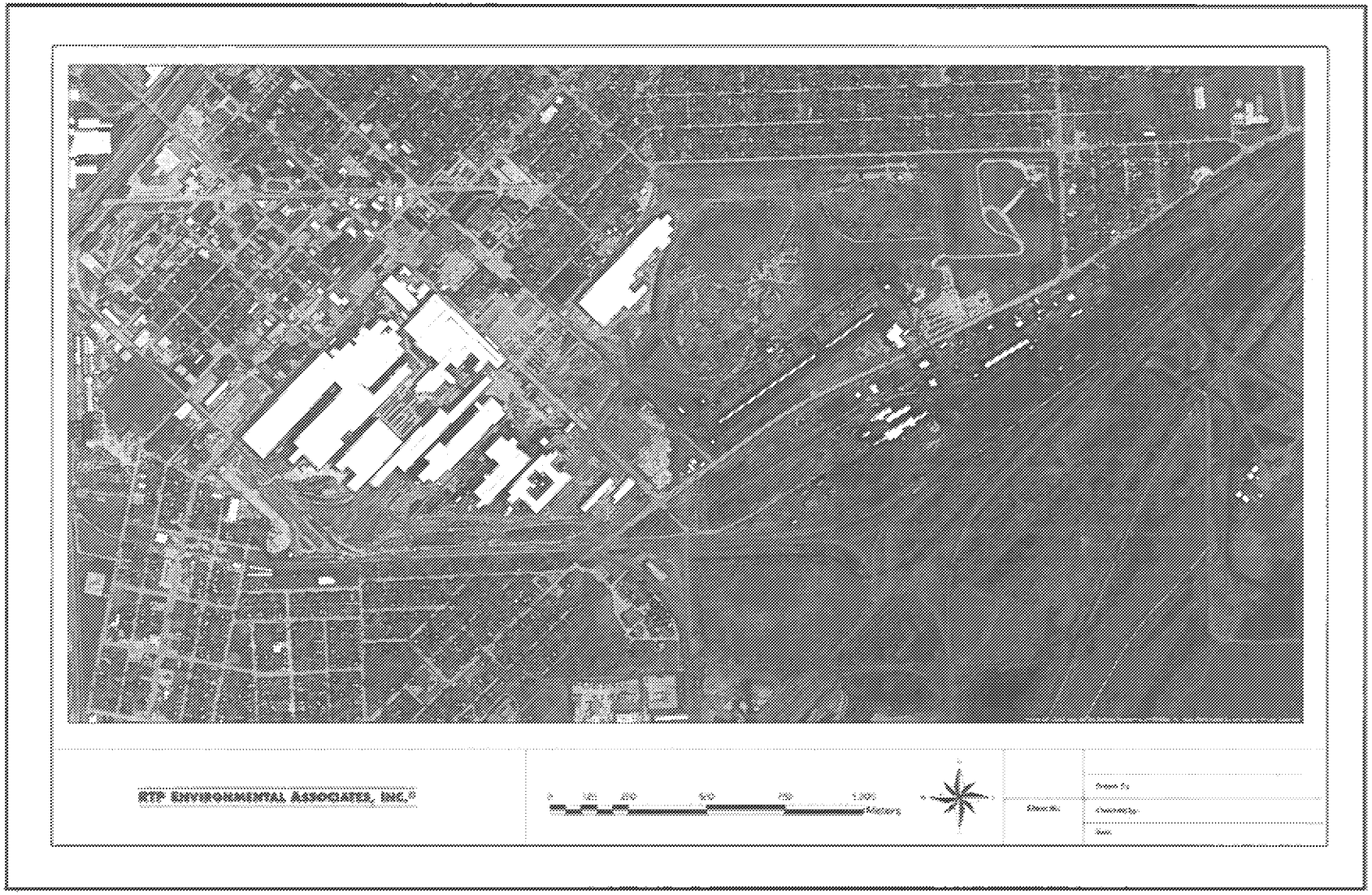


Figure 3. Structures Included in the US Steel GEP Analysis

R005425

4.4 Monitored Background Data

Ambient, background pollutant concentrations are needed to establish a representative background concentration to complete the NAAQS portion of the *Source Impact Analysis* of 40 CFR § 52.21(k). The background concentrations are added to the modeled concentrations to assess NAAQS compliance. Ambient pollutant concentrations are also needed to fulfill the *Air Quality Analysis* requirement of 40 CFR § 52.21(m), as discussed in Section 5.0herein.

Pursuant to 40 CFR § 52.21(i)(5), requirements for ambient monitoring data may be waived by the permitting authority if projected increases in ambient concentrations due to the project are less than the Significant Monitoring Concentrations. However, in light of the decision of the D.C. Circuit Court of Appeals *Sierra Club v. EPA*,[5] US Steel has elected not to request such a waiver at this time.

The USEPA Monitoring Guidelines[6], other USEPA interpretive guidance, and USEPA administrative decisions clarify that representative, existing air quality monitoring data may be used to fulfill the PSD pre-construction monitoring requirements and establish background concentrations needed for assessing NAAQS compliance, in lieu of monitoring data. USEPA's Monitoring Guidelines suggest specific criteria to determine representativeness of off-site data: *quality of the data, currentness of the data, and monitor location*.

There are many existing ambient CO monitors within 100 miles in the facility (Figure 4). Existing monitoring data have been evaluated in relation to the criteria provided in USEPA's Ambient Monitoring Guidelines as being representative of the US Steel site.

We have used recently available, quality assured data (2016-2018) from the AQS monitor in East St. Louis, IL (AQS Site # 17-163-0010). 2018 is the latest year of complete, available data. The 4th quarter of 2019 is incomplete and data are not



Figure 4. Ambient Air Quality Monitors in the Vicinity of the US Steel Facility

R005427

available for 2020-2021. This monitor best represents background concentrations near the facility as it is the closest monitor with current CO data and is in the vicinity of the site and therefore representative of conditions as the site. The background data are presented in Table 1.

Table 1. Proposed Background Concentrations 2016-2018

Pollutant	Averaging Time	Design Value (ppb)[µg/m³]	Basis	AQS Site No.
CO	1-hour	(2,200) [2,515]	Maximum	17-163-0010 St. Louis
	8-hour	(1,440) [1,646]		

The existing monitoring data satisfy the criteria provided in USEPA's Ambient Monitoring Guidelines[7] as being representative of the site.

Monitor Location

Of the monitors available, the East St. Louis monitor represents background concentrations as it is the closest monitor with data for the pollutants of concern that is not also significantly influenced by the localized source impacts.

Data Quality

The monitor data were collected and quality assured by the IEPA.

Currentness of Data

The data were collected during 2016-2018, which represents the recently available, quality assured data available for use in assessing compliance.

4.5 Receptor Data

Modeled receptors were placed in all areas considered as "ambient air" pursuant to 40 CFR 50.1(e). Ambient air is defined as that portion of the atmosphere, external to buildings, to which the general public has access. Approximately 14,100 receptors were used in the AERMOD significant impacts analysis. The receptor grid consisted of three cartesian grids and receptors located at 50m intervals along the facility fence line.

The first cartesian grid extended to approximately 3.0km from the facility in all directions. Receptors in this region were spaced at 100m intervals. The second grid extended to 7.5km. Receptor spacing in this region were 250m. A third grid extended to 15km with a spacing of 500m. The receptor grid was designed such that maximum facility impacts fall within the 100m spacing of receptors. The receptor grid spacing is presented in Table 2.

Table 2. Receptor Grid Spacing

Receptor Spacing (m)	Distance from Facility (m)
100	3,000
250	5,000
500	15,000

The US Steel facility is located in southern Illinois. Terrain within 10km of the site is generally flat. Receptor elevations and hill height scale factors were calculated with AERMAP (18081). The elevation data were obtained from the USGS one arc second National Elevation Data (NED) obtained from the USGS. Locations were based upon a NAD83, UTM Zone 15 projection. The near-field receptor grid is presented in Figure 5.

4.6 Meteorological Data

The 2016-2020, 5-year sequential hourly surface meteorological data from the National Weather Service (NWS) at St. Louis Lambert Field (WBAN No. 13994) and upper air data from the NWS station in Lincoln, IL (WBAN No. 04833) were used in the analysis. These data were processed into a "model-ready" format using AERMET version 21112.

The AERMET meteorological processor requires estimates of the following surface characteristics: surface roughness length, albedo, and Bowen ratio. The surface roughness length is related to the height of obstacles to the wind flow. It is the height above the surface where the average wind speed is zero. The smoother the surface, the lower the roughness length. The surface roughness length influences the surface shear stress and is an important factor in calculating mechanical turbulence and stability. The albedo is the fraction of the total incident solar radiation reflected by the surface back to space without absorption.

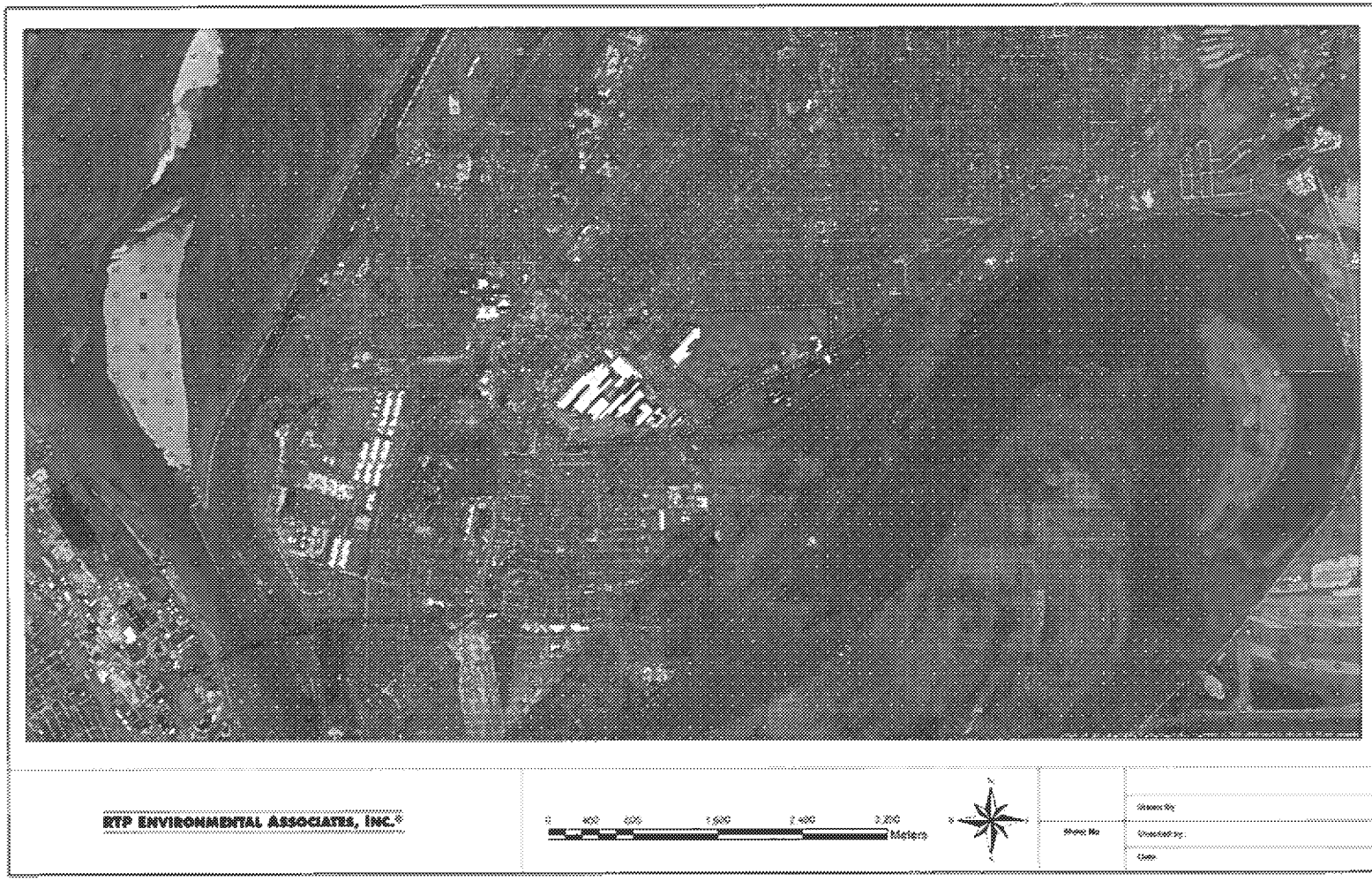


Figure 5. US Steel Facility Near-field Receptor Grid

R005430

The Bowen ratio is an indicator of surface moisture and is the ratio of the sensible heat flux to the latent heat flux. The albedo and Bowen ratio are used for determining the planetary boundary layer parameters for convective conditions due to the surface sensible heat flux. Estimates of the surface characteristics were made by the IEPA using USEPA's AERSURFACE program (Version 13016) and provided to RTP Environmental. A 1km search radius was employed at the location of the meteorological tower. Twelve sectors of 30 degrees each and seasonal resolution were used in the AERSURFACE analysis. RTP employed the "ADJ_U*" option to allow for adjustments to the friction velocity under low wind speeds was employed.

The use of NWS meteorological data for dispersion modeling can often lead to a high incidence of calms and variable wind conditions if the data are collected by Automated Surface Observing Stations ("ASOS"), as are in use at most NWS stations since the mid-1990's. A calm wind is defined as a wind speed less than 3 knots and is assigned a value of 0 knots. In addition, variable wind observations may include wind speeds up to 6 knots, but the wind direction is reported as missing, if the wind direction varies more than 60 degrees during the 2-minute averaging period for the observation. The AERMOD model currently cannot simulate dispersion under calm or missing wind conditions. To reduce the number of calms and missing winds in the surface data, archived 1-minute winds for the ASOS stations were used to calculate hourly average wind speed and directions, which were used to supplement the standard archive of hourly observed winds processed in AERMET. The USEPA AERMINUTE program (Version 15272) was used for these calculations. A wind rose of the 5-year meteorological dataset is provided in Figure 6.

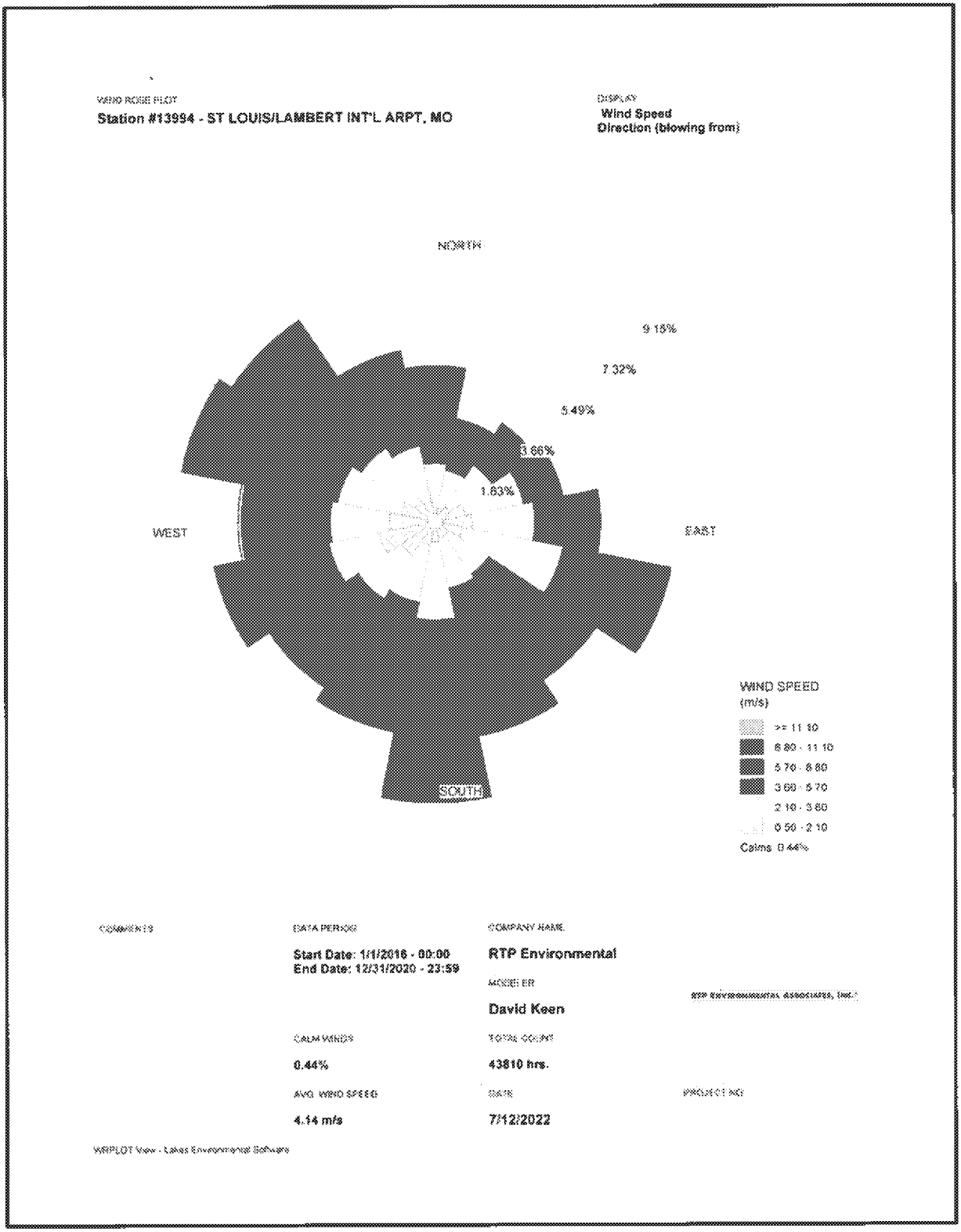


Figure 6. Lambert Field Windrose 2014-2018.

5.0 MODELING METHODOLOGY

5.1 Pollutants Subject to Review

USS Steel is proposing changes to the CO emission limitations in the 1996 Construction Permit that were established per the PSD requirements. Therefore, as requested by Illinois EPA, dispersion modeling of CO emissions have been evaluated and compared to the NAAQS.

5.2 Significant Impact Analysis

The air quality analysis was conducted in two phases: an initial or significant impact analysis, and a refined phase NAAQS analysis. In the significant impact analysis, the calculated maximum impacts due to the project were determined for CO.[b] These impacts determined the net change in air quality resulting from the proposed revision to modification permitted under the 1996 Construction Permit. Five years of meteorological data were used in the significant impact analysis. Maximum modeled CO concentrations were compared to the significance levels. The PSD Class II Significant Impact Levels for CO are listed in Table 3.

Table 3. PSD Class II Significant Impact Levels

Pollutant	Averaging Time	PSD Class II Significant Impact Levels ($\mu g/m^3$)
CO	1-hour	2,000
	8-hour	500

[b] For some of the affected emissions units, in place of project related emissions increases, we conservatively used the potential to emit of CO.

5.3 NAAQS Analysis

Following the determination of significant impacts, a refined air quality analysis to determine compliance with the CO NAAQS was conducted. In the NAAQS analysis, impacts from the US Steel facility were added to concentrations calculated from other nearby sources, plus a regional background concentration. The resultant total concentrations were compared to the NAAQS to assess compliance. The receptors modeled in the NAAQS analyses were limited to those showing a significant CO impact. Five years of meteorological data were again used in this analysis.

Nearby Source Inventory

Off-site sources were included in the NAAQS analysis. A 50km radius was used to define the screening area. A list of sources that are located within the screening area has been obtained from the IEPA as well as the Missouri Department of Natural Resources ("MDNR"). Section 8.3.3.b of Appendix W to 40 CFR Part 51 states that the number of nearby sources to be explicitly modeled is expected to be few, except in unusual situations. Appendix W further states that the sources to be included will usually be located within the first 10 to 20km from the source under consideration. In addition, it states that identification of nearby sources calls for the exercise of professional judgment by the appropriate reviewing authority. Further, USEPA's Guidance for PM2.5 Permit Modeling reiterates the Appendix W emphasis on a 10km screening radius for determining which nearby sources to include in the cumulative modeling analysis.

We conservatively included all sources provided by the IEPA and MDNR that are located within 50km of the US Steel facility. Total facility, potential emissions (i.e., all sources at a facility) were used in the NAAQS evaluation.

NAAQS Compliance Assessment

Ambient background concentrations (as discussed in more detail in Section 4.4) were then added to assess NAAQS compliance. The modeled and monitored values shown in Table 4 were used for this assessment.

Table 4. Monitored and Modeled Values Used to Assess NAAQS Compliance

Pollutant	Averaging Time	Monitored Value	Modeled Value
CO	1-hour & 8-hour	Maximum over 3 years	Highest, second high over 5 years

The NAAQS are shown in Table 5.

Table 5. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Ambient Air Quality Standards ($\mu g/m^3$)	
		Primary	Secondary
CO	1-hour	40,000	--
	8-hour	10,000	--

6.0 RESULTS

Attachment B to this report provides the model summary output. AERMOD input and output files, including the BPIP-PRIME files, are included on the enclosed CD.

6.1 Significant Impact Analysis Results

The project results in CO impacts in excess of the 8-hour Significant Impact Level shown in Table 3. The significant impact analysis results are presented in Table 6. Based upon the results of the significant impacts analysis, a cumulative, NAAQS analysis was conducted.

6.2 NAAQS Analysis Results

Following the determination of significant impacts, an analysis was conducted to assess compliance with the CO NAAQS. The project resulted in insignificant 1-hr CO impacts, as a result the 1-hr average was not included in the NAAQS assessment. All sources located within 50km of the US Steel facility were modeled in conjunction with the US Steel facility in assessing compliance. Background concentrations were added to the model results to assess compliance. Evaluation of compliance with the CO short term standards was based upon the maximum of the highest-second-highest values from the five-year meteorological dataset.

The results of the NAAQS analysis are presented in Table 7. As can be seen, the model demonstrates compliance.

Table 6. Significant Impact Analysis Results

Pollutant	Averaging Period	Maximum Modeled Impact ($\mu g/m^3$)	PSD Significant Class II Impact Level ($\mu g/m^3$)	Significant Monitoring Concentration ($\mu g/m^3$)	Maximum Distance to a Significant Impact (km)
CO	1-hr	1,157	2,000	N/A	NA
	8-hr	692	500	575	2.2

N/A – Not applicable, impacts calculated to be insignificant.

Table 7. NAAQS Analysis Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	Standard ($\mu g/m^3$)	Comment
CO	8-hour	2,045	1,646	3,691	10,000	Compliant

R005437

ATTACHMENT A
MODELING INPUT DATA

US Steel Granite City Point Source Model Input (NAD83, Zone 15)
Last Update (10-5-22)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
132833	DEFAULT	Blast Furnace A Stoves	749816.02	4286809.08	416.83	217.0	500.0	49.66	7.0	1604.52	1604.52
132838	DEFAULT	Blast Furnace B Stoves	749665.50	4286719.93	417.16	225.0	500.0	51.05	9.8	1837.76	1837.76
132837	DEFAULT	Blast Furnace Gas Flare #1	749777.33	4286841.02	418.21	221.8	1831.7	65.62	15.4	6280.99	6280.99
240479	DEFAULT	Blast Furnace Gas Flare #2	749865.93	4286920.23	416.24	221.8	1831.7	65.62	15.4	6280.99	0.00
132836	DEFAULT	Casthouse Baghouse	749616.61	4286732.18	417.75	63.0	150.0	63.88	11.0	63.77	21.68
132927	DEFAULT	Blast Furnace A and B Iron Spout Baghouse	749831.35	4286818.73	415.98	43.0	123.0	43.04	7.8	6.43	2.19
238459	DEFAULT	Cogeneration Boiler BFG-fired some NG-firing	749776.38	4287073.85	415.19	137.0	400.1	62.11	6.0	203.08	0.00
132867	DEFAULT	Boiler 11	749865.15	4286883.84	416.24	149.9	335.0	29.82	8.0	90.48	90.48
132872	DEFAULT	Boiler 12	749881.40	4286887.85	416.50	150.0	335.0	26.74	8.0	90.48	90.48
BOF	DEFAULT	BOF ESP	748415.00	4286681.00	416.57	125.0	400.0	50.00	15.0	4121.79	1274.01
BOF2ND	DEFAULT	BOF Secondary Baghouse	748625.57	4286763.99	413.00	160.0	275.0	38.55	17.0	19.69	19.69
132842	DEFAULT	Slab Reheat Furnace #1	747729.70	4286762.02	417.52	56.8	650.1	44.88	8.0	26.52	0.00
172532	DEFAULT	Slab Reheat Furnace #2	747715.25	4286747.05	416.47	56.8	650.1	44.88	8.0	26.52	0.00
172512	DEFAULT	Slab Reheat Furnace #3	747700.79	4286730.53	415.88	56.8	650.1	44.88	8.0	26.52	0.00
172514	DEFAULT	Slab Reheat Furnace #4	747700.27	4286714.00	416.08	146.0	736.1	26.94	13.7	40.76	0.00
132849	DEFAULT	Galvanizing line #8 - fume scrubber	748883.00	4287195.00	416.57	80.0	80.0	41.66	3.0	0.00	0.00
229337	DEFAULT	Galvanizing line #8 - space heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229338	DEFAULT	Galvanizing line #8 - drying oven and storage area heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229339	DEFAULT	Galvanizing line #8 - miscellaneous heaters	748398.00	4287038.00	418.90	39.0	284.1	23.16	2.0	0.00	0.00
229601	DEFAULT	Emergency Generator (3500 HP)	749641.00	4286863.00	416.17	37.0	442.0	32.80	1.9	0.00	0.00
GTEWY1	DEFAULT	Gateway Energy & Coke Co., LLC - Coking (New Main Stack)	749279.00	4286984.00	415.78	199.9	293.1	48.249	13.0	2.62E+01	0.00
GTEWY2	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 2 of 6	749549.00	4287055.00	418.18	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY3	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 3 of 6	749433.00	4286972.00	418.93	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY4	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 4 of 6	749357.00	4286918.00	418.64	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY5	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 5 of 6	749278.00	4286861.00	418.44	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY6	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 6 of 6	749202.00	4286808.00	418.60	26.0	299.9	68.093	4.5	6.64E-02	0.00
GTEWY7	DEFAULT	Gateway Energy & Coke Co., LLC - Charging - Stack 1 of 6	749624.00	4287108.00	418.50	26.0	299.9	68.093	4.5	6.68E-02	0.00
GTEWY8	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 1	749199.00	4286809.00	418.60	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY9	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 1 of 6	749620.00	4287113.00	418.11	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY10	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 2	749274.00	4286862.00	418.31	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY11	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 3	749353.00	4286919.00	418.67	85.0	2000.0	74.653	9.0	7.30E-01	0.00
GTEWY12	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 4	749429.00	4286973.00	419.00	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY13	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 5	749545.00	4287055.00	418.27	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY14	DEFAULT	Gateway Energy & Coke Co., LLC - Waste heat stack 6	749620.00	4287109.00	418.34	85.0	2000.0	74.653	9.0	7.35E-01	0.00
GTEWY15	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 2 of 6	749545.00	4287060.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY16	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 3 of 6	749429.00	4286977.00	418.93	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY17	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 4 of 6	749352.00	4286923.00	418.57	20.0	400.0	69.602	5.0	1.31E+00	0.00
GTEWY18	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 5 of 6	749274.00	4286866.00	418.24	20.0	400.0	69.602	5.0	1.32E+00	0.00
GTEWY19	DEFAULT	Gateway Energy & Coke Co., LLC - Pushing - Stack 6 of 6	749198.00	4286813.00	418.77	20.0	400.0	69.602	5.0	1.32E+00	0.00

US Steel Granite City Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	CO Potential Emissions (lb/hr)	CO Emissions Increase (lb/hr)
26070	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748457.20	4286596.40	413.88	169.0	21.6	78.6	1.373	1.373
26080	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748466.60	4286606.00	413.98	169.0	21.6	78.6	1.373	1.373
26090	Ladle Preheaters/Dryers (formerly BOF 4, NG & COG) - Roof Monitor	748475.40	4286616.10	413.88	169.0	21.6	78.6	1.373	1.373
26100	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748483.60	4286624.10	413.85	169.0	21.6	78.6	1.029	1.029
26110	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748495.20	4286635.90	414.01	169.0	21.6	78.6	1.029	0.000
26120	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748504.10	4286646.00	414.37	169.0	21.6	78.6	1.029	0.000
26130	Ladle Preheaters / Dryers (formerly BOF 5, NG & COG) - Roof Monitor	748513.90	4286656.70	414.63	169.0	21.6	78.6	1.029	0.000
26570	Galv Line 8	748368.26	4287046.91	420.41	101.7	12.3	48.5	0.254	0.000
26580	Galv Line 8	748374.01	4287041.49	420.11	101.7	12.3	48.5	0.254	0.000
26590	Galv Line 8	748379.56	4287036.28	419.82	101.7	12.3	48.5	0.254	0.000
26600	Galv Line 8	748420.52	4286997.79	419.55	38.0	15.1	38.0	0.254	0.000
26610	Galv Line 8	748428.00	4286990.81	419.95	38.0	15.1	38.0	0.254	0.000
26620	Galv Line 8	748436.60	4286982.91	419.85	38.0	15.1	38.0	0.254	0.000
26630	Galv Line 8	748444.54	4286975.49	419.62	38.0	15.1	38.0	0.254	0.000
26640	Galv Line 8	748451.78	4286968.87	418.50	38.0	15.1	38.0	0.254	0.000
26650	Galv Line 8	748324.79	4287118.60	421.65	38.0	15.6	17.7	0.254	0.000
26660	Galv Line 8	748331.95	4287112.00	421.52	38.0	15.6	17.7	0.254	0.000
26670	Galv Line 8	748340.34	4287104.30	421.39	38.0	15.6	17.7	0.254	0.000
26680	Galv Line 8	748347.69	4287097.51	421.29	38.0	15.6	17.7	0.254	0.000
26690	Galv Line 8	748354.48	4287091.31	421.16	38.0	15.6	17.7	0.254	0.000
26700	Galv Line 8	748362.29	4287084.18	420.87	38.0	15.6	17.7	0.254	0.000
26710	Galv Line 8	748370.46	4287076.71	420.51	38.0	15.6	17.7	0.254	0.000
26720	Galv Line 8	748378.04	4287069.70	420.14	38.0	15.6	17.7	0.254	0.000
26730	Galv Line 8	748385.51	4287062.91	419.52	38.0	15.6	17.7	0.254	0.000
0126A_1	Slag Pit Volume 1	749691.91	4286762.44	418.70	53.0	29.0	17.7	0.000	0.000
0126A_2	Slag Pit Volume 2	749708.01	4286772.50	421.33	53.0	29.0	17.7	0.000	0.000
0126A_3	Slag Pit Volume 3	749724.24	4286782.31	420.44	53.0	29.0	17.7	0.000	0.000
0126A_4	Slag Pit Volume 4	749740.84	4286791.62	419.00	53.0	29.0	17.7	0.000	0.000
0126A_5	Slag Pit Volume 5	749757.20	4286801.31	418.86	53.0	29.0	17.7	0.000	0.000

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Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL131772	DEFAULT	Star Memorial Pet Crematory - Crematory	749244.00	4324486.00	641.44	16.0	800.0	27.585	1.0	2.70E+00	0.00E+00	0.00E+00
IL131841	DEFAULT	Alton Steel Inc. - Electric arc furnaces	747753.00	4307832.00	433.07	100.0	250.1	31.029	24.2	2.25E+02	7.07E+01	7.07E+01
IL131845	DEFAULT	Alton Steel Inc. - 14 inch rolling mill reheat furnace	747645.00	4307692.00	432.64	106.0	200.0	2.394	16.0	2.40E+01	0.00E+00	0.00E+00
IL131945	DEFAULT	Alton Memorial Hospital - 3 Boilers	746364.00	4309470.00	521.36	89.0	389.9	24.108	3.0	0.00E+00	1.28E+01	1.28E+01
IL132052	DEFAULT	Olin Winchester, LLC - Package Boiler (B-4)	750887.00	4308614.00	435.63	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132062	DEFAULT	Olin Winchester, LLC - Package Boiler (B-3)	750891.00	4308619.00	435.89	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132063	DEFAULT	Olin Winchester, LLC - Package Boiler (B-2)	750892.00	4308613.00	435.53	35.0	400.0	84.854	2.0	0.00E+00	4.57E+00	4.57E+00
IL132064	DEFAULT	Olin Winchester, LLC - Package Boiler (B-1)	750888.00	4308609.00	435.30	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132065	DEFAULT	Olin Winchester, LLC - Package Boiler (B-5)	750883.00	4308610.00	435.27	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL132148	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #1 (EF-1)	747122.00	4287625.00	425.26	55.0	250.1	54.087	6.2	3.84E+01	4.07E+00	4.07E+00
IL132149	DEFAULT	Amsted Rail Co., Inc. - Electric Arc Furnace #2 (EF-2)	747147.00	4287625.00	425.20	44.0	250.1	42.443	7.0	3.84E+01	4.07E+00	4.07E+00
IL132193	DEFAULT	Velocity Services, LLC. - North American Boiler	748928.00	4286192.00	416.21	27.0	450.1	24.305	2.3	2.36E+00	0.00E+00	0.00E+00
IL132194	DEFAULT	Velocity Services, LLC. - Cleaver Brooks boiler	748928.00	4286192.00	416.21	29.0	440.0	39.590	2.0	2.36E+00	0.00E+00	0.00E+00
IL132225	DEFAULT	Gateway Regional Medical Center - Boiler #3	748587.00	4287448.00	426.05	48.0	600.0	41.131	4.5	1.53E+00	1.28E+01	1.28E+01
IL132226	DEFAULT	Gateway Regional Medical Center - Boilers #1 and 2	748592.00	4287452.00	425.85	48.0	600.0	38.966	4.5	3.07E+00	2.57E+01	2.57E+01
IL132247	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #1	747505.00	4287550.00	424.64	75.0	375.0	30.078	2.5	1.30E-01	0.00E+00	0.00E+00
IL132248	DEFAULT	Prairie Farms Dairy, Inc. - Boiler #2	747505.00	4287550.00	424.64	25.0	375.0	65.010	2.5	2.40E-01	1.19E+00	1.19E+00
IL132324	DEFAULT	Precoat Metals - Afterburner AB1 and AB2	749468.00	4292538.00	424.97	34.0	1000.0	64.518	4.0	3.23E+00	0.00E+00	0.00E+00
IL132424	DEFAULT	Highland Electric Light Plant - Engine IC-5	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	2.07E+01	0.00E+00	0.00E+00
IL132425	DEFAULT	Highland Electric Light Plant - Engine IC-7	788126.93	4293320.17	534.65	57.0	734.1	6.265	11.4	2.51E+01	0.00E+00	0.00E+00
IL132496	DEFAULT	ConocoPhillips Co. - Catalytic reformer #1 (STK12-4)	754868.00	4302625.00	442.55	349.9	600.0	56.810	15.0	6.28E+01	9.53E+01	9.53E+01
IL132510	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-FB01 (STK5-2)	754327.00	4303077.00	444.68	185.0	319.0	21.878	8.0	1.21E+01	0.00E+00	0.00E+00
IL132511	DEFAULT	ConocoPhillips Co. - Distilling unit: HTR-DU1-FB02 (STK5-1)	754328.00	4303100.00	444.49	150.0	150.0	11.677	8.5	1.57E+01	5.29E+00	5.29E+00
IL132512	DEFAULT	ConocoPhillips Co. - Steam methane reformer: SMR Heater (HTR-SMR - STK12-8)	754873.00	4302750.00	443.04	199.9	749.9	38.638	12.0	4.75E+01	6.82E+01	6.82E+01
IL132516	DEFAULT	ConocoPhillips Co. - Rectified absorption unit: Reboiler heater (HTR-RAU-GEBUT - STK5-5)	754470.00	4302943.00	444.98	75.0	850.0	34.440	5.0	7.16E+00	0.00E+00	0.00E+00
IL132517	DEFAULT	ConocoPhillips Co. - Rectified absorption system to RFG	754240.00	4303144.00	443.47	150.0	710.0	26.338	6.0	0.00E+00	1.20E+02	1.20E+02
IL132519	DEFAULT	ConocoPhillips Co. - Cracked absorption unit (HTR-CAU-ROSTIL - STK5-4)	754468.00	4302983.00	445.41	85.0	800.0	22.173	7.2	6.72E+00	0.00E+00	0.00E+00
IL132526	DEFAULT	ConocoPhillips Co. - CCU-1 Startup heater B-1	754240.00	4303144.00	443.47	212.0	900.1	86.953	4.5	0.00E+00	3.55E+01	3.55E+01
IL132535	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #2 (STK6-3)	754848.00	4302895.00	443.27	199.9	175.0	49.954	11.0	4.72E+01	2.17E+03	2.17E+03
IL132551	DEFAULT	ConocoPhillips Co. - Alkylation unit: HTR-ALKY-HM2 (STK6-6)	754930.00	4303043.00	442.59	150.9	475.1	12.398	5.7	4.32E+00	0.00E+00	0.00E+00
IL132556	DEFAULT	ConocoPhillips Co. - Utility boiler #15 (STK12-15)	754859.00	4302776.00	443.44	132.0	425.0	43.165	7.0	2.65E+01	1.62E+01	1.62E+01
IL132557	DEFAULT	ConocoPhillips Co. - Utility boiler #16 (STK12-16)	754875.00	4302778.00	443.21	132.0	425.0	43.165	7.0	2.78E+01	1.41E+01	1.41E+01
IL132558	DEFAULT	ConocoPhillips Co. - Utility boiler 17 (STK12-17)	754902.00	4302784.00	442.91	150.0	317.0	52.218	10.0	3.60E+01	1.82E+01	1.82E+01
IL132559	DEFAULT	ConocoPhillips Co. - Utility boiler 18 (STK6-9)	754919.00	4302809.00	442.52	100.0	325.0	14.465	6.2	3.00E+01	6.61E+00	6.61E+00
IL132561	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #1: Charge heater (HTR-HDU-1 - STK13-1)	755217.00	4302588.00	442.16	150.0	790.1	32.144	5.0	5.60E+00	0.00E+00	0.00E+00
IL132564	DEFAULT	ConocoPhillips Co. - Hydrodesulfurization unit #2: Charge heater (HTR-HDU-2 - STK12-14)	755022.00	4302580.00	442.85	150.0	900.1	31.422	5.8	4.90E+00	0.00E+00	0.00E+00
IL132565	DEFAULT	ConocoPhillips Co. - Cat reformer #3: Stabilizer reboiler (HTR-CR3-H2 - STK12-9)	755014.00	4302580.00	442.62	150.0	850.1	7.019	7.8	4.79E+00	0.00E+00	0.00E+00
IL132567	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: Charge heater (HTR-CR3 -H4)	755019.00	4302571.00	442.65	150.0	800.0	28.766	7.8	1.75E+01	8.04E+00	8.04E+00
IL132568	DEFAULT	ConocoPhillips Co. - Catalytic reformer unit #3: Feed interreactor heater (HTR-CR3-H5)	755019.00	4302548.00	442.78	150.0	749.9	26.829	7.8	2.11E+01	6.93E+00	6.93E+00
IL132569	DEFAULT	ConocoPhillips Co. - Cat reformer #3- Second interreactor heater (HTR CR3-H6 - STK12-11)	755019.00	4302559.00	442.72	150.0	749.9	14.006	7.8	5.55E+00	0.00E+00	0.00E+00
IL132594	DEFAULT	ConocoPhillips Co. - Sulfuric acid tank	755114.00	4302829.00	441.93	40.0	186.0	26.273	2.0	1.78E+00	2.35E+00	2.35E+00
IL132598	DEFAULT	ConocoPhillips Co. - CCU-2 Startup heater B-1	754240.00	4303144.00	443.47	16.0	509.1	32.964	3.2	4.40E-01	0.00E+00	0.00E+00
IL132599	DEFAULT	Airgas USA, LLC - Liquified carbon dioxide plant	756314.00	4302509.00	435.93	30.0	70.1	79.573	0.2	4.10E-01	0.00E+00	0.00E+00
IL132701	DEFAULT	Kinder Morgan Liquids Terminals, LLC - New Truck loading rack	752998.00	4303578.00	435.63	20.0	70.1	0.262	2.2	4.87E+00	0.00E+00	0.00E+00
IL132739	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 1 of 2)	750915.00	4300904.00	402.46	34.0	450.1	23.321	2.0	1.90E+00	5.00E+00	5.00E+00
IL132777	DEFAULT	Elias Kaial & Schaal Funeral Home & Crematory - Crematorium	742098.00	4312210.00	627.30	30.0	1400.1	18.368	1.7	3.00E+00	0.00E+00	0.00E+00
IL132781	DEFAULT	Christ Bros Products, LLC - Baghouse	754160.00	4283243.00	419.46	32.0	240.0	83.706	3.9	5.54E+01	2.48E+01	2.48E+01
IL132928	DEFAULT	Enable Mississippi River Transmission, LLC - Engine SN-02	782556.00	4285336.00	492.29	30.0	1000.0	9.414	2.6	1.36E+01	0.00E+00	0.00E+00
IL133625	DEFAULT	Waterloo City Light Plant - Engine #1	748326.00	4246769.00	640.45	29.0	749.9	13.579	2.3	4.00E+01	1.35E+00	1.35E+00
IL133627	DEFAULT	Waterloo City Light Plant - Engine #9	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL133628	DEFAULT	Waterloo City Light Plant - Engine #10	748326.00	4246769.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL135983	DEFAULT	Lakeview Memorial Gardens - Crematory	762896.00	4273894.00	579.99	16.0	895.0	26.666	2.6	8.40E+00	0.00E+00	0.00E+00
IL136012	DEFAULT	Breckenridge of IL - Natural gas combustion	756461.00	4277782.00	423.82	38.0	341.0	25.781	2.7	3.94E+00	0.00E+00	0.00E+00
IL136014	DEFAULT	Touchette Regional Hospital - 2 Boilers	791890.00	4279014.00	415.94	39.0	800.0	6.560	3.7	2.28E+00	0.00E+00	0.00E+00
IL136018	DEFAULT	Upchurch Ready Mix Concrete Company - Boiler	749859.00	4276616.00	418.44	30.0	376.1	29.884	3.7	0.00E+00	3.00E-01	3.00E-01

R005441

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL136098	DEFAULT	Safety Kleen Systems, Inc. - Pure still (heat exchanger)	749786.00	4276425.00	420.25	15.0	170.0	0.295	1.0	0.00E+00	1.38E+00	1.38E+00
IL136125	DEFAULT	Milam Recycling and Disposal Facility - Open flare	750434.00	4282812.00	420.54	42.0	1800.1	10.070	1.0	1.83E+01	6.00E+00	6.00E+00
IL136129	DEFAULT	Village of Freeburg - Engine #6	769352.00	4257578.00	509.42	24.0	748.9	24.239	1.8	3.93E+00	0.00E+00	0.00E+00
IL136130	DEFAULT	Village of Freeburg - Engine #4	769352.00	4257578.00	509.42	25.0	550.0	87.873	1.3	9.60E+00	0.00E+00	0.00E+00
IL136131	DEFAULT	Village of Freeburg - Engine #7	769352.00	4257578.00	509.42	22.0	900.1	18.926	2.7	4.50E+01	4.43E+00	4.43E+00
IL136169	DEFAULT	Darling Ingredients, Inc. - Continuous rendering process	747472.00	4281438.00	414.93	44.0	74.9	84.854	4.0	6.67E+00	1.43E+00	1.43E+00
IL136187	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	772958.00	4275690.00	514.30	33.0	325.0	47.134	4.5	6.49E+01	2.90E+01	2.90E+01
IL136486	DEFAULT	Cerro Flow Products, LLC. - Piercing Mill Furnace #2	746228.00	4275272.00	407.32	25.0	299.9	38.901	2.0	8.68E-01	0.00E+00	0.00E+00
IL136547	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	747162.00	4269805.00	448.72	36.0	315.1	86.592	3.5	1.34E+01	5.91E+00	5.91E+00
IL142809	DEFAULT	Magnesium Elektron North America - Combustion units	746452.00	4285724.00	415.49	60.0	450.1	30.537	2.0	1.02E+01	4.44E+00	4.44E+00
IL143317	DEFAULT	Waterloo City Light Plant - Engine #11	748326.00	4246789.00	640.45	17.0	936.1	84.854	1.0	1.50E+01	3.60E+00	3.60E+00
IL143319	DEFAULT	Waterloo City Light Plant - Engine #7	748326.00	4246789.00	640.45	33.0	749.9	84.854	2.0	3.41E+01	0.00E+00	0.00E+00
IL143320	DEFAULT	Waterloo City Light Plant - Engine #8	748326.00	4246789.00	640.45	27.0	880.1	84.230	2.3	1.87E+01	1.36E+00	1.36E+00
IL145809	DEFAULT	ConocoPhillips Co. - Crude heaters (STK5-8)	754415.00	4303616.00	445.93	231.9	530.0	87.970	14.0	7.81E+01	1.98E+01	1.98E+01
IL145820	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #1 (STK3-1)	752928.00	4303077.00	428.41	129.0	985.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145826	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-1	754240.00	4303144.00	443.47	15.0	117.1	20.369	1.5	7.10E-01	1.74E+00	1.74E+00
IL145832	DEFAULT	ConocoPhillips Co. - Sulfur recovery unit #2 (STK3-2)	752928.00	4303078.00	428.38	129.0	985.9	17.712	7.2	0.00E+00	4.05E+01	4.05E+01
IL145850	DEFAULT	ConocoPhillips Co. - Flare for major effluent treatment project	754240.00	4303144.00	443.47	30.0	78.0	14.006	9.2	4.51E+00	0.00E+00	0.00E+00
IL147845	DEFAULT	Mayco Mfg, LLC - Brut kettles combustion stack	747189.00	4286970.00	421.78	34.0	250.1	2.362	1.1	2.00E-01	0.00E+00	0.00E+00
IL147846	DEFAULT	Mayco Mfg, LLC - Mixed metals A-B dross baghouse discharge stack	747189.00	4286970.00	421.78	30.0	95.1	52.611	5.0	5.77E-01	0.00E+00	0.00E+00
IL148354	DEFAULT	ConocoPhillips Co. - Catalytic cracking unit #1 (STK6-2)	754864.00	4302895.00	442.88	199.9	175.0	49.954	11.0	2.32E+01	3.84E+01	3.84E+01
IL149873	DEFAULT	City of Alton - Incinerator	749456.00	4310990.00	446.33	25.0	1400.1	53.038	1.0	1.40E+00	0.00E+00	0.00E+00
IL149908	DEFAULT	Charles E. Mahoney - Drum mix asphalt plant	749517.00	4309892.00	443.14	25.0	295.1	66.289	4.0	5.74E+01	2.56E+01	2.56E+01
IL154190	DEFAULT	Milam Recycling and Disposal Facility - Engine #1	750544.00	4282853.00	411.88	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154191	DEFAULT	Milam Recycling and Disposal Facility - Engine #2	750538.00	4282852.00	412.01	26.0	820.0	86.231	0.8	6.93E+00	1.78E+00	1.78E+00
IL154192	DEFAULT	Milam Recycling and Disposal Facility - Engine #3	750548.00	4282855.00	411.81	26.0	820.0	86.231	0.8	7.14E+00	1.84E+00	1.84E+00
IL155302	DEFAULT	Alton Steel Inc. - Ladle Furnace	747753.00	4307832.00	433.07	74.0	275.1	87.215	3.0	2.24E+01	1.12E+01	1.12E+01
IL155304	DEFAULT	Precoat Metals - Boiler B1	749469.00	4292538.00	424.97	24.0	700.1	20.730	1.6	8.80E-01	0.00E+00	0.00E+00
IL155305	DEFAULT	Granite City Pickling & Warehousing - Boiler	746973.00	4286390.00	422.41	50.0	331.1	15.449	2.7	7.06E-01	0.00E+00	0.00E+00
IL155307	DEFAULT	Kraft Heinz Co. - Boiler 8	748105.00	4289560.00	423.55	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL155437	DEFAULT	Southwestern Illinois Correctional Center - 2 Boilers	753202.00	4278290.00	421.46	32.0	450.1	15.285	1.5	7.06E-01	0.00E+00	0.00E+00
IL155441	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	772959.00	4275690.00	514.30	33.0	341.0	18.368	3.2	0.00E+00	2.80E+00	2.80E+00
IL156624	DEFAULT	US Air Force/Scott Air Force Base - Boilers and Heaters	774397.00	4270862.00	440.32	30.0	391.1	28.288	2.2	4.81E+00	0.00E+00	0.00E+00
IL156970	DEFAULT	Olin Winchester, LLC - Package Boiler (B-6)	750908.00	4308625.00	436.06	35.0	400.0	84.854	2.0	0.00E+00	4.60E+00	4.60E+00
IL159940	DEFAULT	Afton Chemical Corp. - 258 Sulfonation Stack	746613.00	4276305.00	407.05	158.0	70.1	41.820	1.0	0.00E+00	5.59E+00	5.59E+00
IL159942	DEFAULT	Afton Chemical Corp. - Unit 266: Flare 36-0011/36-0610	746653.00	4276356.00	410.10	100.0	700.1	59.368	0.7	8.55E+00	4.90E+01	4.90E+01
IL159965	DEFAULT	Afton Chemical Corp. - Flare 36-0218	746513.00	4276305.00	407.05	146.0	1000.0	42.837	0.4	3.84E+00	2.74E+01	2.74E+01
IL160741	DEFAULT	Brady McCasland, Inc. - Compaction plant	748518.00	4276987.00	413.75	17.0	1521.1	65.469	1.8	5.20E-01	0.00E+00	0.00E+00
IL160742	DEFAULT	Darling Ingredients, Inc. - Kewanee boiler	747472.00	4281438.00	414.93	35.0	450.1	54.448	2.6	1.96E+00	1.51E+01	1.51E+01
IL160799	DEFAULT	ConocoPhillips Co. - Supplemental air compressor engine CCU-2	754240.00	4303144.00	443.47	48.0	117.1	20.369	1.5	0.00E+00	1.74E+00	1.74E+00
IL160898	DEFAULT	Afton Chemical Corp. - Boiler 500-15-0110	746653.00	4276489.00	405.22	45.0	350.0	17.318	7.0	4.89E+00	0.00E+00	0.00E+00
IL165120	DEFAULT	BFI Waste Systems of North America, Inc. - Flare	758882.00	4264336.00	574.97	35.0	1600.1	29.485	0.8	6.80E+00	0.00E+00	0.00E+00
IL166479	DEFAULT	Union Electric Co. - Turbine CT02A	745573.00	4283620.00	420.60	30.0	850.0	18.860	11.4	7.73E+01	2.73E+01	2.73E+01
IL166491	DEFAULT	Enable Mississippi River Transmission, LLC - Turbine SN-03	782556.00	4285336.00	492.29	30.0	749.9	86.854	2.5	9.56E+00	0.00E+00	0.00E+00
IL167781	DEFAULT	Amsted Rail Co., Inc. - Pouring and casting (PR/CST-1)	747025.00	4287611.00	424.80	101.0	251.0	34.768	9.7	0.00E+00	6.70E-01	6.70E-01
IL167787	DEFAULT	Amsted Rail Co., Inc. - Ladle Preheater (LDP-1)	747039.00	4287611.00	424.93	82.0	505.0	31.482	6.1	6.50E+00	2.20E-01	2.20E-01
IL167858	DEFAULT	ConocoPhillips Co. - Sect unit	754240.00	4303144.00	443.47	16.0	115.1	15.580	9.0	0.00E+00	1.72E+02	1.72E+02
IL169226	DEFAULT	Messer, LLC - 2 Boilers	752369.00	4301226.00	434.42	15.0	850.0	0.525	1.4	2.52E+00	0.00E+00	0.00E+00
IL172707	DEFAULT	St. Anthony's Hospital - Boiler #4	749097.00	4310364.00	584.58	64.0	400.0	58.614	2.3	0.00E+00	6.02E+00	6.02E+00
IL179611	DEFAULT	Highland Electric Light Plant - Engine IC-1	788126.93	4293370.17	534.65	12.0	656.0	86.920	1.2	1.44E+01	0.00E+00	0.00E+00
IL179671	DEFAULT	Village of Freeburg - Engine #1	769352.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179672	DEFAULT	Village of Freeburg - Engine #2	769357.00	4257578.00	509.42	30.0	500.1	40.311	1.0	8.55E+00	8.25E-01	8.25E-01
IL179673	DEFAULT	Village of Freeburg - Engine #3a	769352.00	4257578.00	509.42	25.0	500.1	55.170	1.0	5.92E+00	0.00E+00	0.00E+00
IL181173	DEFAULT	ConocoPhillips Co. - Loading rack	752292.00	4299987.00	429.92	40.0	1800.1	87.510	2.0	1.58E+00	0.00E+00	0.00E+00
IL183783	DEFAULT	Veolia ES Technical Solutions, LLC - Hazardous waste incinerator #4 (rotary kiln)	745532.00	4275942.00	414.76	57.0	650.9	32.570	2.8	3.17E+00	1.16E+01	1.16E+01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
IL189066	DEFAULT	US Air Force/Scott Air Force Base - Diesel generators	774387.00	4270862.00	440.32	37.0	402.0	29.389	1.3	5.83E+01	0.00E+00	0.00E+00
IL190090	DEFAULT	Contract Services, LLC - 3 Boilers	746767.00	4275755.00	417.81	40.0	310.0	50.381	4.2	8.53E+00	5.14E+00	5.14E+00
IL192953	DEFAULT	Midwest Metal Coatings, LLC - Chemical coater/infrared oven (CC/ IRO)	748281.00	4290395.00	423.88	34.0	110.0	18.926	3.0	2.90E-01	0.00E+00	0.00E+00
IL192964	DEFAULT	Midwest Metal Coatings, LLC - Afterburner	748281.00	4290395.00	423.88	34.0	900.1	23.780	5.0	3.28E-01	0.00E+00	0.00E+00
IL192967	DEFAULT	Midwest Metal Coatings, LLC - Boiler (B1)	748281.00	4290395.00	423.88	34.0	400.0	67.338	1.5	2.12E+00	0.00E+00	0.00E+00
IL198552	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	778702.00	4276345.00	439.34	35.0	297.1	62.254	3.8	2.95E+01	1.32E+01	1.32E+01
IL201652	DEFAULT	Empire Comfort Systems - Stack	768528.00	4286182.00	477.26	25.0	800.0	14.334	1.0	2.69E+00	0.00E+00	0.00E+00
IL204833	DEFAULT	Milam Recycling and Disposal Facility - 3 Passive solar flares	750550.00	4282537.00	594.06	20.0	1800.1	57.138	0.7	4.23E+00	4.38E+00	4.38E+00
IL207740	DEFAULT	Chemtrade Solutions, LLC - Scrubber C007	758398.00	4281367.00	422.21	30.0	70.1	0.384	0.3	0.00E+00	2.00E-01	2.00E-01
IL208343	DEFAULT	Center Point Terminal Co. - Asphalt and polymer modified blend tank (T-8)	746361.00	4289240.00	416.44	33.0	385.1	0.951	1.5	1.00E-01	0.00E+00	0.00E+00
IL209238	DEFAULT	Concrete Supply, LLC - Natural gas combustion	757768.00	4302270.00	444.69	20.0	341.0	25.781	2.7	9.69E-01	0.00E+00	0.00E+00
IL209455	DEFAULT	Alton Water Treatment Facility - Stack	742583.00	4309460.00	488.98	22.0	400.0	85.083	0.7	0.00E+00	5.50E-01	5.50E-01
IL211274	DEFAULT	Kienstra-Illinois, LLC - Natural gas combustion	764550.00	4296982.00	575.95	20.0	341.0	25.781	2.7	7.68E-01	0.00E+00	0.00E+00
IL211772	DEFAULT	Center Point Terminal Co - Incinerator/waste heat boiler	746361.00	4289240.00	416.44	18.0	650.0	7.970	2.0	1.83E-01	1.05E+00	1.05E+00
IL212692	DEFAULT	Chain of Rocks Recycling & Disposal - Open flare	746845.00	4293274.00	481.59	20.0	1400.1	47.265	0.7	6.92E+00	1.06E+00	1.06E+00
IL212881	DEFAULT	Koch Fertilizer, LLC - Ammonia heater	750008.00	4305316.00	428.15	25.0	250.1	42.443	1.0	2.43E+00	5.30E-01	5.30E-01
IL213573	DEFAULT	Illinois Department of Transportation - R and K model 867-1 incinerator	732106.00	4332182.00	623.79	15.0	736.1	30.865	2.8	2.88E+00	0.00E+00	0.00E+00
IL213834	DEFAULT	Darling Ingredients, Inc. - Johnson boiler	747472.00	4281438.00	414.93	33.0	450.1	46.937	2.8	1.96E+00	1.51E+01	1.51E+01
IL213854	DEFAULT	Solvay Fluorides, LLC - Boiler	750245.00	4276115.00	419.72	30.0	361.0	7.314	2.8	1.44E+00	0.00E+00	0.00E+00
IL215315	DEFAULT	Madison County Sand, LLC - Drum mix asphalt plant	758921.00	4289026.00	422.01	32.0	245.0	64.452	4.1	1.63E+01	5.00E-01	5.00E-01
IL217756	DEFAULT	Phillips 66 Pipeline, LLC - Truck loading racks	748935.00	4274152.00	407.25	20.0	70.1	10.594	2.0	1.10E+01	0.00E+00	0.00E+00
IL218530	DEFAULT	ConocoPhillips Co. - North property ground flare (FLR1-2)	754486.00	4303322.00	445.08	195.0	1800.1	2.394	3.0	1.41E+01	0.00E+00	0.00E+00
IL218537	DEFAULT	Custom Steel Processing - Scrubber	746335.00	4286043.00	416.99	55.0	70.1	49.036	4.2	0.00E+00	1.00E-01	1.00E-01
IL218539	DEFAULT	Custom Steel Processing - Sulfuric acid storage tank	746335.00	4286043.00	416.99	35.0	127.0	0.000	2.4	0.00E+00	1.00E-01	1.00E-01
IL218569	DEFAULT	Contract Services, LLC - Boiler #4	746767.00	4275755.00	417.81	40.0	310.0	49.036	3.7	1.30E+01	1.64E+00	1.64E+00
IL218687	DEFAULT	ConocoPhillips Co - Gas plant sour water stripper	754240.00	4303144.00	443.47	15.0	128.9	11.382	2.9	1.06E+00	0.00E+00	0.00E+00
IL218895	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silos and truck loadout	772959.00	4275690.00	514.30	32.0	86.1	84.854	1.5	1.26E+00	0.00E+00	0.00E+00
IL219420	DEFAULT	Crown Textile Services - Boiler	744287.00	4259382.00	486.40	24.0	450.1	35.227	1.7	1.03E+00	0.00E+00	0.00E+00
IL220266	DEFAULT	American Colloid Co. - Sand drying	746862.00	4287239.00	418.91	72.0	491.1	28.766	3.3	1.29E+00	0.00E+00	0.00E+00
IL220267	DEFAULT	American Colloid Co. - Space Heaters	746862.00	4287239.00	418.91	35.0	198.1	21.484	1.4	2.30E-01	0.00E+00	0.00E+00
IL220618	DEFAULT	Asphalt Sales & Products Inc. - Drum mix asphalt plant	757560.00	4299901.00	441.63	32.0	280.0	68.922	4.3	7.61E+01	3.40E+01	3.40E+01
IL220849	DEFAULT	ConocoPhilips Co. - Alkylation unit flare (FLR6-1)	755035.00	4303081.00	442.55	199.9	1800.1	2.034	2.5	1.85E+01	0.00E+00	0.00E+00
IL222033	DEFAULT	Waterloo City Light Plant - Dual Fuel-fired Turbine GT1	748326.00	4246769.00	640.45	39.0	612.1	41.590	4.8	1.77E+01	0.00E+00	0.00E+00
IL222134	DEFAULT	Asphalt Sales & Products Inc. - Asphalt silo loading	757560.00	4299901.00	441.63	26.0	123.0	4.986	1.7	7.00E-01	0.00E+00	0.00E+00
IL222135	DEFAULT	Asphalt Sales & Products Inc. - Asphalt heaters and boilers	757560.00	4299901.00	441.63	35.0	361.0	26.896	3.7	0.00E+00	2.80E+00	2.80E+00
IL222988	DEFAULT	Apex Oil Co., Inc. - Thermal oxidizers	752471.00	4302667.00	431.07	18.0	820.0	43.985	2.3	2.98E+00	0.00E+00	0.00E+00
IL223796	DEFAULT	Union Electric Co - Turbine CT03	745735.00	4282930.00	420.96	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223797	DEFAULT	Union Electric Co. - Turbine CT04	745776.00	4282947.00	421.16	38.0	603.1	74.948	3.4	4.90E+01	1.30E+00	1.30E+00
IL223798	DEFAULT	Union Electric Co - Turbine CT05	745538.00	4283620.00	420.90	38.0	603.1	74.948	3.4	6.90E-01	9.00E-01	9.00E-01
IL224167	DEFAULT	Interurban ILAWC - Emergency generator	757265.00	4276109.00	482.38	29.0	880.1	61.463	1.3	1.10E+01	4.60E+00	0.00E+00
IL224416	DEFAULT	Belleville Landfill, Inc. - Flare	760402.00	4264040.00	571.88	35.0	1600.1	8.659	0.8	1.22E+01	0.00E+00	0.00E+00
IL224592	DEFAULT	Christ Bros Products, LLC - Drum mix asphalt plant	795685.00	4299823.00	431.10	32.0	251.0	53.628	4.1	3.09E+01	1.38E+01	1.38E+01
IL224594	DEFAULT	Christ Bros Products, LLC - Asphalt tank heaters and boilers	795701.00	4299841.00	427.46	10.0	416.0	42.443	1.0	1.18E+00	2.80E+00	2.80E+00
IL224838	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-01	750039.00	4285426.00	410.47	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224839	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-02	750044.00	4285416.00	410.24	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224840	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-03	750049.00	4285406.00	410.37	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224841	DEFAULT	Enable Mississippi River Transmission, LLC - Compressor engine SN-04	750054.00	4285397.00	410.30	22.0	1125.1	66.453	1.1	5.67E+00	0.00E+00	0.00E+00
IL224901	DEFAULT	Premcor Refining Group, Inc. - Thermal oxidizer	752775.00	4302414.00	429.95	20.0	342.1	49.462	0.8	7.40E-01	0.00E+00	0.00E+00
IL225166	DEFAULT	Metro Crematory - Crematory	754120.00	4290785.00	417.29	18.0	736.1	84.854	1.0	1.50E+00	0.00E+00	0.00E+00
IL225832	DEFAULT	ConocoPhillips Co. - Startup/malfunction/breakdown	754240.00	4303144.00	443.47	103.0	623.9	21.681	4.6	2.86E+01	1.91E+02	1.91E+02
IL225843	DEFAULT	City of O'Fallon - 400 kW (591 HP) Diesel generator	774612.00	4277280.00	434.42	13.0	300.1	86.592	0.7	3.37E+00	0.00E+00	0.00E+00
IL225844	DEFAULT	City of O'Fallon - 900 kW (1 322 HP) Diesel generator	774612.00	4277280.00	434.42	17.0	500.1	86.592	0.7	7.55E+00	0.00E+00	0.00E+00
IL225960	DEFAULT	Waterloo City Light Plant - Engine #4	748326.00	4246769.00	640.45	37.0	680.1	87.904	2.5	3.32E+01	0.00E+00	0.00E+00
IL226013	DEFAULT	Milam Recycling and Disposal Facility - 325 HP Tub grinder	750550.00	4282537.00	594.06	7.0	827.0	74.030	0.3	2.20E+00	8.00E-01	8.00E-01
IL226014	DEFAULT	Milam Recycling and Disposal Facility - Enclosed flare	750476.00	4282825.00	419.62	55.0	1400.1	0.656	12.0	2.40E+01	6.08E+00	6.08E+00

R005443

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL226015	DEFAULT	Milam Recycling and Disposal Facility - 760 HP Tub grinder	750650.00	4282537.00	594.66	8.0	627.0	70.881	0.7	5.16E+00	1.90E+00	1.90E+00
IL226184	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - 1F Mix muller (MM-3) Low profile turbine (LF-1) and induction form sta	750075.00	4306259.00	432.32	41.0	209.9	36.080	2.1	2.00E+00	0.00E+00	0.00E+00
IL226204	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #4 (SA-4)	750150.00	4306388.00	431.10	90.0	350.0	41.426	1.6	9.33E+01	0.00E+00	0.00E+00
IL226256	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip Anneal #3 (SA-3)	750439.00	4306328.00	433.63	100.0	350.0	62.746	1.3	9.83E+01	0.00E+00	0.00E+00
IL226257	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - #7 Strip Anneal (SA-7)	750222.00	4306335.00	433.26	89.0	850.0	38.671	1.5	1.18E+02	0.00E+00	0.00E+00
IL226352	DEFAULT	Olin Winchester, LLC - Hammermill 1 2 and 3 (HM-1 HM-2 and HM-3)	750496.00	4308287.00	434.42	21.0	160.1	19.647	1.8	8.03E+00	0.00E+00	0.00E+00
IL226612	DEFAULT	Solutia Inc. - Sanoflex process: Thermal oxidizer 2770934	746325.00	4275822.00	405.12	112.0	865.0	16.794	12.6	1.50E+01	0.00E+00	0.00E+00
IL226783	DEFAULT	Schildknecht Funeral Home, Inc. - Crematory	769033.00	4275796.00	549.67	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL227030	DEFAULT	ConocoPhillips Co. - #4 Crude unit heater H-24 (STK9-5)	753051.00	4302413.00	428.81	179.9	550.0	26.287	8.5	2.27E+01	0.00E+00	0.00E+00
IL227032	DEFAULT	ConocoPhillips Co. - Hydrogen plant #1 flare (FLR12-2)	755194.00	4302793.00	443.67	130.0	1600.1	7.870	1.7	1.62E+01	0.00E+00	0.00E+00
IL227034	DEFAULT	ConocoPhillips Co. - Sulfur operation	754240.00	4303144.00	443.47	158.0	590.1	57.753	3.4	0.00E+00	3.60E+01	3.60E+01
IL227035	DEFAULT	ConocoPhillips Co. - Process heater HP-1 (STK12-6)	755194.00	4302793.00	443.67	127.0	360.1	27.093	7.5	6.97E+00	0.00E+00	0.00E+00
IL227038	DEFAULT	ConocoPhillips Co. - SZU Charge heater H-3	755219.00	4302667.00	442.29	150.0	567.1	25.538	5.0	5.75E+00	0.00E+00	0.00E+00
IL227333	DEFAULT	Waterloo City Light Plant - Engine SGS	750635.00	4249410.00	528.97	8.0	924.0	61.172	0.7	1.40E+00	0.00E+00	0.00E+00
IL227400	DEFAULT	Collinsville Wastewater Treatment Plant - Emergency diesel generator (2922 HP/2180 kW)	758289.00	4283982.00	419.36	36.0	892.0	67.371	2.0	1.72E+01	1.20E+00	0.00E+00
IL227432	DEFAULT	Total Metal Recycling, Inc. - Safety certification unit	748030.00	4289120.00	422.74	6.0	587.0	8.069	1.2	1.00E-01	0.00E+00	0.00E+00
IL227590	DEFAULT	Illinois Electric Works - 3 Burn off ovens	747872.00	4288124.00	423.20	46.0	250.1	41.230	2.4	1.17E+00	6.90E-02	6.90E-02
IL227679	DEFAULT	Union Electric Co. - Diesel generator	745516.00	4283326.00	430.58	26.0	490.0	60.811	1.4	1.30E+00	1.60E-01	1.60E-01
IL228139	DEFAULT	St. Clair Crematory - Human crematory	773291.00	4275644.00	507.28	17.0	1241.0	13.612	1.7	1.20E+00	0.00E+00	0.00E+00
IL228260	DEFAULT	Center Ethanol Co - West boiler	745888.00	4275662.00	412.66	75.0	428.1	43.460	3.0	3.23E+00	0.00E+00	0.00E+00
IL228262	DEFAULT	Center Ethanol Co. - East boiler	745888.00	4275662.00	412.66	75.0	428.1	45.428	3.0	3.23E+00	0.00E+00	0.00E+00
IL228263	DEFAULT	Center Ethanol Co. - RTO	745888.00	4275662.00	412.66	50.0	310.0	70.664	5.5	6.85E+00	0.00E+00	0.00E+00
IL228294	DEFAULT	ConocoPhillips Co. - Distilling west refinery flare (FLR10-1)	753647.00	4302546.00	430.31	197.0	1800.1	6.626	3.0	2.51E+01	0.00E+00	0.00E+00
IL228295	DEFAULT	ConocoPhillips Co. - SZU Regenerator vent	755209.00	4302720.00	442.32	44.0	135.1	32.341	2.0	1.78E+00	2.35E+00	2.35E+00
IL229921	DEFAULT	Christ Bros Products, LLC - 8 Heaters and boilers	754160.00	4283243.00	419.46	37.0	400.0	20.664	1.8	1.18E+00	2.80E+00	2.80E+00
IL229922	DEFAULT	Christ Bros Products, LLC - Silo filling	754160.00	4283243.00	419.46	25.0	74.0	0.262	0.4	5.10E-01	0.00E+00	0.00E+00
IL229923	DEFAULT	Christ Bros Products, LLC - Truck loading	754160.00	4283243.00	419.46	29.0	135.1	48.052	2.0	5.80E-01	0.00E+00	0.00E+00
IL230300	DEFAULT	Afton Chemical Corp. - Flare 36-0090	746478.00	4276293.00	407.28	45.0	1600.1	0.656	8.0	2.20E+00	0.00E+00	0.00E+00
IL230350	DEFAULT	Village of Freeburg - Engine #10	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL230355	DEFAULT	Asphalt Sales & Products Inc. - Truck loadout	757560.00	4299901.00	441.63	28.0	135.1	43.198	1.9	7.90E-01	0.00E+00	0.00E+00
IL231259	DEFAULT	Village of Freeburg - Engine #11	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231260	DEFAULT	Village of Freeburg - Engine #12	769352.00	4257578.00	509.42	28.0	929.9	87.674	1.5	1.28E+01	3.20E+00	3.20E+00
IL231291	DEFAULT	Kurrus Funeral Home - 2 Crematories	759066.00	4271294.00	547.31	18.0	787.0	13.186	1.1	2.70E+00	0.00E+00	0.00E+00
IL232739	DEFAULT	ConocoPhillips Co. - Benzene extraction unit #3 (STK6-4)	754923.00	4302930.00	442.59	185.0	470.0	16.138	9.7	1.22E+01	0.00E+00	0.00E+00
IL232785	DEFAULT	Roxana Landfill, Inc. - Enclosed flare	759153.00	4301368.00	619.62	35.0	1600.1	20.008	12.0	2.31E+01	1.76E+00	1.76E+00
IL233294	DEFAULT	Gateway Terminals, LLC. - Marine vapor combustion unit (MVCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	1.69E+01	0.00E+00	0.00E+00
IL233295	DEFAULT	Gateway Terminals, LLC. - Truck/Rail vapor destruction unit (TRCU)	744607.00	4275093.00	422.70	74.0	514.0	25.158	3.3	8.39E+00	0.00E+00	0.00E+00
IL235261	DEFAULT	Gulfstream Aerospace Services Corp. - Make-up air unit 19-3	747639.00	4273560.00	410.10	42.0	577.0	29.356	2.5	1.63E+00	0.00E+00	0.00E+00
IL235939	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #5 (SA-5)	750151.00	4308373.00	430.91	90.0	450.1	54.087	1.4	1.07E+02	0.00E+00	0.00E+00
IL235940	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Strip anneal #6 (SA-6)	750207.00	4308390.00	431.82	110.0	580.0	62.779	1.3	1.07E+02	0.00E+00	0.00E+00
IL236260	DEFAULT	Bunge-SF Grain, LLC. - Grain Dryer	746158.00	4281645.00	417.55	96.0	185.0	87.904	8.2	5.06E+00	1.71E+01	1.71E+01
IL236359	DEFAULT	City of Belleville - 2 Emergency generators (1500 kW each)	763544.00	4265595.00	474.70	28.0	627.0	73.767	1.2	2.57E+01	1.84E+00	0.00E+00
IL236927	DEFAULT	Kraft Heinz Co. - Boiler C	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236928	DEFAULT	Kraft Heinz Co. - Boiler D	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236929	DEFAULT	Kraft Heinz Co. - Boiler E	748105.00	4289580.00	423.56	40.0	380.0	68.946	2.0	1.44E+00	0.00E+00	0.00E+00
IL236930	DEFAULT	National Maintenance and Repair - Cleaver Brooks boiler (Stack 2 of 2)	750920.00	4300804.00	402.46	34.0	450.1	23.521	2.0	1.90E+00	5.00E+00	5.00E+00
IL237099	DEFAULT	Union Electric Co. - Turbine CT02R	745573.00	4283613.00	419.58	30.0	850.0	18.860	11.4	7.74E+01	2.73E+01	2.73E+01
IL237182	DEFAULT	Highland Electric Light Plant - Engine IC-6	788126.93	4293320.17	534.65	28.0	612.1	84.854	2.0	1.32E+01	0.00E+00	0.00E+00
IL237183	DEFAULT	Highland Electric Light Plant - Engine IC-8	788126.93	4293320.17	534.65	57.0	734.1	61.762	11.4	2.57E+01	0.00E+00	0.00E+00
IL237340	DEFAULT	Charles E. Mahoney - Asphalt silo filling	749517.00	4309892.00	443.14	25.0	74.0	0.262	0.4	5.30E-01	0.00E+00	0.00E+00
IL237341	DEFAULT	Charles E. Mahoney - Truck loadout	749517.00	4309892.00	443.14	27.0	136.0	42.050	1.9	6.00E-01	0.00E+00	0.00E+00
IL237342	DEFAULT	Charles E. Mahoney - Asphalt heaters and boilers	749517.00	4309892.00	443.14	10.0	350.0	69.995	1.0	1.18E+00	2.80E+00	2.80E+00
IL237659	DEFAULT	Green Plains Madison, LLC - Boiler #1	745256.00	4285477.00	414.14	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL237660	DEFAULT	Green Plains Madison, LLC - Fire Pump back-up Engine (460 HP)	745191.00	4285409.00	413.85	13.0	627.0	86.231	0.8	4.80E-01	9.40E-01	0.00E+00
IL237661	DEFAULT	Green Plains Madison, LLC - Electrical system backup Engine (1496 HP)	745144.00	4285537.00	415.68	28.0	627.0	73.767	1.2	3.54E+00	1.21E+01	0.00E+00

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
1,237878	DEFAULT	Green Plains Madison, LLC - Indirect dryer #1	745195.00	4285468.00	415.12	71.0	387.1	12.136	4.6	7.97E+00	4.10E-01	4.10E-01
1,237886	DEFAULT	Amsted Rail Co., Inc. - Curing oven	746813.00	4287625.00	419.28	39.0	158.0	27.978	1.8	2.52E-01	0.00E+00	0.00E+00
1,237899	DEFAULT	Center Ethanol Co. - Emergency generator	745886.00	4275602.00	412.66	28.0	627.0	73.787	1.2	3.30E+00	0.00E+00	0.00E+00
1,237905	DEFAULT	Center Ethanol Co. - Ethanol loadout Rack	745838.00	4275662.00	412.66	18.0	99.1	7.806	0.7	6.60E-01	0.00E+00	0.00E+00
1,238199	DEFAULT	Solutia Inc. - An in-situ soil vapor extraction system	748325.00	4275822.00	405.12	15.0	70.1	73.406	0.2	4.00E-01	0.00E+00	0.00E+00
1,238839	DEFAULT	Waterloo City Light Plant - Turbine Generator (GT2)	748326.00	4266769.00	649.41	39.0	965.9	87.937	4.8	1.78E+01	0.00E+00	0.00E+00
1,238942	DEFAULT	ConocoPhillips Co. - Rental Boiler #3	754240.00	4303144.00	443.47	20.0	350.0	46.432	4.0	1.65E+00	0.00E+00	0.00E+00
1,239395	DEFAULT	Amsted Rail Co., Inc. - Sand dryer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	1.23E+00	0.00E+00	0.00E+00
1,239396	DEFAULT	Amsted Rail Co., Inc. - Thermal sand reclaimer	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	3.70E-01	0.00E+00	0.00E+00
1,239899	DEFAULT	Shell Oil Products US - RTO	753758.00	4303650.00	442.59	16.0	200.0	33.948	2.5	0.00E+00	8.47E-01	8.47E-01
1,240058	DEFAULT	Westwood Lands, Inc. - Process Heater DPH-1	748864.00	4285684.00	412.99	39.0	284.1	23.157	2.0	8.30E-01	0.00E+00	0.00E+00
1,240359	DEFAULT	Afton Chemical Corp. - Boiler 500-15-021B	746660.00	4276408.00	405.74	45.0	350.0	17.318	2.0	4.89E+00	0.00E+00	0.00E+00
1,240360	DEFAULT	Afton Chemical Corp. - Boiler 500-15-031B	746679.00	4276485.00	407.25	45.0	350.0	17.318	2.0	4.91E+00	0.00E+00	0.00E+00
1,241300	DEFAULT	ConocoPhillips Co. - VOC Flare (West - FLR4-1)	753428.00	4303073.00	428.81	30.0	1800.1	26.174	0.7	1.43E-08	0.00E+00	0.00E+00
1,241301	DEFAULT	ConocoPhillips Co. - VOC Flare (East - FLR4-2)	753441.00	4303073.00	428.77	30.0	1800.1	26.174	0.7	1.43E+00	0.00E+00	0.00E+00
1,241302	DEFAULT	ConocoPhillips Co. - Coker north flare (FLR1-3)	754047.00	4303684.00	444.23	139.0	911.0	26.595	5.4	0.00E+00	9.68E+01	3.58E+01
1,241303	DEFAULT	ConocoPhillips Co. - VR-5 Heater (H350#4 - STK1-1)	754937.00	4303459.00	444.98	150.0	650.0	26.765	12.0	0.00E+00	1.35E+01	1.35E+01
1,241304	DEFAULT	ConocoPhillips Co. - Coker north heater (H351#2 - STK1-2)	754853.00	4303305.00	444.85	150.0	500.1	22.304	10.0	0.00E+00	7.37E+00	7.37E+00
1,241305	DEFAULT	ConocoPhillips Co. - Coker north heater (H351#1 - STK1-3)	754986.00	4303305.00	444.82	150.0	500.1	22.304	10.0	0.00E+00	7.38E+00	7.38E+00
1,241312	DEFAULT	ConocoPhillips Co. - Heater HF-2 (STK7-1)	755283.00	4302820.00	443.66	118.0	400.0	45.902	10.8	0.00E+00	2.87E+01	2.87E+01
1,241405	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #1	756604.00	4295423.00	425.00	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
1,241449	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #2	756494.00	4295735.00	424.74	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
1,247126	DEFAULT	Center Point Terminals Co. - Tank Heater	748359.00	4289027.00	411.84	49.0	331.1	32.144	2.5	1.93E+00	0.00E+00	0.00E+00
1,245578	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #3	756198.00	4295409.00	424.97	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
1,245580	DEFAULT	Procter & Gamble Distributing - Emergency diesel generator #4	756182.00	4295721.00	424.77	26.0	490.0	60.811	1.4	1.68E+01	0.00E+00	0.00E+00
1,245839	DEFAULT	Milam Recycling and Disposal Facility - Landfill gas conversion plant	750666.00	4281805.00	413.09	25.0	70.1	0.000	4.5	9.60E+00	9.00E-01	9.00E-01
1,246759	DEFAULT	Steuben Township WWTP - 1000 kW Emergency generator	756253.00	4268975.00	518.88	28.0	627.0	73.787	1.2	1.54E-01	0.00E+00	0.00E+00
1,245761	DEFAULT	Omega Partners Hartford, LLC - Truck Rail Marine racks loadout and VOCs	752132.00	4300466.00	430.74	33.0	68.5	0.328	0.3	8.60E+00	0.00E+00	0.00E+00
1,245762	DEFAULT	Omega Partners Hartford, LLC - Boiler 1 and 2	752273.00	4300698.00	430.18	58.0	336.0	27.650	5.4	8.83E+00	0.00E+00	0.00E+00
1,245060	DEFAULT	Kraft Heinz Co. - Boiler F	748106.00	4289560.00	423.56	26.0	380.0	34.407	2.0	1.44E+00	0.00E+00	0.00E+00
1,248262	DEFAULT	Olin Winchester, LLC - New Rotary retort process (RDR-2)	750495.00	4308287.00	434.42	16.0	119.9	26.634	1.7	9.62E+00	0.00E+00	0.00E+00
1,248799	DEFAULT	Gateway Terminals, LLC - 600 HP Boiler	744607.00	4275093.00	422.70	26.0	440.0	39.557	2.2	2.11E+00	0.00E+00	0.00E+00
1,249480	DEFAULT	Highland Electric Light Plant - Engine IC-2	788126.93	4293320.17	534.65	57.0	734.1	61.782	11.4	1.44E+01	0.00E+00	0.00E+00
1,249481	DEFAULT	Highland Electric Light Plant - Engine IC-3	788126.93	4293320.17	534.65	57.0	734.1	61.782	11.4	1.28E+01	0.00E+00	0.00E+00
1,249482	DEFAULT	Highland Electric Light Plant - Engine IC-9	788126.93	4293320.17	534.65	57.0	734.1	61.782	11.4	1.50E+01	0.00E+00	0.00E+00
1,249483	DEFAULT	Highland Electric Light Plant - Engine IC-10	788126.93	4293320.17	534.65	57.0	734.1	61.782	11.4	1.50E+01	0.00E+00	0.00E+00
1,249499	DEFAULT	Roxana Landfill, Inc. - Zink ultra-Low emissions (Zulu) Flare	759153.00	4301385.00	619.62	50.0	1850.1	46.938	13.0	1.25E+01	1.55E+01	1.55E+01
1,250043	DEFAULT	Mayco Mfg, LLC - Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.74E+00	0.00E+00	0.00E+00
1,250892	DEFAULT	ConocoPhillips Co. - Lift station pump (21028)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.90E-01	4.90E-01
1,250893	DEFAULT	ConocoPhillips Co. - Lift station pump (21029)	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	1.40E+00	4.80E-01	4.80E-01
1,250894	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #1	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
1,250895	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #2	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
1,250896	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #3	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
1,250897	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #4	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
1,250898	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #5	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	6.01E+00	2.12E+00	2.12E+00
1,250899	DEFAULT	ConocoPhillips Co. - Non-emergency air compressor #6	754240.00	4303144.00	443.47	26.0	490.0	60.811	1.4	5.98E+00	2.10E+00	2.10E+00
1,251099	DEFAULT	Amsted Rail Co., Inc. - Annealing Furnace 1B	747071.00	4287670.00	426.02	39.0	284.1	23.157	2.0	1.11E+00	1.00E-01	1.00E-01
1,251285	DEFAULT	Premcor Refining Group, Inc. - Vapor Combustion Unit	752775.00	4302810.00	429.96	83.0	289.0	24.830	2.9	1.00E+01	0.00E+00	0.00E+00
1,251795	DEFAULT	ConocoPhillips Co. - Diesel engine (605 HP)	754240.00	4303144.00	443.47	15.0	69.5	0.328	0.3	3.50E+00	0.00E+00	0.00E+00
1,251754	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #1	745944.00	4293279.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
1,253107	DEFAULT	Alnor USA, Inc. - Natural gas combustion	749698.00	4276478.00	418.37	38.0	436.0	27.650	3.4	3.26E+00	0.00E+00	0.00E+00
1,253166	DEFAULT	Cerro Flow Products, LLC. - Generators	746126.00	4275272.00	407.32	26.0	490.0	60.811	1.4	9.23E-01	2.82E-01	2.82E-01
1,255187	DEFAULT	City of Belleville - Emergency diesel generator (1500 kW)	762469.00	4266351.00	488.70	76.0	490.0	60.811	1.4	1.16E+01	0.00E+00	0.00E+00
1,253300	DEFAULT	Phillips 66 Pipeline, LLC - Engines (insignificant activities)	744835.00	4274152.00	407.25	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
1,253361	DEFAULT	Amsted Rail Co., Inc. - Sand regeneration process (combustion)	746975.00	4287537.00	422.05	39.0	284.1	23.157	2.0	2.80E-01	2.80E-01	2.80E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
IL253367	DEFAULT	Green Plains Madison, LLC - Boiler #2	745258.00	4285486.00	414.27	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253368	DEFAULT	Green Plains Madison, LLC - Boiler #3	745260.00	4285491.00	414.24	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253369	DEFAULT	Green Plains Madison, LLC - Boiler #4	745262.00	4285500.00	414.21	71.0	284.1	22.960	3.3	1.29E+00	5.00E-01	5.00E-01
IL253370	DEFAULT	Green Plains Madison, LLC - Indirect dryer #2	745164.00	4285430.00	414.60	81.0	387.1	8.430	5.5	7.97E+00	4.10E-01	4.10E-01
IL253386	DEFAULT	GBC Metals, LLC (d/b/a Olin Brass) - Engines (insignificant activities)	750423.00	4308352.00	434.28	26.0	490.0	60.811	1.4	9.23E-01	0.00E+00	0.00E+00
IL253738	DEFAULT	Milam Recycling and Disposal Facility - 2000 scfm Utility Flare	750550.00	4292537.00	594.06	36.0	852.0	18.565	4.6	1.83E+01	7.32E+00	7.32E+00
IL253769	DEFAULT	Veolia ES Technical Solutions, LLC - 2 Emergency generators	745532.00	4275942.00	414.76	26.0	490.0	60.811	1.4	7.41E-01	0.00E+00	0.00E+00
IL254175	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #2	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254176	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #3	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254177	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #4	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254178	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #5	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254179	DEFAULT	Chain of Rocks Recycling & Disposal - Passive flare #6	746944.00	4293274.00	431.79	10.0	841.0	4.756	0.5	4.95E-01	0.00E+00	0.00E+00
IL254699	DEFAULT	HSHS St. Elizabeth's Hospital - 2 Emergency generators	767237.00	4275111.00	541.01	38.0	627.0	73.767	1.2	1.93E+01	0.00E+00	0.00E+00
IL255341	DEFAULT	Roxana Landfill, Inc. - New open flare	759153.00	4301368.00	619.62	45.0	1800.1	61.434	1.3	3.77E+01	8.17E+00	8.17E+00
IL255527	DEFAULT	Magnesium Elektron North America - Natural gas combustion	748452.00	4285724.00	415.49	39.0	284.1	23.157	2.0	4.20E-01	0.00E+00	0.00E+00
IL255741	DEFAULT	ConocoPhillips Co. - Utility Boiler #19 (BLR-19)	754755.00	4302798.00	442.16	132.0	304.1	46.281	7.0	0.00E+00	1.54E+01	1.54E+01
IL255816	DEFAULT	Mayco Mfg. LLC - Expansion: Natural gas combustion	747189.00	4286970.00	421.78	39.0	284.1	23.157	2.0	1.94E+00	0.00E+00	0.00E+00
IL255953	DEFAULT	Moore Recycling Concrete & Asphalt, LLC. - Drum mix asphalt plant	762178.00	4246660.00	463.19	35.0	251.0	56.908	4.0	1.32E+01	0.00E+00	0.00E+00
IL256624	DEFAULT	PBT Acquisition, LLC - ASR Dryer	748704.00	4280830.00	418.77	32.0	305.0	19.483	1.5	2.53E+00	0.00E+00	0.00E+00
IL257535	DEFAULT	Marathon Ashland Pipe Line, LLC - Marine vapor combustion unit	751238.00	4302663.00	402.85	51.0	810.1	27.749	7.4	2.71E+01	0.00E+00	0.00E+00
SJEFF1	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	410.0	370.0	54.081	19.0		1.44E+02	1.44E+02
SJEFF2	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	125.0	210.0	59.173	6.6		2.04E-02	2.04E-02
SJEFF3	DEFAULT	RIVER CEMENT CO. DBA BUZZI UNICEM USA SELMA PLANT	733431.84	4229131.13	406.36	10.0	1100.0	23.333	0.5		1.32E-01	0.00E+00
SJEFF15	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	52.0	260.0	10.666	2.0		5.09E-03	5.09E-03
SJEFF16	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	2.29E-01
SJEFF17	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.40E-03	2.40E-03
SJEFF18	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		2.29E-01	0.00E+00
SJEFF19	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.80E-03	1.80E-03
SJEFF20	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		1.20E-03	1.20E-03
SJEFF21	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		5.40E-04	5.40E-04
SJEFF22	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.80E-04	4.80E-04
SJEFF23	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		4.20E-04	4.20E-04
SJEFF24	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	10.0	1100.0	23.333	0.5		3.00E-04	3.00E-04
SJEFF25	DEFAULT	SPECIALTY ELECTRONIC MATERIALS US INC THE RIVERSIDE PLANT	728353.47	4240500.97	465.09	15.0	1049.0	149.734	0.2		4.80E-04	0.00E+00
SJEFF26	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	28.7		1.73E+03	1.73E+03
SJEFF27	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	700.0	270.0	82.001	29.0		2.50E+03	2.50E+03
SJEFF28	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	30.0	985.0	105.633	1.3		8.52E-06	0.00E+00
SJEFF29	DEFAULT	AMEREN MISSOURI RUSH ISLAND ENERGY CENTER	739491.07	4224078.19	407.87	240.0	600.0	32.999	7.0		3.54E-03	3.54E-03
SJEFF59	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF60	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	3.03E-01	2.17E-03	2.17E-03
SJEFF61	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.003	1.7	4.20E-02	3.00E-04	3.00E-04
SJEFF62	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	392.0	0.000	1.7	1.12E-02	7.98E-05	7.98E-05
SJEFF63	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	27.0	1800.0	10.046	1.5	2.86E-02	1.63E-01	1.63E-01
SJEFF65	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.45E-02	4.34E-04	4.34E-04
SJEFF66	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	0.0	0.000	0.5	1.40E-02	4.20E-04	4.20E-04
SJEFF67	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	8.35E-02	5.97E-04	5.97E-04
SJEFF68	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	20.0	-459.7	0.003	2.0	3.54E-01	2.53E-03	2.53E-03
SJEFF69	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	14.0	-459.7	0.003	2.0	2.51E-01	1.79E-03	1.79E-03
SJEFF70	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF71	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	1.11E+00	3.37E-01	0.00E+00
SJEFF72	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	5.0	-459.7	0.003	0.5	3.32E-01	1.02E-01	0.00E+00
SJEFF73	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF74	DEFAULT	MERCY HOSPITAL JEFFERSON	728195.03	4230846.83	425.75	10.0	-459.7	0.003	1.0	1.92E-05	1.37E-07	1.37E-07
SJEFF82	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	7.38E-02	3.77E+00	3.77E+00
SJEFF83	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	156.0	611.0	39.902	5.8	1.98E-01	8.37E+00	8.37E+00

R005446

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF86	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	20.0	0.0	0.000	0.5	1.26E-01	9.66E-04	9.66E-04
SJEFF92	DEFAULT	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	10.0	1100.0	23.333	0.5		2.17E+00	0.00E+00
SJEFF99	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.58	2.5	170.0	46.499	2.0	5.60E-01	4.25E-02	4.25E-02
SJEFF100	DEFAULT	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.58	2.5	170.0	46.499	2.0	1.40E-01	1.14E-03	1.14E-03
SJEFF125	DEFAULT	FRED WEBER, INC. ANTONIA	720102.79	4248877.71	670.57	20.0	250.0	49.249	5.0		5.88E-02	5.88E-02
SJEFF128	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.33E-01	2.33E-01
SJEFF129	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.866	1.0		1.92E-02	1.92E-02
SJEFF130	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		9.62E-03	9.62E-03
SJEFF131	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		3.50E-01	3.50E-01
SJEFF132	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1413.0	18.734	2.0		2.95E-01	2.95E-01
SJEFF133	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1347.0	38.316	1.0		1.54E-02	1.54E-02
SJEFF134	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	30.0	1448.0	22.418	2.0		6.01E-03	6.01E-03
SJEFF135	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	18.0	1354.0	25.866	1.0		1.44E-02	1.44E-02
SJEFF136	DEFAULT	ANIMAL CARE SERVICE INC FESTUS	724479.42	4236856.27	436.22	28.0	1600.0	18.734	2.0		7.50E-02	7.50E-02
SJEFF137	DEFAULT	JEFFERSON COUNTY CREMATION SERVICES LC PEVELY	728536.07	4238554.88	583.23	10.0	1100.0	23.333	0.5		9.39E-02	9.39E-02
SJEFF138	DEFAULT	SIMPSON CONSTRUCTION MATERIALS PAULINA HILLS SITE	726459.86	4259186.04	426.64	12.0	885.0	42.441	0.5		1.29E-01	1.29E-01
SJEFF144	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	32.0	147.0	0.853	8.7	3.03E+00	1.21E+00	1.21E+00
SJEFF145	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	5.35E-02	3.07E-01	3.07E-01
SJEFF146	DEFAULT	N. B. WEST CONTRACTING CO INC HOUSE SPRINGS ASPHALT	712353.42	4251763.19	532.22	5.0	400.0	0.003	2.0	1.61E-03	9.62E-08	9.62E-08
SSTC1	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.81	445.64	496.5	138.7	46.759	23.6		2.32E+02	2.32E+02
SSTC2	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.81	445.64	496.5	136.8	46.844	23.6		2.89E+02	2.89E+02
SSTC3	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.81	445.64	212.0	325.0	50.000	4.5		8.90E-04	8.90E-04
SSTC4	DEFAULT	AMEREN MISSOURI SIOUX ENERGY CENTER	734752.14	4310260.81	445.64	25.0	1100.0	23.333	1.0		1.42E+00	0.00E+00
SSTC9	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.73E-04	2.23E-04
SSTC10	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC11	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.73E-04	2.23E-04
SSTC12	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC13	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		2.73E-04	2.23E-04
SSTC14	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	50.0	1000.0	0.151	2.3		1.70E-03	1.70E-03
SSTC15	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	40.515	0.6		3.59E-01	0.00E+00
SSTC16	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC17	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	3.0	1011.0	154.085	0.8		1.08E+00	0.00E+00
SSTC18	DEFAULT	SSM HEALTH ST JOSEPHS HOSPITAL	718499.57	4295433.59	515.16	14.0	1063.0	56.732	0.4		3.86E-01	2.38E-04
SSTC28	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	522.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC29	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	522.57	250.0	365.0	12.999	10.0		7.21E+02	7.21E+02
SSTC30	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	522.57	250.0	365.0	12.999	10.0		2.16E+01	2.16E+01
SSTC31	DEFAULT	GENERAL MOTORS LLC WENTZVILLE CENTER	689428.03	4299089.70	522.57	93.0	526.0	58.899	1.8		1.33E-01	1.33E-01
SSTC45	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		2.31E+00	2.31E+00
SSTC46	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		1.86E+01	2.46E-02
SSTC47	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	10.0	1100.0	23.333	0.5		1.52E+00	0.00E+00
SSTC48	DEFAULT	SSM HEALTH ST JOSEPH HOSPITAL WEST	693164.96	4297283.00	533.89	66.0	200.0	0.003	3.0		1.50E+00	1.50E+00
SSTC57	DEFAULT	BLASTCO INC	698213.84	4297755.23	548.44	20.0	0.0	0.000	0.5		3.96E-04	3.96E-04
SSTC63	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	65.0	10.499	1.5		4.70E-03	4.20E-03
SSTC64	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	17.0	450.0	27.681	1.3		4.09E-03	4.09E-03
SSTC65	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	20.0	0.0	0.000	0.5		4.16E-03	4.16E-03
SSTC66	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		1.56E-03	1.56E-03
SSTC67	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	77.0	33.015	1.5		8.40E-04	8.40E-04
SSTC68	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	33.0	450.0	89.418	1.5		1.44E-03	1.44E-03
SSTC69	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	400.0	29.708	1.0		1.74E-03	1.74E-03
SSTC70	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	30.0	450.0	24.803	1.2		4.68E-03	4.68E-03
SSTC71	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	475.0	1.667	0.5		0.00E+00	0.00E+00
SSTC72	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	28.0	450.0	27.500	2.3		0.00E+00	0.00E+00
SSTC73	DEFAULT	TRUE MANUFACTURING CO O'FALLON	702777.57	4297717.78	496.26	10.0	1100.0	23.333	0.5		3.07E+00	0.00E+00
SSTC87	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	2.16E-02	6.31E-04	6.31E-04
SSTC88	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	1.54E-02	1.73E-04	1.73E-04

R005447

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SSTC89	DEFAULT	HANSEN'S TREE SERVICE O'FALLON	697357.18	4298189.47	585.40	20.0	0.0	0.000	0.5	1.20E+00	3.65E-01	3.65E-01
SSTC98	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC99	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC100	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC101	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	3.87E-01	2.76E-03	2.76E-03
SSTC102	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC103	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC104	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC105	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC106	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTC107	DEFAULT	AMERISTAR ST. CHARLES	718432.28	4294005.30	443.64	1.0	-459.7	0.003	1.0	1.27E-03	9.46E-04	0.00E+00
SSTL1	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.28E-02	2.28E-02
SSTL2	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	250.0	326.0	101.627	11.0		2.30E-02	2.30E-02
SSTL3	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	345.0	135.400	14.0		2.97E+02	2.97E+02
SSTL4	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	350.0	374.0	123.284	16.0		4.69E+02	4.69E+02
SSTL5	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	40.0	642.0	38.100	1.0		5.46E-03	5.46E-03
SSTL6	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL7	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.98E+00	1.98E+00
SSTL8	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL9	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		2.01E-02	2.01E-02
SSTL10	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		4.55E-01	4.55E-01
SSTL11	DEFAULT	AMEREN MISSOURI MERAMEC ENERGY CENTER	732736.78	4253752.81	418.24	32.0	1050.0	103.799	12.0		1.10E-02	1.10E-02
SSTL14	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	9.84E-01	1.42E+00	1.42E+00
SSTL15	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	99.0	440.0	9.432	4.5	1.06E-02	7.55E-05	7.55E-05
SSTL16	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	10.0	1100.0	23.333	0.5	5.03E+00	1.53E+00	0.00E+00
SSTL17	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	2.91E+00	4.19E+00	4.19E+00
SSTL18	DEFAULT	MISSOURI BAPTIST MEDICAL CENTER NORTH BALLAS	722244.75	4279363.47	652.56	104.0	450.0	7.172	1.2	9.59E-02	6.85E-04	6.85E-04
SSTL19	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.95E-05	2.95E-05
SSTL20	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	40.0	315.0	30.098	4.0		2.24E-02	2.24E-02
SSTL21	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		1.06E+00	0.00E+00
SSTL22	DEFAULT	MONSANTO WORLD HEADQUARTERS LINDBERGH BLVD	726250.11	4283348.63	691.57	10.0	1100.0	23.333	0.5		5.74E-04	0.00E+00
SSTL23	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.57E+01	2.57E+01
SSTL24	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		6.69E-03	6.69E-03
SSTL25	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	80.0	150.0	50.000	3.0		2.66E-02	2.66E-02
SSTL26	DEFAULT	U. S. SILICA COMPANY PACIFIC	698244.91	4262010.04	471.16	110.0	70.0	0.003	2.7		1.39E-02	1.39E-02
SSTL27	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.11E+01	1.11E+01
SSTL28	DEFAULT	ST. JOHNS MERCY MEDICAL CNTR/MAINTENANCE NEW BALLAS RD	722224.73	4280414.44	627.82	30.0	400.0	4.951	4.0		1.95E-02	1.95E-02
SSTL29	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		3.08E-05	3.08E-05
SSTL30	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	159.0	300.0	32.667	4.8		2.36E-02	2.36E-02
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-01	0.00E+00
SSTL32	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		4.04E-03	0.00E+00
SSTL33	DEFAULT	MONSANTO CHESTERFIELD VILLAGE	712608.90	4282124.50	590.78	10.0	1100.0	23.333	0.5		3.77E+00	0.00E+00
SSTL37	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	0.00E+00	0.00E+00	0.00E+00
SSTL38	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	175.0	350.0	4.849	9.0	2.24E+00	1.60E-02	1.60E-02
SSTL39	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	0.00E+00	0.00E+00	0.00E+00
SSTL40	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	21.0	475.0	9.616	1.2	6.04E-01	4.31E-03	4.31E-03
SSTL41	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.39E+01	2.34E-03	0.00E+00
SSTL42	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	2.12E+01	3.78E-02	0.00E+00
SSTL43	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	10.0	1100.0	23.333	0.5	1.59E+01	4.87E+00	0.00E+00
SSTL44	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.13E-02	2.37E+01	2.37E+01
SSTL45	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	9.02E-02	4.11E+01	4.11E+01
SSTL46	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	1.05E-01	1.48E+01	1.48E+01
SSTL47	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7	2.86E-01	2.62E+01	2.62E+01
SSTL48	DEFAULT	WASHINGTON UNIVERSITY DANFORTH CAMPUS	734425.40	4281363.46	506.46	55.0	316.0	84.150	0.7		2.04E-03	2.04E-03
SSTL68	DEFAULT	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4284042.31	462.50	20.0	230.5	31.309	5.1		3.27E-01	3.27E-01

R005448

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SSTL79	DEFAULT	FRED WEBER, INC. ANTIRE	711291.97	4284547.49	448.49	30.0	250.0	58.950	4.0		1.27E+00	1.27E+00
SSTL76	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	5.58E+00	8.24E+00	8.24E+00
SSTL77	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	45.0	400.0	44.167	2.5	1.38E+00	9.87E-03	9.87E-03
SSTL78	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	3.02E-00	4.47E+00	4.47E+00
SSTL79	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	38.0	400.0	25.968	2.0	1.06E+00	7.57E-03	7.57E-03
SSTL80	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	2.95E-00	4.36E+00	4.36E+00
SSTL81	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	50.0	461.0	14.616	3.0	7.03E-01	5.01E-03	5.01E-03
SSTL82	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	1.0	100.0	12.733	0.1	1.66E-00	1.19E-02	1.19E-01
SSTL83	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	15.0	355.0	10.880	0.7	2.52E+01	4.48E-02	0.00E+00
SSTL84	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	7.0	980.0	113.182	0.3	2.50E+01	7.68E+00	0.00E+00
SSTL85	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	30.0	965.0	51.234	5.0	2.03E-01	1.04E-02	1.04E-02
SSTL86	DEFAULT	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	17.0	72.0	29.882	7.8		5.58E-03	5.58E-03
SSTL88	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291146.98	571.46	28.0	1400.0	25.466	1.0		1.01E+00	1.01E+00
SSTL89	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291146.98	571.46	38.8	1400.0	21.568	12.0		7.77E-01	7.77E-01
SSTL90	DEFAULT	CHAMP LANDFILL COMPANY LLC	720845.43	4291146.98	571.46	38.0	1400.0	21.568	12.0		6.35E-01	6.35E-01
SSTL92	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		1.88E-02	1.88E-02
SSTL93	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	40.0	1200.0	61.381	1.1		6.98E-02	6.98E-02
SSTL94	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1,200.0	50.226	1.3		1.70E+01	1.70E+01
SSTL95	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	45.0	1100.0	50.226	1.3		5.43E+01	5.43E+01
SSTL96	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	35.0	1,200.0	58.051	1.0		1.22E-01	1.22E-01
SSTL97	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	534.0	1450.0	21.923	4.7		1.08E-03	1.08E-03
SSTL98	DEFAULT	BRIDGETON LANDFILL, LLC	722107.35	4294454.70	459.06	584.0	1450.0	21.923	4.7		1.07E-03	1.07E-03
SSTL100	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	501.67	17.2	500.0	25.000	3.0		9.06E+00	9.06E+00
SSTL101	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	501.67	17.2	500.0	25.000	3.0		7.14E-03	7.14E-03
SSTL102	DEFAULT	SSM HEALTH ST MARYS HOSPITAL	734075.92	4279544.88	501.67	130.0	1000.0	58.156	1.0		2.56E+00	0.00E+00
SSTL106	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	23.932	3.0		6.69E-02	6.69E-02
SSTL107	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	23.932	3.0		1.15E-02	1.15E-02
SSTL108	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	12.0	900.0	38.160	1.2		8.33E+00	0.00E+00
SSTL109	DEFAULT	SSM HEALTH DEPAUL HOSPITAL - ST. LOUIS BRIDGETON	723046.72	4292134.06	542.16	45.0	450.0	23.932	3.0		1.57E-03	1.57E-03
SSTL111	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4284089.51	508.83	45.0	425.0	1.667	2.0	8.03E+00	4.35E+00	4.35E+00
SSTL112	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4284089.51	508.83	45.0	425.0	1.667	2.0	4.17E-01	2.98E-03	2.98E-03
SSTL113	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4284089.51	508.83	45.0	425.0	1.667	2.0	6.40E-03	6.40E-03	6.40E-03
SSTL114	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4284089.51	508.83	45.0	425.0	1.667	2.0	6.81E-01	4.86E-03	4.86E-03
SSTL115	DEFAULT	VETERANS ADMIN MEDICAL CENTER JEFFERSON BARRACKS DRIVE	736944.98	4284089.51	508.83	10.0	1100.0	23.333	0.5	1.02E+02	3.11E+01	0.00E+00
SSTL116	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	585.65	35.0	270.0	10.000	4.0	1.46E-01	6.26E-03	6.26E-03
SSTL117	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	585.65	35.0	270.0	10.000	4.0	9.17E-01	6.55E-03	6.55E-03
SSTL118	DEFAULT	CHRISTIAN HOSPITAL NORTHEAST DUNN ROAD	739738.60	4295554.78	585.65	15.0	-459.7	0.003	1.0	3.28E+01	3.00E-01	0.00E+00
SSTL120	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	15.0	65.0	7.165	2.2		3.20E-03	3.20E-03
SSTL121	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	16.0	75.0	26.949	1.1		8.96E-03	8.96E-03
SSTL122	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	600.0	14.167	2.5		4.83E-01	4.83E-01
SSTL123	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	30.0	365.0	17.001	1.2		4.48E-01	4.48E-01
SSTL124	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	29.0	560.0	25.499	0.7		1.63E-01	1.63E-01
SSTL126	DEFAULT	BODINE ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.60	10.0	0.0	0.000	0.5		1.23E-02	1.23E-02
SSTL127	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4289850.38	422.90	30.0	650.0	11.998	1.3		3.60E-03	3.60E-03
SSTL128	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4289850.38	422.90	30.0	650.0	11.998	1.3		1.79E+01	1.79E+01
SSTL129	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4289850.38	422.90	26.0	650.0	13.264	2.0		2.26E-03	2.26E-03
SSTL130	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4289850.38	422.90	26.0	650.0	13.264	2.0		1.44E+01	1.44E+01
SSTL131	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4289850.38	422.90	54.0	1800.0	17.218	2.9		1.21E-03	1.21E-03
SSTL132	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4289850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL133	DEFAULT	REICHHOLD LLC 2 VALLEY PARK	718899.54	4289850.38	422.90	10.0	1100.0	23.333	0.5		9.83E-01	9.83E-01
SSTL141	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4285428.04	633.14	25.0	495.0	4.068	2.5		3.40E+00	3.40E+00
SSTL142	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4285428.04	633.14	25.0	495.0	4.068	2.5		8.76E-04	8.76E-04
SSTL143	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4285428.04	633.14	30.0	450.0	0.003	1.5		5.59E-04	5.59E-04
SSTL146	DEFAULT	ST. ANTHONY'S MEDICAL CENTER KENNERLY ROAD	728489.70	4285428.04	633.14	10.0	1100.0	23.333	0.5		4.66E-02	0.00E+00
SSTL147	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTEWATER TREATMENT PLANT	718353.79	4290583.38	444.32	25.0	550.0	1.181	0.7	9.18E-01	8.00E-01	8.00E-01

R005449

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 [1-hour]
SSTL148	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	25.0	550.0	1.181	0.7	1.58E+00	5.47E-03	5.47E-03
SSTL149	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	4.42E-01	2.28E-01	2.28E-01
SSTL150	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	15.2	446.0	19.393	1.7	9.18E-02	4.81E-03	4.81E-03
SSTL151	DEFAULT	MSD, MISSOURI RIVER WWTP MO RIVER WASTERWATER TREATMENT PLANT	718333.79	4290583.38	444.32	16.0	77.0	4.774	2.0	2.46E+00	4.74E-01	4.74E-01
SSTL152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	42.0	300.0	38.494	4.2	2.49E+01	5.49E+00	5.49E+00
SSTL153	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	3.84E-03	1.20E-04	1.20E-04
SSTL154	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	26.7	400.0	26.785	0.8	4.60E-02	1.44E-03	1.44E-03
SSTL162	DEFAULT	MACLAN INDUSTRIES	742058.49	4291436.76	495.44	14.0	190.0	0.003	0.2		2.29E-01	2.29E-01
SSTL165	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	22.0	871.0	24.016	0.8		1.02E-01	1.02E-01
SSTL166	DEFAULT	MISSOURI AMERICAN WATER-CENTRAL PLANT CHESTERFIELD	715427.34	4284896.78	451.44	16.0	871.0	24.016	0.8		2.38E-01	2.38E-01
SSTL169	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	1.79E-01	1.28E-03	1.28E-03
SSTL170	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	25.0	-459.7	0.003	0.8	2.33E+01	3.69E-03	3.69E-03
SSTL171	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	18.0	-459.7	0.003	4.0	1.61E+00	6.69E-02	6.69E-02
SSTL172	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	15.0	-459.7	0.003	2.0	1.20E-02	8.60E-05	8.60E-05
SSTL173	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	16.0	-459.7	0.003	0.5	9.34E-01	2.85E-01	2.85E-01
SSTL174	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL175	DEFAULT	SPIRE MISSOURI, EAST INC.	736637.09	4302290.45	525.66	20.0	0.0	0.000	0.5	4.62E-03	3.30E-05	3.30E-05
SSTL196	DEFAULT	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	7.7	25.0	11.788	0.9	3.02E+00	1.28E-01	1.28E-01
SSTL199	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		1.59E-01	1.59E-01
SSTL200	DEFAULT	A.G. RECYCLING	734844.18	4284158.21	525.43	10.0	1100.0	23.333	0.5		7.25E-01	7.25E-01
SSTL209	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	34.0		9.51E+00	9.51E+00
SSTL214	DEFAULT	THE HARPER COMPANY	731184.93	4292013.86	588.35	10.0	1100.0	23.333	0.5		2.75E-01	0.00E+00
SCITY1	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	320.0	21.217	10.0		2.38E-02	2.38E-02
SCITY2	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	100.0	350.0	47.149	3.0		5.80E-02	5.80E-02
SCITY3	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.67E+01	1.67E+01
SCITY4	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		1.78E-02	1.78E-02
SCITY5	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.53E+01	2.53E+01
SCITY6	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	225.0	350.0	18.468	10.0		2.15E-02	2.15E-02
SCITY7	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	195.0	950.0	19.867	1.5		1.75E+01	1.75E+01
SCITY8	DEFAULT	ANHEUSER-BUSCH INC ST. LOUIS	743002.81	4275906.67	469.19	20.0	50.0	70.000	1.0		1.69E+00	1.69E+00
SCITY9	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	1.33E+00	9.51E-03	9.51E-03
SCITY10	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	70.0	200.0	0.003	5.5	2.13E+00	1.52E-02	1.52E-02
SCITY11	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	2.53E+00	1.81E-02	1.81E-02
SCITY12	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	100.0	145.0	62.500	4.5	3.20E-01	2.29E-03	2.29E-03
SCITY13	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	12.0	200.0	0.335	1.0	3.77E+00	1.15E+00	0.00E+00
SCITY14	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.55E-02	1.07E-03	1.07E-03
SCITY15	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	50.400	2.0	3.07E-02	9.22E-04	9.22E-04
SCITY16	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	45.0	150.0	69.751	1.7	3.07E-02	9.22E-04	9.22E-04
SCITY17	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	16.0	77.0	24.600	0.2		1.41E-03	1.41E-03
SCITY18	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	3.0	800.0	0.335	0.5	1.63E-01	4.98E-02	0.00E+00
SCITY22	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	0.0	0.000	0.5	5.72E-03	1.72E-04	1.72E-04
SCITY23	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	6.00E-02	1.83E-02	0.00E+00
SCITY24	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.8	2.11E+00	6.44E-01	0.00E+00
SCITY25	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	785.0	42.283	0.5	8.12E-03	4.79E-03	0.00E+00
SCITY26	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	1.73E-02	5.29E-03	0.00E+00
SCITY27	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	42.0	77.0	3.734	0.2	4.35E-02	1.33E-02	0.00E+00
SCITY28	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	20.0	200.0	0.335	1.0	1.98E-01	6.04E-02	0.00E+00
SCITY29	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.07E-01	3.27E-02	0.00E+00
SCITY30	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.09E-04	3.32E-05	0.00E+00
SCITY31	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	22.0	312.0	1.296	1.0	5.28E-01	1.61E-01	0.00E+00
SCITY32	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	90.0	77.0	33.315	2.2	1.09E-04	3.32E-05	0.00E+00
SCITY33	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	10.0	1100.0	23.333	0.5	3.65E-02	1.12E-02	0.00E+00
SCITY34	DEFAULT	MALLINCKRODT N SECOND	744362.95	4283022.76	417.81	8.0	800.0	0.335	0.5	1.98E-01	6.04E-02	0.00E+00
SCITY48	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.58E-01	2.58E-01
SCITY49	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		2.42E-02	2.42E-02

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY50	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.20E+00	1.20E+00
SCITY51	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	111.0	300.0	72.900	4.0		1.51E-01	1.51E-01
SCITY52	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY53	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		6.91E-03	6.91E-03
SCITY54	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		1.17E+00	1.17E+00
SCITY55	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	115.0	280.0	41.099	5.0		7.87E-03	7.87E-03
SCITY56	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	30.0	975.0	237.684	0.8		3.10E-02	0.00E+00
SCITY57	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		2.59E+01	2.59E+01
SCITY58	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		5.09E+00	5.09E+00
SCITY59	DEFAULT	ASHLEY ENERGY LLC	745321.30	4280225.01	423.00	161.0	250.0	34.101	4.0		3.48E-02	3.48E-02
SCITY60	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	3.97E-01	3.97E-01
SCITY61	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.97E-01	5.32E-02	5.32E-02
SCITY62	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY63	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.30E+00	2.36E-02	2.36E-02
SCITY64	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.00E+00	4.43E+00	4.43E+00
SCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.20E+00	2.29E-02	2.29E-02
SCITY66	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	20.0	0.0	0.000	0.5	4.42E-01	1.33E+00	1.33E+00
SCITY67	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	4.19E+00	4.64E+00	4.64E+00
SCITY68	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	69.0	318.0	63.035	3.0	6.11E-01	5.15E-03	5.15E-03
SCITY69	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	3.04E+00	4.48E+00	4.48E+00
SCITY70	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	225.0	280.0	35.784	7.3	1.14E-00	8.17E-03	8.17E-03
SCITY71	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	2.98E-03	4.70E-07	0.00E+00
SCITY72	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	10.0	1100.0	23.333	0.5	7.05E-00	2.15E+00	0.00E+00
SCITY83	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		1.14E-04	1.14E-04
SCITY84	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		4.07E-03	4.07E-03
SCITY85	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	430.0	35.000	2.0		8.40E-03	8.40E-03
SCITY86	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY87	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY88	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		1.14E+00	1.14E+00
SCITY89	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	50.0	280.0	35.000	2.0		4.07E-03	4.07E-03
SCITY90	DEFAULT	VETERANS ADMIN MEDICAL CENTER JOHN COCHRAN DIV	741047.52	4280704.99	545.64	10.0	1100.0	23.333	0.5		2.47E+00	0.00E+00
SCITY110	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	32.0	120.0	15.453	2.0		2.08E-02	2.08E-02
SCITY111	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	481.0	200.0	9.432	3.0		5.70E-03	5.70E-03
SCITY112	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	400.0	15.922	4.0		6.81E+01	6.81E+01
SCITY113	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	56.0	400.0	15.922	4.0		3.75E-02	3.75E-02
SCITY114	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	45.0	122.0	151.818	2.0		1.14E-02	1.14E-02
SCITY115	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	80.0	171.0	58.682	2.0		5.14E-03	5.14E-03
SCITY116	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	78.0	176.0	88.484	1.2		1.43E-03	1.43E-03
SCITY117	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	10.0	1100.0	23.333	0.5		1.91E-03	1.91E-03
SCITY121	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		9.43E+01	9.43E+01
SCITY122	DEFAULT	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.36	414.11	42.0	340.0	37.776	4.0		5.31E-02	5.31E-02
SCITY123	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		6.41E+00	6.41E+00
SCITY124	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		7.35E-03	7.35E-03
SCITY125	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		1.86E-02	1.86E-02
SCITY126	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	55.0	700.0	14.738	1.2		5.89E-04	5.89E-04
SCITY127	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	30.0	140.0	0.125	2.0		1.44E-03	1.44E-03
SCITY128	DEFAULT	ELANTAS PDG, INC. SECOND ST	743167.86	4284941.73	426.35	15.4	752.2	82.461	1.0		7.85E-03	0.00E+00
SCITY129	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY132	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	6.916	3.3		1.72E-02	1.72E-02
SCITY133	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1700.0	36.601	2.0		3.72E-03	3.72E-03
SCITY136	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	1800.0	8.301	3.7		8.58E-03	8.58E-03
SCITY137	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	42.0	1700.0	4.665	2.0		3.72E-03	3.72E-03
SCITY140	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY141	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	44.0	200.0	47.149	3.0		5.82E-03	5.82E-03
SCITY142	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	34.0	200.0	39.649	2.8		5.16E-03	5.16E-03

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY143	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY144	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY145	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY146	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	33.0	300.0	20.551	2.2		1.98E-03	1.98E-03
SCITY147	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	25.0	300.0	14.865	2.0		1.14E-02	1.14E-02
SCITY148	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	20.0	0.0	0.000	0.5		3.30E-03	3.30E-03
SCITY149	DEFAULT	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	37.0	600.0	38.983	1.2		1.98E-03	1.98E-03
SCITY156	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY157	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.20E-02	1.20E-02
SCITY158	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	115.0	210.0	38.885	5.0		1.19E-02	1.19E-02
SCITY159	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	14.0	490.0	60.200	0.5		7.80E-01	0.00E+00
SCITY160	DEFAULT	ST. ALEXIUS HOSPITAL JEFFERSON CAMPUS	741441.37	4274961.73	544.65	12.6	200.0	205.400	0.5		7.80E-01	0.00E+00
SCITY162	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	2.69E+00	1.16E-01	1.16E-01
SCITY163	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	210.0	260.0	17.733	2.8	6.20E+00	4.43E-02	4.43E-02
SCITY164	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.20E+00	9.30E-03	0.00E+00
SCITY165	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.18E+00	9.20E-03	0.00E+00
SCITY166	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.77E+00	8.30E-03	0.00E+00
SCITY167	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.12E+00	9.10E-03	0.00E+00
SCITY168	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.01E+00	1.23E+00	0.00E+00
SCITY169	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.15E+00	1.80E-02	0.00E+00
SCITY170	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	4.90E+00	1.08E-02	0.00E+00
SCITY171	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.52E+00	1.88E-02	0.00E+00
SCITY172	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	4.71E+00	2.04E-01	2.04E-01
SCITY173	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	1.09E+01	7.76E-02	7.76E-02
SCITY174	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	2.50E+00	1.08E-01	1.08E-01
SCITY175	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	184.2	400.0	1.949	5.5	8.01E+00	4.29E-02	4.29E-02
SCITY176	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	6.24E+00	1.38E-02	0.00E+00
SCITY177	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	5.17E+00	1.14E-02	0.00E+00
SCITY178	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	9.14E+00	2.02E-02	0.00E+00
SCITY179	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.31E+00	9.84E-01	0.00E+00
SCITY180	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.98E+00	8.40E-03	0.00E+00
SCITY181	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	3.53E-03	3.53E-03
SCITY183	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.29E-01	2.41E-03	2.41E-03
SCITY185	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.24E-02	5.89E-04	5.89E-04
SCITY187	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.36E-01	1.69E-03	1.69E-03
SCITY189	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	1.37E+00	4.86E-01	0.00E+00
SCITY190	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.35E-02	2.31E-03	2.31E-03
SCITY191	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	247.0	190.0	20.417	1.2	5.00E-01	3.57E-03	3.57E-03
SCITY192	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	3.69E+01	6.78E-02	0.00E+00
SCITY193	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	8.48E+00	1.56E-02	0.00E+00
SCITY194	DEFAULT	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	10.0	1100.0	23.333	0.5	2.09E+01	4.41E-02	0.00E+00
SCITY227	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0		2.54E-03	2.54E-03
SCITY228	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0		1.20E+00	1.20E+00
SCITY229	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	25.0	0.0	0.000	1.0		2.19E-04	2.19E-04
SCITY242	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	80.0	250.0	71.667	1.7		2.39E-03	2.39E-03
SCITY243	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	60.0	400.0	19.833	1.5		4.37E-03	4.37E-03
SCITY244	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		1.37E-04	1.37E-04
SCITY245	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	55.0	750.0	11.168	4.2		8.16E-03	8.16E-03
SCITY246	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	43.0	500.0	7.467	2.5		7.33E-05	7.33E-05
SCITY247	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	20.0	0.0	0.000	0.5		3.46E-04	3.46E-04
SCITY248	DEFAULT	PQ CORPORATION -THE	739053.43	4285317.19	495.80	36.0	375.0	1.716	2.0		2.48E-03	2.48E-03
SCITY266	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	24.0	1139.0	15.515	1.7		1.10E-02	1.10E-02
SCITY267	DEFAULT	HUMANE SOCIETY OF MISSOURI ST. LOUIS - MACKLIND AVE	737162.32	4278817.40	474.08	28.0	1800.0	15.584	2.0		6.76E-01	6.76E-01
SCITY275	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		2.93E+01	2.93E+01
SCITY276	DEFAULT	ALSCO, INC ST. LOUIS	743334.17	4275818.28	427.92	10.0	1100.0	23.333	0.5		4.99E-03	4.99E-03

Off-Site Point Source #Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SCITY277	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	23.5	850.0	0.003	0.5	7.13E-01	1.25E-05	0.00E+00
SCITY278	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.5	3.05E-01	1.78E-04	1.28E-04
SCITY279	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.5	6.87E-01	4.01E-04	4.01E-04
SCITY280	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.5	8.05E-01	1.28E-05	1.28E-05
SCITY281	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	250.0	0.003	1.5	6.89E-01	4.02E-04	4.02E-04
SCITY282	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	1.0	1.22E-01	5.27E-03	5.27E-03
SCITY283	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	1.0	2.73E-01	1.95E-03	1.95E-03
SCITY284	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.5	250.0	0.003	2.0	6.10E-01	2.56E-04	2.56E-04
SCITY285	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	22.0	250.0	0.003	2.0	1.36E-00	9.84E-03	9.84E-03
SCITY286	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	850.0	0.003	1.5	8.68E-01	1.53E-05	0.00E+00
SCITY287	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	7.84E-00	1.38E-04	0.00E+00
SCITY288	DEFAULT	NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY ST LOUIS	743107.71	4275132.40	439.30	20.5	800.0	0.003	1.5	7.84E+00	1.38E-04	0.00E+00
SCITY289	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		2.26E-03	2.26E-03
SCITY290	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	26.0	400.0	50.535	2.0		7.91E+01	2.91E-01
SCITY291	DEFAULT	ARTCO ST. LOUIS-AMERICAN RIVER TRANS CO ST. LOUIS	741227.54	4273049.76	423.52	28.0	400.0	50.535	2.0		1.63E-03	1.63E-03
SCITY292	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		1.28E+01	1.28E+01
SCITY293	DEFAULT	SOUTHERN METAL PROCESSING	739807.53	4271091.77	426.02	31.0	1590.0	19.255	2.5		3.47E-00	3.47E+00
SCITY295	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E-00	6.17E+01	6.17E-01
SCITY296	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.81E+00	1.29E-02	1.29E-02
SCITY297	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	8.93E-01	2.57E+01	2.57E-01
SCITY298	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	6.62E+00	4.73E-02	4.73E-02
SCITY299	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.99E-00	5.45E+01	5.45E-01
SCITY300	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	7.92E+00	5.66E-02	5.66E-02
SCITY301	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	2.14E+00	6.17E+01	6.17E+01
SCITY302	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	220.0	350.0	14.856	5.0	1.04E+00	7.40E-03	7.40E-03
SCITY303	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	9.62E+00	5.13E+00	0.00E+00
SCITY304	DEFAULT	SSM HEALTH ST. LOUIS UNIVERSITY HOSPITAL	740857.18	4278600.20	527.85	10.0	1100.0	23.333	0.5	5.11E-00	6.04E+00	0.00E-00
SCITY315	DEFAULT	J S ALBERICI CONSTRUCTION	736723.50	4285287.44	575.43	10.0	1100.0	23.333	0.5	6.50E+00	1.93E+00	0.00E+00
SCITY316	DEFAULT	J S ALBERICI CONSTRUCTION	736723.50	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY317	DEFAULT	J S ALBERICI CONSTRUCTION	736723.50	4285287.44	575.43	20.0	0.0	0.000	0.5	7.40E-02	2.22E-03	2.22E-03
SCITY318	DEFAULT	J S ALBERICI CONSTRUCTION	736723.50	4285287.44	575.43	10.0	1100.0	23.333	0.5	9.62E+00	5.00E+01	5.00E+01
SCITY319	DEFAULT	J S ALBERICI CONSTRUCTION	736723.50	4285287.44	575.43	20.0	0.0	0.000	0.5	2.00E-02	6.00E-04	6.00E-04
SCITY320	DEFAULT	J S ALBERICI CONSTRUCTION	736723.50	4285287.44	575.43	20.0	0.0	0.000	0.5	1.26E-02	3.79E-04	3.79E-04
SCITY321	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.9	8.09E-01	3.88E-02	3.88E-02
SCITY322	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	380.0	33.766	2.9	4.46E-01	3.28E-03	3.28E-03
SCITY323	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	1.40E-02	3.08E-05	0.00E+00
SCITY324	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	7.00E-04	1.54E-06	0.00E+00
SCITY325	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	850.0	73.133	0.7	5.78E-03	1.22E-05	0.00E+00
SCITY326	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.9	8.71E-02	3.76E-03	3.76E-03
SCITY327	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.9	6.86E-01	5.93E-03	5.93E-03
SCITY328	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.9	7.46E-01	3.22E-02	3.22E-02
SCITY329	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	80.0	405.0	33.766	2.9	9.04E-01	6.46E-03	6.46E-03
SCITY330	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	15.0	1007.0	51.050	0.7	4.68E-01	1.03E-03	0.00E+00
SCITY331	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	4.08E+00	1.24E+00	0.00E+00
SCITY332	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	10.0	1100.0	23.333	0.5	2.02E-01	1.44E-03	1.44E-03
SCITY333	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	8.0	1157.0	35.000	0.3	8.24E-00	2.57E+00	0.00E+00
SCITY334	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	8.0	1078.0	151.867	0.3	2.96E-00	7.82E-01	0.00E+00
SCITY335	DEFAULT	NESTLE PURINA PETCARE COMPANY ST. LOUIS	743912.49	4278167.30	467.68	8.9	815.0	37.895	0.8	6.13E-01	1.35E-03	0.00E+00
SCITY344	DEFAULT	PAULO PRODUCTS COMPANY	736597.70	4278776.67	503.12	82.0	200.0	5.933	1.2		5.04E-03	5.04E-03
SCITY355	DEFAULT	CHARTY REFRACTORIES CO L.L.C	738223.37	4278219.85	483.66	3.0	325.0	0.003	1.0		9.60E-02	9.60E-02
SCITY356	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	631.0	79.216	2.0		9.54E-01	9.54E-01
SCITY357	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	428.0	79.216	2.0		9.54E-01	9.54E-01
SCITY358	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY359	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01

Off-Site Point Source Model Input (NAD83, Zone 15)

Source ID		Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Stack Height (ft)	Temp (F)	Exit Velocity (ft/sec)	Stack Diameter (ft)	Potential Emissions (lb/hr)		
										CO	SOx	SO2 (1-hour)
SCITY360	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	565.0	985.0	23.035	0.7		3.05E-01	3.05E-01
SCITY361	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		1.09E-03	1.09E-03
SCITY362	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	660.0	300.0	23.035	1.5		4.92E-03	4.92E-03
SCITY363	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY364	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	390.0	960.0	23.035	9.5		7.17E-01	7.17E-01
SCITY365	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		1.19E+00	1.19E+00
SCITY366	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		5.13E+00	5.13E+00
SCITY367	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY368	DEFAULT	SOUTHWESTERN BELL TELEPHONE COMPANY	744346.61	4279152.95	459.35	290.0	722.0	96.401	2.0		8.24E+00	8.24E+00
SCITY380	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	25.0	450.0	20.000	2.5		2.46E-03	2.46E-03
SCITY381	DEFAULT	BKEP MATERIALS, LLC ST. LOUIS TERMINAL CO	739332.17	4270413.67	420.93	12.0	150.0	8.333	1.0		1.63E-01	1.63E-01
SCITY394	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5		2.06E+00	0.00E+00
SCITY395	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		9.53E-03	9.53E-03
SCITY396	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5		1.71E-03	1.71E-03
SCITY401	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		9.30E-05	9.30E-05
SCITY402	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		4.97E-03	4.97E-03
SCITY403	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		5.07E-05	5.07E-05
SCITY404	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	40.0	200.0	21.667	2.5		2.48E-03	2.48E-03
SCITY405	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	10.0	1100.0	23.333	0.5		1.83E-02	0.00E+00
SCITY406	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.55E+00	2.55E+00
SCITY407	DEFAULT	SSM CARDINAL GLENNON CHILDRENS HOSPITAL	740376.29	4278334.05	544.29	23.5	200.0	16.667	2.9		2.87E-02	2.87E-02
CJEFF34	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	25.6	77.0	20.800	1.8	2.68E-02		
CJEFF35	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	350.0	40.000	2.0	3.90E-01		
CJEFF36	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	2.07E-01		
CJEFF37	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	20.0	0.0	0.000	0.5	9.13E-03		
CJEFF43	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	56.0	370.0	33.333	2.5	1.01E-01		
CJEFF44	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	41.667	2.5	8.06E-01		
CJEFF45	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	112.999	2.5	9.97E-02		
CJEFF46	DEFAULT	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	70.0	850.0	20.600	2.5	2.58E-01		
CSTLC55	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.68E-02		
CSTLC56	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	34.0	375.0	26.555	2.3	1.27E+00		
CSTLC57	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	1.66E-02		
CSTLC58	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	33.0	428.0	15.669	3.8	3.85E-01		
CSTLC59	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	20.0	250.0	1.083	1.0	7.72E-02		
CSTLC60	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	3.28E+00		
CSTLC61	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	1.29E-01		
CSTLC62	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	5.5	1200.0	254.649	0.2	9.99E-05		
CSTLC63	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	19.0	425.0	7.047	1.7	6.01E-01		
CSTLC64	DEFAULT	ST. LOUIS AIRPORT AUTHORITY LAMBERT INTERNATIONAL BLVD	728947.29	4291571.16	554.63	24.0	270.0	105.951	2.0	3.24E+00		
CSTLC152	DEFAULT	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	480.05	43.0	-459.7	3.225	1.0	1.38E-01		
CSTLC155	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	37.0	230.0	51.250	4.2	2.57E+01		
CSTLC156	DEFAULT	FRED WEBER INC. - SOUTH ASPHALT BATCH SOUTH ASPHALT	732929.25	4259955.19	424.64	12.0	355.0	0.804	1.3	4.03E-01		
CSTLC157	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	31.0	230.0	80.499	4.2	3.93E+01		
CSTLC158	DEFAULT	FRED WEBER INC. - NORTH ASPHALT H and B	720614.10	4290798.15	468.70	20.0	300.0	16.667	1.1	2.29E-01		
CSTLC207	DEFAULT	MISSOURI-AMERICAN WATER CO FLORISSANT	728394.88	4300010.04	461.78	15.0	896.0	0.000	14.0	1.61E+02		
CCITY65	DEFAULT	WASHINGTON UNIV MEDICAL SCHOOL BOILER PLANT	738259.22	4279906.98	511.94	100.0	350.0	29.984	1.3	3.08E-02		
CCITY203	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	250.0	18.068	1.0	5.56E-01		
CCITY204	DEFAULT	INDUSTRIAL CONTAINER SERVICES - MO, LLC MANCHESTER	737686.12	4278652.89	459.06	20.0	150.0	22.218	1.0	1.68E+02		
CCITY344	DEFAULT	GP RECYCLING, LLC	743830.86	4284034.28	422.18	20.0	0.0	0.000	0.5	1.72E-02		
CCITY368	DEFAULT	GP RECYCLING, LLC	740384.08	4280241.69	507.64	10.0	1100.0	23.333	0.5	6.73E+00		
CCITY369	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	1.38E+00		
CCITY370	DEFAULT	SAINT LOUIS UNIVERSITY FACILITIES SERVICES	740384.08	4280241.69	507.64	20.0	0.0	0.000	0.5	5.69E-02		

R005454

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr) CO	SOx	SO2 (1-hour)
SJEFF84	MERCY HOSPITAL JEFFERSON	728196.03	4230846.83	425.79	16.4	3.8	15.3	1.23E-02	9.13E-05	9.13E-05
SJEFF84	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	4.66E-03	4.66E-03
SJEFF85	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	7.06E-03	7.06E-03
SJEFF87	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	16.4	3.8	15.3	2.29E-01	1.44E-03	1.44E-03
SJEFF88	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6	2.29E-01	3.91E-03	3.91E-03
SJEFF89	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.47E-03	1.47E-03
SJEFF90	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		2.29E-01	2.29E-01
SJEFF91	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		6.88E-03	6.88E-03
SJEFF93	ARDAGH GLASS INC. PEVELY	727306.83	4241579.49	466.57	8.2	2.3	7.6		1.38E-03	1.38E-03
SJEFF101	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	4.81E-01	2.40E-02	2.40E-02
SJEFF102	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	6.41E-01	1.42E-02	1.42E-02
SJEFF103	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	5.24E-01	6.09E-03	6.09E-03
SJEFF104	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6	1.91E-01	3.75E-03	3.75E-03
SJEFF105	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.08E-03	1.08E-03
SJEFF106	CARONDELET CORPORATION PEVELY	727491.85	4241725.78	485.56	8.2	2.3	7.6		1.14E-03	1.14E-03
SJEFF107	AERO METAL FINISHING	718099.61	4268747.23	613.55	8.2	2.3	7.6		2.43E-01	2.43E-01
SJEFF126	FRED WEBER, INC. ANTONIA	726102.79	4246877.71	670.57	8.2	2.3	7.6		3.08E+00	3.08E+00
SSFC56	BLASTCO INC	890213.84	4287755.23	549.44	8.2	2.3	7.6		1.47E-01	1.47E-01
SSTL67	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		5.88E-04	5.88E-04
SSTL68	MISSOURI ASPHALT PRODUCTS, LLC WEST LAKE QUARRY MATERIAL CO	721914.39	4294042.31	462.50	16.4	3.8	15.3		1.02E+00	1.02E+00
SSTL125	BOEING ALUMINUM INC WALTON ROAD	730791.15	4286068.83	618.50	8.2	2.3	7.6		7.18E-03	7.18E-03
SSTL197	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	8.2	2.3	7.6		1.80E-01	1.80E-01
SCITY19	MALLINCKROUT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	8.24E-02	2.47E-02	2.47E-02
SCITY20	MALLINCKROUT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	4.44E-03	7.73E-01	7.73E-01
SCITY21	MALLINCKROOT N SECOND	744362.95	4283022.76	417.81	8.2	2.3	7.6	2.59E+00	7.94E-01	7.94E-01
SCITY44	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		6.22E-04	6.22E-04
SCITY45	ADM GRAIN COMPANY ST. LOUIS	744141.30	4284932.90	425.39	15.0	0.2	14.0		2.76E-02	2.76E-02
SCITY118	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.35	414.11	8.2	2.3	7.6		7.50E-05	7.50E-05
SCITY119	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.35	414.11	8.2	2.3	7.6		4.00E-01	4.00E-01
SCITY120	ICL SPECIALTY PRODUCTS INC CARONDELET PLANT	737985.63	4270043.35	414.11	8.2	2.3	7.6		2.61E-01	2.61E-01
SCITY130	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY131	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY134	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY135	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY138	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		7.40E-02	7.40E-02
SCITY139	JW ALUMINUM ST. LOUIS	740003.39	4271318.74	425.30	8.2	2.3	7.6		3.00E-04	3.00E-04
SCITY182	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY184	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	6.59E-02	4.71E-04	4.71E-04
SCITY186	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	3.36E-02	2.40E-04	2.40E-04
SCITY188	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	16.4	3.8	15.3	4.86E-02	3.53E-04	3.53E-04
SCITY195	BARNES JEWISH HOSPITAL	738059.57	4279829.93	507.94	8.2	2.3	7.6	8.40E-02	6.00E-04	6.00E-04
SCITY241	PQ CORPORATION -THE	739053.43	4285317.19	499.80	8.2	2.3	7.6		2.66E-02	2.66E-02
SCITY340	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		3.60E-04	3.60E-04
SCITY341	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.13E-03	1.13E-03
SCITY342	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-03	1.20E-03
SCITY343	PAULO PRODUCTS COMPANY	736597.70	4278776.67	501.12	8.2	2.3	7.6		1.20E-02	1.20E-02
CJEFF33	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.49E-01		
CJEFF38	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.71E-03		
CJEFF39	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.22E-03		

Off-Site Volume Source Inputs

Source ID	Source Description	Easting (m)	Northing (m)	Base Elevation (ft)	Release Height (ft)	Sigma Y (ft)	Sigma Z (ft)	Potential Emissions (lb/hr)		
								CO	SOx	SO2 (1-hour)
CJEFF40	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.01E-01		
CJEFF41	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.10E-03		
CJEFF42	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.18E-04		
CJEFF47	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.55E-02		
CJEFF48	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	6.56E-06		
CJEFF49	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.09E-04		
CJEFF50	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.48E-04		
CJEFF51	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	5.28E-02		
CJEFF52	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	2.46E-03		
CJEFF53	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.53E-01		
CJEFF54	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.56E-02		
CJEFF55	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.16E-01		
CJEFF56	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	8.45E-03		
CJEFF57	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	3.42E-01		
CJEFF58	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	4.74E-03		
CJEFF59	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.92E-01		
CJEFF60	METAL CONTAINER CORPORATION ARNOLD	730800.10	4257280.94	441.70	16.4	3.8	15.3	1.36E-02		
CSTLC92	THE BOEING COMPANY ST. LOUIS	728742.77	4293777.11	545.54	8.2	2.3	7.6	2.25E-01		
CSTLC151	SIMPSON CONSTRUCTION MATERIALS LLC VALLEY PARK	715996.20	4268469.87	430.05	13.5	1.4	0.7	1.58E-01		
CSTLC185	FRED WEBER, INC. FT. BELLE	739499.97	4302900.13	443.27	13.5	1.4	0.7	5.97E-01		
CCITY343	GP RECYCLING, LLC	743830.85	4284034.28	422.18	8.2	2.3	7.6	5.57E-02		

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ATTACHMENT B
MODEL SUMMARY OUTPUT

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City Sit_2019_CO.SUM	CO	1-HR	ALL	1ST	1157.328	746400	4286400	128.82	132.25		19020109	STL_LCN19	13	1	14098
AERMOD 22112	Granite City Sit_2016_CO.SUM	CO	1-HR	ALL	1ST	1094.348	750800	4288100	127.44	127.44		16121910	STL_LCN16	13	1	14098
AERMOD 22112	Granite City Sit_2018_CO.SUM	CO	1-HR	ALL	1ST	1038.463	745200	4287400	179.9	134.11		18112209	STL_LCN18	13	1	14098
AERMOD 22112	Granite City Sit_2020_CO.SUM	CO	1-HR	ALL	1ST	997.1573	746700	4287100	126.89	126.89		20010610	STL_LCN20	13	1	14098
AERMOD 22112	Granite City Sit_2017_CO.SUM	CO	1-HR	ALL	1ST	982.0781	748434.9	4287033	127.16	127.16		17051502	STL_LCN17	13	1	14098
AERMOD 22112	Granite City Sit_2019_CO.SUM	CO	8-HR	ALL	1ST	693.6775	748481.6	4286378	126.67	126.67		19041908	STL_LCN19	13	1	14098
AERMOD 22112	Granite City Sit_2018_CO.SUM	CO	8-HR	ALL	1ST	668.2876	748481.6	4286378	126.67	126.67		18111224	STL_LCN18	13	1	14098
AERMOD 22112	Granite City Sit_2017_CO.SUM	CO	8-HR	ALL	1ST	651.0973	750472	4287091	175.7	125.7		17090416	STL_LCN17	13	1	14098
AERMOD 22112	Granite City Sit_2016_CO.SUM	CO	8-HR	ALL	1ST	645.9934	748434.9	4287033	127.16	127.16		16110108	STL_LCN16	13	1	14098
AERMOD 22112	Granite City Sit_2020_CO.SUM	CO	8-HR	ALL	1ST	618.4866	748434.9	4287033	127.16	127.16		20041108	STL_LCN20	13	1	14098

10-5-22 US Steel CO Scale-up Significant Impacts Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Significant Impact Level (ug/m3)	% SIL
CO	1-HR	ALL	1ST	1157.3	2,000	58%
CO	8-HR	ALL	1ST	693.7	500	138%

10-5-22 US Steel CO NAAQS Analysis Results

Model	File	Pollutant	Average	Group	Rank	Conc/Dep	East (X)	North (Y)	Elev	Hill	Flag	Time	Met File	Sources	Groups	Receptors
AERMOD 22112	Granite City NAAQS_2016_CO.SUM	CO	8-HR	ALL	2ND	1856.677	748434.9	4287033	127.16	127.16		16032208	STL_LCN16	584	1	205
AERMOD 22112	Granite City NAAQS_2017_CO.SUM	CO	8-HR	ALL	2ND	1841.334	748434.9	4287033	127.16	127.16		17121624	STL_LCN17	584	1	205
AERMOD 22112	Granite City NAAQS_2018_CO.SUM	CO	8-HR	ALL	2ND	1726.885	748478.1	4287000	126.94	126.94		18092424	STL_LCN18	584	1	205
AERMOD 22112	Granite City NAAQS_2019_CO.SUM	CO	8-HR	ALL	2ND	2045.17	748434.9	4287033	127.16	127.16		19110908	STL_LCN19	584	1	205
AERMOD 22112	Granite City NAAQS_2020_CO.SUM	CO	8-HR	ALL	2ND	1966.713	748434.9	4287033	127.16	127.16		20092408	STL_LCN20	584	1	205

10-5-22 US Steel CO NAAQS Analysis Results

Pollutant	Average	Group	Rank	Model Conc. (ug/m3)	Background Conc. (ug/m3)	Total Conc. (ug/m3)	Standard (ug/m3)	% Standard
CO	8-HR	ALL	2ND	2045.2	1646	3691.2	10,000	37%

Background data from East St. Louis monitor (AQS No. 85-S10-029), high second high value from 2016-2018.

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3. AERSCREEN User's Guide. EPA-454/B-15-005, July 2015.

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