Commonwealth of Kentucky
Division for Air Quality

STATEMENT OF BASIS / SUMMARY

Title V / PSD, Operating / Construction
Permit: V-25-035

Fritz Winter North America, LP
1 Fritz Winter Drive
Franklin, KY 42134

12/29/2025
Eric Amdahl, Reviewer

SOURCE ID:	21-213-00064
AGENCY INTEREST:	129745
ACTIVITY:	APE20210001; APE20220001; APE20220002; APE20220003

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SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 3321, Gray and Ductile Iron Foundries

Single Source Det. ☐ Yes ☒ No If Yes, Affiliated Source AI:

Source-wide Limit ☒ Yes ☐ No If Yes, See Section 4, Table A

28 Source Category ☒ Yes ☐ No If Yes, Category: Secondary metal production plants

County: Simpson
Nonattainment Area ☒ N/A ☐ PM_{10} ☐ $PM_{2.5}$ ☐ CO ☐ NO_X ☐ SO_2 ☐ Ozone ☐ Lead
If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☒ PM_{10} ☒ $PM_{2.5}$ ☒ CO ☐ NO_X ☐ SO_2 ☒ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☒ Yes ☐ No
If yes, for what pollutant(s)?
☒ PM_{10} ☒ $PM_{2.5}$ ☒ CO ☐ NO_X ☐ SO_2 ☐ VOC

PTE* greater than 10 tpy for any single hazardous air pollutant (HAP) ☒ Yes ☐ No
If yes, list which pollutant(s): Manganese and Compounds

PTE* greater than 25 tpy for combined HAP ☒ Yes ☐ No

*PTE does not include self-imposed emission limitations.

Description of Facility:
Fritz Winter North America LP (FW) operates a gray iron foundry, casting, and machining operation to produce automotive parts in Simpson County, Kentucky. The facility comprises of an approximately 95 acre site, consisting of scrap handling and preparation equipment, melt furnaces, sand, and mineral storage, mixing and handling equipment, mold and core making facilities, casting equipment, and finishing facilities where castings are machined and coated.

FW is a major source of criteria pollutants and an area source of Hazardous Air Pollutants (HAPs). FW has accepted conditional major limits on emissions of HAP to preclude major source status for HAPs. The FW facility is a new major source under 401 KAR 51:017, Prevention of Significant Deterioration (PSD). The project is major for Carbon Monoxide (CO) and has the potential to emit more than the significant emission rates for Particulate Matter (PM, PM_{10}, and $PM_{2.5}$), and Volatile Organic Compounds (VOC). FW is a secondary metal production plant which is one of the 28 source categories with respect to PSD; therefore, fugitive emissions are included in determinations of PSD applicability. FW is in Simpson County, which is classified as attainment or unclassifiable for all pollutants.

The gray iron foundry, or melt shop, involves melting steel and iron and various additives in induction furnaces. Steel and iron scrap, alloying materials, and flux are brought to the site and stored inside the foundry building. FW plans to use only clean scrap, meaning the metals used will not be postconsumer scrap and the materials should be free of oils and paints. Baghouse dust is collected and conveyed to a waste dust silo [Emission Unit (EU)17]. Alloying materials and fluxes, such as carbon, magnesium, molybdenum, copper, chromium, vanadium, and niobium, are stored in the shop and are added manually to the induction furnaces without additional processing.

Scrap metals are melted in electric induction furnaces. Melting takes place under a large furnace hood that is pivoted into place after the furnace is charged with scrap and alloys. The hood collects emissions during melting and vents to the melt-shop baghouse filter and stack.

Once melted, flux, magnesium carbonate and/or graphite materials, may be added to the molten material to draw together any impurities and form slag. This waste material can be manually skimmed from the surface and collected for disposal. Once the molten material reaches specific design content and consistency requirements, the hood is raised and the furnace is tilted to pour the molten iron into a large transport ladle that is also refractory lined. When ready to be cast, the ladles pour the material into the pouring furnace that has been preheated with a gas-fired burner to prevent shock to the molten material. The pouring furnace maintains material temperature through electrical induction heating. Transport ladles move the materials between the furnaces as necessary. All of the various furnaces are vented to the melt shop baghouse for emissions control.

The Sand Plant is where the green sand molds are made for casting the metal brake rotors. The molds are formed using a mixture of three basic ingredients: silica sand, bentonite (clay material) which acts as a glue to hold the sand mixture in the required shape, and a blend of bentonite and coal dust called Seacoal which prevents sand from adhering to the iron casting. The name “green sand” does not refer to the color of the sand mixture but is a reference to the wet state, or the “green”, uncured state of the mold when the molten metal is poured.

Materials for the green sand mixture are delivered via truck and offloaded pneumatically into storage silos where bin vent filters help control particulate emissions. Materials are transferred to smaller bins and then weigh hoppers before ending up in the green sand mixers for blending. The materials are transported from place to place within the building through the use of pneumatic conveyors, which are tubes and pipes that move the sand materials through the use of air pressure and minimize the release of dusts.

Before the mold can be assembled, a core must be formed that is shaped to allow the hollows and voids of the brake rotor to form when the molten metal is poured into the mold. The core must be strong enough to stand up to the heat of the molten material and is formed of silica sand, resin, and hardener. Core silica sand is processed through a sand classifier that sorts out fine-sized particles to ensure a uniform gain sized sand. It is then mixed with two parts phenolic resin and hardener in an enclosed mixer. This blend is sent to an automated core machine where it is shaped into the desired form and subjected to an amine gas that acts as a catalyst to accelerate curing of the resin. Hardened cores are separated from their molds and dipped into a coating that provides abrasive protection. The cores are then heated in a natural gas fired dryer before exiting the automatic core machines. Emissions from most of the core making area, including the sand silos, sand classifier, sand bin, weigh hopper, core removal area and dryers are vented to the pouring and cooling baghouse (CU08) and then to stack (ST09). Emissions from use of the amine gas are sent through a sulfuric acid scrubber, to control odors, before exiting to the atmosphere through a stack.

Once a core is complete, the mold can be assembled for the actual casting. Metal frameworks, a top (cope) and bottom (drag) are sprayed with a releasing agent (lubricant) before being filled and compacted with the mixed green sand. The outer shape of the brake rotors is then stamped, using a solid pattern called a tool, into both the cope and drag. The pattern also includes pathways through which molten metal can flow into and gases can be vented out of the mold. A small number of pathways may also be robotically drilled into the mold. Finished cores are then placed in the bottom part of the mold before the top is placed over the bottom and the completed mold is sealed. Emissions from this part of the process are ducted through the pouring and cooling baghouse (CU08) and exhausted through stack (ST09).

Molds are moved to the pouring and cooling area via a conveyor where the casting takes place along one continuous line. Molds are brought to the pouring furnaces on a rail system. The furnace is tilted and the molten material flows into the mold. The extreme heat of the material contacting carbon in the mold causes volatile organic compounds (VOCs) and carbon monoxide (CO) to be generated. These gases escape through vents designed into the mold and auto ignite due to the extreme heat. Natural gas pilot burners are placed around the mold conveyor to ensure vent gases ignite and burn off pollutants.

The cast molds are then conveyed through a cooling tunnel where the cool-down is closely controlled to ensure that the proper structure forms in the metal as it solidifies. Emissions from the pouring stations and tunnel are routed to the area baghouse (CU08) and exhausted through a stack (ST09) to atmosphere.

Once the castings solidify, the mold frames are opened and the mold enters the shakeout conveyer where the mold is broken and the castings are separated. The shakeout conveyor also breaks off the sprues left over from the casting. Sprues are created in the pathways that allow the molten material to flow into the mold. When the mold is cooled any material in the pathways solidifies, too. The sprues are broken off and magnetically collected so they can be sent back to the melt shop for use as internal scrap. Sand from the shakeout conveyor is collected and routed through a screening sieve and sand cooler where air and water cool and hydrate the sand to the desired temperature and moisture content. Most of the sand is recycled back into the green sand mixing process. Approximately 5 percent, however, must be removed to prevent build-up of left over core sand binder (resins) decomposition byproducts. Waste sand is kept in a silo until it is shipped off site for disposal. Emissions from the shakeout conveyor and the sand separation and recycling processes are vented to the sand plant baghouse (CU06) that exhausts through a stack (ST07).

From shake-out, the castings are sent to a forced air cooler and then sorted to remove any remaining sprues. Finishing begins when the cast parts are sent to the steel shot blasting units, where a stream of abrasive material (steel shot) is forcibly propelled in a stream against the surface of the castings under high pressure. This process removes sand and smooths the casting surface. Grinders are then used to remove any raised areas or bits of sprue left on the surface of the product. The finished castings are placed in short term storage to allow the gray iron to fully crystallize and reach its desired structure before being sent to the final machining operation. Emissions from sorting, shot blasting, and milling are vented to the finishing baghouse (CU11) and exhausted through a stack (ST12).

In the machine shop, computerized dry lathes, milling, perforation lines, and drilling machines correct specifications and tolerances on the castings. Iron chips generated by the various machining operations are collected and reused in the melt shop and particulate generated is ducted to individual cartridge filters within building 2 (CU13a-j).

After machining, each brake rotor is coated with zinc. Two types of coating operations are used. In one, the castings are heated through induction before passing through a paint booth to receive the coating, and then enter a cooling unit. In the second type, castings first enter a paint booth which applies a solids-based coating, followed by treatment in a preheater and then final induction heating to cure the coating. All paint booths are fitted with individual filters and ducted to stacks ST15a, ST15b and ST16.

Utility operations on the site include the replacement of refractory surfaces. The linings of the ladles and furnaces must be routinely replaced because they are subjected to high temperatures and extreme wear and stress. Replacement of the linings of the furnaces must be conducted in place. This is accomplished by inserting a mold into the furnace and filling the space between the furnace wall and the mold with refractory slurry. The new lining is allowed to set, the mold insert is removed, and a portable natural gas burner is lowered into the furnace to heat cure the lining.

The ladles are relined in a manner similar to procedures used for the furnaces. In the refractory repair area, a mold insert is placed in the ladle and a portable natural gas is used to cure the refractory material.

The FW site also has three diesel-fired and one natural gas fired emergency generators for back-up electrical power during main supply failure and a 2,000 gallon above-ground diesel storage tank. All other chemicals used on site are received and stored in totes and drums.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-25-035

Activities: APE20210001, APE20220001, APE20220002 & APE20220003

Received: 5/3/21; 2/21/22; 2/21/22; 3/7/22

Application Complete Date(s): 8/2/21; 5/18/22; 5/18/22; 1/18/23

Permit Actions: ☐ Initial ☒ Renewal ☒ Significant Rev ☒ Minor Rev ☐ Administrative

Construction/Modification Requested? ☒Yes ☐No NSR Applicable? ☒Yes ☐No

Previous 502(b)(10) or Off-Permit Changes incorporated with this permit action ☒Yes ☐No

- *APE20240001 – Section 502(b)10 Change:* Addition of EU 85, Natural Gas Generator that serves the computer room as an emergency generator.

Description of Action:
Fritz Winter North America LP (FWNA) applied for the renewal of their Title V operating permit on May 3, 2021. As part of the renewal, the Division updated the following regulatory language in the permit:
- 40 CFR 63, Subpart ZZZZZ to reflect published changes in 2020;
- 40 CFR 60, Subpart IIII, 40 CFR 60, Subpart JJJJ, and 40 CFR 63, Subpart ZZZZ to reflect removal of the vacatur and emergency demand response provisions;
- 401 KAR 63:010 to reflect published changes in 2020.

Additionally, with the renewal permit, the Division is processing the following additional permitting actions:

- On February 21, 2022, FWNA submitted a minor permit revision application for the addition of Rotary Sprue Cleaners and Return Conveyors (EU 83). The unit will be installed following Sprue Conveyor (EU 60) to receive sprue and sand. The liner of the Rotary Sprue causes the adhering sand to separate from the sprue. The sand and small metallics will be discharged to a series of return conveyors that will eventually transfer the sand to an existing metal separation system that is near the existing Shakeout (EU53). Cleaned sprue will exit onto a belt and then to a temporary storage location prior to being returned to the charge handling where it will be remelted with other charge materials. Emissions from EU 83 will be exhausted to two existing baghouses core/mold baghouse (CU08) and fettling baghouse (CU11). This project is a separate project from the original site construction PSD project.
- On February 21, 2022, FWNA submitted a minor permit revision application for the addition of Perforation Line #1 (EU 84). Products machined are cast at the existing facility. Emissions from EU 84 will be exhausted to perforation line #1 cartridge collector (CU23), which emits indoors. Secondary emission control occurs through Paint Line #1 Booth Filter (CU17) and are emit through ST16. This project is a separate project from the original site construction PSD project.

- On March 7, 2022, FWNA submitted a permit application for the revision of the project in the original Title V/PSD permit V-16-022 R1 with as-built design configurations and to reflect the actual capability of the originally permitted equipment to meet the BACT limitations imposed during the initial permitting process. To support the requested changes in the permit application, FWNA included a process description, a summary of the expected air emissions, a regulatory analysis of the proposed project, a Best Available Control Technology (BACT) analysis, a modeling analysis, and an assessment of other impacts.

As part of the significant revision application, the following emission units have been removed from the permit and the scope of the original PSD project:

- EU 03, Scrap Drying
- EU 04, Scrap Cleaning
- EU 11, Holding Furnace #1
- EU 12, Holding Furnace #2
- EU 58, Mold Shop Baghouse Waste Dust Silo
- EU 70, Paint Booth #3
- EU 75, Gasoline Storage Tank

Additionally, the building vents, BV01 and BV02, have permanently closed the louvers on each vent and are no longer considered emission points from the building. Initially, Emission Units 01, 05, 06, 13, 14 and 18 emitted through BV01. With the revision, these emission points will exhaust to Melt Baghouse Stack (CU01/ST02). The facility will maintain negative pressure within the facility by keeping the louvers closed.

Also, as part of the significant revision application, the following emission units have been consolidated into single emission units based on their operation/design:

- EUs 01 and 02 consolidated to EU 01 – Charge Handling: Scrap Steel Storage (EU 01) and Alloy Storage (EU 02) are co-located under the same roof. The charge materials include scrap, fluxes, and alloys of which are received in bulk containers. The materials are deposited into one of four huge hoppers which carry the charge through roll-up doors to one of the four furnaces. The receiving and storage of all charge materials are addressed under the same SCC code (3-04-003-15). The emissions for this process are determined based on the tons of metal charged and not the type of material received.

- EUs 13 (Transport Ladle #1) and 14 (Transport Ladle #2) consolidated to EU 13 – Hot Metal Transfer: Emissions results from the transfer of molten metal from the induction furnaces to the pouring furnace. Due to abrasion and thermal degradation, the ladle refractory must be repaired. When a ladle is out of service, a repaired ladle takes its place. The uncontrolled emissions from the Hot Metal Transfer are calculated based on the molten metal transferred, not whether the metal is transported by a specific ladle.

- EUs 22 (Mold Silica Sand Bin) and 26 (Mold Silica Sand Weigh Hopper) consolidated to EU 22 – Mold Silica Sand Handling and Preparation: These emission units operate in sequence; silica sand is pneumatically transferred from the Mold Silica Sand Silo (EU 19) to day bins and then to weigh hoppers. Specific portion of this sand is mixed in a Green Sand Mixer (either EU 30, 31 or 32) for blending with blend and bentonite sand.

- EUs 23 (Blend Bin) and 27 (Blend Weigh Hopper) consolidated to EU 23 – Blend Sand Handling and Preparation: These emission units operate in sequence; blend sand is pneumatically transferred from the Blend Sand Silo (EU 20) to day bins and then to weigh hoppers. Specific portion of this sand is mixed in a Green Sand Mixer (either EU 30, 31 or 32) for blending with mold silica and bentonite sand.

- EUs 24 (Bentonite Bin) and 28 (Bentonite Weigh Hopper) will be consolidated into EU 24 – Bentonite Sand Handling and Preparation: These emission units operate in sequence; bentonite sand is pneumatically transferred from the Bentonite Sand Silo (EU 21) to day bins and then to weigh hoppers. Specific portion of this sand is mixed in a Green Sand Mixer (either EU 30, 31 or 32) for blending with mold silica and blend sand.

- EUs 33 (Mold Stamping No. 1) and 48 (Mold Assembly No. 1) consolidated to EU 33 – Molding Making #1. These emission units operate in sequence. The mold assembly process starts with an outer metal frame onto which a release agent is applied before the frame is filled and compacted with green sand. The outer shape of the desired casting is then stamped into both the cope and drag of the green sand. Cores are placed into the bottom half of the molds before the top half of the mold is placed on the bottom half to form one complete sealed mold. The mold is then converted to the pouring furnaces. Emissions generated from the mold assembly area are ducted to the Core/Mold Baghouse (CU08) which exhausts to the atmosphere through stack ST09.

- EUs 36 (Sand Classifier), 37 (Core Silica Sand Bin) and 38 (Core Silica Sand Weigh Hopper) will be consolidated into EU 36 – Core Sand Handling and Preparation: These units are in constant operation. When sand is needed for core making sand is automatically and pneumatically conveyed from Core Silica Sand Silo A (EU 35A) or Core Silica Sand Silo B (EU 35B). Once sized, the sand is gravity fed to the sand bin and then gravity fed to the weigh hopper prior to being discharged to a mixer where the weighed sand is mixed with resin. These units are stacked on top of each other above the core machine and are not necessarily identifiable from one another. The weigh hopper receives sand directly from the sand bin. Binder is added and mixed to be delivered to the core machine calling for sand.

- EU 50 (Pouring #1), EU 52 (Mold Cooling), will be consolidated into EU 50 Pouring and Cooling: Emissions have been combined in the calculations based on the upper 95% confidence interval of 2019 and 2024 CU08/ST09 stack test results, and the two sources share the same stack. Additionally, AP-42 emission factors list pouring and cooling as one emission factor in Table 12.10-9, for gray iron foundries. This change will include the use of natural gas mold vent pilot burners that are strategically placed at the mold conveyor to ignite the vent gases that have not already ignited, with burner rate of 1 MMBtu/hr.

- EUs 54 (Sand Cooler), 55 (Used Mold & Core Sand Storage), and 56 (Sand Screening) will be consolidated into EU 54 – Used Sand Handling and Preparation: Recycled sand from pouring, cooling, and shakeout, is screened, cooled, and sent to storage. Used mold and core sand is reused in the green sand mixers.

As part of the significant revision application, the following emission units have been added into the scope of the PSD project and the permit:

- EU 77 – Snag Grinder #1

- EU 78 – Snag Grinder #2
- EU 79 – Core Wash Station #2
- EU 82 – Rust Preventative Application

The following emission units, included in the PSD project, experienced changes to their descriptions, maximum capacity, emission factors, construction commencement dates, control efficiency, stack parameters, or BACT limits.

- **EU 01 – Charge Handling**: The description has been updated from Scrap Steel Storage to Charge Handling. Stack parameters for ST02 have been updated. Emission factors for PM, PM_{10}, $PM_{2.5}$ and HAPs have been updated. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy. The SCC code for EU 01 has been updated.
- **EU 05 – Refractory Burner #1**: Emissions originally emitted from BV01-4, but they now travel to ST02 instead. PM, PM_{10} and $PM_{2.5}$ emissions are now controlled by Melt Baghouse (CU01). Stack parameters for ST02 have been updated. The commencement date has been updated from August 2016 to May 2017. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters.
- **EU 06 – Refractory Burner #2**: Emissions used to be released from BV01-5, but they now travel to ST02 instead. PM emissions are now controlled by Melt Baghouse (CU01). Stack parameters for ST02 have been updated. The commencement date has been updated from March 2019 to May 2017. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters.
- **EU 07 – Induction Furnace #1**: The commencement date has been updated from August 2016 to May 2017. Stack parameters for ST02 have been updated. PM_{10}, $PM_{2.5}$, and HAP emission factors have been updated. CO and VOC emission factors have been added to the potential emission calculations. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters.
- **EU 08 – Induction Furnace #2**: The commencement date has been updated from August 2016 to May 2017. Stack parameters for ST02 have been updated. PM_{10}, $PM_{2.5}$, and HAP emission factors have been updated. CO and VOC emission factors have been added to the potential emission calculations. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters.
- **EU 09 – Induction Furnace #3**: The commencement date has been updated from March 2019 to July 2019. Stack parameters for ST02 have been updated. PM_{10}, $PM_{2.5}$, and HAP emission factors have been updated. CO and VOC emission factors have been added to the potential emission calculations. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters.
- **EU 10 – Induction Furnace #4**: The commencement date has been updated from March 2019 to July 2019. Stack parameters for ST02 have been updated. PM_{10}, $PM_{2.5}$, and HAP emission factors have been updated. CO and VOC emission factors have been added to the potential

emission calculations. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters.

- **EU 13 – Hot Metal Transfer**: The description has been updated from Transport Ladle #1 to Hot Metal Transfer. Emissions originally emitted from BV01-2, but they now travel to ST02 instead. PM, PM_{10}, $PM_{2.5}$ and HAP emissions are controlled by Melt Baghouse (CU01). The commencement date has been updated from August 2016 to March 2017. The PM, PM_{10}, $PM_{2.5}$ and HAP emission factors have been updated. The grain loading value, air flow rate, and temperature have been updated for Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy.
- **EU 15 – Pouring Furnace #1**: This unit has been purchased but is not installed. Stack parameters for ST02 have been updated. The SCC code has been updated to 3-04-003-03 to represent the equipment as an induction furnace used for pouring. The PM_{10} and $PM_{2.5}$ emission factors have been updated. The grain loading value, air flow rate, and temperature have been updated for the Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy.
- **EU 17 – Melt and Core/Mold Baghouse Waste Dust Silo:** The construction commencement date has been updated from August 2016 to May 2017. Stack parameters for ST03 have been updated. Emissions factors for PM, PM_{10}, $PM_{2.5}$ and HAP have been updated. The grain loading value, air flow rate, and temperature have been updated for the Melt and Core/Mold Baghouse Waste Dust Silo Bin Vent Filter (CU02). Control efficiency for CU02 has been updated according to the new parameters. Maximum hourly throughput has been updated to 0.38 tons/hr and the maximum yearly capacity of 3,323 tpy.
- **EU18 – Refractory Curing Mobile Burning:** EU 18 was previously designated as BV01-6; however emissions are now vented to ST02. PM emissions are now controlled by CU01. The construction commencement date has been updated from August 2016 to September 2016. Stack parameters for ST02 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Melt Baghouse (CU01). Control efficiency for CU01 has been updated according to the new parameters.
- **EU 19 – Mold Silica Sand Silo:** The construction commencement date has been updated from August 2016 to March 2017. Stack parameters for ST04 have been updated. The maximum hourly capacity has been updated to 25 tons per hour. Emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. The grain loading value, air flow rate, and temperature have been updated for the Mold Silica Sand Silo Bin Vent Filter (CU03). Control efficiency for CU03 has been updated according to the new parameters. Maximum hourly throughput has been updated to 25.0 tons/hr and the maximum yearly capacity of 21,000 tpy.
- **EU 20 – Blend Silo:** The construction commencement date has been updated from August 2016 to March 2017. The maximum hourly capacity has been updated to 25 tons per hour. Stack parameters for ST05 have been updated. Emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. The grain loading value, air flow rate, and temperature have been updated for the Blend Silo Bin Vent Filter (CU04). Control efficiency for CU04 has been updated according to the new parameters. Maximum hourly throughput has been updated to 25.0 tons/hr and the maximum yearly capacity of 5,500 tpy.
- **EU 21 – Bentonite Silo:** The construction commencement date has been updated from August 2016 to March 2017. The maximum hourly capacity has been updated to 25 tons per hour. Stack parameters for ST06 have been updated. Emission factors for PM, PM_{10} and $PM_{2.5}$ have

been updated. The grain loading value, air flow rate, and temperature have been updated for the Bentonite Silo Bin Vent Filter (CU05). Control efficiency for CU05 has been updated according to the new parameters. Maximum hourly throughput has been updated to 25.0 tons/hr and the maximum yearly capacity of 3,500 tpy.

- **EU 22 – Mold Silica Sand Handling and Preparation:** The description has been updated from Mold Silica Sand Bin to Mold Silica Sand Handling and Preparation. The construction commencement date has been updated from August 2016 to March 2017. Stack parameters for ST07 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters. Maximum hourly throughput has been updated to 25.0 tons/hr and the maximum yearly capacity of 21,000 tpy.
- **EU 23 – Blend Handling and Preparation:** The description has been updated from Blend Bin to Blend Handling and Preparation. The construction commencement date has been updated from August 2016 to March 2017. Stack parameters for ST07 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters. Maximum hourly throughput has been updated to 25.0 tons/hr and the maximum yearly capacity of 5,500 tpy.
- **EU 24 – Bentonite Handling and Preparation:** The description has been updated from Bentonite Bin to Bentonite Handling and Preparation. The construction commencement date has been updated from August 2016 to March 2017. Stack parameters for ST07 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters. Maximum hourly throughput has been updated to 25.0 tons/hr and the maximum yearly capacity of 3,500 tpy.
- **EU 29 – Dust Weigh Hopper**: Commencement dates have been updated from August 2016 to March 2017. Stack parameters for ST07 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters. Maximum hourly throughput has been updated to 2.8 tons/hr and the maximum yearly capacity of 10,149 tpy.
- **EU 30 – Green Sand Mixer #1:** Commencement dates have been updated from August 2016 to March 2017. The maximum yearly capacity has been updated. Stack parameters for ST07 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters.
- **EU 31 – Green Sand Mixer #2:** Commencement dates have been updated from August 2016 to March 2017. Stack parameters for ST07 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters.
- **EU 32 – Green Sand Mixer #3:** Commencement dates have been updated from August 2016 to March 2017. Stack parameters for ST07 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters.
- **EU 33 – Mold Making #1**: The description has been updated from Mold Stamping #1 to Mold Making #1. The construction commencement date has been updated from August 2016 to January 2017. Stack parameters for ST09 have been updated. The hourly and yearly throughputs have been updated. Emission factors for PM, PM_{10}, $PM_{2.5}$ have been updated. HAP emissions from core processing has been added to the potential emissions for this unit.

The grain loading value, air flow rate, and temperature have been updated for the Core/Mold Baghouse (CU08). Control efficiency for CU08 has been updated according to the new parameters. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy.

- **EU 35A – Core Silica Sand Silo A:** The construction commencement date has been updated from August 2016 to February 2017. Stack parameters for ST09 have been updated. The hourly design rate has been updated. Emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. The grain loading value, air flow rate, and temperature have been updated for the Core Silica Sand Silo A Bin Vent Filter (CU19). Control efficiency for CU19 has been updated according to the new parameters. Secondary emission capture and control occurs through CU08 and emits through ST09. Maximum hourly throughput has been updated to 25 tons/hr and the maximum yearly capacity of 3,345 tpy.
- **EU 35B – Core Silica Sand Silo B:** The construction commencement date has been updated from August 2016 to February 2017. Stack parameters for ST09 have been updated. The hourly design rate has been updated. The maximum loading hours for this unit has been updated to 125 hours per year. Emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. The grain loading value, air flow rate, and temperature have been updated for the Core Silica Sand Silo B Bin Vent Filter (CU20). Control efficiency for CU20 has been updated according to the new parameters. Secondary emission capture and control occurs through CU08 and emits through ST09. Maximum hourly throughput has been updated to 25 tons/hr and the maximum yearly capacity of 3,345 tpy.
- **EU 36 – Core Sand Handling and Preparation:** The description has been updated from Sand Classifier to Core Sand Handling and Preparation. The construction commencement date has been updated from August 2016 to February 2017. Stack parameters for ST09 have been updated. Emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. HAP emissions from core processing have been added to the potential emissions for this unit. The grain loading value, air flow rate, and temperature have been updated for the Core/Mold Baghouse (CU08). Control efficiency for CU08 has been updated according to the new parameters. Maximum hourly throughput has been updated to 1.86 tons/hr and the maximum yearly capacity of 6,690 tpy.
- **EU 39 – PUCB Core Machine #1:** The description has been updated from Core Machine #1 to PUCB Core Machine #1. The construction commencement date has been updated from August 2016 to March 2017. Stack parameters for ST08 have been updated. Hourly design rates for process ID 1 and 2 have been updated. Emission factors for PM, PM_{10}, $PM_{2.5}$ and HAPs have been added. VOC emission factors for resin, catalyst and binder calculations have been updated. The grain loading value, air flow rate, and temperature have been updated for the Acid Scrubber (CU07). Control efficiency for CU07 has been updated according to the new parameters.
- **EU 40 – PUCB Core Machine #2:** The description has been updated from Core Machine #2 to PUCB Core Machine #2. The construction commencement date has been updated from August 2016 to March 2019. Stack parameters for ST08 have been updated. Hourly design rates for process ID 1 and 2 have been updated. Emission factors for PM, PM_{10}, $PM_{2.5}$ and HAPs have been added. VOC emission factors for resin, catalyst and binder calculations have been updated. The grain loading value, air flow rate, and temperature have been updated for the Acid Scrubber (CU07). Control efficiency for CU07 has been updated according to the new parameters.
- **EU 43 – Core Wash Station #1:** The description has been updated from Core Removal to Core Wash Station #1. The construction commencement date has been updated from August

2016 to March 2017. Stack parameters for ST09 have been updated. Emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. HAP emissions from core processing have been added to the potential emissions for this unit. The grain loading value, air flow rate, and temperature have been updated for the Core/Mold Baghouse (CU08). Control efficiency for CU08 has been updated according to the new parameters. Maximum hourly throughput has been updated to 0.3375 tons/hr and the maximum yearly capacity of 135 tpy.

- **EU 44 – Core Dryer #1:** The description has been updated from Dryer #1 to Core Dryer #1. The construction commencement date has been updated from August 2016 to March 2017. Stack parameters for ST09 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Core/Mold Baghouse (CU08). Control efficiency for CU08 has been updated according to the new parameters.
- **EU 45 – Core Dryer #2:** The description has been updated from Dryer #2 to Core Dryer #2. The construction commencement date has been updated from August 2016 to March 2019. Stack parameters for ST09 have been updated. The grain loading value, air flow rate, and temperature have been updated for the Core/Mold Baghouse (CU08). Control efficiency for CU08 has been updated according to the new parameters.
- **EU 50 – Pouring and Cooling:** The construction commencement date has been updated from August 2016 to March 2017. Stack parameters for ST09 have been updated. Emission factors for PM, PM10, PM2.5, CO, Lead, NOx, SO2, VOC and HAP have been updated. The grain loading value, air flow rate, and temperature have been updated for the Core/Mold Baghouse (CU08). Control efficiency for CU08 has been updated according to the new parameters.
- **EU 53 – Shakeout Conveyor:** The construction commencement date has been updated from August 2016 to January 2017. Stack Parameters for ST07 have been updated. Emission factors for PM10, PM2.5, CO and HAPs have been updated. PM, PM_{10} and $PM_{2.5}$ BACT limits have been updated for CU06. VOC and CO BACT limits have been updated for VOC and CO. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters.
- **EU 54 – Recycled Sand Handling and Preparation:** The description has been updated from Sand Cooler to Recycled Sand Handling and Preparation. HAP emissions from sand have been added, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse (CU06). Control efficiency for CU06 has been updated according to the new parameters. Maximum hourly throughput has been updated to 0.38 tons/hr and the maximum yearly capacity of 3,323 tpy.
- **EU 57 – Sand Plant Waste Dust Silo:** The construction commencement date has been updated from August 2016 to January 2017. Stack parameters for ST11 have been updated. PM, PM_{10} and $PM_{2.5}$ emission factors have been updated. HAP emissions from sand have been added, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Sand Plant Baghouse Waste Dust Silo Bin Vent Filter (CU10). Control efficiency for CU10 has been updated according to the new parameters. Maximum hourly throughput has been updated to 0.38 tons/hr and the maximum yearly capacity of 3,323 tpy.
- **EU 59 – Forced Air Cooler:** The description has been updated from Forced Air Cooler to Casting Cooling. The construction commencement date has been updated from August 2016 to January 2017. The stack parameters for ST09 have been updated. HAP emissions from core have been added, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Core/Mold

Baghouse (CU08). Control efficiency for CU08 has been updated according to the new parameters. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy.

- **EU 60 – Sorting Conveyor:** The description has been updated from Sorting to Sorting Conveyor. The construction commencement date has been updated from August 2016 to December 2016. Stack parameters for ST12 have been updated. PM, PM_{10} , $PM_{2.5}$ and HAP emission factors have been updated. HAP emissions from fettling have been updated, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Fettling Baghouse (CU11). Control efficiency for CU11 has been updated according to the new parameters. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy.
- **EU 61 – Steel Blasting #1:** The construction commencement date has been updated from August 2016 to April 2017. Stack parameters for ST12 have been updated. PM, PM_{10} and $PM_{2.5}$ emission factors have been updated. HAP emissions from fettling have been updated, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Fettling Baghouse (CU11). Control efficiency for CU11 has been updated according to the new parameters. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy.
- **EU 63 – Fettling Shop Baghouse Waste Dust Silo:** The construction commencement date has been updated from August 2016 to November 2016. Stack parameters for ST13 have been updated. PM, PM_{10} and $PM_{2.5}$ emission factors have been updated. HAP emissions from fettling have been updated, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Fettling Waste Dust Silo Bin Vent Filter Baghouse (CU12). Control efficiency for CU12 has been updated according to the new parameters. Maximum hourly throughput has been updated to 0.38 tons/hr and the maximum yearly capacity of 3,323 tpy.
- **EU 64 – Auto Grinding #1:** The description has been updated from Grinding #1 to Auto Grinding #1. The construction commencement date has been updated from August 2016 to February 2019. Stack parameters for ST12 have been updated. HAP emissions from fettling have been updated, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Fettling Baghouse (CU11). Control efficiency for CU11 has been updated according to the new parameters. Maximum hourly throughput has been updated to 7.5 tons/hr and the maximum yearly capacity of 40,000 tpy.
- **EU 65 – Auto Grinding #2:** The description has been updated from Grinding #2 to Auto Grinding #2. This unit has not been installed. Stack parameters for ST12 have been updated. HAP emissions from fettling have been updated, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Fettling Baghouse (CU11). Control efficiency for CU11 has been updated according to the new parameters. Maximum hourly throughput has been updated to 7.5 tons/hr and the maximum yearly capacity of 40,000 tpy.
- **EU 66 – Machining Lines (9):** The description has been updated from Turning Lathes (8) to Machining Lines (9). The construction commencement date has been updated for each machining line. Stack parameters for ST16 have been updated. The emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. HAP emissions from fettling have been updated, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air

flow rate, and temperature have been updated for the Machining Cartridge Collectors (CU13a-CU13h). Control efficiency for CU13a-CU13h have been updated according to the new parameters. Secondary emission capture and control occurs through CU17 and emits through ST16. Maximum hourly throughput has been updated to 15.0 tons/hr and the maximum yearly capacity of 80,000 tpy.

- **EU 67 – Perforation Line #2 (Drilling & Milling):** The description has been updated from Drilling & Milling (2) to Perforation Line #2. The construction commencement date has been updated for each machining line. Stack parameters for ST16 have been updated. The emission factors for PM, PM_{10} and $PM_{2.5}$ have been updated. HAP emissions from fettling have been updated, according to test results from a Pace analytical report dated June 10, 2021. The grain loading value, air flow rate, and temperature have been updated for the Machining Cartridge Collectors (CU13i-CU13j). Control efficiency for CU13i-CU13j have been updated according to the new parameters. Secondary emission capture and control occurs through CU17 and emits through ST16. Maximum hourly throughput has been updated to 7.5 tons/hr and the maximum yearly capacity of 40,000 tpy.
- **EU 68 – Paint Line #3:** The construction commencement date has been updated from August 2016 to September 2018. The description has been updated from Paint Booth #1 to Paint Line #3. Stack parameters for ST15a have been updated. PM, PM10, PM2.5, VOC and HAP emissions have been updated. The grain loading value, air flow rate, and temperature have been updated for Paint Line #3 Booth Filter (CU14). Control efficiency for CU14 has been updated according to the new parameters. Maximum hourly throughput has been updated to 9.0 lbs of post-induction coating/hr and 1.0 lbs of thinner/hr.
- **EU 69 – Paint Line #2:** The construction commencement date has been updated from August 2016 to November 2017. The description has been updated from Paint Booth #2 to Paint Line #2. Stack parameters for ST15b have been updated. PM, PM10, PM2.5, VOC and HAP emissions have been updated. The grain loading value, air flow rate, and temperature have been updated for Paint Line #2 Booth Filter (CU15). Control efficiency for CU15 has been updated according to the new parameters. Maximum hourly throughput has been updated to 9.0 lbs of post-induction coating/hr and 1.0 lbs of thinner/hr.
- **EU 71 – Paint Line #1:** The construction commencement date has been updated from August 2016 to March 2017. The description has been updated from Paint Booth #4 to Paint Line #1. Stack parameters for ST16 have been updated. PM, PM10, PM2.5, VOC and HAP emissions have been updated. The grain loading value, air flow rate, and temperature have been updated for Paint Line #1 Booth Filter (CU17). Control efficiency for CU17 has been updated according to the new parameters. Maximum hourly throughput has been updated to 5.5 lbs of post-induction coating/hr.
- **EU 72 – Emergency Generator #1:** The construction commencement date has been updated from August 2016 to September 2016.
- **EU 73 – Emergency Generator #2:** The construction commencement date has been updated from August 2016 to September 2016.
- **EU 74 – Emergency Generator #3:** The construction commencement date has been updated from August 2016 to September 2016.
- **EU 75 – Diesel Storage Tank:** The construction commencement date has been updated from August 2016 to July 2019.
- **EU 76 - Paved Roadways:** The construction commencement date has been updated from August 2016 to September 2016.

On August 26, 2025, FWNA submitted an updated application for their Title V/PSD Significant Revision based on requests for information by the Division. In this application, FWNA has also requested the following additional changes to the permit:

- Update the hourly and annual equipment capacity for each emission unit; and
- Reduction of maximum capacity to 80,000 tons of gray iron poured per 12-month total.

Additionally, with the revised application, the following additional emission units have been removed from the permit and the scope of the project because they have not been constructed and FWNA does not plan on constructing them in the future:

- EU 16 – Pouring Furnace #2
- EU 34 – Mold Stamping #2
- EU 41 – PUCB Core Machine #3
- EU 42 – PUCB Core Machine #4
- EU 46 – Core Dryer #3
- EU 47 – Core Dryer #4
- EU 49 – Mold Assembly #2
- EU 58 – Mold Shop Baghouse Waste Dust Silo
- EU 62 – Steel Shot Blasting #2
- EU 80 – Core Wash Station #3
- EU 81 – Core Wash Station #4

The following table outlines changes to the grouped BACT Limits from the previous application.

Control Unit	Emission Unit	Pollutant	Previous Limit	New Limit
CU01 (ST02)	EU01, EU04, EU05, EU06, EU07, EU08, EU09, EU10, EU13, EU15, EU16, EU18	PM	0.002 gr/dscf 2.64 lb/hr 11.577 ton/yr	0.0015 gr/dscf 1.98 lb/hr 8.68 ton/yr
		PM_{10}	0.002 gr/dscf 2.64 lb/hr 11.577 ton/yr	0.0015 gr/dscf 1.98 lb/hr 8.68 ton/yr
		$PM_{2.5}$	0.002 gr/dscf 2.64 lb/hr 11.577 ton/yr	0.0015 gr/dscf 1.98 lb/hr 8.68 ton/yr
		CO	22.04 lb/hr 31.85 ton/yr	1.59 lb/ton gray iron 57.58 lb/hr 63.68 ton/yr
		VOC	3.85 lb/hr 4.845 ton/yr	0.247 lb/ton gray iron 9.48 lb/hr 9.88 ton/yr
CU06 (ST07)	EU22, EU23, EU24, EU29, EU30, EU31, EU32, EU53, EU54	PM	0.0025 gr/dscf 2.20 lb/hr 9.67 ton/yr	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr
		PM_{10}	0.0025 gr/dscf 2.20 lb/hr 9.67 ton/yr	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr
		$PM_{2.5}$	0.0025 gr/dscf 2.20 lb/hr 9.67 ton/yr	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr

Control Unit	Emission Unit	Pollutant	Previous Limit	New Limit
		CO	25.3 lb/hr 45.793 ton/yr	0.515 lb/ton 7.73 lb/hr 20.6 ton/yr
		VOC	13.358 lb/hr 24.179 ton/yr	0.616 lb/ton gray iron 9.24 lb/hr; 24.64 ton/yr
CU07 (ST08)	EU39, EU40	PM	N/A	0.0005 gr/dscf 0.032 lb/hr 0.138 ton/yr
		PM_{10}	N/A	0.0005 gr/dscf 0.032 lb/hr 0.138 ton/yr
		$PM_{2.5}$	N/A	0.0005 gr/dscf 0.032 lb/hr 0.138 ton/yr
		VOC	18.22 lb/hr; 33.31 ton/yr	4.59 lb/ton core sand 8.39 lb/hr; 15.35 ton/yr
CU08 (ST09)	EU33, EU35A*, EU35B*, EU36, EU39, EU40, EU44, EU45, EU50, EU59	PM	0.002 gr/dscf; 1.90 lb/hr; 8.321 ton/yr	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr
		PM_{10}	0.002 gr/dscf; 1.90 lb/hr; 8.321 ton/yr	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr
		$PM_{2.5}$	0.002 gr/dscf; 1.90 lb/hr; 8.321 ton/yr	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr
		CO	127.818 lb/hr; 234.736 ton/yr	6.238 lb/ton gray iron 93.15 lb/hr; 249.52 ton/yr
		VOC	33.256 lb/hr; 27.378 ton/yr	3.561 lb/ton gray iron 54.70 lb/hr; 142.44 ton/yr
CU11 (ST12)	EU60, EU61, EU64, EU65, EU77*, EU78*	PM	0.001 gr/dscf; 0.573 lb/hr; 2.511 ton/yr	0.001 gr/dscf 0.55 lb/hr 2.42 ton/yr
		PM_{10}	0.001 gr/dscf; 0.573 lb/hr; 2.511 ton/yr	0.001 gr/dscf 0.55 lb/hr 2.42 ton/yr
		$PM_{2.5}$	0.001 gr/dscf; 0.573 lb/hr; 2.511 ton/yr	0.001 gr/dscf 0.55 lb/hr 2.42 ton/yr

*Denotes secondary capture and control.

Additional changes made as a result of the revised application include:

- Update to the hourly and yearly throughputs for EU 77 and 78. The new maximum hourly and yearly throughputs for these emissions units is 7.5 tons/hr and 40,000 tpy.
- Update to the hourly and yearly throughputs for EU 79. The new maximum hourly and yearly throughputs for these emissions units is 0.338 tons/hr and 135 tpy.
- Update to the hourly and yearly throughputs for EU 84. The new maximum hourly and yearly throughputs for these emissions units is 7.5 tons/hr and 40,000 tpy.

The updated application also included update air dispersion modeling that demonstrated compliance with the revised NAAQS for $PM_{2.5}$ of 9 $\mu g/m^3$.

The complete PSD permit application package including all supplemental information and updated permit documents was submitted to the US EPA and federal agencies on December 19, 2025.

The following table includes a revised site-wide emission summary. Due to the changes to the original PSD project, the Division has included a revised BACT analysis below. Where the selected control technology was not changed and there were no better control options available, the Division did not revisit the control technology analysis and included details on the selection of the revised BACT limit.

V-25-035 Emission Summary		
Pollutant	2024 Actual (tpy)	V-25-035 (tpy)
CO	123.3	337
NO_X	1.10	25.4
PT	8.62	28.9
PM_{10}	7.86	28.4
$PM_{2.5}$	4.71	27.8
SO_2	0.61	6.47
VOC	27.1	231.4
Lead	0.124	0.05
Greenhouse Gases (GHGs)		
Carbon Dioxide	649	15,968
Methane	0.011	0.748
Nitrous Oxide	0.0011	0.034
CO_2 Equivalent (CO_2e)	650	15,996
Hazardous Air Pollutants (HAPs)		
Benzene	0.325	3.95
Ethyl Benzene	1.24	0.66
Methanol	---	1.87
Phenol	0.27	1.92
Polycyclic Organic Matter	0.33	0.99
Toluene	0.06	1.8
Xylenes (Total)	2.50	2.5
Combined HAPs:	5.43	15.4

I. Emissions

In the revised application to construct and operate the described facility, FW calculated the air pollutants to be emitted by the source. Under the Clean Air Act, U.S. EPA established standards for six common air pollutants, referred to as criteria pollutants. The facility is expected to be a source of stack and fugitive emissions of these criteria pollutants: particulate matter 10 microns diameter and smaller (PM_{10}), particulate matter 2.5 microns diameter and smaller ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), volatile organic contaminants (VOCs), and lead. The facility will also be a source of the HAPs aniline, xylene (C_8H_{10}), benzene (C_6H_6), ethyl benzene, phenol (C_6H_6O), naphthalene, polycyclic organic matter (POM), cresol (methylphenols), toluene and various other HAPs in small amounts. Greenhouse gases (GHGs) are present, due to the use of natural gas and diesel, and will be comprised of carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O).

FWNA is located in Simpson County, Kentucky which is designated by U.S. EPA as Unclassifiable/Attainment for all criteria pollutants. Therefore, under the federal New Source Review permitting program, Prevention of Significant Deterioration (PSD) requirements apply to the proposed project and the application has been reviewed accordingly. Under PSD, FW North America is defined as a secondary metal production facility and is on the list of 28 industrial source categories for which the major source threshold is the emission of 100 tpy of any regulated air pollutant.

Potentials to emit pollutants for this project were calculated based on emission factors obtained from U.S. EPA's AP-42, *Compilation of Air Pollutant Emission Factors,* U.S. EPA's WebFIRE online database, engineering estimates, mass balances, manufacturer's specifications, industry study publications, similar processes at other iron foundry facilities, and Material Safety Data Sheets (MSDS) chemical content specifications. Based on these emission factors and the assumption of a 24 hour, 7 days a week, 52 weeks a year operation (8760 hours per year), the potential emissions calculated for CO for this facility will exceed 300 tpy. Therefore, the FW project is classified as a new major source under the PSD program.

As a major source subject to PSD, the emissions from the project must be evaluated to determine applicability of PSD requirements for each pollutant. The source will be a major source for carbon monoxide (CO) and will have emissions more than significant emissions rates for particulate matter (PM, PM_{10}, and $PM_{2.5}$), and volatile organic compounds (VOC) under this regulation. If a source subject to PSD has the potential to emit one of these pollutants in an amount that exceeds the significant emission rates, the source is required to analyze control methods to ensure the BACT is applied to minimize the emission/impact of that pollutant and for the pollutants for which the source is major. For this project, particulate (including PM, PM_{10}, and $PM_{2.5}$), CO, and VOC will be the impacted pollutants.

FWNA is an area source for HAPs. An "area source of HAP" is one that emits less than 10 tpy of any individual HAP and less than 25 tpy for all HAPs, source wide. FWNA has taken conditional major limitations on both individual HAP and the total HAP emissions from the facility to preclude major source status for HAPs.

The potential increases in emissions of regulated air pollutants for the project have been calculated and are presented in the following table.

Table 1–1, Project PSD Significance

Pollutant	**PTE** tons per year (tpy)	**Significance Threshold** Increase in tpy	**PSD Significant Emissions Increase?**
PM (filterable, only)	27.6	25	Yes
PM_{10} (filterable and condensable)	27.8	15	Yes
$PM_{2.5}$ (filterable and condensable)	27.3	10	Yes
CO	337	100	Yes
VOC	231.2	40	Yes
SO_2	6.49	40	No
NOx	25.4	40	No
Lead	0.075	0.6	No
GHGs (CO_2e)	16,502	75,000	No

II. BACT Analysis

The PSD permitting program is designed to ensure that economic growth occurs in a manner consistent with the preservation of existing clean air resources. It requires that new or modified pollutant sources do not endanger public health and welfare, or deteriorate air quality in areas of special natural, scenic, or historical value. The PSD program also allows for public participation in the decision making process. [401 KAR 51:017]

The Commonwealth of Kentucky implements a PSD program through 401 KAR 51:017. As part of this regulation, "a new major stationary source shall apply BACT for each regulated NSR pollutant for which the source has the potential to emit in significant amounts." BACT represents the maximum degree of reduction for each regulated NSR pollutant that will be emitted from a proposed major stationary source or major modification and is determined by the cabinet pursuant to 401 KAR 51:017, Section 8, after taking into account energy, environmental, and economic impacts and other costs, to be achievable by the 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 that pollutant.

BACT determines what will be the permitted standard (or maximum allowable emissions) for a particular pollutant for a particular project or emission source. BACT is a case-by-case decision that considers energy, environmental and economic impact. BACT can be add-on control equipment or modification of the production processes or methods to reduce emissions or an emission standard. BACT may also be a design, equipment, work practice or operational standard if setting an emissions standard is not practical.

Since the FW project will emit more than 100 tpy for CO, it is required to perform BACT on CO and on the pollutants that are emitted in quantities that exceed significant emission rates. For the FW project, the pollutants requiring BACT analysis are particulate (including PM, PM_{10}, and $PM_{2.5}$), CO, and VOCs (See Table 1-1 above, for the actual emission levels and thresholds exceeded).

FW conducted a BACT analysis for each pollutant with the potential to be emitted in excess of the PSD significant emission rate for their proposed project in accordance with the *"Top-Down" Best Available Control Technology Guidance Document* outlined in the 1990 draft U.S. EPA *New*

Source Review Workshop Manual, which outlines steps for conducting a top-down BACT analysis. The steps FW followed are:

(1) Identify available control possibilities for each PSD pollutant based on source knowledge and previous regulatory decisions for identical and similar sources;
(2) Reject inappropriate and technically infeasible control options;
(3) Rank feasible alternatives in descending order of control effectiveness;
(4) Evaluate the most effective controls and weigh the economic, energy and environmental impacts of each; and
(5) Select BACT.

BACT analyses for each PSD significant pollutant were included in the FW application and supplemented in subsequent submissions to the Division.

The Division reviewed the information submitted by FW, along with information available from industry, scholarly publications, and the RACT/BACT/LAER Clearinghouse (RBLC), a U.S. EPA maintained database that contains case-specific information on the "Best Available" air pollution technologies that have been required to reduce the emission of air pollutants from stationary sources. The Division used this information to make BACT determinations for PM, PM_{10}, $PM_{2.5}$, CO, and VOCs, all of which are subject to PSD review for this project.

Under PSD review, once a control technology (or practice) has been selected, BACT limits are assigned. BACT limits may be both emissions related or related to operation of equipment. For the FW project, there are instances where emissions from several pieces of disparate equipment (a group) are routed to a common control device and then out a common stack. In these cases, emission limits (both short term and long term) have been established for the output of that control device (at the stack) and individual throughput/processing limits have been established for the individual pieces of equipment that contribute to the emissions from the control device. In this way both the common control device emission point (stack) and each individual piece of equipment have BACT limitations. For example, when a group of equipment such as Sand Handling Units (bins, weigh hoppers, mixers) feed into a single control (Baghouse CU06) that emits through stack ST07, the baghouse PM/PM_{10}/$PM_{2.5}$ emissions have been limited to a specific grain loading per dry standard cubic foot (dscf) of air flow and lbs/hr and tpy emission limitations while each bin, hopper and mixer has a lbs/hr throughput limit for each of the three types of PM.

BACT emission limits are established at the final exhaust point in the case of commonly ducted equipment, and only operational limits are established for the individual pieces of production equipment. Please note that for inventory emission (reporting) purposes, only, each individual piece of equipment, in a group, that contributes to the emissions of a control device will be assigned a percentage of the total controlled emission based on a mass balance calculation that estimates the contribution of each pollutant from each individual piece of equipment.

For individually controlled equipment, such as a silo controlled by an individual bin vent filter, individual long and short-term BACT limits have been established for each emitted pollutant. For groups of uncontrolled equipment that vent to a common stack, BACT limits for each applicable pollutant have been established for the stack and operational limits have been established for the individual piece of equipment. Individual pieces of uncontrolled equipment have been assigned individual BACT limits.

A summary of the BACT analyses, and the Division's decisions, are outlined, below. They are arranged by pollutant first and then by each emission group that produces that pollutant. Within each emission group section, a summary of the BACT decisions made for the group and a table of BACT limits assigned precedes the analysis of possible technologies for that group, a discussion of how the BACT limits were set, and comments on the compliance demonstration required by the permit.

A. BACT for PM, PM_{10}, and $PM_{2.5}$

FW submitted BACT analyses for PM, PM_{10} and $PM_{2.5}$, but addressed all three types of PM together since the same control technologies and practices reduce all three of these emissions. FW also evaluated the technologies in light of the groups of equipment likely to be served by a single control device. As with the assignment of BACT limits, discussed above, the technology chosen to control a particular final emission point may serve as the BACT control for a diverse group of equipment.

Technologies for Particulate Control: The technologies identified as possible BACT controls for the three types of particulates for the FW project are the following:

Cyclones: These mechanical collectors work on the principal of inertial separation. The collectors use a rapid change in air direction and the property of inertia to separate mass (particulate) from the process gas stream. This type of control is often used when there is a high concentration of coarse particulate. A cyclone is a feasible control but has a lower collection efficiency (about 70 percent), over the range of possible particulate sizes and are most effective for particulate of >10 micron size. They are often used as pre-controls to reduce particle concentration in a gas stream before it enters a second control device.

Scrubbers: In a wet scrubber, the process gas stream is either sprayed with a liquid or forced into contact with a liquid in order to impact and remove particles entrained in the gas. The particles are captured in liquid droplets that are then collected from the gas stream in a mist eliminator. The resulting liquid is then treated to remove the particles and recycled or discharged. Wet scrubbers are especially useful when the particulate is sticky, combustive, corrosive, or explosive. Dry scrubbers, which do not saturate the gas stream, are generally used to remove acids from waste gas and are not used for particulate.

Electrostatic precipitators (ESPs): ESPs are another control technology often used to remove particulate from flue gases before they are released to atmosphere. In this technology, particulate entrained in a gas stream is given an electrical charge as the stream passes through a gaseous ion region (corona). The charged particles are then attracted to, and collected by, a neutral or oppositely charged collector plate. In a dry electrostatic precipitator (ESPs), the collector plate is subjected to intermittent mechanical or sonic percussion to knock the particles off the plate and into a hopper positioned under the plate. A wet ESP operates similarly to the dry ESP for removing PM from a gas stream, but the collecting surface is cleaned by water, either intermittently or continuously.

Cartridge Collectors: These devices use a nonwoven filtering media, as opposed to woven or felt bags used in baghouses (see below). The filter media (fabric) is supported by an inner and outer wire framework and is pleated to increase filtering surface area. As a gas stream passes through the filter, particle collects on the surface of the filtering media. Cartridge collectors can be single use or continuous duty designs. In single use, the dirty cartridges are changed and collected dirt is removed while the collector is off. In the continuous duty design, the cartridges are cleaned by pulse-jet cleaning system where a high pressure blast of air is used to remove dust from the filter media by flexing the media, discharging the dust cake gathered on the surface.

Fabric Filters (baghouses): This type of control equipment consists of a series of bags (filters) contained in a shell structure, through which process gas or a dust laden air stream is passed. Baghouses function based on the fact that particles are larger than gas molecules. When a particulate-laden gas is passed through a membrane (fabric filter), the particulate is captured on the filter while the clean gas passes through. The bags can be of woven or felted cotton, synthetic, or glass-fiber material in either a tube or envelope shape. Fabric filters, and the materials from which they are made, can be chosen to effectively clean particulates based on the sizes, shapes, and textures of the particulate expected. Baghouses also have cleaning devices, such as pulse jet, shakers or rappers, reverse air capability, or sonic cleaners, that cause collected dust to fall into dust hoppers at the bottom of the shell structure. The particulate removal efficiency of a baghouse can be as high as 99.9 percent. The bin vent filters used in the FW project are in this category of control.

Combustion Optimization: This is a work practices method for minimizing fuel use and emissions from the burning of fossil fuels. Oxygen and carbon in the fuel combine during combustion in a complex process requiring turbulence, temperature, and time for the reactants to contact and combine to form carbon dioxide (CO_2) and heat. If the combustion and combination of necessary elements are not controlled, the combustion of the fuel is incomplete and undesirable emissions form. Although particulate from natural gas combustion is normally small, poor air/fuel mixing or maintenance problems can cause extra PM to form. Particulates from natural gas combustion are usually larger molecular weight hydrocarbons that are not fully combusted. Increased CO also occurs when there is poor mixing (not enough turbulence) and/or there is not enough air in the mix. Other pollutants such as NOx form if the temperature is too hot. SO_2 can form if there is too much sulfur in the fuel. By taking measures to optimize the combustion process, pollutants are minimized. These measures may include choosing good burner designs, using performance monitoring and process control techniques to improve operation, performing regular and thorough maintenance of the combustion system, etc. Although it is not an add-on control, efficient operation of combustion equipment is often an effective means to reduce combustion related pollutants. Preparation of a specific plan for achieving combustion optimization, such as a Good Combustion and Operation Practices (GCOP) Plan, that defines, measures, and verifies the use of operational and design practices specific to a piece of equipment for the reduction of a specific pollutant provides verifiable implementation of this work practices method.

<u>Emission Group 01–Melt Shop</u>

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the use of a baghouse filter (CU01) prior to stack ST02 for the melt shop constitutes BACT for PM, PM_{10} and $PM_{2.5}$ for the induction furnaces (EU07-EU10), pouring furnace (EU15), hot metal transfer (EU13) and for charge handling (EU01). BACT, for all types of particulates, for EU17, the waste dust silo, uses a bin vent filter which emits through stack ST03. Natural gas-fueled emission units, EU05, EU06, and EU18, also release through ST02, and BACT requirement for each of these units to have a unit specific GCOP plan has been imposed by the permit. Finally, the permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for each group control exit, each individual unit control exit, each uncontrolled emission unit, and for the passively controlled group of emission units for PM, PM_{10} and $PM_{2.5}$. The permit also establishes individual operational limits for each piece of equipment, in terms of annual tons of material processed or million cubic feet of natural gas used, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits. BACT limits of 20 percent opacity, or visible emissions of particulate, are also imposed upon all emissions exiting through a stack or vent to the outside. Fugitive emissions are also limited to 20 percent opacity as defined by 40 CFR 63, Subpart ZZZZZ. The particulate BACT emission limits imposed for Emission Group 01–Melt Shop are as follows:

Table 2-A.1 Melt Shop PM, PM_{10}, $PM_{2.5}$ BACT Limits

Emission Point	Contributing Units	Control Device	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$	Opacity Limit
ST02	EUs 01, 05, 06, 07, 08, 09, 10, 13, 15, & 18	Baghouse CU01	0.0015 gr/dscf 1.98 lb/hr 8.68 ton/yr	0.0015 gr/dscf 1.98 lb/hr 8.68 ton/yr	0.0015 gr/dscf 1.98 lb/hr 8.68 ton/yr	20%
ST03	EU17	Ben Vent Filter CU02	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	20%

<u>**Emission Group 02–Sand Plant**</u>

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the use of a baghouse filter (CU06) prior to stack ST07 for the sand plant constitutes BACT for PM, PM_{10} and $PM_{2.5}$ for mold silica sand handling and preparation (EU22), blend handling and preparation (EU23), bentonite handling and preparation (EU24), dust weigh hopper (EU29), green sand mixers # 1–#3 (EU30–EU32), and Recycled Sand Handling and Preparation (EU54). Use of a baghouse filter (CU08) prior to stack ST09 constitutes BACT for all three types of PM for mold making #1 (EU33), core silica sand silos (EU35A–EU35B), core silica sand handling and preparation (EU36), core wash station #1-#2 (EU43, EU79), and core dryers #1– #2 (EU44–EU45). Use of bin vent filters constitutes PM, PM_{10} and $PM_{2.5}$ BACT for the mold silica sand silo (EU19), blend silo (EU20), bentonite silo (EU21), and sand plant waste sand silo (EU57). PUCB core machines #1-#2 (EU39-EU40) do not have a control device to control particulate matter generated from the formation of a core. Dryers #1–#2 (EU44–EU45) have an additional requirement of development of a GCOP plan.

The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for each group control exit, and each individual unit control exit for PM, PM_{10} and $PM_{2.5}$. There are no uncontrolled or passively controlled particulate emitting units in the sand plant. The permit also establishes individual operational limits for individual pieces and groups of equipment, in terms of annual tons of material processed or million cubic feet of natural gas used, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits. BACT limits of 20 percent opacity, or visible emissions of particulate, are also imposed upon all emissions exiting through a stack or vent to the outside. Fugitive emissions are also limited to 20 percent opacity as defined by 40 CFR 63, Subpart ZZZZZ. The particulate BACT emission limits imposed for Emission Group 02–Sand Plant are as follows:

Table 2-A.2 Sand Plant PM, PM_{10}, $PM_{2.5}$ BACT Limits

Emission Point	Contributing Units	Control Device	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$	Opacity Limit
ST04	EU19	Bin Vent Filter CU03	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	20 %
ST05	EU20	Bin Vent Filter CU04	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	20%
ST06	EU21	Bin Vent Filter CU05	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr	20%
ST07	EU22, EU23, EU24, EU29, EU30, EU31, EU32, EU53, EU54	Baghouse CU06	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr	20%
ST08	EU39, EU40	Acid Scrubber	0.0005 gr/dscf 0.032 lb/hr 0.14 ton/yr	0.0005 gr/dscf 0.032 lb/hr 0.14 ton/yr	0.0005 gr/dscf 0.032 lb/hr 0.14 ton/yr	N/A
ST09	EU33, EU34, EU35A, EU35B, EU36, EU38, EU39, EU40, EU43, EU44, EU45, EU50, EU59	Baghouse CU08, GCOP plan	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr	20%
ST11	EU57	Bin Vent Filter CU10	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	0.0030 gr/dscf; 0.009 lb/hr; 0.068 ton/yr	20%

Emission Group 03–Casting & Molding

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the use of a baghouse filter (CU08) prior to stack ST09 constitutes BACT for PM, PM_{10} and $PM_{2.5}$ for mold assembly #1 (EU48), pouring and cooling (EU50), and forced air cooler (EU59). The Division also determines that the use of a baghouse filter (CU06) prior to stack ST07 constitutes BACT for PM, PM_{10} and $PM_{2.5}$ for the shakeout conveyor (EU53). It should be noted that the equipment in Emission Group 03–Casting & Molding share common baghouses with equipment considered part of the sand plant. Although the equipment is considered to be in different emission groups, the BACT requirements applied to the common baghouses under the sand plant analysis apply for the casting and molding area, as well.

BACT limits of 20 percent opacity, or visible emissions of particulate, are also imposed upon all emissions exiting through a stack or vent to the outside. Fugitive emissions are also limited to 20 percent opacity as defined by 40 CFR 63, Subpart ZZZZZ. The particulate BACT emission limits imposed for Emission Group 03–Casting & Molding are as follows:

Table 2-A.3 Casting &Molding PM, PM_{10}, $PM_{2.5}$ BACT Limits

Emission Point	Contributing Units	Control Device	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$	Opacity Limit
ST07	EU53	Baghouse CU06	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr	0.002 gr/dscf 1.75 lbs/hr 7.67 ton/hr	20 %
ST09	EU50, EU59	Baghouse CU08	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr	0.0015 gr/dscf 1.43 lb/hr 6.24 ton/yr	20%

<u>Emission Group 04–Fettling Shop</u>

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the use of a baghouse filter (CU11) prior to stack ST12 for the fettling shop constitutes BACT for PM, PM_{10} and $PM_{2.5}$ for the sorting area (EU60), steel shot blasting #1 (EU61) and grinding station #1–#2 (EU64–EU65) for all three types of particulate. Secondary capture and control occur through CU11 for particulate emissions from Snag Grinder #1 and #2 (EU77 and EU78). BACT for PM, PM_{10}, and $PM_{2.5}$, for EU63, the fettling baghouse waste dust silo, is determined to be a bin vent filter which emits through stack ST13. The building provides some passive control, 90 percent due to enclosure, for the uncaptured emissions from this equipment. These units are under a BACT requirement to have a capture and collection system certified to achieve 98 percent capture efficiency at all times, so that only 2 percent of the emissions are not captured and routed to baghouse filter CU11). Finally, the permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for each group control exit, and each individual unit control exit for each piece of equipment, in terms of annual tons of material processed or million cubic feet of natural gas used, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits. BACT limits of 20 percent opacity, or visible emissions of particulate, are also imposed upon all emissions exiting through a stack or vent to the outside. Fugitive emissions are also limited to 20 percent opacity as defined by 40 CFR 63, Subpart ZZZZZ. The particulate BACT emission limits imposed for Emission Group 04–Fettling Shop are as follows:

Table 2-A.4 Fettling Shop PM, PM_{10}, $PM_{2.5}$ BACT Limits

Emission Point	Contributing Units	Control Device	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$	Opacity Limit
ST12*	EU60, EU61, EU64, EU65, EU77 & EU78	Baghouse CU11	0.001 gr/dscf 0.55 lb/hr 2.41 ton/yr	0.001 gr/dscf 0.55 lb/hr 2.41 ton/yr	0.001 gr/dscf 0.55 lb/hr 2.41 ton/yr	20%

Emission Point	Contributing Units	Control Device	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$	Opacity Limit
ST13	EU63	Bin Vent Filter CU12	0.003 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	0.003 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	0.003 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	20%

*Primary capture and control for EU 77 and 78 emit from CU21 and CU22 respectively. Secondary capture and control occur through CU11, and emit through ST12

Emission Group 05–Machining Shop

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the use of a baghouse filter (CU13a-j) prior to stack ST14 for the machining shop constitutes BACT for PM, PM_{10} and $PM_{2.5}$ for the machining lines (9) (EU66), and drilling and milling operations (EU67) for all three types of particulate. Controlled emissions are captured by ST16 (CU17) and go through secondary control. The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for the group control exit for PM, PM_{10} and $PM_{2.5}$. The permit also establishes individual operational limits for each piece of equipment, in terms of annual tons of material processed, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits. BACT limits of 20 percent opacity, or visible emissions of particulate, are also imposed upon all emissions exiting through a stack to the outside. Fugitive emissions are also limited to 20 percent opacity as defined under 40 CFR 63, Subpart ZZZZZ. The particulate BACT emission limits imposed for Emission Group 05–Machining Shop are as follows:

Table 2-A.5 for Machining Shop PM, PM_{10}, $PM_{2.5}$ BACT Limits

Emission Point	Contributing Units	Control Device	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$	Opacity Limit
ST16	EU66*, EU67* & EU71	Baghouse CU13	0.0035 gr/dscf; 0.587 lb/hr; 2.57 ton/yr	0.0035 gr/dscf; 0.587 lb/hr; 2.57 ton/yr	0.0035 gr/dscf; 0.587 lb/hr; 2.57 ton/yr	20 %

*Controlled emission from these is captured by ST16

Emission Group 06–Coating

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the use of individual paint booth filters (CU14, CU15 & CU17) prior to stacks ST15A, ST15B and ST16 for the coating area constitutes BACT for PM, PM_{10} and $PM_{2.5}$ for paint line #3, paint line #2 and paint line #1 (EU68, EU69 and EU71, respectively). The permit establishes the BACT emission limitations, in terms of pound of particulate content per pound of coating or paint used for the individual paint booth for PM, PM_{10} and $PM_{2.5}$. The permit also establishes a combined annual BACT emission limit for PM, PM_{10}, and $PM_{2.5}$ from particulate emissions of the three paint booths. The permit requires testing, monitoring, and recordkeeping to ensure compliance with those limits. BACT limits of 20 percent opacity, or visible emissions of particulate, are also imposed upon all emissions exiting through a stack to the outside. The particulate BACT emission limits imposed for Emission Group 06–Coating are as follows:

Table 2-A.6 Coating PM, PM_{10}, $PM_{2.5}$ BACT Limits*

Emission Point	Contributing Units	Control Device	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$	Opacity Limit
ST15a	EU68	Paint Booth Filter CU14	0.87 lbs solids/lb coating used	0.87 lbs solids/lb coating used	0.87 lbs solids/lb coating used	20 %
ST15b	EU69	Paint Booth Filter CU15	0.87 lbs solids/lb coating used	0.87 lbs solids/lb coating used	0.87 lbs solids/lb coating used	20 %
ST16	EU71	Paint Booth Filter CU17	0.35 lbs solids/lb coating used	0.35 lbs solids/lb coating used	0.35 lbs solids/lb coating used	20 %

*BACT limits listed in this table are per paint booth. Stacks ST15a, ST15b and ST16 have a total, combined BACT limits of 0.202 tpy, 0.202 tpy and 1.133 tpy respectively for each of the types of particulate, PM, PM_{10}, and $PM_{2.5}$.

Emission Group 07–Emergency Generators > 500 HP

Decision Summary: For these diesel generators, the PM/PM_{10}/$PM_{2.5}$ BACT will be installation, operation, and maintenance of each engine such that it meets, or is certified to meet, the BACT emission limits imposed by the permit. In addition, the source is required to prepare and implement a GCOP plan to ensure combustion optimization when using the engines.

Table 2.A-7 Emergency Generators > 500 HP PM, PM_{10}, $PM_{2.5}$ BACT Limits

Emission Point	Contributing Units	Control	BACT limit for PM	BACT limit for PM_{10}	BACT limit for $PM_{2.5}$
STG1	EU72	GCOP Plan	0.149 grm/hp-hour	0.149 grm/hp-hour	0.149 grm/hp-hour
STG2	EU73	GCOP Plan	0.149 grm/hp-hour	0.149 grm/hp-hour	0.149 grm/hp-hour
STG3	EU74	GCOP Plan	0.298 grm/hp-hour	0.298 grm/hp-hour	0.298 grm/hp-hour

Emission Group 09–Haul Roads

Decision Summary: For the paved haul roads of this project, FW will be required to minimize fugitive PM/PM_{10}/$PM_{2.5}$ emissions by employing dust suppression methods proposed in the application, such as weekly vacuum sweeping (except during recent rain events), vacuuming spills, and generally maintaining the roads in a clean condition. The facility is also limited to the length of paved roadways included in the application. Therefore, BACT is implementing the proposed weekly vacuum sweeping of the pavement and spill cleanup (Work Practices).

Table 2.A-9 Haul Roads PM, PM_{10}, $PM_{2.5}$ BACT

Emission Point	Description	Control
EU76	Paved Roadways	Work Practices (Vacuuming, Dust Suppression, Cover Trucks, Etc.)

B. BACT for CO emissions.

FW submitted BACT analyses for CO emissions. As with the assignment of BACT limits, discussed above, the technology chosen to control a particular final emission point may serve as the BACT control for a diverse group of equipment.

Technologies for CO Control: The technologies identified as possible BACT controls for emissions of CO for the FW project are the following:

Incineration: This technology, also called thermal oxidation, is a process of combusting (burning) gases, such as CO, at a high temperature to decompose the gas into carbon dioxide (CO_2) and water (H_2O) before release into the atmosphere. Temperature of the gas is raised above its auto-ignition point, in the presence of oxygen, and maintained at a high temperature (>1,500 F) for sufficient time to complete combustion.

Add-on air pollution controls that accomplish incineration of pollutants include regenerative thermal oxidizers (RTOs), regenerative catalytic oxidizers (RCO), recuperative thermal oxidizers, and recuperative catalytic oxidizers. Of these only RCO and recuperative catalytic oxidizers are known to control CO. All of the thermal oxidation methods control VOC. See the BACT section on VOC, below, for additional information regarding all types of thermal oxidation.

RTOs use a ceramic bed as a heat exchanger that absorbs heat from cleaned, hot gases exiting a combustion chamber and releases that heat to the next in-coming, waste gas stream as a means of preheating. Once this preheated waste gas is combusted in a chamber (and cleaned), the now hot clean gas is passed over a different ceramic bed that was cooled in the previous cycle. This now heated bed begins the next cycle by preheating the next in-coming waste gas stream. RTOs are the most common means of VOC control, have high temperature capability, are fairly rugged and easy to maintain and produce less NOx emissions than flares. Disadvantages include high capital costs, large size with complex, expensive installation, and high maintenance demand for moving parts.

RCOs operate in the same type of cycle as an RTO but use a catalyst material rather than ceramic for the bed. A catalyst is a substance that increases the rate of a chemical reaction without undergoing permanent chemical change itself. Since the material in the bed pushes the combustion of the waste gases, it allows for the cleaning process to occur at a lower temperature. This means less fuel is needed to complete combustion in the combustion chamber. RCOs have lower fuel requirements and less NOx emissions than RTOs. However, the need to change out the catalyst, usually platinum, palladium, or rhodium, translates to higher long-term maintenance costs. RCOs also have high capital costs and require a large area.

Recuperative thermal oxidizers are similar to RTOs in that they use incineration to destroy pollutants in waste gas, but the regenerative passes hot exhaust gas and cooler inlet gas through (or over) one or more fixed heat exchanger beds while the recuperative passes hot exhaust through an air-to air heat exchanger to heat the cooler inlet gas. Recuperative thermal oxidizers use metallic shell and tube heat exchangers to accomplish the transfer. They are good for low volume applications, are compact and have a long life span. Disadvantages include the higher energy costs (operating costs) and are not effective for higher air flows (>30, 000 cfm).

Recuperative catalytic oxidizers are arranged such that after in-coming waste gases are heated in the heat exchanger, they passed through a catalyst to enhance the oxidation process in the combustion chamber. As with the RCO, full combustion can occur at lower temperatures than in the non-catalytic recuperative thermal oxidizer. This means recuperative catalytic oxidizers have lower fuel costs and produce fewer NOx emissions. Some disadvantages of this form of control are the high capital costs and higher long term maintenance costs.

Flaring: This is a high-temperature, open combustion process wherein combustible components, mostly hydrocarbons, of waste gases from industrial operations are burned off. There are two types of flares, elevated and ground flares. Elevated flares are more common and consist of a waste gas stream combusted at the tip of a stack that may be from 10 to 100 meters tall. They are open to the elements and can be affected by wind and precipitation. For ground flares, the combustion takes place at ground level. Flares can also be classified by the type of mixing that occurs at the flare tip, i.e., steam-assisted, air-assisted, pressure assisted, or non-assisted. Per the EPA Air Pollution Control Technology Fact Sheet for flares, these devices are primarily safety mechanisms meant to deal with short term conditions rather than for continuous waste streams. They can be economical to dispose of sudden releases of large amounts of gas, do not usually require extra fuel and can control intermittent waste streams. Disadvantages include smoke and noise, heat released is wasted and they can actually create additional pollution, including SOx, NOx, and CO.

Mold Vent Off Gas Auto Ignition: This is a process that occurs because molten iron comes in contact with carbon in the mold and phenolic resin in the core to produce volatile organic compound (VOC) gases and CO through the casting and molding process. Vents formed in the molds allow the hot gases to escape and the extreme heat causes the gases to combust automatically (auto ignite). This burns off the pollutants and reduces emissions. The MACT rule (40 CFR 63, Subpart EEEEE) for Iron and Steel foundries located at major sources for HAPs, states that if the flame occurs more than 75 percent of the time, it is auto ignition. In order to ensure combustion occurs, an ignition source, such a small gas burner, may be placed on the conveyor downstream of the pouring stations (ignition assist).

Combustion Optimization: This is a work practices method for minimizing fuel use and emissions from the burning of fossil fuels. Oxygen and carbon in the fuel combine during combustion in a complex process requiring turbulence, temperature, and time for the reactants to contact and combine to form carbon dioxide (CO_2) and heat. If the combustion and combination of necessary elements are not controlled, the combustion of the fuel is incomplete and undesirable emissions form. Particulates from natural gas combustion are usually larger molecular weight hydrocarbons that are not fully combusted. Increased PM emissions may result from poor air/fuel mixing or maintenance problems. CO also occurs when there is poor mixing (not enough turbulence) and/or there is not enough air in the mix. Other pollutants such as NOx form if the temperature is too hot. SO_2 can form if there is too much sulfur in the fuel. By taking measures to optimize the combustion process, pollutants are minimized. These measures may include choosing good burner designs, using performance monitoring and process control techniques to improve operation, performing regular and thorough maintenance of the combustion system, etc. Although it is not an add-on control, efficient operation of combustion equipment is often an effective means to reduce combustion related pollutants. Preparation of a specific plan for achieving combustion optimization, such as a Good Combustion and Operation Practices (GCOP) Plan, that defines, measures, and verifies the use of operational and design practices specific to a piece of equipment for the reduction of a specific pollutant provides verifiable implementation of this work practices method.

Emission Group 01–Melt Shop

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the development of a defined GCOP plan constitutes CO BACT for the following units in the melt shop: Refractory curing #1–#2 (EU05–EU06), induction furnaces (EU07-EU10), pouring furnace #1 (EU15), and refractory curing mobile burner (EU18), all of which exit through ST02. None of the listed units has an add-on control for CO. The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for each exit for CO. The permit also establishes individual operational limits for each piece of equipment, in terms of million cubic feet of natural gas used per year, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits. The CO BACT emission limits imposed for Emission Group 01–Melt Shop are as follows:

Table 2-B.1 Melt Shop CO BACT Limits

Emission Point	Contributing Units	BACT	BACT limit CO
ST02	EUs 05, 06, 07, 08, 09, 10, 15, & 18	GCOP Plan	1.59 lb/ton gray iron 57.58 lb/hr 63.68 ton/yr

Emission Group 02–Sand Plant

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the development of a defined GCOP plan constitutes CO BACT for the following natural gas burning units in the sand plant: Dryers #1–# 4 (EU44–EU47), which exits through stack ST09. None of the listed units has an add-on control for CO. The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for CO at the stack. The permit also establishes individual operational limits for each piece of equipment, in terms of million cubic feet of natural gas used per year, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits.

The CO BACT emission limits imposed for Emission Group 02–Sand Plant are as follows:

Table 2.B-2 Sand Plant CO BACT Limits

Emission Point	Contributing Units	BACT	BACT limit CO*
ST09	EU44, EU45	GCOP Plan	6.238 lb/ton gray iron 93.15 lb/hr; 249.52 ton/yr

*Note that the sand plant shares ST09 with some Emission Group 03–Casting & Molding equipment, which have much higher CO emissions.

Emission Group 03–Casting & Molding

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the development of a defined GCOP plan constitutes CO BACT for the natural gas-burning unit in the cooling tunnel (EU53), which exits through stack

ST09 of the casting and molding area of the plant. CO BACT for remainder of the equipment (EU50) is vent mold auto ignition, with burner assistance. None of the listed units has an add-on control for CO, with the exception of the ignition assistance added to the conveyor line between the pouring and cooling stations (EU50). The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for CO at the two stacks. The permit also establishes individual operational limits for each piece of equipment, in terms of tons of gray iron poured per year and (as applicable) million cubic feet of natural gas used per year. The permit requires testing, monitoring, and recordkeeping to ensure compliance with those limits.

The CO BACT emission limits imposed for Emission Group 03–Casting & Molding are as follows:

Table 2.B-3 Casting & Molding CO BACT Limits

Emission Point	Contributing Units	BACT	BACT limit CO
ST07	EU53	Mold Vent Off Gas Auto Ignition	0.515 lb/ton 7.73 lb/hr 20.6 ton/yr
ST09	EU50	Mold Vent Off Gas Auto Ignition, GCOP Plan	6.238 lb/ton gray iron 93.15 lb/hr; 249.52 ton/yr

<u>Emission Group 07–Emergency Generators > 500 HP</u>
Decision Summary: BACT for the diesel generators was established as combustion optimization practices. The source is required to prepare a GCOP plan that defines, measures, and verifies the use of operational and design practices for minimizing CO emissions. The permit establishes the BACT emission limitations, both short term (grams of CO emitted per hp-hour) and long term (tpy) for each of the three generators.

The CO BACT emission limits imposed for Emission Group 07–Emergency Generators >500 HP are as follows:

Table 2.B-4 Emergency Generators >500 HP CO BACT Limits

Emission Point	Contributing Units	BACT	BACT limit CO
STG1	EU72	GCOP Plan	<2.60 grams hp-hour
STG2	EU73	GCOP Plan	<2.60 grams hp-hour
STG3	EU74	GCOP Plan	<3.73 grams hp-hour

C. <u>BACT for VOC</u>

FW submitted a BACT analysis for VOC. Several VOC technologies were identified and discussed. As with $PM/PM_{10}/PM_{2.5}$ and CO, the technologies were evaluated in light of the groups of equipment likely to be served by a single control device. As with the assignment of BACT limits, discussed above, the technology chosen to control a particular final emission point may serve as the BACT control for a diverse group of equipment.

Technologies for VOC Control: The technologies identified as possible BACT controls for emissions of VOC for the FW project are the following:

Incineration: As discussed under CO control technologies, incineration (thermal oxidation) is a process of burning gases, such as VOCs, at a high temperature to reduce the gas into CO_2 and water. Temperature of the gas is raised in the presence of oxygen and maintained at a high temperature to complete combustion. Per the U.S. EPA Air Pollution Control Technology Fact Sheet for Thermal Incinerator, destruction of VOC efficiencies ranges from 98 to 99.99 percent effective for this type of control. Design parameters such as chamber temperature, residence time, inlet VOC loading, compounds, and mixing affect the final destruction efficiency. Thermal incinerators are not well suited to highly variable flow waste gas streams.

Add-on air pollution controls that accomplish incineration of pollutants include regenerative thermal oxidizers (RTOs), regenerative catalytic oxidizers (RCO), recuperative thermal oxidizers, and recuperative catalytic oxidizers. All of these controls are known to reduce VOC in waste gas streams.

RTOs, as discussed under CO BACT, use a ceramic bed heat exchanger to preheat incoming waste gas for combustion and cool (absorb heat from) the exiting cleaned gas. These controls are mostly used for VOC control. RTOs have VOC destructive efficiency that ranges from 95 to 99 percent with the lower efficiencies generally being associated with lower VOC concentrations in the waste gas flow.

RCOs, as discussed under CO BACT, operate in a manner similar to that of an RTO, but use a catalyst material to drive the combustion of the waste gases at a lower temperature. RCOs typically have efficiencies in the 90 to 99 percent effective range for VOC but have an additional advantage in that they also destroy 98 percent and more of the CO in a waste gas stream, too.

Recuperative thermal oxidizers, as discussed under CO BACT, are similar to an RTO, but use an air to air heat exchanger rather than a ceramic bed. Depending on characteristics of the waste stream, efficiencies range from 98 percent to 99.9999+ percent destruction of VOCs. Waste streams generally require 1500 to 3000 ppmv of VOC to achieve higher efficiencies.

Recuperative catalytic oxidizers, as discussed under CO BACT, are much like RCOs. This device uses a catalyst to enhance combustion so that gas cleaning (burning) can occur at lower temperatures. This means recuperative catalytic oxidizers have lower operating costs and produce fewer NOx emissions. Disadvantages of this type of control are high capital, high long term maintenance costs, and expensive catalysts.

Flaring: As discussed under CO BACT, flaring is a high-temperature, open combustion process where components of industrial waste gases are burned off. They are often gas streams combusted at the tip of a stack but may also be at ground level. Open to weather, they are affected by wind and precipitation. There are several forms of flares based on the type of mixing that occurs and are considered primarily safety mechanisms meant to deal with short term conditions rather than for continuous waste streams.

Scrubbers: These controls, previously discussed for the removal of particulate, can also be used for the removal of other pollutants, such as VOCs. For the removal of organics, a liquid solvent is sprayed through an organic containing gas stream. Contact between the absorbing liquid (solvent) and the vent gas can occur in a number of different configurations (counter current spray tower, scrubber, or packed or plate columns). For wet scrubbers, the process gas stream is either sprayed with a liquid or forced into contact with a liquid in order to impact and remove particles entrained in the gas. The liquid droplets, containing the captured organic, are collected from the gas stream in a mist eliminator. The resulting liquid must then be treated. Dry scrubbers, that use alkaline slurries or sorbents, are generally used for the removal of acid gases and their precursors such as sulfur oxides (SO_2 and SO_3) and Hydrogen Chloride (HCl).

Carbon Adsorption: This is a process by which gas molecules are passed through a bed of solid carbon particles and are held on the surface of the solids by attractive forces. Adsorption is a surface-based process and in this form, activated carbon, that has a high number of tiny low-volume pores (i.e., it is microporous), is used as the adsorbent. The adsorbed gas molecules can be removed from the adsorbent by heat or vacuum when the adsorbent is regenerated. Activated carbon is commonly used to remove VOCs from a gas stream.

Membranes: This is another type of adsorption technology used for the selective separation of gases in a waste stream. In this technology, specially developed permeable materials allow different components in a gas stream pass through at different rates or selectively allow only certain molecules to pass through. Diffusion across a membrane can happen under different mechanisms. Molecular sieving occurs when pores are too small and specifically shaped to allow one component to pass through. These membranes are often synthetic polymers of intrinsic microporosity, that is the openings are tiny and just a few billionths of a meter in size. Another type of diffusion is low pressure driven where lighter particles travel across the membrane faster than other particles and can be captured. There is also solution-diffusion where particles in the waste gas are dissolved onto the membrane and then diffuse through the membrane at different component-specific rates.

Absorption: This is a process whereby certain components in a gas stream (such as VOCs) are removed by dissolving them into a liquid. The gas may be simply dissolved within the liquid (straight dissolution) or irreversibly reacted with a chemical liquid absorbent (dissolution with chemical reaction). This process differs from adsorption in that in adsorption, the pollutant collects on a solid surface. In absorption the pollutant passes into the liquid and is distributed throughout the liquid phase. Absorption is often used in the control of acid gases such as sulfuric acid gas (H_2SO_4), hydrochloric acid gas (HCl), and nitric acid gas (HNO_3).

Condensation: This is a technique where the temperature of a waste gas stream is lowered at constant pressure or pressure is increased at a constant temperature to force VOC(s) to change from the gas or vapor state to a liquid state. The VOC(s) in liquid form is then collected. Condensers are mostly used when there are only one or two VOCs in the waste gas stream. There are two general types of condensers: Conventional systems that use chilled water; and refrigeration/cryogenic units that use chemical refrigerants, even liquid nitrogen, to achieve extremely low temperatures. Condensation is often used when recovered VOCs have high economic value. They can also be used to concentrate the VOC stream before sending it to a second control device such as an RTO for thermal destruction.

Volume Concentration: This technique is used for control of low-concentration VOC or HAP gas streams. The goal of concentration is to gather as much of a pollutant as possible before treating the target compound extracted from the waste stream. Concentrators are often designed in a rotary carousel system. Each sector of the carousel alternately adsorbs VOC and/or HAP and then releases it as the section is regenerated by being subjected to hot gas. The higher concentration gas can then be treated via another control such as thermal oxidation or fixed-bed adsorption.

Biodegradation: In air pollution control, biodegradation is the process of removing contaminants from waste gas streams through using the natural ability of some microorganisms (bioreactors) to degrade, transform or accumulate those contaminants. Different air-type bioreactors used for odor and VOC removal include biofilters, biotrickling filters, and bioscrubbers. Some highly soluble and low molecular weight VOCs, such as methanol and aldehydes, are easily digested in bioreactors.

Ultraviolet (UV) Oxidation: This control technique uses oxygen-based chemicals to convert VOCs into CO_2 and H_2O in the presence of specific frequency UV light. The UV radiation excites the oxygen-based chemicals (often ozone and/or peroxide) to destroy the VOCs.

Mold Vent Off Gas Auto Ignition: As discussed under CO BACT, auto ignition is a process that occurs because molten iron encounters carbon in the mold and phenolic resin in the core to produce VOC and CO gases. The extreme heat causes gas escaping through vents in the mold to combust automatically (auto ignite). This burns off the pollutants. To ensure combustion occurs, an ignition source, such as a small gas burner, may be placed on the conveyor downstream of the pouring stations (ignition assistance).

VOC Minimization Work Practices Plans: These documents, like GCOPs, containing required work practices that help reduce VOC emissions. The word “volatile” means that a substance is easily evaporated at room temperature, i.e. when a substance is exposed to air the volatile portion is released to atmosphere. Preventing exposure of these types of materials to air is the goal of a VOC minimization work practices plan. In the case of VOC control, such a plan includes a defined set practices and procedures for VOC containing materials and dictates how those materials are stored, handled, and disposed to prevent releases and spills.

Combustion Optimization: As discussed previously, this is a work practices method for minimizing fuel use and emissions from the fossil fuels. If the combustion and combination of necessary elements are not controlled, the combustion of the fuel is incomplete and undesirable emissions, such as VOCs, form. By taking measures to optimize the combustion process, pollutants are minimized. Preparation of a specific plan for achieving combustion optimization, such as a Good Combustion and Operation Practices (GCOP) Plan, that defines, measures, and verifies the use of operational and design practices specific to a piece of equipment for the reduction of a specific pollutant provides verifiable implementation of this work practices method. Although it is not an add-on control, efficient operation of combustion equipment is often an effective means to reduce VOCs and other combustion related pollutants.

Emission Group 01–Melt Shop

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the development of a defined GCOP plan constitutes VOC BACT for the following units in the melt shop: Refractory curing #1–#2 (EU05–EU06), induction furnaces (EU07-EU10) pouring furnace #1 (EU15), and refractory curing mobile burner (EU18), all of which exit through ST02. None of the listed units has an add-on control for VOC. The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for each exit for VOC. The permit also establishes individual operational limits for each piece of equipment, in terms of million cubic feet of natural gas used per year, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits.

The VOC BACT emission limits imposed for Emission Group 01–Melt Shop are as follows:

Table 2.C-1 Melt Shop VOC BACT Limits

Emission Point	Contributing Units	BACT	BACT limit VOC
ST02	EU05, EU06, EU15, EU18	GCOP Plan	0.247 lb/ton gray iron 9.48 lb/hr 9.88 ton/yr

Emission Group 02–Sand Plant

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the development of a defined GCOP plan constitutes CO BACT natural gas-burning process units in the sand plant: Dryer #1 –#2 (EU44–EU45), which exits through stack ST09. None of the listed units has an add-on control for CO. The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for CO at the stack. The permit also establishes individual operational limits for each piece of equipment, in terms of million cubic feet of natural gas used per year, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits.

The CO BACT emission limits imposed for Emission Group 02–Sand Plant are as follows:

Table 2.C-2 Sand Plant VOC BACT Limits

Emission Point	Contributing Units	VOC BACT	BACT limit VOC*
ST08	EU39, EU40	Scrubber#	4.59 lb/ton core sand 8.39 lb/hr; 15.35 ton/yr
ST09	EU43, EU44, EU45, EU47, EU79	GCOP Plan (for gas combustion, only)	3.561 lb/ton gray iron 54.70 lb/hr; 142.44 ton/yr

Per FW, the scrubber was installed for odor control at the core machines, only. However, the scrubber does provide some control of a specific VOC (amine gas) and has been established as a BACT requirement for stack ST08.

* Note that the sand plant shares stack ST09 with some Emission Group 03 – Casting & Molding equipment.

Emission Group 03–Casting & Molding

Decision Summary: In accordance with the BACT evaluation conducted and submitted by the applicant, the Division determines that the development of a GCOP plan constitutes VOC BACT for the natural gas burning unit in the shakeout conveyor (EU53) which exits through stack ST09 of the casting and molding area of the plant. VOC BACT for remainder of the equipment (EU50) is vent mold auto ignition, with burner assist. None of the listed units has an add-on control for VOC, with the exception of the ignition assistance added to the conveyor line between the pouring and cooling station (EU50). The permit establishes the BACT emission limitations, both short term (lbs/ton) and long term (tpy), for VOC at the two stacks. The permit also establishes individual operational limits for each piece of equipment, in terms of tons of gray iron poured per year and (as applicable) million cubic feet of natural gas used per year, and requires testing, monitoring, and recordkeeping to ensure compliance with those limits.

The VOC BACT emission limits imposed for Emission Group 03–Casting & Molding are as follows:

Table 2.C-3.a Casting& Molding VOC BACT Limits

Emission Point	Contributing Units	BACT	BACT limit VOC
ST07	EU53	Mold Vent Off Gas Auto Ignition	0.616 lb/ton gray iron 9.24 lb/hr; 24.64 ton/yr
ST09	EU50	Mold Vent Off Gas Auto Ignition, GCOP Plan	3.561 lb/ton gray iron 54.70 lb/hr; 142.44 ton/yr

Technologies: The possible VOC control technologies identified for the casting and molding area are Incineration (oxidation), Flares, Carbon Adsorption, Membranes/Molecular Sieves, Absorption, Condensation, Concentration, Biodegradation, UV Oxidation, Mold Vent Gas Auto Ignition, and Combustion Optimization, with development of a GCOP plan.

Analyses: After identifying possible VOC control technologies, the technical feasibility, some costs, and the applicability of the technologies were examined

A thermal oxidizer is technically feasible and, as discussed under previous BACT determinations, would have to be installed downstream of a particulate collector due to the high potential for fouling of either the ceramic media or catalyst from the heavy particulate loading of the gas streams. Placing an RTO or an RCO downstream of the baghouses on stacks ST07 and ST09 was examined and a cost analysis was performed to estimate the annualized costs for using this control device for VOC (and CO) removal in Pouring, Cooling and Shakeout (PCS) areas of Emission Group 03–Casting & Molding. Some additional emissions were included for stack ST09 from combustion equipment in the sand plant. The cost analysis for each stack is as follows:

Table 2.C-3.b: CO and VOC Control for Emissions through stack ST07

CONTROL	TONS CO REMOVED * (TPY)	COST EFFECTIVENESS ($/TON CO REMOVED)	TONS VOC REMOVED * (TPY)	COST EFFECTIVENESS ($/TON VOC REMOVED)	COMBINED TONS REMOVED *(TPY)	COST ($/TON COMBINED REMOVED)
RTO	**20.5**	**$89,847**	**22.4**	**$75,540**	**45.1**	**$40,735**
RCO	**20.5**	**$171,027**	**22.4**	**$143,777**	**45.1**	**$77,684**

* Note that number of tons removed have been rounded

Table 2.C-3.c: CO and VOC Control for Emissions through stack ST09

CONTROL	TONS CO REMOVED * (TPY)	COST EFFECTIVENESS ($/TON CO REMOVED)	TONS VOC REMOVED * (TPY)	COST EFFECTIVENESS ($/TON VOC REMOVED)	COMBINED TONS REMOVED *(TPY)	COST ($/TON COMBINED REMOVED)
RTO	**227**	**$8,057**	**129.6**	**$14,053**	**356.6**	**$5,106**
RCO	**227**	**$15,350**	**129.6**	**$26,709**	**356.6**	**$9,665**

* Note that number of tons removed have been rounded

Of the scenarios examined, the most cost effective would be an RTO on stack ST09. It would provide a 95% destruction for the VOCs and 98% destruction for CO from this area. At $5,106 per ton of pollutant removed, it is not considered cost prohibitive for use in this area. However, the typical air flow rate for this type of control technology is from 500 to 50,000 scfm. The air flow rates are well above the maximum of the typical of the typical range. The pollutant loading (concentration) for this technology should be approximately 1500 to 3000 ppmv to maintain appropriate temperatures required. This installation is well below these concentrations regardless of the emission unit. Based on the descriptions in USEPA's Air Pollution Control Technology Fact Sheet, RTOs were considered infeasible.

It should be noted that two facilities in the RBLC database actually list RTOs for use in the PCS operations, but these facilities are major for HAPs and the RTOs were necessary to assist in complying with the 20 ppm VOHAP limit applicable from the MACT 40 CFR 63, Subpart EEEEE. This MACT is not applicable to the FW project.

Flares, though technically feasible, would not be a good choice for the casting and molding operations because flares are mostly used to control large flows and large pollutant concentrations such as upsets, emergencies, or purges such as those in chemical and petroleum manufacturing. Although this part of the plant is a source of VOC emissions, the amounts translate into low concentrations and would require the use of additional fuel for combustion. In addition, flares produce undesirable emissions including NOx, SOx, and CO.

Carbon adsorption is also technically feasible; however, the efficiency depends on the waste gas stream. In general, heavier molecules tend to show higher equilibrium concentrations adsorbed onto the carbon, i.e. xylene would likely be adsorbed efficiently, but other low molecular weight VOCs, such as methanol and aldehydes, may not. Adsorbents may also saturate quickly and require frequent regeneration or replacement, driving up maintenance costs.

Membranes/Molecular Sieves are more appropriate for highly loaded, very low flow (≈ 100 acfm) gas streams. The much higher flows from most of the equipment in this part of the plant, plus the relatively low amount of VOC (≈ 27.49 tpy) make these devices technically infeasible for use in the casting and molding area.

For absorption, as discussed for adsorption, the effectiveness and ultimate cost per ton for removal of VOCs is directly related to the characteristics of the gas stream. This technology is not considered suitable for low concentrations and it generates wastewater that requires treatment or disposal. It would not be cost effective for the relatively small amount of VOCs generated in the area of the facility.

Condensation is generally used to concentrate a pollutant (such as VOC) before sending the condensate to another control device, such as an RTO, for destruction. This control technique would not be cost effective since two control devices, in addition to the baghouses already chosen for particulate control, would be used for a relatively small amount of VOC.

Concentration may not be feasible. The technique is mostly economical when recovering solvents from a highly laden stream but would be difficult to use with mold vent gases. This is because the vent gases would require extreme cooling to be brought into the temperature range for the control process.

Biodegradation is a low cost technology often used to control low flow and low pollutant containing waste streams. However, the different forms of this technology each require very close control of biological parameters and have specific disadvantages that make them less appropriate choices for this portion of the plant. Biofilters require extremely large bioreactors and have a large footprint, use limited life packing and are prone to clogging. Biotrickling filters tend to accumulate excess biomass in the filter bed, are very complex in construction and operation and have a secondary waste stream. Bioscrubbers treat only the water soluble compounds, can be complex to operate and maintain, need an additional air supply to operate, and generate liquid waste and some sludge that require disposal.

UV Oxidation is not appropriate for use in the casting and molding area of the project. This technology is often used to eliminate fugitive VOC emission during curing in a coating process and is not applied to gas streams.

Mold vent off gas auto ignition, according to the application, is the only effective VOC control available for the pouring and cooling portion of the casting and molding process. FW stated that the gases venting from their molds, after the molten iron is poured, self-ignites more than 75 percent of the time. However, to ensure that VOC is burned off as completely as possible, two small natural gas-fired burners will be located on the conveyor to insure ignition of all vented gases. Mold vent off gas auto ignition is chosen as VOC BACT for the casting and molding area. Auto ignition is an industry standard for pouring, cooling and shakeout and a check of the RBLC shows no add-on controls with the exception of the two RTOs installed to comply with VOHAP limits.

Development and implementation of a GCOP plan, specific to the natural gas-fueled cooling tunnel (EU50) in the casting and molding area, would be beneficial in reducing VOC emissions from this unit. Also, a GCOP plan has already been chosen as CO BACT for the cooling tunnel, so including the plan as VOC BACT, too, is prudent since optimizing the combustion process will also minimize VOC emissions from the natural gas use at this unit.

As with previous small natural gas units, combustion optimization is the chosen BACT for the natural gas burner used for EU50. For minimizing the formation of VOC at this point, a GCOP a plan to affect complete combustion is both practical and economic. As required for the CO emitting equipment in the casting and molding area, the permit requires that FW prepare a GCOP plan within 90 days of equipment startup as BACT for VOC. The plant must define, measure, and verify the use of operational and design practices determined as BACT for the natural gas combusting burners. The permittee is also required to operate as outlined in the plan, verify the optimization practices are occurring and that the facility is lowering its energy consumption.

BACT limits for VOC from the equipment in the casting and molding area have been Based on upper 95th% Confidence Interval of 2019 and 2024 CU08/ST09 stack test results. The particular groupings of equipment with particular stacks in the FW project are not equivalent to the groupings used for plants listed in the RBLC. In most cases, this makes the BACT limits available in the database not directly relatable to the stacks for the FW project. Short term and long term limits, i.e. maximum lbs/hr and tpy of VOC that may be emitted from each stack, as well as natural gas use limits, have been imposed on the equipment of the casting and molding area.

Initial compliance for the casting and molding equipment will be demonstrated through testing. Continuous compliance will be demonstrated through monitoring, recording, and reporting throughputs for the equipment. Additional continuous compliance assurance for the gas-burning equipment is demonstrated through the continued implementation of the GCOP and verification of that implementation.

<u>Emission Group 06–Coating</u>

Decision Summary: The Division has determined that the use of regenerative carbon adsorption constitutes BACT for VOC for the paint booths #1–#3 (EU68–EU69, EU71). The permit establishes limitations on VOC emissions from these units and requires testing, monitoring, and recordkeeping to ensure compliance with those limits. Additionally, the permit contains requirements to operate and maintain the paint booths and the regenerative carbon adsorber system according to the manufacturer's written recommendations, instructions, and/or operating manual(s) unless alternatives are approved in writing by the Division. The permit also includes provisions for reclamation of the waste gas stream and/or destruction of it, so that the permittee has flexibility in managing the final destination of the waste gas stream.

The VOC BACT emission limits imposed for Emission Group 06–Coating are as follows:

Table 2.C-4.a Coating VOC BACT Limits

Emission Point	Description	BACT	BACT limit VOC
ST15a	EU68	Regenerative Carbon Adsorption, Work Practices Plan	Coating VOC Content <3.5 lbs/gal Combined <19.425 tpy VOC
ST15b	EU69	Regenerative Carbon Adsorption, Work Practices Plan	Coating VOC Content <3.5 lbs/gal Combined <19.425 tpy VOC
ST16	EU71	Regenerative Carbon Adsorption, Work Practices Plan	Coating VOC Content <3.5 lbs/gal Combined <3.24 tpy VOC

Technologies: The possible VOC control technologies identified for coatings are Incineration (oxidation), Flares, Membranes/Molecular Sieves, Absorption, Condensation, Concentration, Biodegradation, UV Oxidation, , Carbon Adsorption, and VOC Minimization Work Practices Plan.

Analyses: After identifying possible VOC control technologies, the technical feasibility, some costs, and the applicability of the technologies were examined.

A thermal oxidizer is technically feasible and, as discussed under previous BACT determinations, would have to be installed downstream of a particulate collector due to the high potential for fouling of either the ceramic media or catalyst from the heavy particulate loading of the gas streams. Placing an RTO downstream of the baghouses on the stacks was examined and a cost analysis was performed to estimate the annualized costs for using this control device for VOC removal in paint booths areas of Emission Group 06–Coating. The analyses determined that an RTO was cost prohibitive for the amount of VOC removed (See Table 5.C-4.b, VOC Control for Emissions through stack ST15, below). An RCO would likely be too costly, too, since the amount of VOC removed would be less than that removed under the analysis of an RCO at stack ST09 (see Emission Group 03–Casting & Molding analysis, above) and there is no secondary benefit of CO removal.

The same arguments made in the discussion of RTOs and RCOs hold for the recuperative types of thermal oxidizers. They are technically feasible but are not cost effective, due to auxiliary fuel needs and higher operating costs, and were rejected for use as BACT.

Flares, though technically feasible, would not be a good choice for the coating operations because flares are mostly used to control large flows and large pollutant concentrations such as upsets, emergencies, or purges such as those in chemical and petroleum manufacturing. Although this part of the plant is a source of VOC emissions, the amounts translate into low concentrations for this type of application and would require the use of additional fuel for combustion. In addition, flares produce undesirable emissions including NOx, SOx, and CO.

Membranes/Molecular Sieves are more appropriate for highly loaded, very low flow (≈ 100 acfm) gas streams. The much higher flows from most of the equipment in this part of the plant, plus the relatively low amount of VOC (≈ 23 tpy) make these devices technically infeasible for use in the coating area.

For absorption, as discussed for adsorption, the effectiveness and ultimate cost per ton for removal of VOCs is directly related to the characteristics of the gas stream. This technology is not considered suitable for low concentrations and it generates wastewater that requires treatment or disposal. It would not be cost effective for the relatively small amount of VOCs generated in the coating area of the facility.

Condensation is generally used to concentrate a pollutant (such as VOC) before sending the condensate to another control device, such as an RTO, for destruction. This control technique would not be cost effective since two control devices, in addition to the baghouses already chosen for particulate control, would be used for a relatively small amount of VOC.

Concentration would not be economical for use in this instance. Concentration works best for recovering solvents from a highly laden solvent stream. Since the goal would be to destroy the VOCs rather than collect and reuse or sell them, there would be no cost benefit to offset installation and operation expense.

Biodegradation is a normally low cost technology often used to control low flow and low pollutant containing waste streams. However, the different forms of this technology each require very close control of biological parameters and have specific disadvantages that make them less appropriate choices for this portion of the plant. Biofilters require extremely large bioreactors and have a large footprint, use limited life packing and are prone to clogging. Biotrickling filters tend to accumulate excess biomass in the filter bed, are very complex in construction and operation and have a secondary waste stream. Bioscrubbers treat only the water soluble compounds, can be complex to operate and maintain, need an additional air supply to operate, and generate liquid waste and some sludge that require disposal. Biofilters, which have been used in Europe in coating applications to reduce VOC and VOHAP for decades, were examined for this project. FW performed a cost analysis to estimate the annualized costs for using this control device for VOC removal in the paint booths areas of Emission Group 06–Coating. The analyses determined that only 62 percent of the VOCs would be removed by this method for this application. Since the amount of VOC removed is small, as compared with other control technologies, the cost increases to over $27,000 per ton of VOC destroyed. (See Table 5.C-4.b, VOC Control for Emissions through stack ST15, below) This technology was rejected for use with this project.

Table 2.C-4.b: VOC Control for Emissions through ST15a, ST15b & ST16

CONTROL	TONS VOC REMOVED* (TPY)	PERCENT REMOVED	COST EFFECTIVENESS ($/TON VOC REMOVED)
RTO	15.3	95%	$23,788
Biofilter	10.0	62%	$43,307
Activated Carbon with Regeneration	14.5	90%	$47,377

UV Oxidation is not appropriate for use in the coating area of the project. This technology is often used to eliminate fugitive VOC emission during curing in a coating process and is not applied to gas streams.

Carbon adsorption was examined for its technical feasibility and projected costs for use in removing VOC at the paint booths. FW provided some information about their process and waste gas stream and a cost analysis for the technology in their application.

The Division evaluated controls and emission reductions achievable by paint booth operations by reviewing relevant literature to determine BACT for the paint booths. The Division also evaluated other similar sources and information identified by FW and determined that regenerative carbon adsorption is both available and applicable to the paint booths at FW.

Regenerative carbon adsorption is a feasible control measure for VOC emissions from the paint booths. The gas stream characteristics of the paint booths after the fabric filters are similar to other coating operations to which the technology could be applied. The permittee identified possible bed fires as a technical concern, however, the gas stream entering the adsorber will be less than 93 degrees Fahrenheit and the permittee has several options for suppressing the possibility of a bed fire. These options include humidification of the air, leaving some water in the bed after steam regeneration, and by intentional cooling of the carbon, all of which have been included in the cost analysis the permittee performed. The permittee also identified frequent carbon replacement as a possible concern, however, the Division does not agree that this would be an issue due to the particulate filter that will remove 99% of the zinc in the air stream, and the lack of heavy organic compounds (boiling points above 400°F) that would require a granular carbon pre-filter that would need frequent changing. If the zinc were to cause more frequent fouling than what was included in the cost estimate the permittee submitted, the cost would not make it infeasible due to the low cost of carbon.

Advantages of regenerative carbon adsorption include the applicability to a wide range of painting/coating processes and paint/coating compositions including those in Japan, Europe, and the United States, high VOC removal efficiency in spite of the low concentration of VOC and mixture of solvents in the waste stream, low operating costs because of the concentrating effect of the carbon adsorption system, light weight and small size allowing it to fit into tight spaces or rooftop mount close to the exhaust stack, modular factory fabricated design resulting in low installation costs and quick installation onsite, extensive operating experience in terms of total units and years of operation on various painting/coating processes. The permittee also has the option of recovering the waste stream for sale or destroying it. The average control efficiency for regenerative carbon adsorption across multiple industries is 90%, with many industries able to achieve higher efficiencies.

Based on this information, the Division does not agree that the cost of implementing a regenerative carbon adsorber with a VOC control efficiency of 90% or greater on the combined paint booth operations is prohibitive. Therefore, the Division has determined that a regenerative carbon adsorber can be implemented at the paint booths.

Development and implementation of a VOC minimization work practices plan for the coating operations of the plant is a viable and highly cost effective means for limiting VOC emissions. Simple procedural methods, such as always covering containers containing coatings, closing lids on mixers, transporting containers with closed and secured lids to prevent spills, etc., do not incur many costs. In the case of VOC control, the plan will include defined requirements for how the coatings, gun cleaners, and waste materials will be stored, handled, and disposed to prevent releases and spills.

The Division finds that BACT for the paint booths (EU68, EU69 and EU71) will be the use of regenerative carbon adsorption with a VOC control efficiency of at least 90 percent and development of a work practices plan.

As required for the equipment requiring a GCOP, the VOC minimization work practices plan requires that FW prepare and implement the plan within 90 days of equipment startup as BACT for VOC. The plant must define, measure, and verify the use of operational and design practices determined as BACT for the paint booths. The permittee is also required to ensure that the capture system achieves the prescribed efficiency and that the facial velocity of air flow through the enclosure be maintained.

BACT limits for VOC from the equipment in the coating operations area have been set based upon the projected throughputs of the equipment and emission factors supplied in the MSDS information specific to the coatings to be used and the required control equipment. Short term BACT limits are related to the amount of VOC present in the coatings and are also subject to state regulation. Long term VOC BACT emission limits, in total tpy, are also established. BACT limits listed in the RBLC database for paint booths are not directly relatable to the stacks for the FW project. Requirements for establishing a work practice plan to minimize VOC release is established as the control BACT for the coating operations. Limits on throughput (coating used) is an additional operational BACT requirement. The permit requires a number of tests to verify that VOC content and VOC emission limits will be met.

Initial compliance for the coating operations will be demonstrated through testing. Continuous compliance will be demonstrated through monitoring, recording, and reporting throughputs for the equipment. Additional continuous compliance assurance is demonstrated through the continued implementation of the VOC Minimization Work Practices Plan and verification of that implementation.

Emission Group 07 – Emergency Generators > 500 HP

Decision Summary: BACT for the diesel generators was established as combustion optimization practices. The source is required to prepare a GCOP that defines, measures, and verifies the use of operational and design practices for minimizing VOC emissions. The permit establishes the BACT emission limitations, both short term (grams of VOC emitted per hp-hour) and long term (tpy) for each of the three generators.

The VOC BACT emission limits imposed for Emission Group 07 – Emergency Generators >500 HP are as follows:

Table 2.C-5 Emergency Generators >500 HP VOC BACT Limits

Emission Point	Description	BACT	BACT limit VOC
STG1	EU72	GCOP Plan	<4.77 grams hp-hour
STG2	EU73	GCOP Plan	<4.77 grams hp-hour
STG3	EU74	GCOP Plan	<3.50 grams hp-hour

Emission Group 08 – Diesel Storage Tank

Decision Summary: BACT for the diesel storage tank was established as good operation and diesel handling measures. The source is required to ensure diesel is handled in a manner that would not result in vapor releases to the atmosphere.

Table 2.C-6 Diesel Storage Tank VOC BACT

Emission Point	Description	BACT	BACT limit VOC
STTK1	EU75	Good Handling and Operation Measures	0.92 lb/hr

BACT SUMMARY
Table 2-I:

Pollutant	Emission Group	BACT Determination
$PM/PM_{10}/PM_{2.5}$	Emission Group 01–Melt Shop	Baghouse, Bin Vent Filter, Enclosure, Good Combustion and Operation Practices (GCOP) Plan
	Emission Group 02–Sand Plant	Baghouse, Bin Vent Filters, Scrubber, GCOP Plan
	Emission Group 03–Casting & Molding	Baghouse, Bin Vent Filter, GCOP Plan
	Emission Group 04–Fettling Shop	Baghouse, Bin Vent Filter
	Emission Group 05–Machining Shop	Baghouse
	Emission Group 06–Coating	Paint Booth Filter
	Emission Group 07–Emergency Generators	GCOP Plan
Fugitive $PM/PM_{10}/PM_{2.5}$	Emission Group 09–Haul Roads	Work Practices
CO	Emission Group 01–Melt Shop	GCOP Plan
	Emission Group 02–Sand Plant	GCOP Plan
	Emission Group 03–Casting & Molding	Mold Vent Off Gas Auto Ignition, GCOP Plan
	Emission Group 07–Emergency Generators	GCOP Plan
VOC	Emission Group 01–Melt Shop	GCOP Plan
	Emission Group 02–Sand Plant	GCOP Plan, Scrubber
	Emission Group 03–Casting & Molding	Mold Vent Off Gas Auto Ignition, GCOP Plan
	Emission Group 06–Coating	Work Practices Plan
	Emission Group 07–Emergency Generators	GCOP Plan
	Emission Group 08–Diesel Storage Tank	Good Handling and Operation Measures

III. Air Quality Impact Analysis

i. ***Screening Methodology***

The incremental increases in ambient pollutant concentrations associated with the Fritz Winter project have been estimated through the use of a dispersion model (AERMOD) applied in conformance to applicable guidelines in the United States Environmental Protection Agency (USEPA) Guideline on Air Quality Models (GAQM, 40 CFR Appendix W, May 2017) and other applicable guidance, and followed the methodology presented in the Air Dispersion Modeling Protocol approved by KDAQ on August 20, 2025.

Model simulations for short-term and annual-averaged CO, PM_{10}, and $PM_{2.5}$ emissions are performed with the AERMOD model using the 5-year meteorological database. The highest predicted impacts (H1H) were used as the design concentrations in the SIL analyses while the design concentrations for the NAAQS and PSD increment analyses followed the form of the NAAQS and PSD increment for each applicable pollutant and averaging time. Each pollutant is being assessed against the SIL for the NAAQS, the maximum value over 5 years for each applicable time averaging period is compared to the appropriate SIL.

Significant Impact Levels (SILs)

Pollutant	Averaging Period	Modeled Concentration (μg/m^3)	Significant Impact Level (μg/m^3)	Significant Monitoring Concentrations (μg/m^3)	SIL Exceeded & Additional Modeling Required?	Significant Monitoring Concentration Exceeded?
CO	1-hour	179.0	2000	-	No	-
	8-hour	41.78	500	575	No	No
PM_{10}	24-hour	13.2	5	10	Yes	Yes
	Annual	2.15	1	-	Yes	-
$PM_{2.5}$ (2)	24-hour	11.0	1.2	4	Yes	Yes
	Annual	1	0.2	-	Yes	-

ii. Background Concentrations

Representative background concentrations were added to the maximum predicted concentrations so that small sources that were not explicitly modeled are included in the NAAQS and KYAAQS assessment. Background concentrations are based on ambient monitoring data collected for the most recent three-year period available (2022 through 2024) determined to be the most representative for use in the modeling analysis. Since all of the study pollutants are not monitored at one location, data from several different monitoring locations are used.

Representative Background Concentrations

Monitoring Location	Site ID	Data Collection Period	Pollutant	Averaging Period	Basis of Design Value	Design Value
Bowling Green, KY	21-227-0009	2022-2024	$PM_{2.5}$	24-hour	Average of the three year 98th percentile	17.0 μg/m^3
				Annual	Average of three year annual averages	6.9 μg/m^3
Evansville, IN	18-163-0021	2022-2024	PM_{10}	24-hour	2nd high	60.0 μg/m^3

The applicant may propose for the reviewing authority's consideration use of existing monitoring data if appropriate justification is provided. Fritz Winter proposed the use of representative regional background data to satisfy this requirement as necessary.

iii. Cumulative NAAQS Analyses

NAAQS analyses, using five years of meteorological data, were performed for the 24-hour PM_{10}; and 24-hour and annual $PM_{2.5}$. The NAAQS analyses were carried out by modeling facility-wide Fritz Winter source parameters and emission rates; modeling off-property source inventory for the surrounding area; and adding the representative background concentrations to modeled concentrations for comparison with the NAAQS.

NAAQS Modeling Results

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Max Fritz Winter Contribution ($\mu g/m^3$)
PM_{10}	24-hour	8.14	60.0	68.14	150	N/A
$PM_{2.5}$	24-hour	6.81	17.90	24.71	35	N/A
	Annual	1.86	6.90	8.76	9	N/A

iv. Class II Increment Analysis

In addition, a PSD Class II increment modeling analysis, using five years of meteorological data, was also performed for annual NO_2, 3-hour SO_2, 24-hr and annual PM_{10}, and 24-hour and annual $PM_{2.5}$ by modeling increment consuming and expanding Fritz Winter source parameters and emission rates as well increment consuming and expanding off-property sources.

Class II Increments

Pollutant	Averaging Period	Modeled Concentration ($\mu g/m^3$)	PSD Class II Increment Standard ($\mu g/m^3$)
PM_{10}	24 hour	8.19	30
	Annual	1.95	17
$PM_{2.5}$[1]	24 hour	8.19	9
	Annual	1.95	4
(1) Secondary PM2.5 concentrations estimated using the default KDAQ MERP values.			

v. Secondary $PM_{2.5}$ and Ozone Formation

The Division has provided recent (November 13, 2024) guidance on addressing secondary pollutant impacts with a state-specific guidance on the application of EPA's Modeled Emission Rates for Precursors (MERPs) Tier-1 demonstration tool. This guidance was used to assess secondary formation of ozone and $PM_{2.5}$for this project. A MERP represents a level of precursor emissions that is not expected to contribute significantly to concentrations of ozone or secondarily formed $PM_{2.5}$.

MERPs are used to determine if proposed emission increases from a facility will result in primary and secondary impacts. NOx, SO_2, $PM_{2.5}$, and VOC emissions from the project must be included in the analysis. If the project emissions from all relevant pollutants are below the SER, no further analysis is required. If the project emissions from any of the relevant emissions are above the SER, a Tier 1 demonstration is required. The Tier 1 demonstration consists of a SILs analysis and, if needed, a cumulative analysis. The analysis must be below the NAAQS for each precursor in order to pass.

Fritz Winter Emission for MERPs Analysis

Precursor	Emissions (tpy)	SER (tpy)
NO_X	13.24	40
SO_2	.88	40
$PM_{2.5}$	28.54	10
VOC	223.47	40

The values represent the maximum predicted concentrations over the five modeling years and are later used in the PSD Increment analysis. In the NAAQS analysis of the direct model-predicted concentrations, the average over 5 years were used.

SIL Modeling Results for $PM_{2.5}$ MERPs Analysis

Pollutant	Project Modeled Concentration (µg/m^3)
Annual $PM_{2.5}$	14.31
Daily $PM_{2.5}$	8.76

The highest modeled concentration for all sources, including nearby sources, for annual and 24-hour primary $PM_{2.5}$ NAAQS are as follow:

NAAQS and PSD Increment Modeling Results for MERP*s* Analysis

Pollutant	Project + Nearby NAAQS Source Impacts (µg/m^3)	Project + Nearby PSD Increment Source Impacts (µg/m^3)
Annual $PM_{2.5}$	8.76	1.95
Daily $PM_{2.5}$	24.72	8.19

The background concentrations for $PM_{2.5}$ annual / 24-hour are as follows:

Background Concentrations for MERPs Analysis

Pollutant	Background Concentrations	Monitor ID
Annual $PM_{2.5}$	6.9	21-227-0009
Daily $PM_{2.5}$	17.9	

If the result of the SIL Analysis is greater than 1, a cumulative analysis is required for that precursor. If the result is less than 1, a cumulative analysis is not required. The SIL analysis results for ozone and PM2.5 are as follows:

MERPs SIL Analyses

Pollutant	Analysis Results	Less than 1?
Ozone	.16	Yes
Annual $PM_{2.5}$	14.31	No
Daily $PM_{2.5}$	8.76	No

The table below shows the cumulative analysis results for $PM_{2.5}$.

MERP Cumulative NAAQS Analysis

Precursor	Analysis	NAAQS	Below NAAQS?
Annual $PM_{2.5}$	8.76	9 µg/m^3	Yes
Daily $PM_{2.5}$	24.72	35 µg/m^3	Yes

Summary of the PSD Increment analysis results is as follows:

MERPs PSD Increment Analysis

Precursor	Analysis	PSD INC	Below PSD INC?
Annual $PM_{2.5}$	1.95	4 µg/m^3	Yes
Daily $PM_{2.5}$	8.19	9 µg/m^3	Yes

vi. Class I MERPs Analysis

In order to assess the total $PM_{2.5}$ impacts (primary and secondary) at the Class I area, the USEPA approved distance-dependent technique was used. In this case, the MERPs values were calculated based on the concentrations from Barren County hypothetical stack at a specific distance representative of the distance between the Project and the Class I area.

The combined primary and secondary $PM_{2.5}$ impacts were compared to their respective SILs. The 24-hour and the annual $PM_{2.5}$ total concentrations are below the SIL standards. Therefore, it is not expected that the Project will contribute significantly to $PM_{2.5}$ levels at AREA, and no further analysis is necessary.

Class I Primary and Secondary $PM_{2.5}$ Modeling Results

Period	AERMOD $PM_{2.5}$ Concentrations ($\mu g/m^3$) at 50 km			Class I SIL
	Primary	Secondary	Total	
24-hour	0.109	0.050	0.16	0.27
Annual	0.006	0.003	0.01	0.03

vii. Class I Area Analysis

Class I area impacts are addressed if the proposed project has an impact that exceeds the screening threshold as described by Federal Land Managers' (FLM) Air Quality Related Values Work Group (FLAG) guidance. In this guidance the sum of the proposed project emissions (in tpy) of SO_2, NOx, PM_{10} and H_2SO_4 is divided by the distance to the Class I area and compared to the value of 10. This ratio is known as Q/D. If Q/D is 10 or less, the project is considered to have a negligible impact on the Class I area. If the Q/D value is greater than 10, then further analysis to evaluate impacts in the Class I area is warranted.

There are four Class I areas within 300 km of the Fritz Winter casting facility: Mammoth Cave, which is the closest at 51 km followed by Great Smoky Mountains National Park, Joyce Kilmer-Slickrock Wilderness 273km, Sipsey 283km and Cohutta 265km. The sum of emissions (SO_2, NOx, PM_{10} and H_2SO_4) for the proposed project is 335.2 tpy. The calculated Q/D for the proposed project relative to Mammoth Cave NP is 0.84; which is below the FLM screening level of 10.

Class I Area Q/D Screening Analysis

Pollutant	Project Emissions (tpy)	Q/D Analysis
NO_2	25.4	[redacted]
SO_2	6.49	
PM_{10}	27.8	
H_2SO_4	0	
Total	42.6	
AREA	51	1.17

The project related increase of NO_2, PM_{10}, and $PM_{2.5}$, were evaluated against the Class I SILs by applying the AERMOD dispersion model receptors at the maximum spatial extent (50 km from the Project site to receptor). The maximum-modeled concentrations at the 50 km receptors are less than the Class I SILs for all pollutants and averaging periods.

Class I SIL Analysis with AERMOD at 50 km

Pollutant	Averaging Period	Modeled Concentration at 50 km (μg/m^3)	Class I SIL	% of SIL
PM_{10}	24-hour	0.155	0.32	48%
	Annual	0.0075	0.16	4.7%
$PM_{2.5}$[1] secondary	24-hour	.1560	0.27	58%
	Annual	.0076	0.03	25%
(1) The $PM_{2.5}$ peak concentrations represent the sum of the AERMOD predicted concentrations and the fraction accounting for the secondary $PM_{2.5}$ formations.				

As evident from the AERMOD modeling results, model-predicted impacts from Fritz Winter emission sources are below the Class I SILs for all pollutants and averaging periods; therefore, compliance is demonstrated and no further analysis is required.

SECTION 3 – EMISSIONS, LIMITATIONS, AND BASIS

Emission Group 01 – Melt Shop				
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**	**Compliance Method**
HAP	0.008 lbs of total metal HAP per ton of metal charged	40 CFR 63.10895(c)(2)	Arsenic 75.1 mg/Kg Cadmium 51.3 mg/Kg Chromium 491 mg/Kg Cobalt 35.1 mg/Kg Lead 5140 mg/Kg Manganese 34000 mg/Kg Nickel 142 mg/Kg Selenium 26.7 mg/Kg Pace Analytical Report June 10, 2021 (Melt)	Testing, Monitoring & Recordkeeping
Opacity	20% except for one 6-minute average per hour that does not exceed 30%	40 CFR 63.10895(e)	N/A	Testing, Monitoring & Recordkeeping
PM	• P≤0.5 tons/hr: E=2.34 lb/hr • P≤30 tons/hr: $E=3.59P^{0.62}$	401 KAR 59:010, Section 3(2)	0.9 lb/tons; FIRE 6.25 SCC 3-04-003-03	Testing and Recordkeeping
Opacity	20% (stack and fugitive)	401 KAR 59:010, Section 3(1)(a); 40 CFR 63.10895(e)	N/A	Weekly qualitative visual observation, & recordkeeping

Construction Dates: March 2017 for EUs 07 & 08; July 2019 for EUs 09 & 10

Process Description: Four (4) electric induction furnaces that have a maximum short-term capacity of 10 tons gray iron/hr each.

EU07 Induction Furnace #1
Description:
Manufacturer: Junker
Model: MFTGe Duomelt
Maximum Throughput: 10 tons of gray iron/hr
Controls: Baghouse (CU01)

EU08 Induction Furnace #1
Description:
Manufacturer: Junker
Model: MFTGe Duomelt
Maximum Throughput: 10 tons of gray iron/hr
Controls: Baghouse (CU01)

EU09 Induction Furnace #1
Description:
Manufacturer: Junker

Emission Group 01 – Melt Shop

Model: MFTGe Duomelt
Maximum Throughput: 10 tons of gray iron/hr
Controls: Baghouse (CU01)

EU10 Induction Furnace #1
Description:
Manufacturer: Junker
Model: MFTGe Duomelt
Maximum Throughput: 10 tons of gray iron/hr
Controls: Baghouse (CU01)

Scrap metal is melted by heat generated by passing a high amperage electric current through coils surrounding the steel jacket of the furnace. The alternating current in the coil induces an internal current in the scrap metal inside the furnace that in turns produces enough heat to melt the scrap and alloys. Prior to heating a pivoted ring hood is lowered over the top of the furnace that collects emissions generated during the melting process. Induction furnace emissions are vented to the melt baghouse (CU01) then is exhausted via stack ST02.

Flux added to the molten metal extracts impurities from the melt and forms a slag at the surface of the molten metal. Since clean scrap is used there is only a small number of impurities that need to be removed. The slag is removed from the surface of the molten iron by raising the hood slightly and using a long handled scoop, manually skimming off the top of the molten metal. The slag is placed into a small portable dumpster next to the furnace. When the iron in the induction furnace meets the specific elemental analysis and consistency, the hood is raised, and the furnace is tilted so the molten iron flows into a transport ladle.

Applicable Regulation:
401 KAR 51:017, *Prevention of significant deterioration of air quality* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit.

401 KAR 59:010, *New process operations*. Applies to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.
401 KAR 63:002, Section 2(4)(bbbbb), 40 C.F.R. 63.10880 through 63.10906, Tables 1 through 4 (Subpart ZZZZZ), *National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources*. Applies to each new and existing iron and steel foundry processing unit, located at an iron and steel foundry production facility that is an area source of hazardous air pollutants.

Comments:
PM and PM_{10} emission factor sources for the induction furnaces are from WebFIRE 6.25, SCC 3-04-003-03. $PM_{2.5}$ was calculated using USEPA PM calculator (March 2012) PM to $PM_{2.5}$ ratio. CO and VOC were determined from the March 2020 compliance test. HAPs were calculated from a weight concentration for melt emissions. The concentrations were provided by a pace analytical report dated June 10, 2021.

Foundry Operations					
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**		**Compliance Method**
PM	• P≤0.5 tons/hr: E=2.34 lb/hr • P≤30 tons/hr: $E=3.59P^{0.62}$ • P≥ 30 tons/hr: $E=17.31P^{0.16}$	401 KAR 59:010, Section 3(2)	EUs 01	0.07 lb/tons Gutow Article, Modern Casting; Jan 1972	Testing and Recordkeeping
			EU 13	0.056 lb/tons; AP-42 Table 12.5-1	
			EU 15	0.9 lb/tons; FIRE 6.25 SCC 3-04-003-03	
			EUs 05, 06, 18, 44, 45, 47	1.9 lb/hr; lb/mmscf; AP-42 Table 1.4-2	
			EU 17, 19, 20, 21, 35A, 35B, 57, 63	0.24 lb/tons; Ohio EPA RACM, Table 2.22-1, pg 2-474, Silo Vent	
			EUs 22, 23, 24, 29, 30, 31, 32, 54, 79	3.6 lb/tons; AP-42 Chapter 12.10, Table 12.10-7, January 1995.	
			EU 33	0.04 lb/tons; Ohio RACM Table 2.7-1	
			EUs 36	0.65 lb/tons; AIRA Facility Subsystem SCC and EF Listing (EPA 450/4-90-003, March 1990)	
			EUs 39, 40	0.65 lb/tons; Ohio RACN Guide, Page 2-219, Table 2.7-1	

Foundry Operations						
				EUs 50	0.41 lb/tons; Stack Testing at Quality Castings, Orville, OH	
				EU 53	3.2 lb/tons; WebFire SCC 3-04-003-18	
				EU 59	0.032 lb/tons; 1.0% of the emission factor from FIRE 6.25 SCC 3-04-033-31	
				EU 60	0.016 lb/ton; 0.5% of emission factor from FIRE 6.25 SCC 3-04-003-31	
				EU 61	15.5 lb/tons; Bernard S. Gutow Article	
					276 lb/tons; AP-42 Chapter 13.2.6, Table 13.2.6-1, September 1997	
				EUs 64, 65, 66, 67, 77, 78	1.6 lb/tons; Bernard S. Gutow article	
Opacity	20%		401 KAR 59:010, Section 3(1)(a)	N/A		Weekly qualitative visual observation, & recordkeeping
PM	EUs 17, 57 & 63	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	401 KAR 51:017	EUs 17,19, 20, 21 35A, 35B, 57, 63	0.24 lb/tons; Ohio EPA RACM, Table 2.22-1, pg 2-474, Silo Vent	Testing, Monitoring & Recordkeeping

Foundry Operations						
	EUs 19, 20, 21, 35A & 35B	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr				
PM_{10}	EUS 17, 57 & 63	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	401 KAR 51:017	EUs 17,19, 20, 21 35A, 35B, 57, 63	0.24 lb/tons; Ohio EPA RACM, Table 2.22-1, pg 2-474, Silo Vent	Testing, Monitoring & Recordkeeping
	EUs 19, 20, 21, 35A & 35B	0.0030 gr/dscf; 0.015 lb/hr; 0.001 ton/yr				
$PM_{2.5}$	EUs 17, 57, 63	0.0030 gr/dscf; 0.015 lb/hr; 0.068 ton/yr	401 KAR 51:017	EUs 17,19, 20, 21 35A, 35B, 57, 63	0.24 lb/tons; Ohio EPA RACM, Table 2.22-1, pg 2-474, Silo Vent	Testing, Monitoring & Recordkeeping
	EUs 19, 20, 21, 35A & 35B	0.003 gr/dscf; 0.015 lb/hr 0.001 ton/yr				
VOC	EU 53	0.528 lb/ton gray iron; 24.18 ton/yr	401 KAR 51:017	EU 53	0.528 lb/ton; RBLC ID: WI-0256, Waupaca Plant	Testing, Monitoring & Recordkeeping
CO	EU 53	1.00 lb/ton of gray iron; 25.3 lb/hr	401 KAR 51:017	EU 53	1.0 lb/ton; RBLC ID: WI-0429, East Jordan Foundry LLC	Testing, Monitoring & Recordkeeping

Foundry Operations						
Process Description:						
Emission Unit	**Description**	**BACT Control Device**	**Maximum Hourly Capacity**	**PSD Operating Limitations**	**Maximum Burner Capacity (MMBtu/hr)**	**Construction Commenced**
Emission Group 1 – Melt Shop						
01	Charge Handling	Baghouse (CU01)	15 ton gray iron/hr.	80,000 ton gray iron/yr.	N/A	September 2016
05	Refractory Burner #1	Baghouse (CU01)	N/A	73 MMscf/yr.	8.50	May 2017
06	Refractory Burner #2	Baghouse (CU01)	N/A	73 MMscf/yr.	8.50	May 2017
13	Hot Metal Transfer	Baghouse (CU01)	15 ton gray iron/hr.	80,000 ton gray iron/yr.	N/A	March 2017
15	Pouring Furnace #1	Baghouse (CU01)	15 ton gray iron/hr. each	80,000 ton gray iron/yr. & 24.99 MMscf/yr.	2.91	2026
17	Melt and Core/Mold Baghouse Waste Dust Silo	Bin Vent Filter (CU02)	0.38 tons/hr.	3,323 ton gray iron/yr.	N./A	September 2016
18	Refractory Curing Mobile Burner	Baghouse (CU01)	N/A	17.18 MMscf/yr.	2.00	May 2017
Emission Group 2 – Sand Plant						
19	Mold Silica Sand Silo	Bin Vent Filter (CU03)	25.0 ton mold silica sand/hr.	21,000 ton mold silica sand/yr.	N/A	March 2017
20	Blend Silo	Bin Vent Filter (CU04)	25.0 ton blend/hr.	5,500 ton blend/yr.	N/A	March 2017
21	Bentonite Silo	Bin Vent Filter (CU05)	25.0 ton bentonite/hr.	3,500 ton bentonite/yr.	N/A	March 2017
22	Silica Sand Handling and Preparation	Sand Plant Baghouse (CU06)	25 ton mold silica sand/hr.	91,586 ton mold silica sand/yr.	N/A	March 2017
23	Blend Handling and Preparation		1.15 ton blend/hr.	4,179 ton blend/yr.	N/A	March 2017
24	Bentonite Handling and Preparation		0.16 ton bentonite/hr.	595 ton bentonite/yr.	N/A	March 2017
29	Dust Weigh Hopper		2.80 ton waste sand/hr.	10,149 ton waste sand/yr.	N/A	March 2017

Foundry Operations						
30	Green Sand Mixer #1		66.0 ton green sand/hr. each	238,920 ton green sand/yr.	N/A	March 2017
31	Green Sand Mixer #2			238,920 ton green sand/yr.	N/A	March 2017
32	Green Sand Mixer #3			238,920 ton green sand/yr.	N/A	March 2017
33	Mold Making #1	Baghouse (CU08)	15.0 ton gray iron/hr.	80,000 ton gray iron/yr.	N/A	January 2017
35A	Core Silica Sand Silo A	Bin Vent Filter (CU19)	25 ton core sand/hr.	3,345 ton core sand/yr.	N/A	February 2017
35B	Core Silica Sand Silo B	Bin Vent Filter (CU20)		3,345 ton core sand/yr.	N/A	February 2017
36	Core Sand Handling and Preparation	Baghouse (CU08)	1.86 ton core sand/hr.	6,690 ton core sand/yr.	N/A	February 2017
39	PUCB Core Machine #1	Packed Bed (CU07)	0.93 tons/hr. (Resin and Catalyst) 0.0021 tons/hr. (Core Release)	3,345 ton/yr. (Resin and Catalyst) 7.7 ton/yr. (Core Release)	N/A	March 2017
40	PUCB Core Machine #2			3,345 ton/yr. (Resin and Catalyst) 7.7 ton/yr. (Core Release)	N/A	March 2019
43	Core Wash Station #1	Baghouse (CU08)*	0.338 ton /hr.	135.0 ton /yr.	N/A	March 2017
44	Core Dryer #1		32 lb. coating/hr.; 34 lb. binder/hr., each	34.35 MMscf/yr.; 58.3 ton coating/yr.; 60.2 ton binder/yr.; each	4.0	March 2017
45	Core Dryer #2					March 2019
54	Recycled Sand Handling and Preparation	Sand Plant Baghouse (CU06)	194 ton recycled sand/hr.	700,934 ton recycled sand/yr.		March 2017
57	Sand Plant Waste Sand Silo	Bin Vent Filter (CU10)	0.38 ton total used sand/hr.	3,323 ton total used sand/yr.	N/A	March 2017
79	Core Wash Station #2	Baghouse (CU08)	0.338 ton /hr.	135.0 ton /yr.	N/A	March 2019
Emission Group 03 – Casting & Molding						
50	Pouring and Cooling	Baghouse (CU08)	15 ton gray iron/hr.	80,000 ton gray iron/yr	1 MMBtu/hr	March 2017
53	Shakeout Conveyor	Baghouse (CU06 & CU08)	15.0 ton gray iron/hr.	80,000 ton gray iron/yr.	N/A	January 2017
59	Forced Air Cooler	Baghouse (CU08)	15.0 ton gray iron/hr.	80,000 ton gray iron/yr.	N/A	January 2017

Foundry Operations						
Emission Group 4 – Fettling Shop						
60	Sorting Conveyor	Baghouse (CU11)	15 ton gray iron/hr.	80,000 ton gray iron/yr.	N/A	December 2016
61	Steel Shot Blasting #1	Baghouse (CU11)	15 ton gray iron/hr. & 4.40 lb. shot/hr. each	80,000 ton gray iron/yr & 15,928 lbs of shot/yr. Each	N/A	April 2017
63	Fettling Baghouse Waste Dust Silo	Bin Vent Filter (CU12)	0.38 ton gray iron/hr.	3,323 ton gray iron/yr.	N/A	November 2016
64	Auto Grinding #1	Baghouse (CU11)	7.5 ton gray iron/hr.	40,000 ton gray iron/yr.	N/A	February 2019
65	Auto Grinding #2		7.5 ton gray iron/hr.	40,000 ton gray iron/yr.	N/A	2026
77	Snag Grinder #1	Fabric Filter (CU21)	7.5 ton gray iron/hr.	40,000 ton gray iron/yr.	N/A	April 2017
78	Snag Grinder #2	Fabric Filter (CU22)	7.5 ton gray iron/hr.	40,000 ton gray iron/yr.	N/A	April 2017
Emission Group 5 – Machining Shop						
66	Machining Lines (Turning Lathes)? (9)	Cartridge Filters (CU13a thru h) & Paint Booth Filter (sec) (CU 17)	15 ton gray iron/hr.	80,000 ton gray iron/yr.	N/A	Line 3 4/17 Line 4 5/18 Line 2 5/18 Line 1 8/18 ConMet 1 9/18 Line 5 11/18 Line 6 2/19 Line 7 3/19
67	Perforation Line #2 (Drilling and Milling)	Cartridge Filters (CU13i & j) & Paint Booth Filter (sec) (CU 17)	7.5 ton gray iron/hr.	40,000 ton gray iron/yr.	N/A	ConMet 2 9/18 Perf 2 4/19

<u>Description:</u> The processes listed above are considered to meet the definition of Foundry Operations, as defined in 40 CFR 63.10906, which means all process equipment and practices used to produce metal castings for shipment, including: Mold or core making and coating; scrap handling and preheating; metal melting and inoculation; pouring, cooling, and shakeout; shotblasting, grinding, and other metal finishing operations; and sand handling.

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Foundry Operations
inoculation; pouring, cooling, and shakeout; shotblasting, grinding, and other metal finishing operations; and sand handling. Raw materials delivered to the melt shop for production of gray iron include; scrap steel or iron, various alloys, and fluxing agents. Raw materials are delivered to the facility by rail or truck and are stored inside the building. FWNA receives scrap as raw material. Scrap is managed per the pertinent requirements of NESHAP for iron and steel foundries area sources as codified in 40 CFR Part ZZZZZ. Incoming scrap is stored in bins inside the building and is transferred to weigh scales for processing using an overhead crane fitted with an electromagnet. Alloys and fluxes are stored in designated areas inside the building. These additives include carbon, magnesium, molybdenum, copper, chromium, vanadium, and niobium. The alloy storage area is designed with air intakes to draw in fugitive dust and duct it to the melt baghouse (CU01). Alloys and additives are added manually to the furnace, according to specifications and analysis. Metal is melted in the induction furnaces in induction furnaces and flux is added to the molten metal for purification. When the furnace meets the specific elemental analysis and consistency, the hood is raised, and the furnace is tilted so the molten iron flows into a transport ladle. To prepare for casting, the transport ladle is conveyed (Hot Metal Transfer – EU13) to the pouring area where the molten iron is poured from the transport ladle into the pouring furnace. Hot metal transfer and the pouring furnace are vented to the melt baghouse (CU01). The pouring furnace is equipped with a small natural gas burner designed to initially heat the vessel when the first brought into service from a cold start, and to keep the pouring spout hot so the molten iron does not cool against cold refractory when being poured. Baghouse dust collected from the melt baghouse is conveyed to the Melt Baghouse Waste Dust Silo (EU17). The waste dust silo is equipped with a bin vent filter (CU02). The bin vent filter emission point is designated as ST03. There are three basic raw materials used to make the green sand mold. These are silica sand; bentonite, which is a clay material that acts as the glue to hold the sand in the desired shape; and a carbon sources, commonly a blend of bentonite and coal dust, commonly referred to as sea-coal, or some other carbonaceous material which minimizes sand sticking to the iron casting. Raw materials for the sand plant are delivered to the facility by truck and offloaded pneumatically into dedicated storage silos. Each silo has its own bin vent filter to control particulate emissions and their associated emission points are ST04-ST06. From the silos, materials are pneumatically transferred to day bins and then to weigh hoppers. Specific proportion of each material is placed into the green sand mixers for blending. Recycled sand from the shakeout operation is also added to the green sand mixer. Most of the recovered sand from the shakeout process is recycled back into the green sand process. This equipment operates continuous or semi-continuously. Approximately 5% of the sand must be purged from the mold sand system so that the residual core sand binder decomposition byproducts do not accumulate. This waste sand is sent to the waste sand storage silo (EU57) where it is later shipped off site for recycling or to a landfill. Like all other silos in the foundry the waste sand storage silo has a bin vent filter (CU10) and vents to atmosphere through emission point ST11.

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All the sand system day bins, weigh hoppers and mixers are ducted to the Sand Plant Baghouse (CU06) and vents to the atmosphere through stack ST07. To make the required voids and hollows in a brake rotor casting, a specially shaped, structurally sound, and dimensionally stable core needs to be fabricated and placed into the green sand mold before mold assembly and casting. Core silica sand is delivered to the facility by truck and pneumatically conveyed into one of two core silica sand storage silos. As required, core sand is pneumatically conveyed from a silo through a sand classifier that uses air to removed fine sized particles to produce a uniform grain sized particles to produce a uniform grain sized sand feed stream. The classified sand is then pneumatically conveyed to a sand bin for temporary storage. To make the core strong enough to remain intact during the molten iron casting process. FWNA uses the phenolic urethane cold box (PUCB), or cold box method of core production. In the cold box process, silica sand from the sand bin is fed to a weigh hopper before being mixed with a two-part phenolic resin and hardener in an enclosed mixer. The sand classifier, transfer of sand-sand bin and then the transfer of sand to the weigh hopper comprises the core sand handling and preparation emission unit. The blended core sand is the sent to one of four automated core machines. After the resin and sand mixture is shaped in the core machines, an amine gas is injected through the porous phenolic urethane resin/silica sand mixture. The gas remains unreacted and is ducted from each core machine to common sulfuric Acid Scrubber (CU07) and vented to the atmosphere through ST08. The primary purpose of scrubbing out the amine has is for odor control. In the core machines, an oil-based release agent is applied to the core stamping patterns to allow easy separation of the cores from their pattern. This material would likely be exhausted via CU07/ST08. The hardened cores are then coated by dipping into a water based, pyrophyllite slurry, which provides additional abrasive protection which is applied in one of four coating units. The coated cores are then sent through and associate natural gas fired dryer, each with a heat input capacity of 4.0 MMBtu/hr. Emissions from the core silica sand silos, sand classifier, sand bin, weigh hopper, core removal area and the dryers are vented to the core/mold baghouse (CU08) and vented to the atmosphere through stack ST09. The top and bottom halves of the molds, cope and drag respectively, along with the core inserts are assembled in the mold-making area. The mold assembly process starts with an outer metal frame onto which a release agent is applied before the frame is filled and compacted with green sand. The outer shape of the desired casting is then stamped into both the cope and drag of the green sand. Cores are placed into the bottom half of the molds before the top halve of the mold is placed on the bottom half to form one complete sealed mold. The mold is then conveyed to the pouring furnaces. Emissions generated from the mold assembly area are ducted to the core/mold baghouse (CU08) which exhausts to the atmosphere through ST09. At the pouring stations molten iron from the pouring furnace is transferred into the assembled molds that are brought to the furnace on a rail system. The molds are designed to allow the molten iron to be poured into one fill port. Due to the extreme heat contacting the carbon in the mold and the resin in the core, CO and VOC are generated. Vents throughout the mold allow hot gases produced during the pouring process to escape, which typically auto-ignite. To enhance the autoignition process, natural gas mold vent pilot burners are strategically placed at the mold conveyor to ignite the vent gases that have not already ignited.

Foundry Operations
The casted molds are then conveyed through a cooling tunnel to allow controlled cooling of the molten iron to form the required metal crystalline structure. Emissions from the pouring stations and cooling tunnel are routed to the Core/Mold baghouse (CU08) and exhausts to the atmosphere through ST09. Once the iron castings solidify, the mold frames are opened, and the sand mold enters the shakeout conveyor (EU53) where the molds are broken, and the castings separated from the mold and core sand. Emissions from the shakeout conveyor are vented to the sand plant baghouse (CU06) which is vented to the atmosphere through stack ST07. The sand falls onto a conveyor that returns the sand to the sand plant. Before returning to the sand plant, the used mold and core sad runs through a sand screening sieve and a sand cooler where air and water applied to obtain the desired cooling effect and moisture content. The recycled sand is then transferred to storage where it is blended again with other raw materials to make new green sand. Due to impurities in the sand generated from heating the resin-based core sand and carbon in the green sand, some of the recycled sand must be taken out of the sand system and disposed of. Sand destined for a landfill is temporarily stored in the Sand Plant Waste Sand Silo (EU57). Emissions from the sand screen sieve, sand cooler, used sand storage is ducted to the Sand Plant Baghouse (CU06) and vented through stack ST07. Dust generated from the waste sand silo is filtered by a silo bin vent (CU10) before exhausting to the atmosphere through ST11. The shakeout conveyor also breaks away the sprues from the casting which are separated and sent back to the melt shop as internal scrap. The castings are conveyed to the Forced Air Cooler (EU59) is routed to the core/mold baghouse (CU08). After the castings are cooled in the forced air cooler, the parts are sorted at the Sorting Conveyor (EU60) to remove any remaining sprues and sent through the abrasive steel shot blasting unit (EU61) to remove any remaining sand and to smooth the casting surface. Parts then enter one of two grinding stations which removes any remaining sprue or raised surface from the casting. Also, one of two snag grinders may be used for removing metal from the castings. The sorting conveyor shot blasting units and grinders are ducted to the fettling baghouse waste dust silo bin vent filter (CU12) via stack ST13. Sand grinder #1 and #2 each have their own fabric filters (CU21, CU22) that vent inside the building. Any emissions from these stacks would be captured by the fettling baghouse (CU11) and vented through stack ST12. Finished castings are sent to short term storage to allow the gray iron to fully crystalize before being sent to the final machining operation. In the machine shop, a series of computerized Machining Lines (EU66) and a Perforation Line (EU67) machine each casting to the correct specifications and tolerances. Particulate emissions generated from the dry lathes drilling and milling machines are ducted to a series of fabric filters (CU13a-CU13j) that vent into the building. Emissions from these fabric filters vent to atmosphere through stack ST16 which exhausts from the Paint Line #1 Booth Filter. Iron chips generated from the dry lathe, milling and drilling operations are collected as scrap steel and sent back to the melt shop and reused as internal scrap. A low-VOC content rust preventative may be applied to the casting prior to storage (EU82).

Foundry Operations

Applicable Regulation:
401 KAR 51:017, *Prevention of significant deterioration of air quality* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit.

401 KAR 59:010, *New process operations*. Applies to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.
401 KAR 63:002, Section 2(4)(bbbbb), 40 C.F.R. 63.10880 through 63.10906, Tables 1 through 4 (Subpart ZZZZZ), *National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources*. Applies to each new and existing iron and steel foundry processing unit, located at an iron and steel foundry production facility that is an area source of hazardous air pollutants.

Comments:
PM emission factors were provided by the facility for each piece of equipment. To determine the particulate matter emissions, control efficiency was calculated based off the maximum grain loading, temperature, and anticipated maximum air volumes. BACT Limits were determined by taking the product of the BACT-established grain loading (gr/dscf), the total flow (dscf/min), and temperature (°F), to determine controlled hourly and annual stack emission rates from each control device. The control efficiency of the control devices was determined by taking the complement of the percentage for the individual controlled over the total uncontrolled potential to emits.

Heavy metal HAPs concentration in waste dust was determined for the melt, sand, core, and fettling baghouses. PACE Analytical utilized the EPA approved method 6010B to determine the heavy metal concentration of the waste dusts. The concentration of a specific metal in the dust is used to determine an emission factor based on a weight percentage of the PM emission factor. This method to determine emission factors of heavy metals was applied to each emission unit that contributed to the control devices for foundry operations.

The PUCB Core Machines #1-#2 (EU 39 & EU 40) have the potential to emit VOC emissions from the resin and catalyst, as well as the core released. The VOC emission factor for the resin and catalyst is based on information provided by using the OCMA method. Additionally the resin and catalyst are a source of HAPs, which includes formaldehyde, naphthalene, and phenol. The VOC emission factor for the core released is based on information provided by ACMOS 119-63 Core Release.

The core wash station is a source of VOC pollutants, the emission factor was provided in weight percent of the usage weight.

Core dryers #1 & #2 (EU44 & EU45) are a source of VOC, HAPs, and other pollutants from the combustion of natural gas. The binder used in the process is a source of VOC which includes the following HAPs, acetaldehyde, benzene, biphenyl, methyl ethyl ketone, cresol, ethyl benzene, formaldehyde, hexane, naphthalene, phenol, styrene, toluene, POMs, and xylene. These emission factors are based on the information provided in the coated core drying emissions document provided by Technikon, dated September 2005. The VOC emission factor from the coating being processed is based on the coating’s SDS.

Foundry Operations
For Pouring and Cooling (EU50), these emission units have the potential to emit CO, NOx, SO_2, lead, VOC, and HAPs. The metal processing CO and VOC emission factors are based information from Waupaca foundry emission information, the NOx and SO_2 emission factors are based on information provided by WebFIRE for SCC 3-04-003-20, and the lead emission factor is based on information provided for foundries from Mexico. Additionally, these units use the same binder in EU44-EU47 and are a source of the HAPs listed for those emission units. Shakeout Conveyor (EU53) is a source of CO, VOC, and additional HAPs. From the metal being processed, VOC and CO are released. The emission factor for VOC is based on information provided by the RBLC from a Waupaca plant, and the emission factor for CO is based on information provided by a RBLC from East Jordan Foundry, LLC. HAPs from the mold generated during the shakeout, includes acetaldehyde benzene, ethyl benzene, toluene, and xylenes. Haps from the core generated during the shakeout, includes benzene, ethyl benzene, naphthalene, phenol, toluene, and xylenes. Each unit that utilizes combustion for heating purposes in the foundry uses natural gas as the fuel. Emission factors for natural gas combustion are based on information provided in AP-42, Tables 1.4-(1-4). GHGs such as CO_2, methane, and nitrous oxide based their emission factors on information provided by 40 CFR Subpart 98, Table C-(1-2).

Coating Operations					
Pollutant	**Emission Limit or Standard**	**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**		**Compliance Method**
VOC	3.5 lb/gal (0.42 kg/l)	401 KAR 59:225, Section 6(1)(b); 401 KAR 51:017	EUs 68 & 69	0.27 lb/lbs; Worwag Coatings LLC Zinc Dust Primer EDS (INMOTIQ Primer SB 1k); 1.0 lb/lbs Worwag Coatings LLC Reducing Solvent Blend for WG102992 TDS (Thinner Density is 7.26 lb/gal)	Testing, monitoring, & recordkeeping
			EU 71	0.1804 lb/lbs; 95th	

Coating Operations					
				CI of 2018 and 2024 compliance tests (Geomet 360 Air Quality Data Sheet 1.6 lb/gal VOC at coating density of 11.05 lbs/gal or 0.14 lb/lb coating)	
PM/ PM_{10}/ $PM_{2.5}$	0.202 tpy	401 KAR 51:017	EUs 68 & 69	0.783 lb/lbs MSDS for Zinc Paint	Testing, monitoring, & recordkeeping
PM/ PM_{10}/ $PM_{2.5}$	1.133 tpy	401 KAR 51:017	EU 71	0.369 lb/lbs Geomet 360 SDS (upper end of % solids range), Assumes PM = PM10 = PM2.5	Testing, monitoring, & recordkeeping
VOC	19.425 tpy	401 KAR 51:017	EUs 68 & 69	0.27 lb/lbs Worwag Coatings LLC Zinc Dust Primer EDS; 1.0 lb/lbs for Thinner	Testing, monitoring, & recordkeeping
VOC	3.244 tpy	401 KAR 51:017	EU 71	0.1804 lb/lbs 95th CI of 2018 and 2024 compliance tests	Testing, monitoring & recordkeeping

Coating Operations					
PM	P≤0.5 tons/hr: E=2.34 lb/hr	401 KAR 59:010, Section 3(2)	EUs 68 & 69	0.261 lb/lbs Worwag Coatings LLC Zinc Dust Primer EDS (INMOTIQ Primer SB 1k) 70% Transfer Efficiency	Testing and Recordkeeping
			EU 71	0.123 lb/lbs Geomet 360 SDS (midpoint of solids range))	
Opacity	20%	401 KAR 59:010, Section 3(1)(a)	N/A		Weekly qualitative visual observation, & recordkeeping

Construction Dates: 3/2/2017 for EU 71, 11/1/2017 for EU 69, 9/2/2018 for EU 68.

Process Description: Three (3) paint booths that apply coatings to finished parts. EU 68 & 69 apply a zinc paint to each part, EU71 applies a zinc solution. Each of these paint booths are equipped with electrostatic spray nozzles that achieve at least 70% transfer efficiency.

The painting operations take brake rotors and apply a zinc coating. Two types of zinc coating operations are used. In one coating process, castings enter one of two lines, Paint Line #2, or Paint Line #3, each consisting of an induction heating unit followed by paint booth, then a cooling unit.

In an alternative type of coating, castings enter paint line #1, which applies a solid based coating, followed by a preheater and final induction heater to cure the zinc coating.

All three paint lines are fitted with individual filters and ducted to stacks ST15A, ST15B, and ST16.

Emission Group 06 – Coating

EU68 Paint Line #3

Manufacturer: Sturm Maschinenbau
Model: ZS16
Maximum Throughput: 9.0 lb post-induction coating/hr, 1.00 lbs of thinner/hr
Controls: Paint Booth Filter (CU14)

EU69 Paint Line #2

Manufacturer: Sturm Maschinenbau
Model: ZS16
Maximum Throughput: 9.0 lb post-induction coating/hr, 1.00 lbs of thinner/hr

Coating Operations

Controls: Paint Booth Filter (CU15)

EU71 Paint Line #1
Manufacturer: Sturm Maschinenbau
Model: ZS16
Maximum Throughput: 5.5 lb post-induction coating/hr
Controls: Paint Booth Filter (CU17)

Applicable Regulation:
401 KAR 51:017, *Prevention of significant deterioration of air quality* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit.
401 KAR 59:010, *New process operations*. Applies to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.
401 KAR 59:225, *New miscellaneous metal parts and products surface coating operations* Applies to coating lines located at job shops and original equipment manufacturing industries which apply coatings on metal substrates not elsewhere subject to administrative in 401 KAR Chapters 50 through 68.

State-Origin Requirements:
401 KAR 63:020, *Potentially hazardous matter or toxic substances,* applicable with respect to each affected facility which emits or may emit Benzene, Cumene, Ethyl Benzene, Toluene & Xylene.

Precluded Regulations:
40 CFR 63, Subpart HHHHHH, *National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources.* Does not apply since the source has taken voluntary limits on the concentrations of certain compounds (including chromium, lead, manganese, cadmium, lead, manganese, and nickel) in the coatings and/or paints used at the facility. FW will demonstrate compliance with the voluntary limits through documenting the content of coatings used in the facility.

Comments:
Emission factors for the zinc solution included PM, VOC, and methanol. The following emission factor sources were provided for each one respectively; Geomet 360 SDS (midpoint of solids range), additionally it is assumed that $PM=PM_{10}=PM_{2.5}$; Worwag Coatings LLC zinc Dust Primer (INMOTIQ Primer SB 1K) (density is 25.75 lb/gal); Geomet 360 Air Quality Data Sheet.

The zinc paint provides the following emission factor sources for PM, VOC, and HAPs respectively; Worwag Coatings LLC Zinc Dust Primer SDS, additionally it is assumed that $PM=PM_{10}=PM_{2.5}$; Worwag Coatings LLC zinc Dust Primer (INMOTIQ Primer SB 1K); Worwag Coatings LLC Zinc Dust Primer SDS.

The thinner is a source of VOC and HAP emissions, and the emission factor source for these emissions is Worwag Coatings LLC Reducing Solvent Blend for WG102992 TDS (Thinner Density is 7.26 lb/gal).

Emergency Generators > 500 HP						
Pollutant	**Emission Limit or Standard**		**Regulatory Basis for Emission Limit or Standard**	**Emission Factor Used and Basis**		**Compliance Method**
PM	EUs 72 & 73	0.149 g/hp-hr	401 KAR 51:017	EUs 72 & 73	1.06 lb/1000 gallons; AP-42 Table 3.4-2	Engine certification & recordkeeping
	EU 74	0.298 g/hp-hr		EU 74	9.6 lb/1000 gallons; AP-42 Table 3.4-2	
PM_{10}	EUs 72 & 73	0.149 g/hp-hr	401 KAR 51:017	EUs 72 & 73	9.62 lb/1000 gallons; AP-42 Table 3.4-2	Engine certification & recordkeeping
	EU 74	0.298 g/hp-hr		EU 74	9.96 lb/1000 gallons	
$PM_{2.5}$	EUs 72 & 73	0.149 g/hp-hr	401 KAR 51:017	EUs 72 & 73	9.62 lb/1000 gallons; AP-42 Table 3.4-2	Engine certification & recordkeeping
	EU 74	0.298 g/hp-hr		EU 74	9.96 lb/1000 gallons	
CO	EUs 72 & 73	2.60 g/hp-hr	401 KAR 51:017	EUs 72 & 73	117.3 lb/1000 gallons; AP-42 Table 3.4-1	Engine certification & recordkeeping
	EU 74	3.73 g/hp-hr		EU 74	125 lb/1000 gallons	
VOC	EUs 72 & 73	4.77 g/hp-hr	401 KAR 51:017	EUs 72 & 73	12.42 lb/1000 gallons; AP-42 Table 3.4-1	Engine certification & recordkeeping
	EU 74	3.50 g/hp-hr		EU 74	117 lb/1000 gallons	

Emergency Generators > 500 HP

Construction Dates: 9/1/2016 for EUs 72, 73, &74

Process Description: Three diesel fired compression ignition emergency generators: two that generate 750 kW each and one that generates 40 kW. All of these generators have a displacement of less than 30 liters per cylinder.

EU72 Emergency Generator #1
Manufacturer: Caterpillar
Model: C27
Maximum Rating (HP): 1050
Controls: None

EU73 Emergency Generator #2
Manufacturer: Caterpillar
Model: C27
Maximum Rating (HP): 1050
Controls: None

EU74 Emergency Generator #3
Manufacturer: Caterpillar
Model: C4
Maximum Rating (HP): 56
Controls: None

Diesel fired emergency generators provide backup emergency electrical in the event of a main electrical supply power failure.

Applicable Regulation:
401 KAR 51:017, *Prevention of significant deterioration of air quality.* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit.
401 KAR 60:005, Section 2(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8 (Subpart IIII), *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines,* Applies to CI internal combustion engines constructed after July 11, 2005, and manufactured after April 1, 2006.
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.* Applies to stationary RICE located at a major or area source of HAP emissions.

Comments:
Emission factors for diesel combustion from the emergency engines was sourced from AP-42 Tables 3.4-(1, 2, 3 & 4). Greenhouse gases such as carbon dioxide, methane, nitrous oxide was sourced from 40 CFR 98, tables C-(1 & 2). Emissions calculated using an assumption of 500 hrs/yr to be conservative and account for emergency operation.

EU 75 – Diesel Storage Tank
Construction Date: 7/4/2019 **Maximum Capacity:** 1,000 gallons **Maximum Annual Throughput**: 24,000 gallons/year **Controls:** None A horizontal, 1,000 gallon above ground diesel storage tank. **Applicable Regulation:** **401 KAR 51:017,** *Prevention of significant deterioration of air quality.* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit. **Comments:** The VOC emission factors were determined for working and breathing losses using AP-42, Section 7.1. pg 7.1-28, Eq 1-35 and AP-42, Section 7.1-16, Eq 1-2, respectively. The diameter of the tank is 5.63 ft, and the length of the tank is 11 ft.

EU 76 – Paved Roadways
Construction Date: 9/1/2016 **Process Description:** Paved roads within the PSD-prescribed source boundary. This includes emissions from trailer-truck (industrial) traffic only. **Applicable Regulation:** **401 KAR 51:017**, *Prevention of significant deterioration of air quality.* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit. **401 KAR 63:010**, *Fugitive emissions.* **Comments:** The emission factor for PM, PM10 and PM2.5 were determined through AP-42 Chapter 13.2.1 - Paved Roads.

EU 82 - Rust Preventative Application				
VOC	1.00 tons per year	401 KAR 51:017	200 lb/ton; Mass balance	Emission Calculations, Monitoring, & Recordkeeping

EU 82 - Rust Preventative Application

Construction Date: 03/2017

Process Description:
Maximum Capacity: 0.013 tons of Castrol Rustillo 4175/hr
Controls: None

Application of Rustillo 4175 applied to selected castings prior to storage

Applicable Regulation:
401 KAR 59:225, *New miscellaneous metal parts and products surface coating operations.* Applies to coating lines located at job shops and original equipment manufacturing industries which apply coatings on metal substrates not elsewhere subject to administrative in 401 KAR Chapters 50 through 68.
401 KAR 51:017, *Prevention of significant deterioration of air quality.* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit.

Comments:
The VOC emission factor was calculated during a weight loss study. VOC emissions are determined based on the rate of evaporation.

EU 83 - Rotary Sprue Cleaner and Return Conveyors & EU 84 - Perforation Line #1

PM	• $P \leq 0.5$ tons/hr: $E=2.34$ lb/hr • $P \leq 30$ tons/hr: $E=3.59P^{0.62}$	401 KAR 59:010, Section 3(2)	EU 83	0.65 lb/tons; AIRS EPA Doc # 450/4-90-003	Assumed based on PTE & Control Equipment
			EU 84	1.6 lb/tons; Bernard S. Gutow Article	
Opacity	20%	401 KAR 59:010, Section 3(1)(a)	N/A		Weekly qualitative visual observation, & recordkeeping

Construction Date: June 2022

Process Description:
EU 83 Rotary Sprue Cleaner and Return Conveyors
Manufacturer/Model: Didion Model RS-200 SM Mark 5
Maximum Capacity: 10.0 tons sand per hour: 6.6 tons sprue/metallics per hour
Controls: Baghouse (CU08) & Baghouse (CU11)

EU 83 - Rotary Sprue Cleaner and Return Conveyors & EU 84 - Perforation Line #1

The unit will be installed following Sprue Conveyor (EU 60) to receive sprue and sand. The liner of the Rotary Sprue causes the adhering sand to separate from the sprue. The sand and small metallics will be discharged to a series of return conveyors that will eventually transfer the sand to an existing metal separation system that is near the existing Shakeout (EU53). Cleaned sprue will exit onto a belt and then to a temporary storage location prior to being returned to the charge handling where it will be remelted with other charge materials. Emissions from EU 83 will be exhausted to two existing baghouses core/mold baghouse (CU08) and fettling baghouse (CU11).

EU 84 Perforation Line #1
Maximum Capacity: 7.5 tons castings per hour; 40,000 tons castings per year
Controls: Perforation Line #1 Cartridge Collector (CU23)

Products from casting are machined at perforation line #1 and are sent to either the paint lines or is sent to storage. Emissions generated during this process are sent through Perforation Line #1 Cartridge Collector (CU23), which emits into the building. Secondary emission capture and control occurs through ST16 via CU17.

Applicable Regulation:
401 KAR 59:010, *New process operations* Applies to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.
401 KAR 63:002, Section 2(4)(bbbbb), 40 C.F.R. 63.10880 through 63.10906, Tables 1 through 4 (Subpart ZZZZZ), *National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources.* Applies to each iron and steel foundry at an area source of hazardous air pollutant emissions.

Comments:
For EU 83: The emission factor for PM is from AIRS EPA Doc # 450/4-90-003. The emission factor for PM_{10} is from EPA's WebFIRE for SCC code 3-04-003-50. It is assumed that $PM_{2.5}$ equals PM_{10}. HAPs were calculated from a weight concentration for core emissions. The concentrations were provided by a pace analytical report dated June 10, 2021.

For EU 84: PM emission factor for EU 84 is sourced from a Bernard S. Gutow article. PM_{10} and $PM_{2.5}$ were determined by using the EPA PM2.5 calculator. HAPs were calculated from a weight concentration for fettling emissions. The concentrations were provided by a pace analytical report dated June 10, 2021.

EU 85 – Natural Gas Generator #1

Pollutant	Emission Limit or Standard	Regulatory Basis for Emission Limit or Standard	Emission Factor Used and Basis	Compliance Method
NOx + HC	10 ppmv at 15% O2	40 CFR 60.4233(d)	AP-42 Table 3.2-2	Engine certification & recordkeeping
CO	387 ppmv at 15% O2	40 CFR 60.4233(d)	AP-42 Table 3.2-2	Engine certification & recordkeeping

EU 85 – Natural Gas Generator #1

Construction Dates: 11/2024

Process Description: Spark ignition, 4-stroke lean-burn emergency engine that is to serve as back-up power generator for the computer server room.

EU 85 Natural Gas Generator #1
Manufacturer: Cummins
Model: C20N6HC
Construction Commenced: November 2024
Maximum Rating (HP): 27
Fuel: Natural Gas
Controls: None

Applicable Regulation:
401 KAR 60:005, Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines,* Applies to SI internal combustion engines constructed after July 11, 2005, and manufactured after April 1, 2006.
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.* Applies to stationary RICE located at a major or area source of HAP emissions.

Comments:
Emission factors for diesel combustion from the emergency engines was sourced from AP-42 Chapter 3.2. Greenhouse gases such as carbon dioxide, methane, nitrous oxide was sourced from 40 CFR 98, tables C-(1 & 2). Emissions calculated using an assumption of 500 hrs/yr to be conservative and account for emergency operation.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements\Results

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST-02 (CU01)	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	2.11 lb/hr 9.25 ton/yr	26.37 lb/hr	16.7 ton/hr (11/30/18) 11.89 ton/hr (12/3/18)	CMN20180002	11/30/2018 & 12/3/18
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25A	0.14 lb/hr 0.61 ton/yr	0.29 lb/hr	16.7 ton/hr (11/30/18) 11.89 ton/hr (12/3/18)	CMN20180002	11/30/2018 & 12/3/18
	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.001 gr/dscf	0.0006 gr/dscf	16.7 ton/hr (11/30/18) 11.89 ton/hr (12/3/18)	CMN20180002	11/30/2018 & 12/3/18
						1.42 lb/hr	0.85 lb/hr			
			40 CFR 63.10895(c)			0.1 lb/ton	0.067 lb/ton			
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	0.0017 gr/dscf	16.7 ton/hr (11/30/18) 11.89 ton/hr (12/3/18)	CMN20180002	11/30/2018 & 12/3/18
						0.85 lb/hr	2.26 lb/hr			
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	0.0017 gr/dscf	16.7 ton/hr (11/30/18) 11.89 ton/hr (12/3/18)	CMN20180002	11/30/2018 & 12/3/18
						0.85 lb/hr	2.26 lb/hr			

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST-02 (CU01)	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.001 gr/dscf	0.0006 gr/dscf	13.49 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
						1.42 lb/hr	0.8509 lb/hr			
			40 CFR 63.10895(c)			0.1 lb/ton	0.0666 lb/ton			
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	0.0017 gr/dscf	13.49 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
						0.85 lb/hr	2.2515 lb/hr			
			N/A			N/A	0.1676 lb/ton			
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	0.0017 gr/dscf	13.49 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
						0.85 lb/hr	2.2515 lb/hr			
						N/A	0.1676 lb/ton			
	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	2.11 lb/hr	26.3 lb/hr	13.49 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25A	0.14 lb/hr	0.29 lb/hr	13.49 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST-02 (CU01)	Baghouse	Filterable PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.001 gr/dscf	0.0004 gr/dscf	15.48 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						1.42 lb/hr	0.5558 lb/hr			
			40 CFR 63.10895(c)			0.1 lb/ton	0.0353 lb/ton			
	Baghouse	Cond. PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	0.0002 gr/dscf	15.48 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						0.85 lb/hr	0.3187 lb/hr			
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	0.0007 gr/dscf	15.48 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						0.85 lb/hr	0.875 lb/hr			
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	0.0007 gr/dscf	15.48 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						0.85 lb/hr	0.875 lb/hr			
	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	2.11 lb/hr	7.75 lb/hr	15.48 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25 A	0.14 lb/hr	1.38 lb/hr	15.48 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST-02 (CU01)	Baghouse	Filterable PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.001 gr/dscf	3.24E-04 gr/dscf	4.55 tph	CMN20240001	June 11-13 2024
						1.42 lb/hr	0.26 lb/hr		CMN20240001	June 11-13 2024
			40 CFR 63.10895(c)			0.1 lb/ton	0.058 lb/ton		CMN20240001	June 11-13 2024
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	4.9E-04 gr/dscf		CMN20240001	June 11-13 2024
						0.85 lb/hr	0.38 lb/hr		CMN20240001	June 11-13 2024
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0006 gr/dscf	4.9E-04 gr/dscf		CMN20240001	June 11-13 2024
						0.85 lb/hr	0.38 lb/hr		CMN20240001	June 11-13 2024
	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	2.11 lb/hr	5.18 lbs/hr		CMN20240001	June 11-13 2024
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25 A	0.14 lb/hr	0.79 lbs/hr		CMN20240001	June 11-13 2024

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST-02 (CU01)	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	TBD	TBD	TBD	TBD
						1.98 lb/hr	TBD		TBD	TBD
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	TBD		TBD	TBD
						1.98 lb/hr	TBD		TBD	TBD
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	TBD		TBD	TBD
						1.98 lb/hr	TBD		TBD	TBD
	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	57.58 lb/hr	TBD		TBD	TBD
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25 A	9.48 lb/hr	TBD		TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST-07 (CU06)	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	25.3 lb/hr	5.10 lb/hr	17.4 ton of gray iron/hr	CMN20180003	11/27/18
						1 lb/ton of gray iron	0.29 lb/ton of			
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25A	0.1 lb/ton of gray iron	0.18 lb/ton of gray iron	17.4 ton of gray iron/hr	CMN20180003	11/27/18
	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	0.00042 gr/dscf	17.4 ton of gray iron/hr	CMN20180003	11/27/18
						2.16 lb/hr	0.34 lb/hr			
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.0122 gr/dscf	17.4 ton of gray iron/hr	CMN20180003	11/27/18
						1.3 lb/hr	9.91 lb/hr			
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.0122 gr/dscf	17.4 ton of gray iron/hr	CMN20180003	11/27/18
						1.3 lb/hr	9.91 lb/hr			

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST-07 (CU06)	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	0.00042 gr/dscf	17.40 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
						2.16 lb/hr	0.3362 lb/hr			
						NA	0.0193 lb/ton			
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.0122 gr/dscf	17.40 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
						1.3 lb/hr	9.89 lb/hr			
						N/A	0.5685 lb/ton			
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.0122 gr/dscf	17.40 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
						1.3 lb/hr	9.89 lb/hr			
						N/A	0.5685 lb/ton			

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	N/A	5.0931 lb/hr	17.40 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25A	N/A	3.122 lb/hr	17.40 tph	CMN20180005	11/27/18, 11/30/18, 12/3/18
BV-2	Process Enclosed	PM	401 KAR 51:017	Every 5 years	Method 5	0.2 lb/hr	0.1 lb/hr	EU66; 48.67 Tons EU67; 30.86 Tons	CMN20180007	12/04/18
		PM_{10}	401 KAR 51:017			0.2 lb/hr	0.1 lb/hr			
		$PM_{2.5}$	401 KAR 51:017			0.12 lb/hr	0.1 lb/hr			
ST07 (CU06)	Baghouse	Filterable PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	0.00093 gr/dscf	14.5 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						2.16 lb/hr	2.16 lb/hr			
						N/A	0.0515 lb/ton			
	Baghouse	Cond. PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.00093 gr/dscf	14.5 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						1.3 lb/hr	0.746 lb/hr			
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.0019 gr/dscf	14.5 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						1.3 lb/hr	1.4925 lb/hr			
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.0019 gr/dscf	14.5 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						1.3 lb/hr	1.4925 lb/hr			
ST07 (CU06)	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	2.16 lb/hr	0.36 lb/hr	4.55 tons/hr	CMN20240002	June 10-14, 2024
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	5.73 E-04 gr/dscf			
						2.16 lb/hr	0.46 lb/hr			
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	5.73 E-04 gr/dscf			

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						1.3 lb/hr	0.46 lb/hr			
	N/A	VOC	401 KAR 51:017	Every 5 years	Method 25A	N/A	2.39 lb/hr			
		CO	401 KAR 51:017	Every 5 years	Method 10	N/A	2.02 lb/hr			
ST-07 (CU06)	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.002 gr/dscf	TBD	TBD	TBD	TBD
						1.75 lb/hr	TBD	TBD		
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.002 gr/dscf	TBD	TBD		
						1.75 lb/hr	TBD	TBD		
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.002 gr/dscf	TBD	TBD		
						1.75 lb/hr	TBD	TBD		

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
	N/A	VOC	401 KAR 51:017	Every 5 years	Method 25A	9.24 lb/hr	TBD	TBD	TBD	TBD
		CO	401 KAR 51:017	Every 5 years	Method 10	7.73 lb/hr	TBD	TBD	TBD	TBD
EU 53	ST-07 Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	N/A	1.24 lb/hr	14.5 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						1 lb/ton	0.0854 lb/ton			
	ST-07 Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25A	N/A	1.6319 lb/hr	14.5 tph	CMN20200001 & CMN20200002	3/24/2020, 3/25/2020, 3/26/2020
						1 lb/ton	0.1126 lb/ton			
EU 53	ST-07 Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	N/A	TBD	TBD	TBD	TBD
						1 lb/ton	TBD	TBD	TBD	TBD
	ST-07 Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25A	N/A	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						1 lb/ton	TBD	TBD	TBD	TBD
ST-08 (CU07)	Scrubber	CO	N/A	Every 5 years	Method 10	N/A	0.31 lb/hr	**First Shift**: 4.1 Binder lbs/hr **Third Shift**: 2.9 Binder lbs/hr	CMN20180006	11/29/18
	Scrubber	VOC	401 KAR 51:017	Every 5 years	Method 25A	0.70 lb/hr, 1.67 ton/yr	0.59 lb/hr		CMN20180006	11/29/18
ST-08 (CU07)	Scrubber	VOC	401 KAR 51:017	Every 5 years	Method 25A	0.70 lb/hr,	2.27 lb/hr	260.99 lb sand/hr; 3.04 lb resin/hr; 0.32 lb Amine/hr	CMN20240003	06/14/2024
						1.67 ton/yr	9.94 ton/yr			
ST-08 (CU07)	Scrubber	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0005 gr/dscf	TBD	TBD	TBD	TBD
						0.032 lb/hr	TBD	TBD	TBD	TBD
		PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0005 gr/dscf	TBD	TBD	TBD	TBD
						0.032 lb/hr	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
		$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0005 gr/dscf	TBD	TBD	TBD	TBD
						0.032 lb/hr	TBD	TBD	TBD	TBD
	Scrubber	VOC	401 KAR 51:017	Every 5 years	Method 25A	8.39 lb/hr	TBD	TBD	TBD	TBD
ST-09	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	128 lb/hr	20.31 lb/hr	34 lb/hr for binder & 32 lb/hr for coating	CMN20190002	10/15/2019 – 10/17/2019
	Baghouse	VOC	401 KAR 51:017	Every 5 years	Method 25A	20.8 lb/hr	5.93 lb/hr	34 lb/hr for binder & 32 lb/hr for coating	CMN20190002	10/15/2019 – 10/17/2019
	Baghouse	PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	0.0012 gr/dscf	34 lb/hr for binder & 32 lb/hr for coating	CMN20190002	10/15/2019 – 10/17/2019
						3.54 lb/hr	1.07 lb/hr			
	Baghouse	PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	0.0010 gr/dscf	34 lb/hr for binder & 32 lb/hr for	CMN20190002	10/15/2019 – 10/17/2019

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						3.54 lb/hr	0.88 lb/hr	coating		
	Baghouse	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	0.0002 gr/dscf	34 lb/hr for binder & 32 lb/hr for coating	CMN20190002	10/15/2019 – 10/17/2019
						2.12 lb/hr	0.19 lb/hr			
ST-09	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	128 lb/hr; 235 ton/yr	22.63 lb/hr; 99.13 ton/yr	4.55 tons/hr	CMN20240004	06/11/2024 – 06/13/2024
		VOC	401 KAR 51:017	Every 5 years	Method 25A	20.8 lb/hr; 39.70 tons/yr	13.91 lb/hr; 60.91 ton/yr		CMN20240004	06/11/2024 – 06/13/2024
		PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	N/A		CMN20240004	06/11/2024 – 06/13/2024
						3.54 lb/hr	0.22 lb/hr		CMN20240004	06/11/2024 – 06/13/2024
		PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0025 gr/dscf	4.59E-04 gr/dscf		CMN20240004	06/11/2024 – 06/13/2024

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						3.54 lb/hr	0.38 lb/hr		CMN20240004	06/11/2024 – 06/13/2024
		$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	4.59E-04 gr/dscf		CMN20240004	06/11/2024 – 06/13/2024
						2.12 lb/hr	0.38 lb/hr		CMN20240004	06/11/2024 – 06/13/2024
ST-09	Baghouse	CO	401 KAR 51:017	Every 5 years	Method 10	93.15 lb/hr	TBD	TBD	TBD	TBD
		VOC	401 KAR 51:017	Every 5 years	Method 25A	54.70 lb/hr	TBD	TBD	TBD	TBD
		PM	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	TBD	TBD	TBD	TBD
						1.42 lb/hr	TBD	TBD	TBD	TBD
		PM_{10}	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	TBD	TBD	TBD	TBD
						1.42 lb/hr	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
		$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 5/ Method 202	0.0015 gr/dscf	TBD	TBD	TBD	TBD
						1.42 lb/hr	TBD	TBD	TBD	TBD
ST-12 (CU11)	Baghouse	PM/$PM_{2.5}$/ PM_{10}	401 KAR 51:017	Every 5 years	Method 5	0.0015 gr/dscf	0.000499 gr/dscf	10.96 ton/hr	CMN20180004	11/28/18
						0.792 lbs/hr	0.28 lbs/hr			
ST-12 (CU11)	Baghouse	PM/PM_{10}	401 KAR 51:017	Every 5 years	Method 5	0.0025 gr/dscf	0.000359 gr/dscf	9.15 tons/hr	CMN20240005	06/20/2024 – 06/21/2024
						1.32 lbs/hr	0.11 lb/hr			
		$PM_{2.5}$				0.0015 gr/dscf	0.000359 gr/dscf			
						0.79	0.11 lb/hr			
ST-12 (CU11)	Baghouse	PM/$PM_{2.5}$/ PM_{10}	401 KAR 51:017	Every 5 years	Method 5	0.001 gr/dscf	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						0.55 lb/hr	TBD	TBD	TBD	TBD
ST15A	Paint Booth Filter	PM	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.0034 lb/lb coating	9.1 lb/hr	CMN20240006	06/18/2024 - 06/19/2024
						0.101 tpy	0.07 tons/yr			
	Paint Booth Filter	PM_{10}	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.0034 lb/lb coating	9.1 lb/hr	CMN20240006	06/18/2024 - 06/19/2024
						0.101 tpy	0.07 tons/yr			
	Paint Booth Filter	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.0034 lb/lb coating	9.1 lb/hr	CMN20240006	06/18/2024 - 06/19/2024
						0.363 tpy	0.07 tons/yr			
	Paint Booth Filter	VOC	401 KAR 51:017	Every 5 years	Method 25A	25.7 tpy	10.33 tpy	9.1 lb/hr	CMN20240006	06/18/2024 - 06/19/2024
ST15A	Paint Booth Filter	PM	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						0.202 tpy	TBD	TBD	TBD	TBD
		PM_{10}	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD
						0.202 tpy	TBD	TBD	TBD	TBD
		$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD
						0.202 tpy	TBD	TBD	TBD	TBD
		VOC	401 KAR 51:017	Every 5 years	Method 25A	19.425 tpy	TBD	TBD	TBD	TBD
ST15B	Paint Booth Filter	VOC	401 KAR 51:017	Every 5 years	Method 25A	N/A	0.003 lb/lb coating	9.3 lb/hr	CMN20240007	06/18/2024 – 06/19/2024
						0.363 tpy	0.12 tpy			
	Paint Booth Filter	PM_{10}	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.0058 lb/lb coating		CMN20240007	06/18/2024 – 06/19/2024

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						0.363 tpy	0.24 tpy			
	Paint Booth Filter	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.0058 lb/lb coating		CMN20240007	06/18/2024 – 06/19/2024
						0.363 tpy	0.24 tpy			
	Paint Booth Filter	VOC	401 KAR 51:017	Every 5 years	Method 25A	25.7 tpy	9.18 tpy		CMN20240007	06/18/2024 – 06/19/2024
ST15B	Paint Booth Filter	VOC	401 KAR 51:017	Every 5 years	Method 25A	N/A	TBD	TBD	TBD	TBD
						0.202 tpy	TBD	TBD	TBD	TBD
	Paint Booth Filter	PM_{10}	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD
						0.202 tpy	TBD	TBD	TBD	TBD
	Paint Booth Filter	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
						0.202 tpy	TBD	TBD	TBD	TBD
	Paint Booth Filter	VOC	401 KAR 51:017	Every 5 years	Method 25A	19.425 tpy	TBD	TBD	TBD	TBD
ST16	Paint Booth Filter	PM	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.02 lb/lb coating	2.94 lb/hr	CMN20240008	06/19/2024
						0.016 tpy	0.25 tpy			
	Paint Booth Filter	PM_{10}	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.16 lb/lb coating		CMN20240008	06/19/2024
						0.016 tpy	2.0 tpy			
	Paint Booth Filter	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	0.14 lb/lb coating		CMN20240008	06/19/2024
						0.016 tpy	1.77 tpy			
	Paint Booth Filter	VOC	401 KAR 51:017	Every 5 years	Method 25A	1.94 tpy	2.33 tpy		CMN20240008	06/19/2024

Emission Unit(s)	Control Device	Parameter	Regulatory Basis	Frequency	Test Method	Permit Limit	Test Result	Thruput and Operating Parameter(s) Established During Test	Activity Graybar	Date of last Compliance Testing
ST16	Paint Booth Filter	PM	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD
						1.133	TBD	TBD	TBD	TBD
	Paint Booth Filter	PM_{10}	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD
						1.133	TBD	TBD	TBD	TBD
	Paint Booth Filter	$PM_{2.5}$	401 KAR 51:017	Every 5 years	Method 201A/ 202	N/A	TBD	TBD	TBD	TBD
						1.133	TBD	TBD	TBD	TBD
	Paint Booth Filter	VOC	401 KAR 51:017	Every 5 years	Method 25A	3.244	TBD	TBD	TBD	TBD

Footnote: The following initial tests were not observed by state personnel - CMN20180002, CMN20180003, CMN20180004, CMN20180005, CMN20180006 and CMN20180007. The Division for Air Quality was not informed of the test dates before the tests were completed.

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

Table A - Group Requirements:

Emission and Operating Limit		Regulation	Emission Unit
BACT for PM	0.002 gr/dscf; 2.64 lb/hr; 11.58 ton/yr	401 KAR 51:017	EUs 01, 05, 06, 07, 08, 09, 10, 13, 15, 18
BACT PM_{10}	0.002 gr/dscf; 2.64 lb/hr; 11.58 ton/yr		
BACT for $PM_{2.5}$	0.002 gr/dscf; 2.64 lb/hr; 11.58 ton/yr		
BACT for PM	0.0025 gr/dscf; 2.21 lb/hr; 9.67 ton/yr	401 KAR 51:017	EUs 22, 23, 24, 29, 30, 31, 32, 53, 54
BACT for PM_{10}	0.0025 gr/dscf; 2.21 lb/hr; 9.67 ton/yr		
BACT for $PM_{2.5}$	0.0015 gr/dscf; 1.30 lb/hr; 5.67 ton/yr		
BACT for PM	0.002 gr/dscf; 1.90 lb/hr; 8.32 ton/yr	401 KAR 51:017	EUs 33, 34, 36, 43, 44, 45, 46, 47, 50, 59, 79
BACT for PM_{10}	0.002 gr/dscf; 1.90 lb/hr; 8.32 ton/yr		
BACT for $PM_{2.5}$	0.002 gr/dscf; 1.90 lb/hr; 8.32 ton/yr		
BACT for PM	0.001 gr/dscf; 0.57 lb/hr; 2.51 ton/yr	401 KAR 51:017	EU60, 61, 64, 65, 77, 78
BACT for PM_{10}	0.001 gr/dscf; 0.57 lb/hr; 2.51 ton/yr		
BACT for $PM_{2.5}$	0.001 gr/dscf; 0.57 lb/hr; 2.51 ton/yr		
BACT for VOC	3.85 lb/hr; 4.85 ton/yr	401 KAR 51:017	EUs 05, 06, 07, 08, 09, 10, 15, 18
BACT for CO	22.04 lb/hr; 31.85 ton/yr		
BACT for VOC	18.2 lb/hr; 33.3 ton/yr	401 KAR 51:017	EUs 39, 40

Emission and Operating Limit		Regulation	Emission Unit
BACT for PM	0.0005 gr/dscf; 0.065 lb/hr; 0.283 tpy		
BACT for PM_{10}	0.0005 gr/dscf; 0.065 lb/hr; 0.283 tpy		
BACT for $PM_{2.5}$	0.0005 gr/dscf; 0.065 lb/hr; 0.283 tpy		
BACT for VOC	33.3 lb/hr; 27.4 ton/yr	401 KAR 51:017	EUs 43, 44, 45, 46, 47, 50, 79,
BACT for CO	127.8 lb/hr; 234.7 ton/yr		
10.0 tpy of individual HAP emissions		To preclude major source status for HAP	Source-wide
25 tpy of combined HAP emissions		To preclude major source status for HAP	Source-wide

Table B - Summary of Applicable Regulations:

Applicable Regulations	Emission Unit
401 KAR 51:017, *Prevention of significant deterioration.* Applies to each unit of the project at a major new source that emits pollutants exceeding PSD significance levels and requires that a best available control technology (BACT) analysis be performed and controls be applied for the pollutant(s) at each emission unit.	EUs 01, 05, 06, 07, 08, 09, 10, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 29, ,30, 31, 32, 33, 34, 35A, 35B, 36, 39, 40, 43, 44, 45, 46, 47, 50, 53, 54, 57, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69, 71, 72, 73, 74, 75, 76, 77, 78
401 KAR 59:010, *New process operations*. Applies to each affected facility or source, associated with a process operation, which is not subject to another emission standard with respect to particulates in 401 KAR Chapter 59, commenced on or after July 2, 1975.	EUs 01, 05, 06, 07, 08, 09, 10, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 29, 30, 31, 32, 33, 34, 35A, 35B, 36, 39, 40, 43, 44, 45, 46, 47, 50, 53, 57, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69, 71, 77, 78, 83, 84
401 KAR 59:225, *New miscellaneous metal parts and products surface coating operations.* Applies to coating lines located at job shops and original equipment manufacturing industries which apply coatings on metal substrates not elsewhere subject to administrative in 401 KAR Chapters 50 through 68.	EUs 68, 69, 71 & 82
401 KAR 63:010, *Fugitive emissions.* Applies to each apparatus, operation or road that emits or could emit fugitive emissions not elsewhere subject to an opacity standard within 401 KAR Chapters 50 through 68.	EU 76

Applicable Regulations	Emission Unit
401 KAR 63:020, *Potentially hazardous matter or toxic substances*. Applies to each affected facility which emits or may emit potentially hazardous matter or toxic substances as defined in 401 KAR 63:020, Section 2, provided such emission are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality.	EUs 68, 69, 71
401 KAR 60:005, Section 2(2)(dddd), 40 C.F.R. 60.4200 through 60.4219, Tables 1 through 8 (Subpart IIII), *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.* Applies to CI internal combustion engines constructed after July 11, 2005, and manufactured after April 1, 2006.	EUs 72, 73, 74
401 KAR 60:005, Section 2(2)(eeee), 40 C.F.R. 60.4230 through 60.4248, Tables 1 through 4 (Subpart JJJJ), *Standards of Performance for Stationary Spark Ignition Internal Combustion Engines,* Applies to SI internal combustion engines constructed after July 11, 2005, and manufactured after April 1, 2006.	EU 85
401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 through 63.6675, Tables 1a through 8, and Appendix A (Subpart ZZZZ), *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.* Applies to stationary RICE located at a major or area source of HAP emissions.	EUs 72, 73, 74, 85
401 KAR 63:002, Section 2(4)(bbbbb), 40 C.F.R. 63.10880 through 63.10906, Tables 1 through 4 (Subpart ZZZZZ), *National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources.* Applies to each iron and steel foundry in an area source of hazardous air pollutant emissions.	EUs 01, 05, 06, 07, 08, 09, 10, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 29, 30, 31, 32, 33, 34, 35A, 35B, 36, 39, 40, 43, 44, 45, 46, 47, 50, 53, 57, 59, 60, 61, 63, 64, 65, 66, 67, 77, 78, 83, 84

Table C - Summary of Precluded Regulations:

Precluded Regulations	Emission Unit
401 KAR 63:002 Section 2(4)(iiiii), 40 C.F.R. 63.11169 through 63.11180, Table 1 (Subpart HHHHHH) *National emissions standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources.* Does not apply since the source has taken voluntary limits on the concentrations of certain compounds (including chromium, lead, manganese, cadmium, lead, manganese, and nickel) in the coatings and/or paints used at the facility. FW will demonstrate compliance with the voluntary limits through documenting the content of coatings used in the facility.	EUs 68, 69, 71

<u>Air Toxic Analysis</u>:

401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*
The Division for Air Quality (Division) has performed AERMOD on June 26, 2024, of potentially hazardous matter or toxic substances (Benzene, Cumene, Ethyl Benzene, Methanol, Toluene, & Xylene) that may be emitted by the facility based upon the process rates, material formulations, stack heights and other pertinent information provided by the applicant. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

<u>Single Source Determination</u>
N/A

SECTION 5 – PERMITTING HISTORY

Permit	Permit Type	Activity #	Complete Date	Issuance Date	Summary of Action	PSD/Syn Minor
V-16-022	Initial	APE20160001	7/11/2016	10/24/2016	Initial Construction Permit	PSD
V-16-022 R1	Significant Revision	APE20160004	6/6/2017	11/25/2017	Revision to previously permitted PSD project	PSD

SECTION 6 – PERMIT APPLICATION HISTORY

None

APPENDIX A – ABBREVIATIONS AND ACRONYMS

AAQS – Ambient Air Quality Standards
BACT – Best Available Control Technology
Btu – British thermal unit
CAM – Compliance Assurance Monitoring
CO – Carbon Monoxide
Division – Kentucky Division for Air Quality
ESP – Electrostatic Precipitator
GHG – Greenhouse Gas
HAP – Hazardous Air Pollutant
HF – Hydrogen Fluoride (Gaseous)
MSDS – Material Safety Data Sheets
mmHg – Millimeter of mercury column height
NAAQS – National Ambient Air Quality Standards
NESHAP – National Emissions Standards for Hazardous Air Pollutants
NO_x – Nitrogen Oxides
NSR – New Source Review
PM – Particulate Matter
PM_{10} – Particulate Matter equal to or smaller than 10 micrometers
$PM_{2.5}$ – Particulate Matter equal to or smaller than 2.5 micrometers
PSD – Prevention of Significant Deterioration
PTE – Potential to Emit
PUCB – Phenolic Urethane Cold Box
RBLC – RACT BACT LAER Clearinghouse
SO_2 – Sulfur Dioxide
TF – Total Fluoride (Particulate & Gaseous)
VOC – Volatile Organic Compounds