TITLE V AIR PERMIT SIGNIFICANT REVISION APPLICATION

Casting Expansion Project – Guthrie, KY

Volume 1 of 2 – As-Built Emergency Engine Additions and Existing Source Changes

Novelis

Not just aluminum, Novelis Aluminum.™

Novelis Corporation

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April 2025

Project 241801.0153

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1. APPLICATION SUMMARY

Novelis Corporation (Novelis) owns and operates an automotive coil finishing facility located at 8155 Old Railroad Lane in Guthrie, Kentucky (Todd County). On November 10, 2021, Novelis submitted an application for an initial Title V operating permit and Prevention of Significant Deterioration (PSD) construction permit covering the proposed construction of an aluminum casting operation greenfield expansion at the Guthrie site. After the installation of the aluminum casting operation, the Novelis Guthrie facility is classified as a major source under both the Title V operating permit program and the PSD construction permitting program. To accommodate "as-designed" casting expansion project changes and to facilitate issuance of a revised Title V permit, Novelis submitted a Title V significant revision permit application on August 1, 2023 addressing certain minor changes to the original equipment configuration and design specifications for the casting expansion project.[1] Novelis currently operates in accordance with the combined construction and operating permit V-22-011 R1, initially issued by the Kentucky Division for Air Quality (KDAQ) on July 25, 2022 and most recently revised on June 7, 2024 to address the as-designed reconciliation application.

Novelis began the commissioning process of a new aluminum ingot casting facility in May 2024. Various ancillary equipment to support the proposed casting expansion project operations were identified in both the initial PSD permit application from November 2021 to allow start of construction and the as-designed reconciliation application from August 2023. However, the previous engineering design details for the casting project relied upon for both rounds of permitting did not include any plans for the installation of emergency engines for the fire suppression system or for backup power generation. Specifically, the initial casting project design of the fire protection system was planned to source firewater from the existing supply loop at the coil finishing facility already in operation at the Guthrie site.

However, during the early phases of the construction phase of the project, the firewater supply system design basis was revised to conform to applicable insurance and internal Novelis loss prevention policies. This as-built design change resulted in the configuration of the firewater supply system to use a fully dedicated firewater tank and pump house solely serving the new casting facility. Two new Emergency Fire Pumps #3 and #4 (EU 049 and EU 050) each equipped with a 327 hp diesel-driven engine have been installed to support the new dedicated firewater supply loop serving the casting facility. Novelis initially disclosed this design change previously unknown to the permitting team to KDAQ via a call on October 23, 2024, and also subsequently documented in the 2024 Title V Annual Compliance Certification (ACC) submitted via eForms on January 30, 2025. Novelis is now retrospectively seeking air permit coverage for these new firewater pump engines as if they were subject to the same PSD permitting requirements as the initial and as-designed permitting stages because they were completed in conjunction with the original casting project construction timeframe.

With the "re-opening" of the PSD permit action through this Title V significant revision already being required for the fire pump engines, Novelis has also conservatively chosen to include two small natural gas-fired emergency engines used to supply backup power to the casting pit sump pump and the Decoater (EU 029). These emergency generator engines had been previously addressed in an October 10, 2024 Section 502(b)(10) change notification authorizing initial construction and operation of these emergency engines. However, addressing the PSD review elements for these two emergency generator engines on a retrospective basis through this permit application will ensure that they are subject to the same permitting

[1] As part of the *Novelis Guthrie Casting Expansion Project As-Designed Reconciliation Revised Significant Revision Application KDAQ Information Request Response* letter submitted on February 26, 2024, Novelis submitted a revised version of the as-designed reconciliation application that resulted in the issuance of Title V Permit V-22-011 R1.

procedures as the initial casting expansion project and thereby address any potential concerns about project aggregation or other forms of circumvention of the potentially applicable PSD permitting requirements.

Based on an analysis of the potential emissions from the sources in the casting project's equipment scope contained within the November 2021 initial application, subsequent as-designed application updates leading up to the July 2022 final permit issuance and June 2024 final permit revision issuance, and the latest as-built changes addressed in this current permit action, the project will be a major modification under Kentucky's State Implementation Plan (SIP)-approved New Source Review (NSR) permitting program because the casting expansion project will cause an emissions increase exceeding the applicable NSR major stationary source thresholds. Site-wide annual potential emissions after the casting expansion project also exceed the major source thresholds for criteria pollutants and hazardous air pollutants (HAP) under the Title V operating permit program. As Todd County has been designated by the U.S. Environmental Protection Agency (EPA) as unclassified/attainment area for all criteria pollutants, the casting expansion project is only subject to PSD requirements.

Due to the as-built changes to the casting expansion project equipment scope described herein, regulatory applicability determinations from the as-designed application have been updated/supplemented and presented in this application. Updated emission calculations and a revised PSD applicability summary table are also presented. Novelis has determined that the project qualifies for processing as a significant permit revision under 401 KAR 52:020 Section 16. This permit application report includes all information necessary for submittal of a complete significant permit revision application, which will allow for an efficient review by KDAQ. Towards that end, Novelis will also be seeking opportunities to proactively engage with KDAQ staff to provide assistance where beneficial to facilitate the processing of this application and issuance of the amended permit.

1.1 Casting Expansion Project Description

With the casting project at the Guthrie site, Novelis operates a new world-class aluminum ingot casting facility with a maximum annual potential production capacity of approximately 370,000 ton/yr.[2] The casting plant operates entirely independently from the existing coil finishing plant without any shared infrastructure relevant for air permitting evaluations. Novelis has incorporated the newest aluminum scrap processing, decoating, melting, and casting technology available to produce a world-class ingot casting plant with respect to environmental performance, energy efficiency, and other relevant operational performance and quality metrics. The following primary process equipment comprises the casting facility (refer to the Emission Unit Index provided in **Appendix A**):

- One (1) primary scrap shredding line (Emission Unit Description - Scrap Processing Line #1) consisting of various shredding, separation, and storage operations for processing the incoming scrap streams;
- One (1) rotary kiln-type decoater (Decoater) for drying and delacquering/decoating the shredded scrap supplied from the shred line;
- Two (2) conventional sidewell-type aluminum melt furnaces (Sidewell Melting Furnaces #1 and #2) capable of receiving both hot shreds from the decoater and loose scrap and hard charge from other sources;

[2] Nominal aluminum ingot output on an actual basis will be approximately 240,000 metric ton/yr or 265,000 ton/yr representing an annual capacity factor of approximately 72%.

- One (1) Novelis dual-chamber (NDC Recycle Furnace) (e.g., proprietary design) aluminum melting furnace with the capability of both drying/decoating/delacquering and melting the incoming scrap feed streams;
- One (1) front-loaded single chamber aluminum melting furnace (Front-Load Tilting Melting Furnace) with the primary purpose of melting "prime" aluminum and other similar forms of clean charge materials;
- One (1) tilting-type aluminum holding furnace (Holding Furnace #1) operating in a cycle to feed a single casting pit; and
- One (1) in-line fluxer/degassing unit (In-Line Degasser) for final refining of the molten aluminum with gaseous flux before feeding the metal to the casting pit.

Novelis also operates various ancillary equipment such as scrap storage and handling areas, a dross house, sow dryer, ingot saw, casting process preheaters, lime silos for lime-injected baghouses, building heating systems, cooling tower, diesel storage and mobile equipment refueling station, paved haul roads, emergency fire pump engines, emergency generator engines, and molten metal utility heaters.[3]

1.2 Summary of Regulatory Applicability

Pursuant to 401 KAR 51:017, Section 1, a project at an existing minor source located in an area designated as attainment or unclassifiable that meets the definition of a major modification [refer to 401 KAR 51:001 Section 1(114)] is required to conduct a PSD permitting review, including a Best Available Control Technology (BACT) analysis, an Air Quality Analysis, and an Additional Impacts Analysis. Prior to the initial operation of the casting expansion project, the Guthrie facility was classified as a true minor source under the PSD permitting program. PSD permitting is therefore required if the new casting project sources cause an emissions increase for one (1) or more regulated NSR pollutants exceeding the applicable major source threshold (i.e., 100 tpy as a "list of 28" secondary metal production plant). Under the "major for one major for all" concept associated with PSD applicability analyses for expansions at an existing minor source, the PSD triggering threshold for the remaining NSR pollutants drops to the relevant PSD Significant Emission Rate (SER) that would otherwise apply to existing major sources.

Annual potential emission increases from the casting expansion project sources for particulate matter with an aerodynamic diameter less than ten (10) microns (PM_{10}), nitrogen oxides (NO_x), and carbon monoxide (CO) will exceed the applicable major source threshold. For the remaining regulated NSR pollutants evaluated against the SER, particulate matter (PM), particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$), and volatile organic compounds (VOC) will exceed the respective SER. In addition, project emissions increases of greenhouse gases (GHG) in units of carbon dioxide equivalents (CO_2e) will exceed 75,000 tpy for a project that will trigger PSD for a non-GHG pollutant, making GHG emissions subject to regulation as an NSR pollutant with an SER of 0 tpy.[4] The project will not result in significant emissions of any other regulated pollutants, and since the project emissions increase of all other regulated NSR pollutants fall well below the triggering thresholds, explicit PSD avoidance permit limits are unnecessary. Therefore, the necessary elements of a PSD permit application for PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC and GHG were included in the original application submittal and are being revised as necessary with this as-built permit revision application.

[3] The emergency fire pump engines and emergency generator engines are being added to the project equipment scope through this permit action. The molten metal utility heater installation comprises an entirely separate and not substantially related original project initiative that was addressed in a November 2024 Section 502(b)(10) change notification.

[4] "Subject to regulation" is defined under 401 KAR 51:001, Section 1(231), which cross-references the federal definition contained in 40 CFR 51.166(b)(48).

The same basic PSD applicability analysis conclusions reached in the original November 2021 PSD application for the casting expansion project continue to apply to this as-built permit action. However, the as-built equipment installations addressed in this permit application do require supplemental PSD determinations including BACT emission limits and air quality analysis demonstrations.

In addition, some very minor modeled source parameter changes were identified for the Ingot Saw (EU 045) cyclone/filtration unit stack (change from unobstructed, vertical point source to capped point source at the same source location and approximate height) and the DBF Preheater (EU 046b) exhaust duct (change from unobstructed, vertical point source to horizontal point source at a slightly different source location and dimensions). None of these modeled source parameter final as-built changes substantively affect the main conclusions of the prior PSD review process. The basic form and contents of the Title V permit will largely be unchanged even after this as-built permit revision because existing Emission Group 4 for Emergency Generators generally covers the applicable requirements for the new Cast Pit Sump Emergency Generator (EU 047) and Decoater Backup Emergency Generator (EU 048) and the existing Emission Group 5 for Emergency Fire Pumps generally covers the applicable requirements Emergency Fire Pumps #3 and #4 (EU 049 and EU 50).

1.3 Air Quality Analysis

All updates to the casting expansion project air dispersion modeling analyses are provided in **Volume 2** of this application. The supplemental modeling analyses performed for the as-built changes include an evaluation of ambient impacts due to the casting expansion project in the area surrounding the existing Guthrie facility, which is designated as a Class II area, and regional Class I areas within 300 km. The Class II analyses provided in **Volume 2** demonstrate that the casting project will not cause or contribute to an exceedance of any National Ambient Air Quality Standards (NAAQS) or any Class II PSD Increments. In the Class I analysis also provided in **Volume 2**, compliance is demonstrated for Class I PSD Increment and Air Quality Related Values (AQRV) (i.e., visibility and deposition impacts) for the four (4) Class I areas located within 300 km of the Guthrie facility: Mammoth Cave National Park, Mingo Wildlife Refuge, Sipsey Wilderness Area, and Cohutta Wilderness Area. An Additional Impacts Analysis, consisting of an assessment of growth associated with the casting expansion project, an assessment of potential impacts of the proposed project on soils and vegetation, and a Class II visibility analysis, is also included in **Volume 2** of this application.

1.4 Summary of BACT Determinations

A summary of the BACT determinations for the newly added emergency engines included in the as-built casting expansion project scope are presented in **Table 1-1 to Table 1-5.** The detailed "top-down" BACT analysis for NO_x, CO/VOC, PM, and GHG emissions from the emergency engines are provided in **Section 7**.

1.5 Air Permitting Program Applicability and Project Timeline

To resolve the retrospective PSD review contained in this as-built permit action for the emergency engines, Novelis would like to pursue a goal with KDAQ to have a Draft Permit issued for public comment as soon as possible. Novelis has been and will continue to seek every opportunity to proactively engage with KDAQ staff to provide whatever assistance would be beneficial to facilitate the processing of this application and development of the initial permit.

1.6 Organization of Air Permit Application

Following this introduction, a general description of Novelis Guthrie facility and process operations covered by the casting expansion project is provided in **Section 2**. **Section 3** presents the updated PSD applicability analysis for the casting expansion project in the as-built configuration, explains the PSD review approach used for the as-built permitting effort, and identifies the regulatory basis for processing this as-built reconciliation application as a Title V significant revision. **Sections 3 through 6** are organized by emission unit or emission unit grouping (i.e., in the same format as the Title V permit Section B) where each section contains subsections addressing the "new or different" information carried with as-built changes. **Section 7** presents the NO_X, CO/VOC, $PM/PM_{10}/PM_{2.5}$ and GHG BACT analysis for the emergency engines. A revised Emission Unit Inventory addressing the casting expansion project sources only is provided in **Appendix A**. A representative, casting project-wide process flow diagram showing the as-built changes is provided in **Appendix B**. An updated version of the supporting emissions documentation for the casting expansion project is included in **Appendix C** where the overall "Project Emissions Summary" from the as-designed permit action is supplemented with newly added sections for the emergency engines and the change project emissions increases from the as-designed to as-built project stage is presented for reference. A complete set of revised DEP7007 series application forms covering the as-built changes is provided in **Appendix D**. Supporting documentation for the BACT analysis is provided in **Appendix E**, and search results from EPA's BACT database are provided **Appendix F**. The revised emission unit index, emission calculations, and application forms show the as-built changes in **maroon text with light green highlighting** so that KDAQ can readily identify key inputs which have changed as a result of the as-built permitting process versus those inputs which remain unchanged from the most recent, as-designed permit basis.

Table 1-1. Summary of NO_x BACT Determinations for Emergency Engines

EU Description	BACT Emission Limit		Basis for Emission Limit	Control Type
	Value	Units		
Cast Pit Sump Emergency Generator	2	g/hp-hr	NSPS Subpart JJJJ Emissions Standard	• Good combustion practices • Limiting operating hours • Proper operation and maintenance of an EPA certified engine
Decoater Backup Emergency Generator	10	g/hp-hr for NO_x + HC		
Emergency Fire Pump #3	3.0	g/hp-hr for NMHC +NO_x	NSPS Subpart IIII Emissions Standard	• Good combustion practices • Limiting operating hours • Proper operation and maintenance of an EPA certified engine
Emergency Fire Pump #4	3.0	g/hp-hr for NMHC +NO_x		

Table 1-2. Summary of CO BACT Determinations for Emergency Engines

EU Description	BACT Emission Limit		Basis for Emission Limit	Control Type
	Value	Units		
Cast Pit Sump Emergency Generator	4	g/hp-hr	NSPS Subpart JJJJ Emissions Standard	• Good combustion practices • Limiting operating hours • Proper operation and maintenance of an EPA certified engine
Decoater Backup Emergency Generator	387	g/hp-hr		
Emergency Fire Pump #3	2.6	g/hp-hr	NSPS Subpart IIII Emissions Standard	• Good combustion practices • Limiting operating hours • Proper operation and maintenance of an EPA certified engine
Emergency Fire Pump #4	2.6	g/hp-hr		

Table 1-3. Summary of VOC BACT Determinations for Emergency Engines

EU Description	BACT Emission Limit		Basis for Emission Limit	Control Type
	Value	Units		
Cast Pit Sump Emergency Generator	1	g/hp-hr	NSPS Subpart JJJJ Emissions Standard	• Good combustion practices • Limiting operating hours • Proper operation and maintenance of an EPA certified engine
Decoater Backup Emergency Generator	N/A	g/hp-hr	No separate VOC BACT limit is necessary as NO_x + HC NSPS Subpart JJJJ Emission Standard proposed as NO_x BACT limit will inherently control VOC emissions.	
Emergency Fire Pump #3	N/A	g/hp-hr	No separate VOC BACT limit is necessary as NMHC + NO_x NSPS Subpart IIII Emission Standard proposed as NO_x BACT limit will inherently control VOC emissions.	• Good combustion practices • Limiting operating hours • Proper operation and maintenance of an EPA certified engine
Emergency Fire Pump #4	N/A	g/hp-hr		

Table 1-4. Summary of PM/PM_{10}/$PM_{2.5}$ BACT Determinations for Emergency Engines

EU Description	BACT Emission Limit		Basis for Emission Limit	Control Type
	Value	Units		
Cast Pit Sump Emergency Generator	N/A	g/hp-hr	PM emissions from natural gas-driven engines are considered negligible and not included as a regulated pollutant in NSPS Subpart JJJJ Emission Standards. Work practice standards are commonly implemented in place of formal BACT emission limits.	• Good combustion practices • Combustion of pipeline quality natural gas
Decoater Backup Emergency Generator	N/A	g/hp-hr		
Emergency Fire Pump #3	0.15	g/hp-hr	NSPS Subpart IIII Emissions Standard	• Good combustion practices • Limiting operating hours • Proper operation and maintenance of an EPA certified engine
Emergency Fire Pump #4	0.15	g/hp-hr		

Table 1-5. Summary of GHG BACT Determinations for Emergency Engines

EU Description	BACT Emission Limit		Basis for Emission Limit	Control Type
	Value	Units		
Cast Pit Sump Emergency Generator	119,439	lb CO_{2e}/MMscf	40 CFR 98, Subpart C, Tables C-1 and C-2	• Energy efficient design • Selection of ultra-low sulfur fuel oil • Good combustion, operating, and maintenance practices
Decoater Backup Emergency Generator	119,439	lb CO_{2e}/MMscf		
Emergency Fire Pump #3	22,657	lb CO_{2e}/Mgal	40 CFR 98, Subpart C, Tables C-1 and C-2	• Energy efficient design • Selection of ultra-low sulfur fuel oil • Good combustion, operating, and maintenance practices
Emergency Fire Pump #4	22,657	lb CO_{2e}/Mgal		

2. FACILITY AND OPERATIONS DESCRIPTION

2.1 Facility Location

Figure 2-1 shows a general map of the area surrounding the facility showing roads and general boundaries of towns and other nearby municipalities. The boundary of the facility is also shown. As can be seen in **Figure 2-1**, the Novelis facility lies about 22 km northeast of Clarksville, TN. **Figure 2-2** shows a closer, more detailed view of the facility, its boundaries, and the land use in the immediate surrounding area. As can be seen from **Figure 2-2**, the land use near the facility is generally rural with many adjacent farms and scattered groupings of trees.

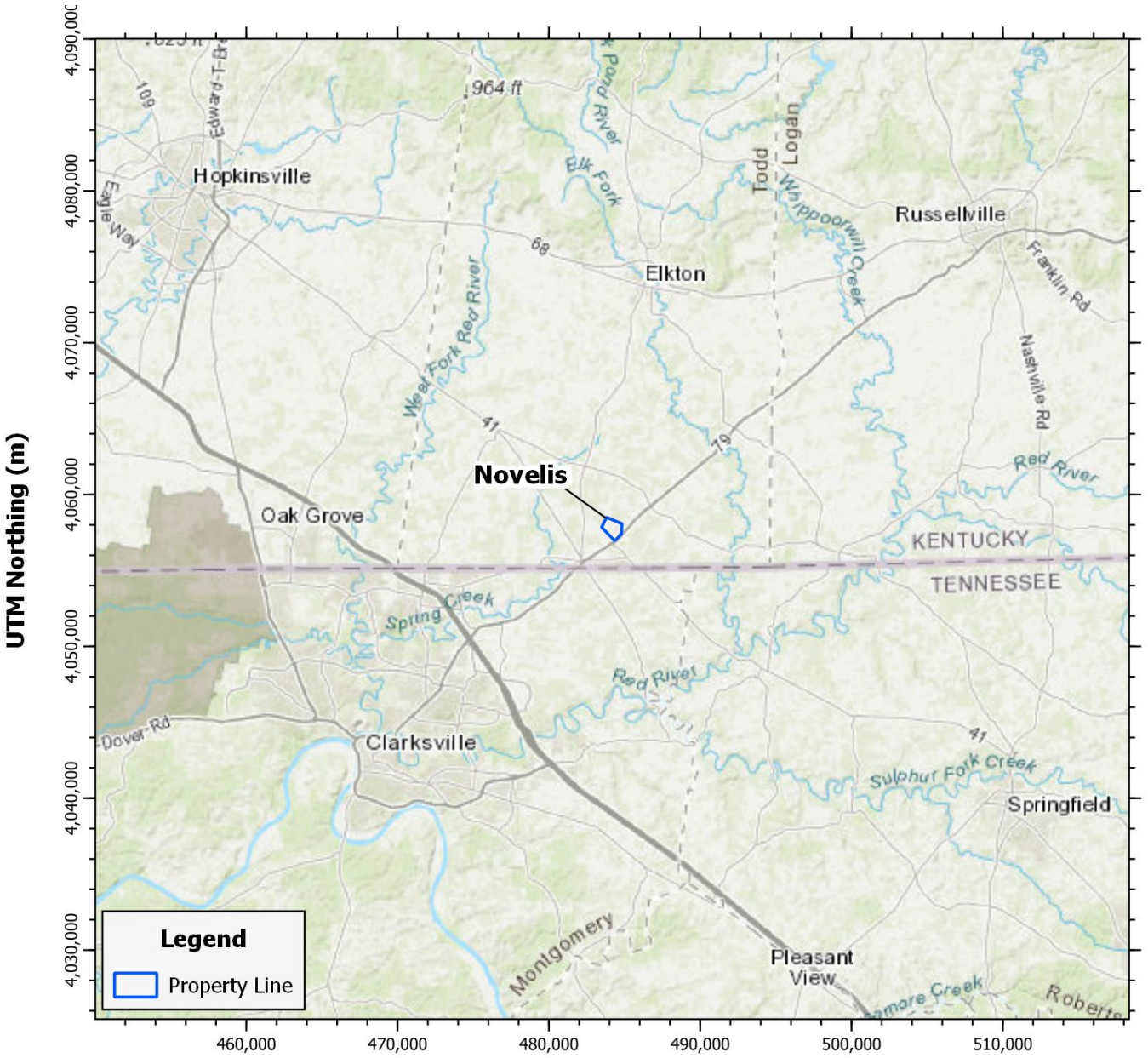
2.2 Casting Facility Operations Summary

The casting expansion project operations can be segregated into the following categories, each of which is represented in more detail in the overall process flow diagram presented in **Appendix B** to this application:

- "Cold End" Scrap Processing,
- "Hot End" Melting & Casting, and
- Auxiliary Systems.

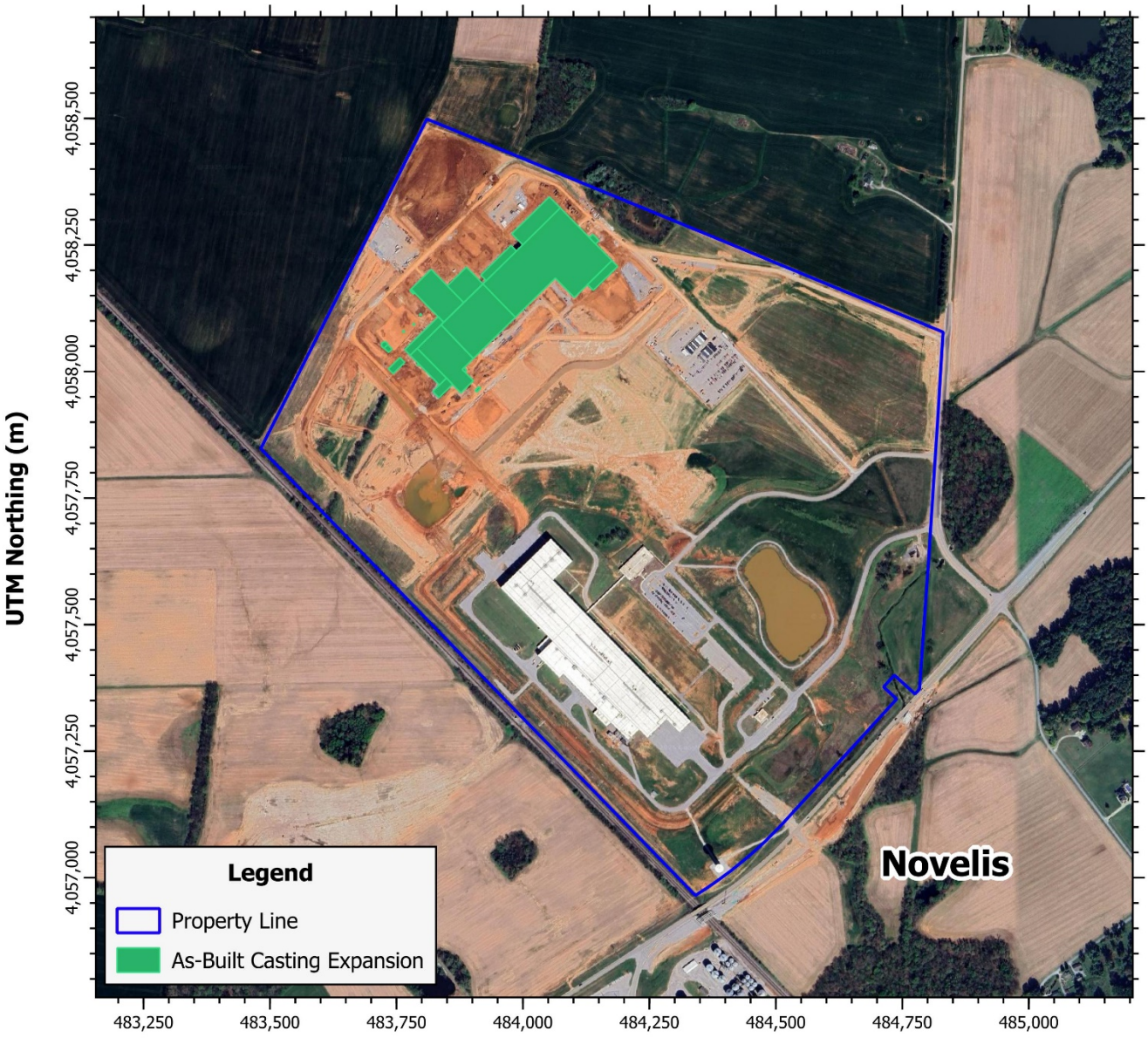
The new casting plant feeds open market, post industrial automotive, and runaround scrap into the scrap processing line where it is shredded for direct feed into the weigh hopper/feeder of the decoater or is stored in bins for manual feed. After decoating, scrap is fed into either of the two sidewell melting furnaces or the Novelis Dual Chamber (NDC) furnace. Clean runaround scrap may be charged to the front-load tilting melting furnace via a charge transfer car as well. Molten metal from the four different melting furnaces is then fed into the holding furnace, which supports solid reactive fluxing. Once ready, the furnace is tilted to feed the in-line degasser and ultimately discharged into the casting pit. Each furnace and the in-line degasser produces dross which is transferred to the Dross House (and potentially dross presses if installed in the future). Various ancillary equipment supports the casting operations.

Figure 2-1. Area Map Showing Novelis' Guthrie Facility Property



All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

Figure 2-2. Site Layout and Nearby Land Use at Novelis' Guthrie Facility



All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

2.3 Coil Finishing Facility Operations Summary

Within the legacy coil finishing plant, Novelis operates aluminum finishing processes that take incoming aluminum sheet coils to produce finished rolled aluminum coils for use by customers in the automotive industry. The facility is capable of operating continuously (8,760 hr/yr) by joining separate aluminum coils to create a continuous aluminum strip for processing within the coil finishing operations.

The coil products are manufactured on separate lines referred to as the heat-treatment line (HTL) and the pre-treatment line (PTL). These separate processes are continuous in nature (from when an input coil is unwound until it is rewound for further finishing steps). The PTL can also independently be supplied with batch annealed coils through natural gas-supplied batch annealing furnaces.

Rolled aluminum sheet coils from other Novelis operations are received by the facility and transferred to coil storage. Input coils can be supplied to either the HTL or batch annealing lines depending on the customer specifications for the final product coils. All production coils will be processed by the PTL, whether they were processed through the HTL or the batch annealing lines.

Other on-site operations for the coil finishing plant that are needed to support the production of automotive sheet coils include the following:

- Packing line to wrap and prepare coils for shipment to customers;
- Process and treatment chemicals bulk storage tanks (Insignificant Activity #12);
- Wastewater treatment system, including dry lime storage silo (used to produce a lime slurry) (EU010), associated chemical storage tanks (Insignificant Activity #12), and cooling tower (EU023);
- Three (3) Boilers (EU007-EU009) used in the wastewater treatment process;
- Building Comfort Heating (Insignificant Activities #14 and #15);
- Two (2) Emergency Generators (EU011 and EU021); and,
- Two (2) Emergency Fire Pump Engines (EU012 and EU022).

None of the coil finishing area emission units are impacted by the casting expansion project as-built updates, so none of these existing coil finishing area emission units are addressed in the remainder of this permit revision application.

3. PSD AND TITLE V PERMITTING APPLICABILITY

Based on the as-built updates to the project emission increase calculation summarized **Appendix C**, the PSD applicability analysis for the casting expansion project is summarized below. **This analysis continues to demonstrate that the casting expansion project triggers PSD permitting requirements for NO_x, CO, VOC, $PM/PM_{10}/PM_{2.5}$ and GHG and will not trigger PSD permitting requirements for any other regulated NSR pollutants.**

3.1 PSD Source Classification

Novelis' Guthrie facility is located in Todd County, which has been designated by the EPA as an unclassified/attainment area for all criteria pollutants.[5] Therefore, with respect to the federal NSR permitting program, only PSD requirements could potentially apply to the source.

Kentucky has incorporated the requirements of the PSD permitting program into its SIP at 401 KAR 51:017.[6] These PSD regulations specifically define 28 industrial source categories for which the "major" source threshold is 100 tpy of any regulated pollutant.[7] The major source threshold for facilities not on this "List of 28" is 250 tpy. After the casting expansion project, Novelis processes secondary aluminum in the Decoater, melting furnaces, holding furnace, and in-line degasser to produce molten aluminum for casting of aluminum ingots. This activity is classified under SIC 3341 (Secondary Smelting and Refining of Nonferrous Metal). This facility classification is included on the "List of 28" source category listing as a secondary metal production plant. Since the potential emissions of at least one (1) regulated NSR pollutant from the casting expansion project will exceed 100 tpy (e.g., NO_x), the Guthrie facility's PSD source classification will change to a major source after the proposed project is completed. Future physical changes or changes in the method of operation at the Guthrie facility after the implementation of the proposed casting project that result in a significant net emissions increase would be subject to PSD permitting requirements.

3.2 PSD Applicability Methodology

Pursuant to 401 KAR 51:017 Section 1(3), an owner or operator of a new major stationary source subject to the requirements in 401 KAR 51:017 Section 8 to 16 (i.e., PSD review for one (1) or more regulated NSR pollutants) shall not begin actual construction without a proposed permit. The new major stationary source in the context of the as-designed configuration of the casting expansion project was the complete listing of emissions generating activities listed in the Emission Unit Index in **Appendix A** of the final revised October 2023 as-designed reconciliation application. The Project Emissions Increase Summary provided in Section 1 of **Appendix C** demonstrates that the as-designed configuration of the casting expansion project caused emissions increases for multiple regulated NSR pollutants (PM_{10}, NO_x, and CO) that exceed the PSD major source threshold for the "list of 28" source activities associated with the proposed project. Therefore, the project can also be considered a major modification as defined under 401 KAR 51:001 Section 1(114) if any of the remaining regulated NSR pollutants with emissions increases below the major source threshold have emissions increases exceeding the SER. For the as-designed configuration of the casting expansion project, this major modification pathway to triggering PSD applicability brought in PM, $PM_{2.5}$ and VOC as additional PSD triggering pollutants.

[5] 401 KAR 51:010, Section 2

[6] 40 CFR 51.166(a)(1)

[7] 401 KAR 51:001, Section 1(118)(a)(2)

For projects involving increases in GHG emissions, the mechanism for triggering PSD review is different from other non-GHG regulated NSR pollutants. For a project to trigger PSD review for GHGs, GHGs must first become "subject to regulation" to be treated as a regulated NSR pollutant that can fall under the PSD requirements.[8] A physical change or change in the method of operation at a facility that results in an emissions increase of a non-GHG pollutant exceeding the major source threshold for new source and/or SER for major modifications that also causes an emissions increase of GHG exceeding 75,000 tpy CO_2e would make the GHG emissions increase from the project subject to regulation and would require PSD review for the GHG emissions from the new units associated with the proposed project. Because the GHG emissions increase for the casting expansion project exceeded 75,000 tpy CO_2e with the as-designed configuration and PSD review was triggered for multiple non-GHG regulated NSR pollutants, the as-designed configuration of the casting expansion project was also subject to PSD review for GHG in addition to NO_x, CO/VOC, and $PM/PM_{10}/PM_{2.5}$.

The entire Novelis Guthrie facility became classified as an existing major PSD source upon initial startup of the first emission unit covered in the casting expansion scope [i.e., initial startup of Holding Furnace #1 (EU 034) on May 25, 2024]. At an existing major PSD source, PSD is triggered for a regulated NSR pollutant if the project under consideration constitutes a "major modification," as defined at 401 KAR 51:001, Section 1(114). To constitute a major modification, the proposed project must first be a "*physical change in or change in the method of operation of a stationary source*," not otherwise exempted. The as-built updates addressed in this application involve installation of new pieces of process equipment and clearly meet this prong of the definition. Second, both the emission increase from the project alone (known as the "Step 1" project emissions increase), and the net emissions increase over a five-year contemporaneous period (known as the "Step 2" net project emissions increase) must be "significant," meaning the increase exceeds the PSD SER defined under 401 KAR 51:001, Section 1(218)(a) for a regulated NSR pollutant. As shown in **Table 3-1**, the change in casting expansion project potential emissions from the as-designed to as-built configuration does not exceed the SER for any regulated NSR pollutant if the as-built changes were to be viewed as a separate, stand-alone project.

Therefore, the key determination regarding PSD applicability for the as-built changes is whether or not these changes should be considered part of the original casting expansion project initiative or whether they can be considered the first post-operational, stand-alone project at the now PSD major Novelis Guthrie facility. This separate versus combined project determination for the as-built changes is rooted in EPA's guidance and policies regarding "project aggregation." The term aggregation comes into play in Step 1 of a PSD applicability analysis and describes the process of grouping together multiple, interrelated projects. If two (2) projects are determined to be interrelated based upon a case-by-case evaluation of several factors outlined by EPA in a series of historical statutory/regulatory interpretations and applicability determinations, the applicant is required to sum the emissions changes for the projects and compare the combined project emissions increase to the SER. EPA's current project aggregation guidance established in a November 2018 final action on a prior January 2009 rulemaking establishes the concepts of "substantially related" and "technical and economic dependence" when performing project aggregation reviews for nominally-separate projects. To be substantially related, "there should be an apparent interconnection - either technically or economically - between the physical and/or operational changes, or a complementary relationship whereby a change at a plant may exist and operate independently, however its benefit is significantly reduced

[8] "Subject to regulation" is defined in 401 KAR 51:001, Section 1(231), which cross-references the federal definition in 40 CFR 51.166(b)(48).

without the other activity."[9] The January 2009 action also included a statement that the EPA would, as a matter of policy, establish a rebuttable presumption that activities that occurred more than three (3) years apart are not "substantially related" and therefore, generally, should not be aggregated for purposes of determining whether they are a single modification at Step 1. EPA clarified that the "occurrence" of two (2) nominally separate projects within the context of the 3-year rebuttable presumption timeframe for non-aggregation is defined based on "the time period separating physical or operational changes…calculated based on time of approval (i.e., minor NSR permit issuance)." EPA further states that "if a permit has not been, or will not be, issued for the physical or operational changes, the time period should be based on when construction commences on the changes."[10]

The only permit action initiated at Novelis' Guthrie facility in the recent past with the potential for project aggregation consideration is the casting expansion addressed within the initial November 2021 PSD permit application and the subsequent August 2023 as-designed Title V/PSD significant permit revision reflecting various revisions to equipment design, operating specifications, and emissions limits. At the time of initiating the PSD permit application development for the November 2021 initial PSD permit action for the casting expansion project, Novelis had completed preliminary engineering as part of a limited Front-End Engineering Design (FEED) study developed to support the capital expenditure (CapEx) budgeting, vendor bid solicitations and associated final equipment selection, and other project planning and initial implementation considerations. At the conclusion of this initial FEED study, Novelis had planned on obtaining fire water from the existing system at the legacy coil finishing operation without the need for installation of a dedicated fire water tank and pump house for the casting expansion project. In addition, Novelis had not planned on installing fossil-fuel driven engines to provide backup electrical power to the cast pit sump pump and critical systems associated with the Decoater. Rather, the decision to add these emergency engines was made well after the initial PSD permit application was submitted in November 2021 and even after portions of the as-designed air permit reconciliation effort had been substantially completed. The following subsections offer formal project aggregation determinations for the emergency generators and fire pumps included in the as-built configuration of the casting expansion project.

3.2.1 Casting Project Emergency Generators Project Aggregation Analysis

As reflected in the October 2024 Section 502(b)(10) change notification, Novelis initially considered the installation of the Cast Pit Sump Emergency Generator and Decoater Backup Emergency Generator to qualify as a separate project from the initial casting expansion project. The preliminary engineering data for the Cast Pit Sump Emergency Generator was not received by Novelis from a prospective vendor until June 2024 which came at the very end of the as-designed permit reconciliation effort and effectively coincided with the Final Permit issuance for Title V Permit V-22-011 R1 on June 7, 2024. Up until this June 2024 timeframe, Novelis had not previously intended to equip the cast pit sump pump with emergency backup power as the sump pump was not considered required for the cast pit to function normally or for the casting facility to achieve all of its originally targeted technical capabilities and economic performance during normal steady-state operation. However, due to site-specific geological conditions (i.e., high groundwater table) and engineering design of the deep cast pit containment structures, some infiltration of water from outside the cast pit was observed which necessitated an engineering design change to equip the pit with a sump pump to keep critical process equipment from becoming adversely impacted. As such, a separate and not substantially-related business risk assessment decision from the original casting expansion project was

[9] 74 FR 2376-2383, Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR): Aggregation and Project Netting, January 15, 2009.

[10] Ibid.

made to also equip the cast pit sump pump with an emergency backup power source for increased operability and protection of critical casting equipment during an unplanned power outage.

Further, casting technology solutions exist in the marketplace without requiring fossil-fuel driven emergency generator engines dedicated to the cast pit sump pump. Therefore, Novelis' decision to pursue the cast pit sump emergency generator as a "discretionary, add-on" engineering design feature of the casting system initially justified coverage of the emergency engine's regulated pollutant emissions within a separate permit action from the original casting expansion project. However, for the sake of administrative completeness in consideration of the casting expansion PSD permit action needing to be reopened for the fire pump engines, Novelis has conservatively chosen to treat the Cast Pit Sump Emergency Generator as being subject to the PSD review process and has included this emergency engine in the BACT determination and PSD air quality analysis contained in this Title V significant revision application.

Novelis' original bid solicitation (Buyers Equipment Specification) associated with the initial November 2021 casting expansion project for the Decoater did not include a request for a backup emergency generator as some of the other aluminum decoating systems in the Novelis network are not equipped with dedicated backup power supply systems equipped with a fossil fuel-driven engine. The Decoater Backup Emergency Generator was carried directly in the scope of the original equipment manufacturer with only a brief mention in the Sellers Technical Specification about the existence of a backup generator to maintain kiln rotation in the event of power outages without highlighting this add-on equipment scope item to the Novelis engineering team. In addition, Novelis' environmental team did not discover the plans to install such an Decoater backup emergency generator until after the as-designed reconciliation permitting effort had concluded. At the time of preparing the October 2024 Section 502(b)(10) change notification, Novelis was exclusively focused on obtaining the requisite final construction and operational authority for this emergency generator to accommodate its use that ensures the safe operational status of the Decoater during a power outage.

Novelis considered the PSD aggregation status of this Decoater Backup Emergency Generator to be a secondary consideration given that there are available Decoater engineering design options that would not have included an emergency generator and based on the original November 2021 permit action not including a dedicated emergency generator for the Decoater in the preliminary engineering design basis available at the time of the initial PSD permit action. Following a similar rationale to the Cast Pit Sump Emergency Generator, Novelis is now also willing to extend the PSD review process to the Decoater Backup Emergency Generator in light of the re-opening of the PSD permit action to include a wider range of more substantive as-built changes.

3.2.2 Casting Project Fire Pumps Project Aggregation Analysis

At the time of initiating the PSD permit application development for the November 2021 initial PSD permit action for the casting expansion project, Novelis had completed preliminary engineering as part of a limited FEED study developed to support the CapEx budgeting, vendor bid solicitations and associated equipment selection, and other project planning and initial implementation considerations. At the conclusion of this initial FEED study, Novelis had planned on obtaining fire water from the existing system at the legacy coil finishing operation without the need for installation of a dedicated fire water tank and pump house for the casting expansion project.

In May 2022, Novelis initiated a process to reconcile the casting expansion project design basis from the initial FEED study to the final engineering design planned to be used for the start of construction. Novelis' environmental team worked closely in coordination with project engineers that had previously led the FEED study to identify key equipment design and operating specifications changes and to assess the impact of

these changes on the air permit basis that would subsequently be reflected in the as-designed reconciliation permit action. Novelis' plans to rely on the existing fire water system at the legacy coil finishing plant remained in place at the start of this as-designed air permit reconciliation effort. However, after issuance of the formal PSD construction authorization for the casting expansion project with the issuance of Proposed Title V/PSD Permit V-22-011 on June 7, 2022, the Novelis project team engineers hosted a site visit for its internal loss prevention specialists in July 2022. The preliminary/conceptual engineering review of the fire water pump system completed in coordination with this loss prevention-focused and risk assessment evaluation site visit concluded that the existing fire water system at the legacy coil finishing site may not be able to provide fire water with adequate supply pressure and backup power redundancy to meet Novelis' best practices around the need to have redundant fire protection system design.

Sometime between July 2022 and September 2022, Novelis made the formal decision to pursue a project design change to include a new fire water tank and pump house in the Overall Site Plan (Rev. 3 dated 9/9/22) and to begin the fire water system re-design effort to reflect the new fire water supply concept. The official start of construction notification for the casting expansion project was filed on November 2, 2022 indicating commencement of construction had been initiated on October 24, 2022. Fundamentally, the introduction of diesel-driven fire pump engines to the fire protection system scope for the Guthrie casting expansion project was driven by the scope change decision to conform to internal loss-prevention philosophy and a desire to mitigate fire risk to the maximum degree possible by having a redundant "uninterruptable" power source to drive the pumps if a simultaneous fire and power outage were to occur.

From the economic dependency aspect of the project aggregation assessment, the project funding for the dedicated fire water system for the casting expansion project was obtained via a change order to the original project funding request. A change order for the fire water system was necessary because the dedicated fire water system was not a part of the original project scope until well after the initial capital funding allocation was made. The initial project funding had already started to be distributed to various third party contractors and suppliers before the funding for the fire water system was authorized. This formal funding approval was not approved/completed until December 2022 and preliminary bid solicitations and engineering design efforts for the dedicated fire water system progressed between February and July 2023.

Only after the fire water supply system bid process was completed did Novelis project engineers have a formal indication of the specific engineering design specifications for the fire water pump engines, and would have been the first potential opportunity for Novelis to consider air permitting applicability and associated federal air regulatory requirements that would have applied specifically to the proposed fire water pump engines. Novelis' efforts for developing the as-designed Title V/PSD significant revision application focused on the key equipment and operating specifications for the core process equipment serving the casting expansion project had been largely completed separately by the environmental team by the time the fire water system engineering design had advanced to this particular point (refer to Volume 1 of the as-designed reconciliation application submitted on August 1, 2023).

Based on the overlapping timing for the shift in firewater supply system engineering design concept with aspects of the as-designed PSD permitting effort and the technical dependency of the primary process equipment on the dedicated firewater supply system under applicable Novelis loss prevention/insurance policies, Novelis believes it is best to consider the fire water system installation to be substantially related to the as-designed permitting effort for the casting expansion project. The primary basis for pursuing this as-built update to the casting expansion project PSD determination is the inclusion of the fire pump engines as part of a dedicated firewater supply system for the casting facility. The other arguably separate as-built changes are being included with this permit action for the fire pump engines from the sake of administrative

completeness and to avoid any potential perceptions of improper application of PSD project aggregation policies to these potentially related as-built equipment installations.

3.3 Project Potential Emissions

For newly constructed emission units, annual emission increases are calculated as the "sum of the potential to emit from each new emissions unit following completion of the project."[11] Fugitive emissions are conservatively included in the annual emissions total for the PSD applicability determination.

For the PSD permitting program, "potential to emit (PTE)" is defined as the "maximum capacity of a stationary source to emit a pollutant under its physical or operational design."[12] The emission increases for all affected emissions units for the proposed project are summed to determine the project emissions increase for each pollutant (i.e., the Step 1 increase). The project emissions increase for each pollutant is then compared to the SER for that pollutant to determine if a significant emissions increase has occurred.

3.4 PSD Applicability Summary

As shown in **Table 3-1**, the potential emissions attributable to the casting expansion project exceed the major source thresholds and lower SER for the following pollutants: PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and GHG under both the as-designed and as-built configuration. The potential emissions from the project for sulfur dioxide (SO_2) and lead are less than their respective SERs, so PSD permitting requirements do not apply to these pollutants. Based on this PSD applicability assessment, this as-built permit action triggers PSD permitting requirements, including a "top-down" BACT and air quality modeling analyses, for PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and GHG only if it the as-built changes are considered to be aggregated with the as-designed reconciliation permitting effort from August 2023. Conversely, if the as-built changes individually or as a group were considered to be a separate, non-aggregated project, the project emissions increases for all regulated NSR pollutants would fall well below the SER and could accommodate a Section 502(b)(10) change notification as the Title V permitting approach.

3.4.1 EPA Guidance on PSD Permit Revisions

Kentucky's combined PSD construction and Title V operating permit programs contain permit revision procedures which mirror the 40 CFR Part 70 Title V regulations, but they do not specifically address the procedures required for revising an initial PSD permit determination solely on the basis of as-built changes. Therefore, Novelis has consulted EPA's operative guidance documents for clarifications on how the specific as-built changes addressed in this application can most effectively be handled from a PSD review perspective.

When the EPA initially promulgated the federal PSD regulations, EPA deferred any rulemaking or guidance on the topic of PSD "permit modifications". The federal PSD regulations do not specifically address the administrative permitting process and procedures applicable to design or operational changes to a previously permitted PSD source and the corresponding revisions to the application and permit that would be required to satisfy the PSD permitting requirements for any such changes. Rather, such changes necessitating a PSD permit revision were initially handled on a case-by-case basis by the EPA Regions and/or delegated state/local permitting authorities. In July 1985, EPA published an initial guidance document entitled "PSD Permit Modifications: Policy Statement on Changes to a Source, a Permit

[11] 401 KAR 51:017 Section 1(4)(a)2.

[12] 401 KAR 51:001 Section 1(190)(b)

Application, or an Issued Permit and on Extensions to Construction Schedules" to offer a new and less cumbersome and more consistent route for sources dealing with PSD source changes and corresponding PSD permit revisions.[13] Subsequent to this initial PSD permit modification guidance document, the Clean Air Act (CAA) Amendments of 1990 also did not specifically address the process to modify an already issued PSD permit covering source design and operating changes. However, in June 1991, EPA released an updated draft guidance document entitled "Guidance Document for Prevention of Significant Deterioration Permit Modifications" which contained similar elements to the July 1985 PSD permit modification guidance but with more specific details about the types of PSD permit changes, classification and review of changes, policies on circumvention, ambient impact changes and BACT changes.[14]

The two primary factors considered in EPA's PSD Permit Modification guidance document are:

1. Magnitude of the proposed changes within a hierarchy of administrative, minor, significant and fundamental changes, where each type of change is defined as follows:
   a. *Administrative Change* – No increase in either emissions or ambient impacts and no fundamental change in either the source or one of the emission units at the source.
   b. *Minor Change* – Changes requiring revisions to permit applications or issued permits and a certain amount of additional review and analysis, but do not constitute either a fundamental or significant change. Emissions or ambient impacts may increase as a result of minor changes, but not above the SER or significant impact levels (SIL).
   c. *Significant Change* – Changes with emissions increases resulting from the change exceeding the SER for one or more regulated NSR pollutants, but which do not constitute a fundamental change.
   d. *Fundamental Change* – Changes to the size, type or location of source or emission unit that are so essential (regardless of the net emissions or ambient impact differences) that the changed source or emission unit is considered a new source/emission unit and thus triggers a totally new PSD permit review process.
2. Stage of source development with the key differentiation being "pre-operational source" versus PSD sources already in operation.
   a. *Pre-Operational Sources* – Changes to applications or permits for sources not yet in operation would generally prompt a re-analysis of the proposed project "as if the original application had been submitted in that form" (i.e., PSD re-analysis using the framework of the original PSD application for new/changed units).
   b. *PSD Sources Already in Operation* – Changes to sources with already issued PSD permits that are in operation are generally treated the same as applications to change any existing stationary source (i.e., applying the major modification definition to the new, modified and otherwise impacted units). However, if the change should reasonably have been part of the initial project rather than a separate project, the change should be evaluated as part of a "new total source impact" rather than as part of a separate permit action. In this instance of a change aggregated back to the original PSD permit action, the permit revision process otherwise applicable to pre-operational sources should be followed.

[13] EPA Memo from Darryl D. Tyler, Director Control Programs Development Division to EPA Regions I-X Air Division Directors, Revised Draft Policy on PSD Permit Modifications and Exemptions, July 5, 1985, available at Revised Draft Policy on Permit Modifications and Extensions

[14] EPA, Guidance Document for Prevention of Significant Deterioration Permit Modfications, Draft June 11, 1991.

In the context of this PSD permit modification framework, Novelis' casting expansion project as-built changes can reasonably be defined as minor changes at a PSD source already in operation which are substantially related to the original PSD permit action. Therefore, the next step of the PSD permit modification procedure is selecting the applicable "level of review" from among the following options:

1. *Amendment* – Administrative application or permit changes which result in no increase in either emissions or the ambient air quality impact of a PSD source. Nature and size of source cannot be altered to the extent of a fundamental change.
2. *Revision* – Review level required for the large majority of minor and significant changes at operating major stationary sources which do not qualify as major modifications or as fundamental changes. Revision review would focus on only that portion of the source immediately involved in the proposed change, rather than all of those units previously reviewed. Revisions are exempted from any new PSD requirements that were added between the time of the original permit issuance and the submission of the application covering the proposed changes as long as the source had commenced construction prior to the adoption of the new PSD requirement and had met its original PSD permit conditions. Finally, the applicant for a revision retains the PSD Increment rights afforded by the original application or permit.
3. *Major Modification* – Operating sources which propose changes that constitute a "major modification" (within the meaning of this term in the applicable PSD permitting program) would pursue PSD review in an analogous manner to a new source (see "New Permit" option below), but with the focus of the PSD review being only on the modification itself and not the entire existing source. Also, operational existing sources proposing changes which are related to and should have been covered in the original PSD permit action would need to pursue these changes as a revision. For sources not yet operating, changes which would otherwise qualify as major modifications would be treated as a Revision under Item 2 above.
4. *New Permit* – Three types of changes can require a separate new application for issuance of a new PSD permit: 1) changes affecting the fundamental nature of the source, 2) significant changes in the size of a permitted emission unit or source (e.g., increasing the output capacity of a source by 50% from the original PSD permit basis), and 3) change in the location of a stationary source with the new proposed location being considered no longer contiguous or adjacent to the original location/property.

The casting expansion project as-built changes covered in this permit action do not constitute a major modification as documented in the "As-Designed to As-Built Casting Expansion Project Potential Emissions Change" column of **Table 3-1**. In addition, the as-built changes do not comprise any of the fundamental changes to the casting expansion project scope that would require a new PSD permit. Finally, the as-built changes do involve nominal increases in regulated NSR pollutant emissions and associated ambient air quality impacts, so these as-built changes cannot be addressed solely via an administrative change to the PSD permit. Therefore, the as-built changes are best characterized as qualifying as a PSD permit revision.

Under EPA's "Guide to Processing PSD Permit Modifications" within the June 1991 PSD Permit Modification guidance document, a minor change requiring a permit revision at a source that has begun operation would not be subject to repeat or screening level PSD review process unless the change constituted a major modification. However, if the proposed changes should reasonably have been part of the initial project rather than a separate project, the changes at this type of operational source should be treated identically to changes that have not yet begun operation. As discussed in Sections 3.2.1 and 3.2.2, Novelis is willing to concede that the as-built changes covered in this permit action are aggregated with the as-designed PSD permit reconciliation permit action which was itself a significant revision to the original PSD permit action from November 2021. In this manner, Novelis considers Item 3.B. of EPA's Guide to Processing PSD Permit Modifications to be the most applicable scenario to the current as-built changes. This PSD permit modification approach requires the following PSD review elements and permitting procedures:

- Revise PSD permit to reflect changes,
- Screen review decisions from original PSD permit determination and repeat or add reviews as needed,
- Repeat public participation,
- Original increment is preserved,
- Additional increment allocations are based on the date that the proposed change was submitted,
- Source or emission unit as originally permitted can begin operation, but changed source or emission unit cannot construct until revised permit is issued,
    - Novelis has acknowledged the construction authorization and operational authority issues for the as-built changes to install new emergency engines at the casting facility with the submittal of the calendar year 2024 Title V ACC.
- Change is not subject to new PSD rules if construction on the original source or emission unit has commenced.

Although Novelis recognizes that EPA's PSD permit modification guidance was never issued as a final document or promulgated in an update to the federal PSD regulations, the framework contained in this document best represents EPA's perspectives and policies on how a PSD permit revision can be pursued for an operational source. Novelis' approach of completing all of the same PSD review elements for the new emergency engines addressed in this as-built significant permit revision that would have otherwise applied if they had been carried in the as-designed reconciliation application package represents the most robust and conservative application of EPA's potentially applicable guidance on the topic.

In addition, EPA's guidance clearly demonstrates how minor, post-operational changes which do not constitute a major modification should not be considered the basis for a "new permit" under the PSD program and should not be subject to any new PSD rules which may have become applicable since the latest issuance of the original PSD permit. Rather, EPA recommends adopting a "new total source impact" concept within the specific framework of the prior PSD permit determination for these minor, post-operational changes as opposed to conducting a new/fresh PSD review under the current day PSD rules. Novelis has adopted this PSD review approach to address the as-built installation of emergency engines at the casting project within the remainder of this Title V significant revision application report and the companion PSD modeling report in Volume 2.

3.5 401 KAR 51:017 & 52:020 – PSD and Title V Permitting Programs

Under the as-designed and as-built configurations of the casting expansion project, emissions increases of PM, PM_{10}, $PM_{2.5}$, NO_x, CO, VOC, and GHG exceed the PSD triggering thresholds, and thus, PSD permitting requirements for these pollutants are addressed in this application. Applicable PSD permitting requirements include the completion of a BACT analysis, which is presented in **Section 7**, and a PSD Air Quality Analysis and Additional Impacts Analysis, which are presented as a separate **Volume 2**. The Guthrie facility is an existing major source under the Title V operating permit program. Pursuant to 401 KAR 52:020, Section 3, a major source shall not construct, reconstruct, or modify without a permit or permit revision, except as provided for administrative revisions, minor revisions, off-permit changes, or 502(b)(10) changes. Because the as-built changes to the casting expansion project are subject PSD review for certain regulated NSR pollutants, the proposed project will require a "significant permit revision" in accordance with 401 KAR 52:020, Section 16. This application package provides information required under 401 KAR 52:020, Section 4 and 5 for this purpose. Completed DEP 7007 series application forms for the as-built configuration are provided in **Appendix D** of the application package.

Table 3-1. Proposed Project Potential Emissions Compared with PSD Significant Emission Rates

Pollutant	As-Designed Casting Expansion Project Potential Emissions (tpy)	PSD Significant Emission Rate [a] (tpy)	As-Designed Casting Expansion Project Triggers PSD Review? (Yes/No)	As-Built Casting Expansion Project Potential Emissions (tpy)	As-Designed to As-Built Casting Expansion Project Potential Emissions Change (tpy)	As-Designed to As-Built Casting Expansion Project Emissions Change Triggers PSD Review? (Yes/No)
PM	81.5	25	**Yes**	81.5	0.033	No
PM_{10}	107.0	15	**Yes**	107.0	0.033	No
$PM_{2.5}$	86.1	10	**Yes**	86.1	0.033	No
NO_x	199.8	40	**Yes**	200.9	1.07	No
CO	191.7	100	**Yes**	193.4	1.72	No
VOC	91.7	40	**Yes**	91.8	0.068	No
SO_2	0.76	40	**No**	0.77	3.32E-03	No
Lead	4.79E-03	0.6	**No**	4.80E-03	9.40E-06	No
GHG (as CO_2e)[b]	208,998	75,000	**Yes**	209,209	210.75	No

a. 401 KAR 51:001 Section 1(218)(a)
b. For a project that causes a 75,000 tpy increase in CO_2e emissions and an increase above the SER for a non-GHG pollutant, GHGs become subject to regulation and are treated as a regulated NSR pollutant with a PSD Significant Emission Rate of 0 tpy.

4. EMISSION GROUP 4 – EMERGENCY GENERATORS

4.1 Casting Project Emergency Generator Process Description

4.1.1 Emergency Generator Equipment Description

Novelis installed two new small natural gas-fired emergency back-up engines to support the new casting expansion project operations in the event of sudden power failure to the operations. One unit designated as the Cast Pit Sump Emergency Generator (proposed Title V ID EP 47) is equipped with a 132-bhp, natural gas-driven Generac SG080 engine and is intended to provide auxiliary power to the casting pit sump pump. The other unit designated as the Decoater Backup Emergency Generator is a 38-bhp, natural gas-driven Generac QT025A engine (proposed Title V ID EP 48) intended to provide auxiliary back-up emergency power to the rotary decoating kiln (Decoater; EU 029). These emergency engines would only be used for brief intermittent non-emergency purposes to conduct routine maintenance and readiness testing following manufacturer's recommended procedures.

4.1.2 Emergency Generator Stack Parameters

The Cast Pit Sump Emergency Generator is equipped with a vertical, unobstructed vent contained within the unit's enclosure which discharges the engine exhaust to the atmosphere located very close to and just outside the casting building wall. The Decoater Backup Emergency Generator is located fully within the casting facility's production building with no discharge to the atmosphere other than as fugitive releases from building roof vents and other openings.

4.1.3 Emergency Generator Air Emissions Quantification

Regulated air pollutant emissions are generated by emergency engines of the size and type reflected by Novelis' proposed Generac emergency engines from normal, natural gas combustion byproducts. Potential emissions of NO_x, CO, and VOC from both emergency engines have been calculated using emission factors from the manufacturer's emissions data sheet, as provided in the detailed emission calculations included in Sections 19 and 20 of **Appendix C**.[15] $PM/PM_{10}/PM_{2.5}$ and SO_2 emissions for the Generac natural gas-fired units are calculated using lean-burn emission factors from AP-42 Chapter 3.2, Table 3.2-2. Potential GHG emissions are calculated using emission factors from 40 CFR 98, Subpart C for natural gas combustion. Consistent with EPA guidance, the annual potential emission calculations for each new emergency engine are based on 500 hours of operation per year.[16]

4.2 Casting Project Emergency Generator Applicable Requirements Summary

An analysis of potentially applicable federal regulations under the New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAP) programs are included in the subsections below.

[15] To reflect the addition of the new sources covered in this as-built update to the casting expansion project PSD application, the original **Appendix C** section numbering from the final revised October 2023 as-designed reconciliation application has been retained, where the last section number used was Section 18 for Paved Haul Roads.

[16] Memorandum from John S. Seitz, Director Office of Air Quality Planning and Standards to Regional Air Division Directors, *Calculating Potential to Emit (PTE) for Emergency Generators*, September 6, 1995.

4.2.1 40 CFR 60, Subpart JJJJ – Stationary Spark Ignition (SI) Internal Combustion Engines (ICE)

Owners and operators of a stationary SI ICE that commenced construction after June 12, 2006, where the stationary SI ICE was manufactured as an emergency engine after January 1, 2009, are subject to 40 CFR 60, Subpart JJJJ pursuant to 40 CFR 60.4230(a)(4)(iv). Pursuant to 40 CFR 60.4233(e), the new 132-bhp SG080 natural gas-fired emergency engine shall comply with the Table 1 emission standards of 2 g/hp-hr for NO_x, 4 g/hp-hr for CO, and 1 g/hp-hr for VOC. Pursuant to 40 CFR 60.4233(d), the new 38-bhp QT025A natural gas-fired emergency engine shall comply with the Table 1 emission standards of 10 g/hp-hr for HC + NO_x and 387 g/hp-hr for CO. According to the manufacturer's emissions data sheet, the new emergency engines are well within the required emissions standards. The engine is also equipped with a non-resettable hour meter for tracking the amount of time spent in emergency and non-emergency operation. Finally, Novelis will operate and maintain the engine in accordance with the manufacturer's emissions related instructions contained in the owner's manuals for the engines.

4.2.1 40 CFR 63, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE)

Pursuant to 40 CFR 63.6590(c)(6), a new emergency RICE that commenced construction after June 12, 2006, meets the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ. No further requirements apply for such engines under 40 CFR 63, Subpart ZZZZ.

4.3 Casting Project Emergency Generator BACT Evaluation

The emergency generator engines are subject to emissions standards in NSPS Subpart JJJJ. This NSPS regulation requires the manufacturer to meet stringent emission limits for CO, NO_x, and VOC depending on engine size. NSPS Subpart JJJJ implements Section 111(b) of the CAA, and Section 111 of the CAA states that a standard of performance "means a standard which reflects the degree of emission limitation achievable though application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."[17] As such, the NSPS already incorporates the Best Demonstrated Technologies (BDT) identified by EPA for control of emissions from such sources. Furthermore, in the proposed rule preamble to 40 CFR 60, Subpart JJJJ, EPA indicates that add-on controls are not included as the part of the BDT and associated emission standards for stationary emergency SI engines when stating "aftertreatment has often been avoided because of factors such as high costs per ton of pollutant removed due to short periods of operation."[18] In the final rule preamble to 40 CFR 60, Subpart JJJJ, EPA further clarified that the "final emission standards for emergency engines below 130 HP are commensurate with the emission standards that are achievable for rich burn engines without aftertreatment and represent the maximum level of control that is attainable for small emergency engines without using aftertreatment."[19]

To support the supplemental air quality analysis in **Volume 2**, Novelis selected an alternate SI engine make/model with a Three-Way Catalyst (TWC) and Air/Fuel Ratio control system for the Cast Pit Sump Emergency Generator installation to meet the more stringent California South Coast Air Quality Management

[17] 71 FR 33814 (June 12, 2006).

[18] 71 FR 33817 (June 12, 2006).

[19] 73 FR 3581 (Janaury 18, 2008),

District (SCAQMD) requirements. Due to the limited annual operating time and the nature of operation for emergency engines, Novelis has determined that other add-on control technologies for the remaining emergency engines carried in this as-built application will not be technically feasible for control of any pollutants from these sources. For the purposes of meeting the intention of BACT, Novelis will be installing new engines that will conform to EPA's standards for manufacturers and for owners/operators. The engines will already be subject to and will comply with NSPS standards and associated emissions limits and work practice standards. Therefore, for the emergency engines, Novelis proposes to meet the standards already set forth in the federal NSPS rules and does not propose any new BACT limits or standards in association with these units. Regardless, to definitively demonstrate that no add-on controls are either technical feasible or cost effective for the removal of PSD triggering pollutants from the emergency generator engines, Novelis has prepared a full 5-step "top down" BACT analysis in **Section 7** which follows the general BACT analysis methodology described in Section 5 of the original November 2021 PSD application for the casting expansion project.

4.4 Casting Project Emergency Generator Air Quality Analysis

To address any possible changes in maximum off-site impacts attributable to the addition of the emergency generator engines with this as-built PSD permit update, Novelis has prepared a supplemental PSD air quality analysis that addresses the grouping of all as-built new sources and changed existing sources (refer to **Volume 2** of this Title V significant revision application).

4.5 Casting Project Emergency Generator Suggested Title V and KyEIS Database Changes

Novelis proposes that the casting project emergency generators be added to the KyEIS using the process rate and emissions data contained in Sections 19 and 20 of **Appendix C** and the DEP7007 N form contained in **Appendix D**. Novelis further proposes that the casting project emergency generators be added to the existing Emission Group 4 which addresses similar stationary emergency SI engines located at the legacy coil finishing operation that are subject to the same federal air regulations as the new emergency generators (page 16 of 147 in V-22-011 R1). The applicable regulations can be found on the DEP7007 V form in **Appendix D**.

5. EMISSION GROUP 5 – EMERGENCY FIRE PUMPS

5.1 Casting Project Fire Pump Process Description

5.1.1 Fire Pump Equipment Description

Novelis has installed two fire water system main water supply sources and pump stations at the casting expansion area of the Guthrie facility to support the existing fire water supply systems in use at the existing Finishing plant. These two dedicated, emergency fire pumps for the casting expansion area will provide water in the case of a fire, and each unit is equipped with a 327 hp John Deere diesel-fired engine that will power a Clarke fire pump (proposed Title V ID EP 49 and EP 50).

As the new emergency fire pumps are equipped with engines designated as new emergency compression ignition (CI) RICE less than 500HP that provide water in case of a fire under the applicable federal air regulations (i.e., 40 CFR 60 Subpart IIII and 40 CFR 63 Subpart ZZZZ), these engines should be added to Group 5 in Novelis' Title V permitting infrastructure.

5.1.2 Fire Pump Stack Parameters

Fire Pump Engine No. 3 and Fire Pump Engine No. 4, each, are equipped with a horizontal, unobstructed, oblique cylindrical vent which discharges the engine exhaust to the atmosphere located very close to and just outside the fire pump house wall where the engines are located.

5.1.3 Fire Pump Air Emissions Quantification

Regulated air pollutant emissions are generated by fire pump engines of the size and type reflected by Novelis' proposed fire water pump engines from normal, diesel fuel combustion byproducts. Potential emissions of NO_x, CO, $PM/PM_{10}/PM_{2.5}$ and VOC from both fire water pump engines have been calculated using emission factors from the manufacturer's emissions data sheet, as provided in the detailed emission calculations included in Section 21 of **Appendix C**.[20] SO_2 emissions for the diesel-fired unit are calculated using the equation in AP-42 Table 3.4-1 which is based on the sulfur content of diesel fuel. Potential GHG emissions are calculated using emission factors from 40 CFR 98, Subpart C for distillate fuel oil combustion. Consistent with EPA guidance, the annual potential emission calculations for each new fire pump engines are based on 500 hours of operation per year.[21]

5.2 Casting Project Fire Pump Applicable Requirements Summary

5.2.1 40 CFR 60, Subpart IIII – Stationary Compression Ignition (CI) Internal Combustion Engines (ICE)

Owners and operators that commenced construction after July 11, 2005, of a stationary CI ICE manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006,

[20] To reflect the addition of the new sources covered in this as-built update to the casting expansion project PSD application, the original **Appendix C** section numbering from the final revised October 2023 as-designed reconciliation application has been retained, where the last section number used was Section 18 for Paved Haul Roads.

[21] Memorandum from John S. Seitz, Director Office of Air Quality Planning and Standards to Regional Air Division Directors, *Calculating Potential to Emit (PTE) for Emergency Generators*, September 6, 1995.

are subject to 40 CFR 60 Subpart IIII pursuant to 40 CFR 60.4200(a)(2)(ii). Pursuant to 40 CFR 60.4205(c), the new fire pump engine with a displacement less than 30 liters per cylinder shall comply with the emission standards in Table 4 to the Subpart IIII. According to the manufacturer emissions data sheet the new fire pump engines are well within the required emission standards for Table 4. The engines are also equipped with a non-resettable hour meter for tracking the amount of time spent in emergency and non-emergency operation. Finally, Novelis will operate and maintain the engines in accordance with the manufacturer's emissions related instructions contained in the owner's manuals for the engines.

5.2.2 40 CFR 63, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE)

Pursuant to 40 CFR 63.6590(c)(6), a new emergency RICE with a rating less than or equal to 500 brake HP located at a major source of HAP emissions must meet 40 CFR 60, Subpart IIII requirements in order to meet the 40 CFR 63, Subpart ZZZZ requirements. No further requirements apply for such engines under 40 CFR 63, Subpart ZZZZ.

5.3 Casting Project Fire Pump BACT Evaluation

The fire pump engines are subject to 40 CFR 63, Subpart ZZZZ which requires compliance with 40 CFR 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. This subpart requires the manufacturer to meet stringent emission limits for PM, PM_{10}, $PM_{2.5}$, CO, NO_x, and VOC depending on engine size. 40 CFR 60, Subpart IIII implements Section 111(b) of the CAA and Section 111 of the CAA states that a standard of performance "means a standard which reflects the degree of emission limitation achievable though application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."[22] As such, the NSPS already incorporates the BDT identified by EPA for control of emissions from such sources. Further in the preamble to 40 CFR 60, Subpart IIII, EPA clearly states that use of add-on controls such as catalyzed diesel particulate filter (CDPF), oxidation catalyst and NO_x adsorber could not be justified as BDT due to the cost of the technology relative to the emission reduction that would be obtained.[23] The EPA, therefore, determined that the engine technologies developed by engine manufacturers to meet the Tier 2 and Tier 3 nonroad diesel engine standards, and those Tier 4 standards that do not require aftertreatment, are the BDT for 2007 model year and later emergency stationary CI ICE with a displacement of less than 10 liters per cylinder.[24]

[22] 70 FR 39872 (July 11, 2005).

[23] 70 FR 39874 (July 11, 2005).

[24] *Ibid.*

Due to the limited annual operating time and the nature of operation for emergency fire pump engines, Novelis has determined that add-on control technologies will not be technically feasible for control of any pollutants from these sources. For the purposes of meeting the intention of BACT, Novelis will be installing new fire pump engines that will conform to EPA's standards for manufacturers and for owners/operators. The fire pump engines will already be subject to and will comply with NSPS standards and associated emissions limits and work practice standards.

Therefore, for the fire pump emergency engines, Novelis proposes to meet the standards already set forth in the federal NSPS rules and does not propose any new BACT limits or standards in association with these units. Regardless, to definitively demonstrate that no add-on controls are either technical feasible or cost effective for the removal of PSD triggering pollutants from the fire pump engines, Novelis has prepared a full 5-step "top down" BACT analysis in **Section 7** which follows the general BACT analysis methodology described in Section 5 of the original November 2021 PSD application for the casting expansion project.

5.4 Casting Project Fire Pump Air Quality Analysis

To address any possible changes in maximum off-site impacts attributable to the addition of the emergency fire pump engines with this as-built PSD permit update, Novelis has prepared a supplemental PSD air quality analysis that addresses the grouping of all as-built new sources and changed existing sources (refer to **Volume 2** of this Title V significant revision application).

5.5 Casting Project Fire Pump Suggested Title V and KyEIS Database Changes

Novelis proposes that the casting project emergency fire pump engines be added to the KyEIS using the process rate and emissions data contained in Section 21 of **Appendix C** and the DEP7007 N form contained in **Appendix D**. Novelis further proposes that the casting project emergency fire pump engines be added to the existing Emission Group 5 which addresses similar stationary emergency CI engines located at the legacy coil finishing operation that are subject to the same federal air regulations as the new emergency fire pump engines (page 20 of 147 in V-22-011 R1). The applicable regulations can be found on the DEP7007 V form in **Appendix D**.

6. ANCILLARY UNIT CHANGES

Subsequent to the original as-built air permit reconciliation effort, Novelis also identified the following additional changes that affect ancillary units serving the casting expansion project. These minor changes solely impact the supplemental PSD air quality analysis provided in **Volume 2** of this Title V significant revision application.

6.1 Changes for Units Covered in Current Air Permit Basis

6.1.1 Ingot Saw Process Rate and Stack Configuration

The Ingot Saw (EU 045) was originally planned to be used on an intermittent basis to cut reject ingots into smaller pieces that will fit into the melting furnaces or to cut the head and tail ends off of cast ingot products before shipping to downstream rolling mills. In its as-built operating configuration, Novelis is currently relying on the Ingot Saw for more production-focused uses where certain batches of over-sized ingots require use of the Ingot Saw to create new smaller length ingots to meet customer ingot length specifications as well. With this more frequent production related use and actual operating experience for defining the minimum batch operating cycle times, Novelis has updated the maximum hourly process rate for the Ingot Saw to reflect processing 2.7 ingots/hr (22 minute minimum batch cycle time for single cut-to-length cycle for production ingots) giving a total hourly process rate of 72.3 ton/hr based on an updated maximum ingot weight of 26.5 ton/ingot.

As shown in Section 12 of **Appendix C**, this change in the Ingot Saw process rate does not change the maximum hourly and annual potential emission rate because the underlying PM/PM_{10}/$PM_{2.5}$ and VOC emission calculations rely on input variables to which the equipment is designed directly and are not a function of the ingot hourly processing rate (i.e., filtration unit flow capacity and PM emissions performance specification for PM/PM_{10}/$PM_{2.5}$ emissions and maximum lubricant application rate, respectively).

However, Novelis is requesting that the "Maximum Capacity (ton/hr)" description referenced for the Ingot Saw in the Emission Group 8 emission unit summary be changed from the prior as-designed basis (32.2 ton/hr) to the current as-built basis (72.3 ton/hr). This proposed change will ensure that actual monthly average hourly process rates used in the 401 KAR 59:010 process weight-based PM allowable emission rate calculations will not exceed the capacity listed in the Title V permit.

The Ingot Saw was originally represented in the as-designed modeling analysis as being equipped with a vertical, unobstructed stack. The as-built Ingot Saw stack configuration incorporates a stack cap for rain protection. This updated stack configuration for the Ingot Saw is reflected in the supplemental PSD air quality analysis provided in **Volume 2** of this Title V significant revision application.

6.1.2 DBF Preheater Stack Configuration

The DBF Preheater (EU 046b) was originally represented in the as-designed modeling analysis as being equipped with a vertical, unobstructed stack located directly adjacent to the southwest wall of the casting bay building. The as-built configuration of the DBF Preheater stack is a horizontal release associated with a rectangular "gooseneck" type discharge from an induced draft fan located further towards the center of the lower roof height, casting support building. The updated source location and stack parameters for the DBF Preheater are reflected in the supplemental PSD air quality analysis provided in **Volume 2** of this Title V significant revision application.

7. BACT EVALUATION

The updated project emissions increases for the Novelis Guthrie casting expansion project with the as-built changes included are presented in **Table 3-1** along with each pollutant's corresponding PSD SER. As shown in the project emission increases of NO_x, CO, VOC, PM, PM_{10}, and $PM_{2.5}$ exceed the SER for non-GHG regulated NSR pollutants and the "subject to regulation" threshold for GHG. Therefore, these pollutants are subject to BACT review. Consistent with the BACT analysis methodology discussed in Section 5 of the original November 2021 PSD permit application, the "top-down" BACT analysis for the casting expansion project emergency engines is organized by pollutant and is presented in the following sections of the application. BACT emission limitations have been proposed to address all operations for each emissions source considered in the analysis.

This Title V significant permit revision involves two new small natural gas-fired emergency generators and two new diesel-fired emergency fire pumps subject to BACT requirements. The emergency generator engines and emergency fire pump engines are intended to operate as critical backup systems when the primary power supply is not otherwise available or emergencies occur at the casting expansion plant. Each of these emergency units are intended to predominantly operate for emergency situations but also have the ability to operate for up to 100 hours per year for maintenance and readiness testing. The emergency generators and fire pumps will combust natural gas and diesel fuel, respectively, and have emissions of PM, PM_{10}, $PM_{2.5}$, CO, NO_x, VOC and GHGs.

Pursuant to 40 CFR 60.4233(d), the 38 bhp natural gas-fired engine on the Decoater Backup Emergency Generator is subject to the NSPS Subpart JJJJ Table 1 emissions standards for emergency stationary SI ICE with a maximum engine power between 25 and 130 hp. Similarly, the 132 bhp natural gas-fired engine on the Cast Pit Sump Emergency Generator is subject to the NSPS Subpart JJJJ Table 1 emissions standards for emergency stationary SI ICE with a maximum engine power greater than 130 hp in accordance with 40 CFR 60.4233(e). Pursuant to 40 CFR 60.4205(c), the 327 bhp diesel-fired engines on the Fire Pumps are subject to the NSPS Subpart IIII Table 4 emissions standards for Stationary Fire Pump Engines with a maximum engine power between 300 and 600 hp and a model year after 2009. The Fire Pump Engines are also required to burn ultra-low sulfur diesel (ULSD) fuel that meets the requirements of 40 CFR 1090.305 for nonroad diesel fuel, including standards for sulfur content.

BACT must reflect emission rates less than or equal to any applicable NSPS or NESHAP emission standards for the source under review. In any case where NSPS or NESHAP emission limits for certain pollutants will apply to proposed equipment and effectively set the floor for BACT for these units, the Step 5 BACT selection process must identify these applicable NSPS or NESHAP standards and must note how they were considered in setting the proposed BACT limit. For the purposes of meeting the intention of BACT, Novelis will be installing new engines that will conform to EPA's standards for manufacturers and for owners/operators. The engines will already be subject to and will comply with NSPS standards and associated emissions limits and work practice standards. Therefore, for the emergency engines, Novelis proposes to meet the standards already set forth in the federal NSPS rules and does not propose any new BACT limits or standards in association with these units. **Table 7-1** below outlines the proposed BACT limits for the emergency engines, where the NO_X and CO BACT limits for the natural gas-fired engines and PM, NO_X and CO BACT limits for the diesel engines are set equal to the applicable NSPS standards.

Table 7-1. BACT Limits for Emergency Engines

Source	$PM/PM_{10}/PM_{2.5}$ (g/hp-hr)	NO_x (g/hp-hr)	CO (g/hp-hr)	VOC (g/hp-hr)	CO_2e (lb/[Units])
132-bhp Cast Pit Sump Emergency Generator[a]	N/A	2	4	1	119,439
38-bhp Decoater Backup Emergency Generator	N/A	10 (as NO_X+HC)	387	N/A	119,439
327-bhp Emergency Fire Pump #3	0.15	3 (as NMHC +NO_X)	2.6	N/A	22,657
327-hp Emergency Fire Pump #4	0.15	3 (as NMHC +NO_X)	2.6	N/A	22,657

a. Conservatively relying on the bhp rating from the emissions data sheet (132 bhp) rather than the value listed in the specification sheet (128 bhp). The NSPS Subject JJJJ Table 1 emissions standards vary based on the engine bhp less than 130 bhp or greater than or equal to 130 bhp.

To definitively demonstrate that no add-on controls are either technically feasible or cost effective for the removal of PSD triggering pollutants from the emergency engines, Novelis has prepared a full 5-step "top down" BACT analysis in the pollutant-specific **Sections 7.1 through 7.4** presented for the casting project emergency engines.

The Reasonably Available Control Technology (RACT)/BACT/Lowest Achievable Emission Reduction (LAER) Clearinghouse (RBLC) database is used to identify potential control options available for reducing emissions of PSD triggering pollutants from the source under review. The natural gas-fired engine-specific RBLC search for this analysis was based on RBLC Process Code 17.230 for "Small Internal Combustion Engines (<500 hp)" burning "Natural Gas (includes propane & liquified petroleum gas)" as fuel with a permit issuance date after 1/1/2015 (i.e., most recent 10 years). Natural gas-fired engine BACT limit listings from the RBLC output with an identifiable maximum power were screened to include any only those units with engine power of less than 171.6 hp (i.e., +30% higher than the largest natural gas-fired engine size for the casting project of 132 bhp). The diesel-fired engine specific RBLC search for this analysis was based on RBLC Process Code 17.210 for "Small Internal Combustion Engines (<500 hp)" burning "Fuel Oil (ASTM # 1, 2, includes kerosene, aviation, diesel fuel)" as fuel with a permit issuance date after 1/1/2015. Diesel-fired engine BACT limit listings from the RBLC output with an identifiable maximum power were screened to include only those units with ± 30% of the casting project's Fire Pump Engine's rating (228.9 to 425.1 hp from 327 bhp rating of Fire Pump Engines). The control method descriptions, numerical BACT limits, and other work practice standards noted in the screened RBLC outputs were considered in each of the pollutant-specific BACT sections presented below.

7.1 NO_X BACT Evaluation

7.1.1 BACT Step 1 – Identify All NO_X Control Technologies

7.1.1.1 Background on Pollutant Formation

The three predominant forms of NO_x formation are thermal NO_x, prompt NO_x and fuel NO_x.

Thermal and fuel NO_x account for the majority of the NO_x formed in diesel- and NG-fired engines; however, the relative contribution of each depends on the combustion process and fuel characteristics. Diesel and NG contain negligible fuel nitrogen; therefore, the majority of the NO_x in these engines is thermal NO_x. The major factors that influence thermal NO_x formation are temperature, concentrations of oxygen and nitrogen, and residence time. If the temperature or the concentration of oxygen or nitrogen can be reduced, thermal NO_x formation can be suppressed or quenched. Prompt NO_x, however, is formed rapidly. Thus, it is not possible to quench prompt NO_x formation as it is for thermal NO_x formation. However, the contribution of prompt NO_x to the total NO_x emissions of a system is rarely large.[25]

7.1.1.2 Available NO_X Control Technologies for Emergency Engines

Based on information obtained from EPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential NO_x controls for the emergency engines includes:

- Purchase of certified NSPS JJJJ and IIII engines;
- Good combustion and operating practices (GCOP);
- Limitations on hours of operation;
- Selective Catalytic Reduction (SCR); and
- TWC with Air/Fuel Ratio control system (SI only).

7.1.1.2.1 Selective Catalytic Reduction (SCR)

SCR is a post-combustion gas treatment process in which ammonia (NH_3) is injected into the exhaust gas upstream of a catalyst bed. On the catalyst surface, ammonia and NO_x react to form elemental nitrogen and water. The primary chemical reactions can be expressed as follows:

$$4\ NH_3 + 4\ NO + O_2 \rightarrow 4\ N_2 + 6\ H_2O$$
$$4\ NH_3 + 2\ NO_2 + 2\ O_2 \rightarrow 3\ N_2 + 6\ H_2O$$

The reaction can result in NO_x removal efficiencies up to 90% for compression ignition engines[26] and for lean-burn spark ignition engines.[27] As the concentration of NO_x in the exhaust gas varies, the ammonia flow must vary to maintain the optimal NH_3/NO_x ratio. To prevent an ammonia slip, new SCR systems have advanced control systems to add precisely the correct amount of ammonia.

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[25] *Alternative Control Technologies Document NO_X Emissions from Utility Boilers*, March 1994, https://www3.epa.gov/ttn/catc/dir1/utboiler.pdf.

[26] *EPA, Alternative Control Techniques Document: Stationary Diesel Engines*, March 2010, https://www.epa.gov/sites/production/files/2014-02/documents/3_2010_diesel_eng_alternativecontrol.pdf

[27] *EPA, Alternative Control Techniques Document – NOx Emissions from Stationary Reciprocating Internal Combustion Engines*, July 1993, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=2000IJLJ.txt

7.1.1.3 Three-way Catalyst (TWC) with Air/Fuel Ratio Control System

A TWC is used in stoichiometric engines (where the air-to-fuel ratio is close to ideal) to remove NO_X, CO, and VOC. The air-to-fuel ratio controller uses a closed-loop system with an oxygen sensor to regulate the air-to-fuel ratio to ensure the catalyst can effectively oxidize CO and VOC while reducing NO_X to nitrogen. To support the supplemental air quality analysis in **Volume 2**, Novelis selected the engine with a TWC and Air/Fuel Ratio control system to meet the more stringent California SCAQMD requirements for the Cast Pit Sump Emergency Generator engine. This separate low-emissions option commonly involving application of TWC with air-to-fuel ratio controllers is available on some of the larger Generac gaseous-fueled generator sets to comply with the more stringent SCAQMD requirements that are recognized in certain areas in California. These SCAQMD-specific SI generator sets are also EPA Certified. However, at the very low emergency generator power output capacity (25 kW) of the Decoater Backup Emergency Generator, SCAQMD certification does not require installation of TWC and air-to-fuel ratio controllers, and thus, Generac does not provide a commercial offering with a lower emissions profiles for emergency generators in this very small size range. Therefore, Novelis does not consider TWC and air-to-fuel ratio control systems to be an available control option for the 38 hp SI engine installed on the 25 kW Decoater Backup Emergency Generator.

7.1.2 BACT Step 2 – Eliminate Technically Infeasible NO_X Control Options

All of the potential control technologies discussed in Step 1 are technically feasible.

7.1.3 BACT Step 3 – Rank Remaining NO_X Control Options by Effectiveness

All of the Step 1 control technologies that are considered available and technically feasible for the emergency generators and fire pumps and are ranked in order of control efficiency in **Table 7-2**.

Table 7-2. Remaining Control Technologies Ranked by Effectiveness for NO_X

Emission Unit	Control Technology	Control Efficiency
Cast Pit Sump Emergency Generator	TWC	Up to 90%
All Emergency Generators and Fire Pumps	SCR	90%
	GCOP	Undefined

7.1.4 BACT Step 4 – Evaluate Most Effective NO_X Controls and Document Results

Due to the relatively low NO_x emissions associated with applying the emergency unit permit basis of 500 hours per year of operation to the casting project's emergency engines, post combustion controls such as an SCR are not cost effective for reducing NO_X emissions from either the natural gas-fired SI ICE or diesel-fired CI ICE. As shown in Table E-1 of **Appendix E**, Novelis has prepared an annualized control cost analysis for installing SCR on each of the natural gas-fired emergency generators (132 bhp Cast Pit Sump Emergency Generator engine and 38 hp Decoater Backup Emergency Generator engine) using cost data

from EPA technical support documents and Regional Haze Four-Factor Analyses.[28] [29] As shown in Table E-2 of **Appendix E**, Novelis has prepared a similar annualized control cost analysis for installing SCR on each of the 327 bhp diesel-fired Emergency Fire Pumps #3 and #4 using cost data from an EPA Alternative Control Techniques (ACT) document for stationary diesel engines. The resulting cost effectiveness values presented in **Table 7-3** demonstrates that applying SCR to control NO_X emissions from the casting project's emergency engines is not cost effective.[30]

Table 7-3. Annualized Cost for NO_X Controls

Emission Unit (Appendix E Tables E-1 & E-2)	**Control Technology**	**Cost Effectiveness per Unit** ($/ton of NO_X removed – 2025 dollars)
132-bhp Cast Pit Sump Emergency Generator (Table E-1)	TWC	N/A – Base Case/Already Included
	SCR	$4,326,696
	GCOP	Undefined
38-bhp Decoater Backup Emergency Generator (Table E-1)	SCR	$996,377
	GCOP	Undefined
327-hp Emergency Fire Pump #3/#4 (Table E-2)	SCR	$48,077
	GCOP	Undefined

7.1.5 BACT Step 5 – Select NO_X BACT Limitations

Good combustion practices and limiting the operating hours for the emergency engines is proposed as BACT. Proposed BACT limits will be set to the emission limits required by NSPS JJJJ and IIII which are obtained through proper operation and maintenance of an EPA certified engine. A summary of the emission limits is shown in **Table 7-1**.

NO_X BACT limits from comparable SI ICE presented in Table F-1.1 of **Appendix F** range from 11 g/hp-hr to as high as 18 g/hp-hr. As shown in Sections 19 and 20 of **Appendix C**, the manufacturer supplied NO_X emission factors for the Cast Pit Sump Emergency Generator and Decoater Backup Emergency Generator (0.17 g/hp-hr and 1.77 g/hp-hr, respectively) fall below the RBLC search range demonstrating that these NSPS Subpart JJJJ certified engines will achieve lower NO_X emissions performance to other recently permitted engines with a similar rated capacity.

[28] EPA Office of Air Quality Planning and Standards (OAQPS), Final Technical Support Document (TSD) for the Cross-State Air Pollution Rule for the 2008 Ozone NAAQS, Docket ID No. EPA-HQ-OAR-2015-0500, Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance Final TSD, August 2016, Appendix A at pg. 5-11 to 5-12, available at https://www.epa.gov/sites/default/files/2017-05/documents/final_assessment_of_non-egu_nox_emission_controls_cost_of_controls_and_time_for_compliance_final_tsd.pdf

[29] Oil and Gas Sector Reasonable Progress Four-Factor Analysis of Controls for Five Source Categories: Natural Gas-Fired Engines…Prepared for National Parks Conservation Association by Vicki Stamper & Megan Williams March 5, 2020, Docket ID. EPA-R04-OAR-2023-0220-0115, Attachment 16.

[30] *EPA, Alternative Control Techniques Document: Stationary Diesel Engines*, March 2010, https://www.epa.gov/sites/production/files/2014-02/documents/3_2010_diesel_eng_alternativecontrol.pdf

NO_X BACT limits for comparable CI ICE represented in Table F-2.1 of **Appendix F** range from 0.3 to 14 g/hp-hr with 35 of the 54 total RBLC search listings carrying a NO_X BACT limit between 2.6 and 3.0 g/hp-hr (i.e., effectively equivalent to the NSPS Subpart IIII NHMC+NO_X emissions standard). The three RBLC entries with NO_X BACT limits below 2.6 g/hp-hr (RBLC ID AK-0088 with 0.45 g/hp-hr NO_X limit, LA-0379 with 0.30 g/hp-hr NO_X limit, and TX-0846 with 0.30 g/hp-hr NO_X limit) appear to represent Tier 4 certified engines which are not equivalent to the Tier 3 certified Emergency Fire Pump #3 and #4 engines installed at the Novelis Guthrie site. This Tier 4 certification for nonroad engines is not required for emergency CI ICE and achieving NO_X emissions at this low level would require "aftertreatment devices" which are not considered cost effective. Therefore, selection of a Tier 4 certified engine is not required to meet NO_X BACT requirements for a diesel-fired emergency engine at the size range applicable to the casting project's fire pump engines as demonstrated by the majority of all recent RBLC entries carrying the ~3.0 g/hp-hr NO_X limit equivalent to the NSPS Subpart IIII emission standard and consistent with a Tier 3 certified engine status.

7.2 CO/VOC BACT Evaluation

7.2.1 BACT Step 1 – Identify CO/VOC All Control Technologies

7.2.1.1 Background on Pollutant Formation

CO and VOC emissions are byproducts of incomplete combustion. Conditions leading to incomplete combustion include insufficient oxygen, poor fuel/air mixing, reduced combustion temperature, reduced combustion gas residence time, tramp oil contamination, and load reduction. CO/VOC reduction can be accomplished by two general methodologies: combustion control techniques and post-combustion control methods.

7.2.1.2 Available CO/VOC Control Technologies for Emergency Engines

Based on information obtained from EPA's RBLC database, recently submitted permit applications, and air pollution control guidance documents, a list of potential CO and VOC controls for the emergency engines includes:

- Purchase of certified NSPS JJJJ and IIII engines;
- Good combustion practices;
- Limitations on hours of operation;
- Catalytic Oxidation (CatOx), TWC and Diesel Oxidation Catalysts (DOC); and
- Catalyzed diesel particulate filters (CDPF) for diesel engines.

7.2.1.2.1 Catalytic Oxidation (CatOx), TWC and Diesel Oxidation Catalysts (DOC)

Catalytic Oxidation (CatOx) units operate as exhaust gas passes through a catalyst bed, which facilitates an overall combustion reaction between the oxygen in the gas stream and the gaseous pollutant (CO/VOC). The catalyst is typically a porous noble metal material. The catalytic oxidation process for CO control is very temperature sensitive; exhaust temperatures that are too high may damage the catalyst, while exhaust temperatures that are too low will reduce destruction efficiency. CO destruction efficiency for a CatOx is dependent upon exhaust composition and CO concentrations, operating temperature, oxygen concentration, catalyst characteristics, and space velocity (the volumetric flow rate of gas entering the catalyst bed chamber divided by the volume of the catalyst bed). VOC removal efficiencies up to 99% may be achieved

with a CatOx unit (depending on the system requirements and exhaust stream concentrations).[31] The range of CatOx control efficiency for CO emissions from incomplete combustion of natural gas and diesel occurring in Novelis affected units may not be as high as for VOC because the CO molecule is generally more difficult to destroy through combustion/oxidation than most of the common organic compounds comprising VOC emissions.[32]

As described in **Section 7.1.1.3**, a TWC for an SI engine is similar to CatOx except an Air/Fuel Ratio Control system is used to maintain the stochiometric ratio such that CO and VOC are destructed while converting NO_X to nitrogen.

Diesel Oxidation Catalyst (DOC) units are a commonly used "flow through" control device for stationary diesel engines which contains a honeycomb-like structure or substrate with a large surface area that is coated with an active catalyst layer reduces emissions of CO and VOC. CO, gaseous hydrocarbons and liquid hydrocarbon particles (unburned fuel and oil) in the exhaust gas are oxidized to CO_2 and H_2O. The reduction of CO and VOC varies depending on the catalyst formulations in the DOC.[33]

7.2.1.2.2 Catalyzed Diesel Particulate Filters (CDPF)

CDPF devices are passive control technology for diesel combustion units that incorporate a catalyst upstream of the filter or coated onto the filter substrate. The catalyst promotes the oxidation of CO and hydrocarbon particles to form CO_2 and H_2O. CDPF units can reduce CO and hydrocarbon emissions by 90%, but requires sufficient exhaust temperatures to facilitate regeneration by the catalyst.[34]

7.2.2 BACT Step 2 – Eliminate Technically Infeasible CO/VOC Control Options

All of the potential control technologies discussed in Step 1 are technically feasible.

7.2.3 BACT Step 3 – Rank Remaining CO/VOC Control Options by Effectiveness

All of the Step 1 control technologies that remain available and technically feasible for the emergency engines are ranked in order of control efficiency in **Table 7-4**.

Table 7-4. Remaining Control Technologies Ranked by Effectiveness for CO and VOC

Emission Unit	Control Technology	CO Control Efficiency	VOC Control Efficiency
Emergency Engines	CatOx/TWC/DOC	Up to 90%	Up to 90%
	CDPF	90%	90%

[31] *EPA, Air Pollution Control Technology Fact Sheet – Catalytic Incinerator*, EPA-452/F-03-018.

[32] *STAPPA-ALAPCO-EPA, Emissions Inventory Improvement Program, Volume II – Point Sources, Chapter 12: How to Incorporate the Effects of Air Pollution Control Device Efficiencies and Malfunctions into Emissions Inventory Estimates, Table 12.3-7 Control Efficiencies (%) for CO by Source Category and Control Device Type*, July 2000, available at https://www.epa.gov/sites/default/files/2015-08/documents/ii12.pdf

[33] *EPA Final Report, Alternative Control Techniques Document: Stationary Diesel Engines*, March 5, 2010.

[34] *EPA, Alternative Control Techniques Document: Stationary Diesel Engines*, March 2010, https://www.epa.gov/sites/production/files/2014-02/documents/3_2010_diesel_eng_alternativecontrol.pdf

7.2.4 BACT Step 4 – Evaluate Most Effective CO/VOC Controls and Document Results

Due to the relatively low CO and VOC emissions associated with applying the emergency unit permit basis of 500 hours per year of operation to the casting project's emergency engines, post combustion controls such as DOC and CDPF are not cost effective. As shown in Table E-3 of **Appendix E**, Novelis has prepared an annualized control cost analysis for installing CatOx on the natural gas-fired 38 hp Decoater Backup Emergency Generator engine using cost data from an EPA sponsored technical memo used in the Regulatory Impact Analysis (RIA) for Existing Stationary Spark Ignition (SI) RICE NESHAP.[35] [36] As shown in Table E-4 of **Appendix E**, Novelis has prepared a similar annualized control cost analysis for installing DOC on each of the 327 bhp diesel-fired Emergency Fire Pumps #3 and #4 using cost data from an EPA ACT document for stationary diesel engines.[37] Finally, Novelis has prepared an annualized control cost analysis for installing CDPF on each of the 327 bhp diesel-fired Emergency Fire Pumps #3 and #4 using the same cost data from EPA's ACT used for the DOC cost analysis (refer to Table E-5 of **Appendix E**).

The resulting cost effectiveness values presented in **Table 7-5** demonstrates that applying CatOx, DOC, and CDPF to control CO and VOC emissions from the casting project's emergency engines is not cost effective. Although the CatOx annualized control cost values for reducing CO emissions from the emergency generator SI ICE fall into a range that may be considered cost effective in other contexts for different source-pollutant combinations, this annualized control cost should not be considered cost effective for CO emissions formed as a byproduct of natural gas combustion in an emergency engine with annual potential CO emissions that would be considered "otherwise insignificant" [i.e., below the Title V insignificant activity emissions threshold of 5 tpy for a non-HAP regulated pollutant at 401 KAR 52:020 Section 6(1)(a)2.]. Generally, the cost effectiveness thresholds for CO are considerably lower than for other criteria pollutants because CO is not considered as harmful to human health as other criteria pollutants as indicated by the very high magnitude of the CO NAAQS relative to other pollutants. Regulatory authorities commonly consider this lower human health risk concern for CO emissions when making judgments about what level of annualized costs an applicant should have to bear for reducing CO emissions from a source undergoing BACT review. Based on this precedent and the site-specific/unit-specific circumstances of this case-by-case BACT review, Novelis can conclude the CatOx annualized control costs for reducing CO emissions from the small natural gas-fired casting project emergency generator engines are not cost effective.

Table 7-5. Annualized Cost for CO/VOC Controls

Emission Unit (Appendix E Tables E-3 to E-5)	**Control Technology**	**Cost Effectiveness per Unit** ($/ton of CO removed – 2025 dollars)	**Cost Effectiveness per Unit** ($/ton of VOC removed – 2025 dollars)
132-bhp Cast Pit Sump Emergency	CDPF	N/A	N/A
	CatOx/TWC	N/A – Base Case/TWC Already Included	

[35] RTI International for EPA OAQPS, Regulatory Impact Analysis (RIA) for Existing Stationary Spark Ignition RICE NESHAP, EPA 452/R-10-010, August 2010, available at https://www.epa.gov/stationary-engines/regulatory-impact-analysis-neshap-reciprocating-internal-combustion-engines

[36] Memorandum from Bradley Nelson, EC/R, Inc. to Melanie King, EPA OAQPS/SPPD/ESG, SUBJECT: Control Costs for Existing Stationary SI RICE, June 29, 2010, available at https://www.epa.gov/sites/default/files/2014-02/documents/5_2011_ctrlcostmemo_exist_si.pdf

[37] *EPA, Alternative Control Techniques Document: Stationary Diesel Engines*, March 2010, https://www.epa.gov/sites/production/files/2014-02/documents/3_2010_diesel_eng_alternativecontrol.pdf

Emission Unit (Appendix E Tables E-3 to E-5)	**Control Technology**	**Cost Effectiveness per Unit** ($/ton of CO removed – 2025 dollars)	**Cost Effectiveness per Unit** ($/ton of VOC removed – 2025 dollars)
Generator (Table E-3)		N/A	
	GCOP	Undefined	Undefined
38-bhp Decoater Backup Emergency Generator (Table E-3)	CDPF	N/A	N/A
	CatOx	$4,032	$176,543
	GCOP	Undefined	Undefined
327-hp Emergency Fire Pump #3/#4 (Tables E-4 & E-5)	CDPF	$66,323	$1,184,332
	DOC	$26,667	$480,007
	GCOP	Undefined	Undefined

7.2.5 BACT Step 5 – Select CO/VOC BACT Limitations

7.2.5.1 BACT Selection for CO and VOC for Emergency Engines

Good combustion practices and limiting the operating hours for the emergency engines is proposed as BACT. Proposed BACT limits will be set to the emission limits required by NSPS Subpart JJJJ and IIII which are obtained through proper operation and maintenance of an EPA certified engine. A summary of these emission limits are shown in **Table 7-1.**

CO BACT limits for comparable SI ICE presented in Table F-1.2 of **Appendix F** range from 1.2 to 387 g/hp-hr with no specific add-on controls noted in the Control Method Description field. This wide disparity of CO BACT limits for small SI ICE in the RBLC output is indicative of NSPS Subpart JJJJ certified engines having a wide range of CO emissions performance supplied by the manufacturer's emissions data sheet all while still complying with the relevant emission standard. Novelis considers this profile of recent CO BACT determinations to be supportive of the CO BACT determination for the small casting project natural gas-fired emergency generator engines.

CO BACT limits for comparable CI ICE presented in Table F-2.2 of **Appendix F** range from 0.5 to 3.7 g/hp-hr with all but 5 of the 57 total RBLC search listings carrying CO BACT limits at or above the applicable NSPS Subpart IIII emissions standard for fire pump engines of 2.6 g/hp-hr. None of the RBLC entries with more stringent CO BACT limits (RBLC IDs LA-0401, WI-0302, NJ-0084, PA-0309, and IN-0234) than the NSPS Subpart IIII emissions standard are designated as being equipped with add-on control devices for CO emissions. In addition, the manufacturer's supplied emissions data sheet for Emergency Fire Pump #3/#4 carries a CO emission factor (0.67 g/hp-hr) which falls below the CO BACT limits for all but one of the RBLC search listing (RBLC ID WI-0302). The CO BACT limit for the WPL- Riverside Energy Diesel Fired Pump Engine (P04) (RBLC ID WI-0302) equates to 0.51 g/hp-hr for the 290 hp diesel-fired engine with reference to good combustion practices as the only control option implemented. The very small difference in CO BACT limits between this lowest limit in the RBLC search listing and Novelis' fire pump engines is attributable to minor differences in engine design and combustion controls and not an indication of superior CO emissions reductions/mitigation. Therefore, Novelis considers the RBLC search for CO BACT limits from comparable CI ICE to be supportive of the CO BACT determination for the Emergency Fire Pumps #3 and #4.

VOC BACT limits for comparable SI ICE presented in Table F-1.3 of **Appendix F** range from 1.2 to 1.4 g/hp-hr. As shown in Sections 19 and 20 of **Appendix C**, the VOC emission factors obtained from the manufacturer's emissions data sheets for the NSPS Subpart JJJJ certified casting project emergency

generator engines are either lower than the RBLC search listings (0.11 g/hp-hr VOC emission factor for the Cast Pit Sump Emergency Generator) or are in the same general range as the RBLC search listings (1.60 g/hp-hr VOC emission factor for the Decoater Backup Emergency Generator). No add-on control devices for VOC emissions reductions are noted in the RBLC search results, so any minor difference in VOC BACT limits is attributable to differences in engine design and combustion controls. Overall, the RBLC search results for VOC BACT limits associated with comparable SI ICE lends support to Novelis' VOC BACT determination for the casting project emergency generator engines.

VOC BACT limits for comparable CI ICE presented in Table F-2.3 of **Appendix F** range from 0.05 to 3.0 g/hp-hr. As shown in Section 21 of **Appendix C**, the VOC emission factors obtained from the manufacturer's emissions data sheets for the NSPS Subpart IIII certified casting project emergency fire pump engines are lower than the RBLC search listings (0.04 g/hp-hr VOC emission factor for the Emergency Fire Pumps #3 and #4). Therefore, Novelis considers the RBLC search for VOC BACT limits from comparable CI ICE to be supportive of the VOC BACT determination for the Emergency Fire Pumps #3 and #4.

7.3 $PM/PM_{10}/PM_{2.5}$ BACT Evaluation

7.3.1 BACT Step 1 – Identify All PM Control Technologies

7.3.1.1 Background on Pollutant Formation

PM emissions from SI ICE form as byproducts of incomplete natural combustion in a similar manner to CO and VOC emissions. Refer to **Section 7.2.1.1**. for additional details on the engine operating factors which can promote complete combustion and associated PM emissions mitigation.

7.3.1.2 Available PM/PM10/PM2.5 Control Technologies for Emergency Generators and Fire Pumps

Particulate emissions are best controlled by utilizing fuels with low sulfur and ash content, using good combustion practices, and complying with the requirements of NSPS Subparts JJJJ and IIII. Particulate emissions from the engines are low to begin with, making add-on controls impractical.

Based on information obtained from EPA's RBLC database, recently submitted permits applications, and air pollution control guidance documents, a list of potential $PM/PM_{10}/PM_{2.5}$ controls for the emergency engines includes:

- Clean burning fuel;
- Good combustion practices;
- Limitations on hours of operation; and
- Catalyzed diesel particulate filters (CDPF) for diesel-fired engines.

7.3.2 BACT Step 2 – Eliminate Technically Infeasible PM Control Options

All of the potential control technologies discussed in Step 1 are technically feasible.

7.3.3 BACT Step 3 – Rank Remaining PM Control Options by Effectiveness

Particulate filters provide the most effective means for reducing PM emissions from CI ICE with a control efficiency of up to 94 percent depending on the size of the engine.[38] Usage of clean burning fuels is the next most effective control option for reducing PM emissions.

7.3.4 BACT Step 4 – Evaluate Most Effective PM Controls and Document Results

Due to the relatively low PM emissions associated with applying the emergency unit permit basis of 500 hours per year of operation to the casting project's diesel-fired emergency engines, post combustion controls such as a CDPF are not cost effective. As shown in Table E-5 of **Appendix E**, Novelis has prepared an annualized control cost analysis for installing CDPF on each of the 327 bhp diesel-fired Emergency Fire Pumps #3 and #4 using cost data from an EPA ACT document for stationary diesel engines.[39] The resulting cost effectiveness values presented in **Table 7-6** demonstrates that applying CDPF to control PM emissions from the casting project's emergency fire pump engines is not cost effective. Even though catalyzed particulate filters are commonly used on diesel engines, Novelis assumes that a similar filtration technology could also be installed on the natural gas-fired emergency generator engines with an even higher annualized control cost and a lower PM removal effectiveness due to the lower PM emissions levels from natural-gas fired engines as compared to diesel-fired engines. Therefore, filtration-based, add-on PM emissions controls for all of the casting project's emergency engines are not cost effective.

Table 7-6. Annualized Cost for PM Controls

Emission Unit (Appendix E Table E-5)	**CDPF Cost Effectiveness per Unit** ($/ton PM removed – 2025 dollars)[40]
327-hp Emergency Fire Pump #3/#4	$530,581

7.3.5 BACT Step 5 – Select PM BACT Limitations

Good combustion practices and limiting the operating hours for emergency engines is proposed as BACT for PM emissions. For the diesel-fired emergency fired pump engines, the proposed PM BACT limits will be set to the emission limits required by NSPS Subpart IIII which are obtained through proper operation and maintenance of an EPA certified engine. A summary of these emission limits is shown in **Table 7-1**. To comply with the proposed PM filterable BACT limits for the emergency fire pump engines, Novelis has purchased engines certified by the manufacturers to meet these emissions levels and will use ULSD. Operation of the engines for the purposes of maintenance checks and readiness testing will be limited to 100 hours per year (per engine) and the total annual hours of operation including emergency use will be limited to 500 hours per year (per engine).

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[38] Memo from Ms, Tanya Parise, Alpha Gamma Technologies, Inc. to Mr. Sims Roy, U.S. EPA OAQPS ESD Combustion Group. *Cost per Ton for NSPS for Stationary CI ICE*. June 9, 2005.

[39] *EPA, Alternative Control Techniques Document: Stationary Diesel Engines*, March 2010, https://www.epa.gov/sites/production/files/2014-02/documents/3_2010_diesel_eng_alternativecontrol.pdf

[40] EPA Final Report, *Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010.*

For the natural gas-fired emergency generator engines, PM emissions are considered negligible and not included as a regulated pollutant in NSPS Subpart JJJJ emission standards. Good combustion practices-based work practice standards are commonly implemented in place of formal BACT emission limits for certified emergency engines under NSPS Subpart JJJJ.

PM BACT limits for comparable SI ICE are presented in Table F-1.4 of **Appendix F**. The AP-42 Table 3.2-2 PM emission factor (9.99E03 lb PM/MMBtu equivalent to 0.04 g/hp-hr) used to define potential emissions from the natural gas-fired emergency generator engine falls below the PM emissions level associated with the limited set of RBLC search listings (0.73 g/hp-hr for RBLC ID LA-0389). Therefore, the PM emissions performance of the casting project's natural gas-fired emergency generator engines appears to be better than comparable SI ICE in the RBLC.

PM BACT limits for comparable CI ICE presented in Table F-2.4 of **Appendix F** range from 0.01 to 15 g/hp-hr with 91 of the 129 total RBLC search listings carrying PM BACT limits comparable to the NSPS Subpart IIII emission standard (0.15 g/hp-hr) in the range of 0.1 to 0.2 g/hp-hr. The only RBLC entries with PM BACT limits significantly below the applicable NSPS Subpart IIII emission standard (RBLC ID AK-0088 with a PM BACT limit of 0.022 g/hp-hr and TX-0846 with a PM BACT limit of 0.015 g/hp-hr) appear to represent Tier 4 certified engines which are not equivalent to the Tier 3 certified Emergency Fire Pump #3 and #4 engines installed at the Novelis Guthrie site. This Tier 4 certification for nonroad engines is not required for emergency SI ICE and achieving PM emissions at this low level would require "aftertreatment devices" which are not considered cost effective. Therefore, selection of a Tier 4 certified engine is not required to meet PM BACT requirements for a diesel-fired emergency engine at the size range applicable to the casting project's fire pump engines as demonstrated by the majority of all recent RBLC entries carrying the ~0.1-0.2 g/hp-hr PM limit range which is roughly equivalent to the NSPS Subpart IIII emission standard and consistent with a Tier 3 certified engine status.

7.4 GHG BACT Evaluation

GHG emissions from the emergency engines result from the oxidation of fuel carbon. This evaluation does not identify and discuss each of the five individual steps of the "top-down" BACT process as there are no post-combustion control technologies identified or available for GHG emissions from small emergency engines. The proposed BACT for GHG emissions from the emergency engines is to follow good combustion practices, the use of natural gas and diesel, limiting hours of operation and proper operation and maintenance consistent with NSPS Subpart JJJJ and IIII. Numerical GHG BACT limits consistent with the fuel selection for emergency engines are presented in **Table 7-1** to ensure the fuel type for each engine is adequately enforceable as a condition of the revised Title V permit.

APPENDIX A. EMISSION UNIT INDEX

1. Novelis Guthrie Casting Project - Emission Unit Index

The following table provides an index of emission units that are referenced in the emission calculations and on air permit application forms. Plant Location references "C" for casting area.

Plant Location	Plant Area	Air Permit Source ID	Process ID	Emission Unit Description	Process Description	Control Device ID	Control Device Description	Plant Stack ID	Stack Description
C	01. Scrap Processing	026	1	Scrap Processing Line #1	Aluminum Production	CBH1	Cold Baghouse #1	S1	Cold Baghouse #1 Stack
C	01. Scrap Processing	026	2	Scrap Processing Line #1	Aluminum Production Uncaptured	na	na	na	Scrap Processing Line #1
C	02. Melting and Casting	029	1	Decoater	Aluminum Production	HBH1	Hot Baghouse #1	S4	Hot Baghouse #1 Stack
C	02. Melting and Casting	029	2	Decoater	Natural Gas Usage	HBH1	Hot Baghouse #1	S4	Hot Baghouse #1 Stack
C	02. Melting and Casting	029	3	Decoater	Aluminum Production Uncaptured	na	na	na	Decoater
C	02. Melting and Casting	030	1	Sidewell Melting Furnace #1	Aluminum Production	HBH2	Hot Baghouse #2	S5	Hot Baghouse #2 Stack
C	02. Melting and Casting	030	2	Sidewell Melting Furnace #1	Natural Gas Usage	HBH2	Hot Baghouse #2	S5	Hot Baghouse #2 Stack
C	02. Melting and Casting	030	3	Sidewell Melting Furnace #1	Aluminum Production Uncaptured	na	na	na	Sidewell Melting Furnace #1
C	02. Melting and Casting	031	1	Sidewell Melting Furnace #2	Aluminum Production	HBH2	Hot Baghouse #2	S5	Hot Baghouse #2 Stack
C	02. Melting and Casting	031	2	Sidewell Melting Furnace #2	Natural Gas Usage	HBH2	Hot Baghouse #2	S5	Hot Baghouse #2 Stack
C	02. Melting and Casting	031	3	Sidewell Melting Furnace #2	Aluminum Production Uncaptured	na	na	na	Sidewell Melting Furnace #2
C	02. Melting and Casting	032	1	Novelis Dual Chamber (NDC) Recycle Furnace	Aluminum Production	HBH3	Hot Baghouse #3	S6	Hot Baghouse #3 Stack
C	02. Melting and Casting	032	2	Novelis Dual Chamber (NDC) Recycle Furnace	Natural Gas Usage	HBH3	Hot Baghouse #3	S6	Hot Baghouse #3 Stack
C	02. Melting and Casting	032	3	Novelis Dual Chamber (NDC) Recycle Furnace	Aluminum Production Uncaptured	na	na	na	Novelis Dual Chamber (NDC) Recycle Furnace
C	02. Melting and Casting	033	1	Front-Load Tilting Melting Furnace	Aluminum Production	HBH3	Hot Baghouse #3	S6	Hot Baghouse #3 Stack
C	02. Melting and Casting	033	2	Front-Load Tilting Melting Furnace	Natural Gas Usage	HBH3	Hot Baghouse #3	S6	Hot Baghouse #3 Stack
C	02. Melting and Casting	033	3	Front-Load Tilting Melting Furnace	Aluminum Production Uncaptured	na	na	na	Front-Load Tilting Melting Furnace
C	02. Melting and Casting	034	1	Holding Furnace #1	Aluminum Production	HBH4	Hot Baghouse #4	S7	Hot Baghouse #4 Stack
C	02. Melting and Casting	034	2	Holding Furnace #1	Natural Gas Usage	HBH4	Hot Baghouse #4	S7	Hot Baghouse #4 Stack
C	02. Melting and Casting	034	3	Holding Furnace #1	Aluminum Production Uncaptured	na	na	na	Holding Furnace #1
C	02. Melting and Casting	036	1	In-Line Degasser	Aluminum Production	HBH4	Hot Baghouse #4	S7	Hot Baghouse #4 Stack
C	02. Melting and Casting	036	2	In-Line Degasser	Aluminum Production Uncaptured	na	na	na	In-Line Degasser
C	02. Melting and Casting	037	1	Sow Dryer	Natural Gas Usage	na	na	S8	Sow Dryer Stack
C	02. Melting and Casting	038	1	Dross House	Dross Processed	DHBH	Dross House Baghouse	S3	Dross House Baghouse Stack
C	02. Melting and Casting	038	2	Dross House	Dross Processed Uncaptured	na	na	na	Dross House
C	02. Melting and Casting	039	1	Dross Press #1	Dross Processed	HBH2 / HBH3	Hot Baghouse #2 and/or #3	na	Dross Press #1
C	02. Melting and Casting	040	1	Dross Press #2	Dross Processed	HBH2 / HBH3	Hot Baghouse #2 and/or #3	na	Dross Press #2
C	02. Melting and Casting	045	1	Ingot Saw	Aluminum Production	na	na	S14	Ingot Saw
C	02. Melting and Casting	046a	1	Casting Process Emission Sources - CFF Preheater	Natural Gas Usage	na	na	na	Casting Process Emission Sources - CFF Preheater
C	02. Melting and Casting	046b	1	Casting Process Emission Sources - DBF Preheater	Natural Gas Usage	na	na	S15	Casting Process Emission Sources - DBF Preheater
C	03. Auxiliary Systems	041a	1	Building Heating Systems - Direct Fired	Natural Gas Usage	na	na	na	Heating System Vent
C	03. Auxiliary Systems	041b	1	Building Heating Systems - Indirect-Fired <= 1 MMBtu/hr	Natural Gas Usage	na	na	na	Heating System Vent
C	03. Auxiliary Systems	042	1	Hot Baghouses Lime Silos (3)	Lime Processed	na	na	S9	Hot Baghouses Lime Silo Integral Filter Vents #1-#3
C	03. Auxiliary Systems	043	1	Cooling Tower #1	Circulating Water	na	na	S10-S13	Cooling Tower #1 Cells 1-4 Stacks
C	03. Auxiliary Systems	044	1	Diesel Fuel Storage and Refueling Station	Diesel Usage - Standing Losses	na	na	na	Diesel Fuel Storage and Refueling Station
C	03. Auxiliary Systems	044	2	Diesel Fuel Storage and Refueling Station	Diesel Usage - Working Losses	na	na	na	Diesel Fuel Storage and Refueling Station
C	03. Auxiliary Systems	044	3	Diesel Fuel Storage and Refueling Station	Diesel Usage - Loading Losses	na	na	na	Diesel Fuel Storage and Refueling Station
C	03. Auxiliary Systems	020	1	Paved Haul Roads	Vehicle Miles Traveled	SW	Periodic Sweeping	na	Paved Haul Roads

1. Novelis Guthrie Casting Project - Emission Unit Index

The following table provides an index of emission units that are referenced in the emission calculations and on air permit application forms. Plant Location references "C" for casting area.

Plant Location	Plant Area	Air Permit Source ID	Process ID	Emission Unit Description	Process Description	Control Device ID	Control Device Description	Plant Stack ID	Stack Description
C	03. Auxiliary Systems	047	1	Cast Pit Sump Emergency Generator	Natural Gas Combustion	na	na	S16	Cast Pit Sump Emergency Generator
C	03. Auxiliary Systems	048	1	Decoater Backup Emergency Generator	Natural Gas Combustion	na	na	S17	Decoater Backup Emergency Generator
C	03. Auxiliary Systems	049	1	Emergency Fire Pump #3	Diesel Fuel Usage	na	na	S18	Emergency Fire Pump #3
C	03. Auxiliary Systems	050	1	Emergency Fire Pump #4	Diesel Fuel Usage	na	na	S19	Emergency Fire Pump #4
C	03. Auxiliary Systems	IA-15	1	Molten Metal Utility Heaters	Natural Gas Combustion	na	na	na	Molten Metal Utility Heaters

APPENDIX B. PROCESS FLOW DIAGRAM

EP: S1
Cold BH #1
Open Market Scrap
Post Industrial Auto. Scrap
Runaround Scrap
Pre-Shredder/ Debaler
Hammer Mill Shredder
Magnet Separator
Air Knife
Eddy Current Separator
Scrap Processing Line #1
EP: S3
DH Baghouse
Hot Dross from Melting and Holding Furnaces
Dross House
Dross Shipments
EP: S18
Emergency Fire Pump #3
Pumped Water for Fire Suppression
Diesel
EP: S19
Emergency Fire Pump #4
Pumped Water for Fire Suppression
Diesel
Shredded Aluminum Scrap
Shredded Scrap Storage Bunker
Manual Shred Feed to Weigh Hopper/ Feeder
Weigh Hopper/ Feeder
EP: S4
Hot BH #1
Cyclone Fines Blown to Baghouse
Fines Material to Waste
Decoater
Decoater Afterburner
EP: S17
Decoater Backup Generator
Power to Decoater
Natural Gas
Natural Gas
EP: S5
Hot BH #2
Runaround Scrap from Charging Machine
Post Industrial Auto. Scrap and/or Open Market Scrap from Charging Machine
Charging Chamber Door Hood
Dry Hearth Charging Chamber
Cold Air Burner
Natural Gas
Furnace Flue Hearth
Natural Gas
Sidewell Furnace #1
Regen Burners
Regen Burners
Main Hearth Door Hood
Hot Dross to Dross House
Decoated Aluminum Scrap
Molten Aluminum Circulation
Main Hearth
Vortex Bowl
Stirring Well
Charge Well
Solid Reactive Flux from Continuous Feeder
Sidewell Hood
Runaround Scrap
Post Industrial Auto. Scrap
Hot Dross to Dross House
Side Door Hood
Molten Flow
Enclosed Sidewell
Solid Reactive Flux from Continuous Feeder
Stirring Well
Vortex Bowl
Molten Flow
Molten Flow
Regen Burners
Runaround Scrap
Post Industrial Auto. Scrap
Sidewell Hood
Open Sidewell
Dual Chamber Furnace (NDC)
Charge Well
Main Hearth
Regen Burners
EP: S6
Hot BH #3
Side Skim Hood
Main Hearth Door Hood
Hot Dross to Dross House
Runaround Scrap
Post Industrial Auto. Scrap
Decoated Aluminum Scrap
Sidewell Hood
Stirring Well
Charge Well
Vortex Bowl
Solid Reactive Flux from Continuous Feeder
Molten Aluminum Circulation
Main Hearth
Runaround Scrap/Prime via Charge Transfer Car
Hot Dross to Dross House
Door Hood
Front-Load Tilting Melting Furnace
Natural Gas
Regen Burners
Sidewell Furnace #2
Regen Burners
Main Hearth Door Hood
Hot Dross to Dross House
Natural Gas
Furnace Flue Hearth
Natural Gas
EP: S7
Hot BH #4
Hearth Door Hood
Holding Furnace #1
Exhaust Flow to Holding Furnace in Casting Mode
Hot Dross to Dross House
Cold Air Burners
Flux Door
Cold Air Burners
Flux Door Hood
Natural Gas
Natural Gas
Solid Reactive Flux from Rotary Flux Injector
In-Line Degasser
Ceramic Foam Filter (CFF)
Deep Bed Filter (DBF)
Cast Bay
Hot Dross to Dross House
Ingots Shipped Off Site
EP: S16
Cast Pit Sump Emergency Generator
Power to Cast Pit Sump
Natural Gas
Flow Legend
Fuel Input
Process Flow
Molten Aluminum Flow
Exhaust Gas Flow
Exit Stack
ADITYA BIRLA
NOVELIS
Novelis Corporation
Guthrie, Kentucky
Casting Project Overview
Trinity Consultants
April 2025

APPENDIX C. SUPPORTING EMISSIONS DOCUMENTATION

1. Project Emissions Summary

Table 1-1 tallies the project emission increases from the proposed casting expansion covered by this permit application. For new emission units, values are the future potential emissions, taking into account inherent operating limitations and control device configurations.

Project Emissions Increases for Regulated NSR Pollutants

		PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	Lead (tpy)	GHG (tpy, CO_2e)	Max. Ind. HAP (HCl) (tpy)	Total HAPs (tpy)
026	Scrap Processing Line #1	24.47	12.48	3.67	--	--	--	--	--	--	--	0.16
029	Decoater	8.00	24.34	23.02	39.41	44.53	23.74	0.079	3.40E-03	53,041	74.12	82.05
030	Sidewell Melting Furnace #1	4.98	11.45	9.68	28.18	28.10	14.73	0.10	2.46E-04	19,490	7.56	8.05
031	Sidewell Melting Furnace #2	4.98	11.45	9.68	28.18	28.10	14.73	0.10	2.46E-04	19,490	7.56	8.05
032	Novelis Dual Chamber (NDC) Recycle Furnace	8.22	14.98	12.05	45.59	33.78	17.08	0.12	3.73E-04	46,913	8.72	13.91
033	Front-Load Tilting Melting Furnace	2.24	8.86	8.72	32.22	26.70	10.29	0.17	1.45E-04	33,851	0.58	1.13
034	Holding Furnace #1	6.69	8.18	7.73	8.21	11.04	5.80	0.079	2.85E-04	15,387	6.63	6.98
036	In-Line Degasser	1.84	0.98	0.36	--	--	--	--	--	--	8.84	8.84
037	Sow Dryer	0.13	0.24	0.24	7.66	10.36	0.39	0.042	3.50E-05	8,206	--	0.13
038	Dross House	12.74	11.98	9.94	--	--	--	--	--	--	--	--
039	Dross Press #1	0.11	0.11	0.088	--	--	--	--	--	--	--	--
040	Dross Press #2	0.11	0.11	0.088	--	--	--	--	--	--	--	--
041a 041b	Building Heating Systems - Direct Fired Building Heating Systems - Indirect-Fired <= 1 MMBtu/hr	0.17	0.31	0.31	8.97	7.54	0.49	0.054	4.49E-05	10,507	--	0.17
042	Hot Baghouses Lime Silos (3)	6.92E-03	6.92E-03	6.92E-03	--	--	--	--	--	--	--	--
043	Cooling Tower #1	0.11	0.049	2.46E-04	--	--	--	--	--	--	--	--
044	Diesel Fuel Storage and Refueling Station	--	--	--	--	--	2.11E-03	--	--	--	--	--
045	Ingot Saw	0.10	0.10	0.10	--	--	4.35	--	--	--	4.83E-04	7.73E-04
046a 046b	Casting Process Emission Sources - CFF Preheater Casting Process Emission Sources - DBF Preheater	0.034	0.063	0.063	1.37	1.52	0.10	0.011	9.02E-06	2,113	--	0.034
020	Paved Roads	6.52	1.30	0.32	--	--	--	--	--	--	--	--
047	Cast Pit Sump Emergency Generator	2.71E-03	2.71E-03	2.71E-03	0.012	0.012	8.00E-03	1.59E-04	1.33E-07	31.74	--	0.020
048	Decoater Backup Emergency Generator	9.68E-04	9.68E-04	9.68E-04	0.037	1.47	0.034	5.70E-05	4.75E-08	11.35	--	7.00E-03
049	Emergency Fire Pump #3	0.015	0.015	0.015	0.51	0.12	0.013	1.55E-03	4.61E-06	83.83	--	4.02E-03
050	Emergency Fire Pump #4	0.015	0.015	0.015	0.51	0.12	0.013	1.55E-03	4.61E-06	83.83	--	4.02E-03
As-Built Total Project Emissions Increase		81.5	107.0	86.1	200.9	193.4	91.8	0.77	4.80E-03	209,209	114.0	129.53
As-Designed Total Project Emissions Increase		81.5	107.0	86.1	199.8	191.7	91.7	0.76	4.79E-03	208,998	114.0	129.50
% Change		0.04%	0.03%	0.04%	0.5%	0.9%	0.1%	0.4%	0.2%	0.1%	0.0%	0.0%
PSD Major Source Threshold		100								--	--	--
PSD Significant Emission Rate (SER)		25	15	10	40	100	40	40	0.6	75,000	--	--
Casting Project Triggers PSD Review?		Y	Y	Y	Y	Y	Y	N	N	Y	--	--

12. Ingot Saw

> One Ingot Saw will be installed in the melting and casting area. The melting and casting area ingot saw will be used on a routine basis to cut the head/tail ends off of cast ingot products before shipping to downstream rolling mills to meet customer ingot length specifications and on a intermittent basis to cut reject ingots into smaller pieces that will fit into the melting furnaces . The operation of the Ingot Saw will generate aluminum fines (i.e., saw dust), which will be collected by an integral saw process cyclone and discharged into a hopper. Exhaust air from the cyclone will vent to a dedicated filtration unit that discharge exhaust through a dedicated stack penetrating the casting building roof. Chips generated by the saws will be transferred to a chip press/briquetting unit, which will convert the chips to consistently sized briquettes. There are no emissions associated with the briquetting process.

Emission Unit ID:	045-1
Emission Unit Description:	Ingot Saw

12.1 Ingot Saw Process Rates: Metal Throughput

Melting and Casting Ingot Saw Maximum Hourly Ingot Processing Rate:	2.7	ingot/hr
Melting and Casting Maximum Ingot Weight:	26.5	ton/ingot
Maximum Hourly Ingot Processing Rate for Melting and Casting Ingot Saw Process:	72.3	ton/hr
Maximum Annual Ingot Processing Rate for Melting and Casting Ingot Saw Process:	633,109	ton/yr

12.2 Documentation of Emission Factors Used for Ingot Saw

> Filterable PM/PM10/PM2.5 emissions for the filtration unit dedicated to the product collection cyclone on the ingot saw are calculated from the flow capacity of the saw chip collection system and the filter's PM emissions performance specification.

> Condensable PM emissions are excluded due to the process temperature. Therefore, filterable PM emissions are equivalent to total PM emissions.

12.2.1 Filterable Particulate Emission Factor

Parameter	Value		Basis
PM/PM10/PM2.5 Emission Factor			
Filterable PM Emissions Performance Specification for Filtration Units	2	mg/m3	Design specification for filtration unit
Filtration Unit Flow Capacity	5,000	m3/hr	Design specification for filtration unit
Filt. PM/PM10/PM2.5 Emission Factor for Melting and Casting Ingot Saw	3.05E-04	lb/ton	= 2 mg/m3 / 1,000 mg/g / 453.59 g/lb x 5000 m3/hr / 72.3 ton ingot/hr

12.2.2 VOC Emission Factor

Parameter	Value		Basis
Hourly Average Lubricant Application Rate	0.99	lb lubricant/hr	Design basis of saw lubricant application system
Lubricant Application Rate - Production Basis for Melting and Casting Area Saw	0.014	lb/ton	= 0.99 lb. lubricant applied / hr / 72.3 ton ingot processed / hr
VOC Emission Factor	0.014	lb/ton	Conservatively assumes 100% VOC loss rate of amount of Ingot Saw lubricant applied

12.3 Potential Emission Calculations for Ingot Saw

12.3.1 Criteria Pollutant Potential Emission Calculations for Ingot Saw

Pollutant	Emission Factor (lb/ton)	Emission Factor Basis	Maximum Hourly Process Rate (ton/hr)	Maximum Annual Process Rate (ton/yr)	Potential Emission Rate (lb/hr)	Potential Emission Rate (tpy)
PM	3.05E-04	Engineering Estimate	72.3	633,109	0.022	0.10
PM10	3.05E-04	Engineering Estimate	72.3	633,109	0.022	0.10
PM2.5	3.05E-04	Engineering Estimate	72.3	633,109	0.022	0.10
VOC	0.014	Engineering Estimate	72.3	633,109	0.99	4.35

12.3.2 HAP Potential Emission Calculations for Ingot Saw

Toxic Air Pollutant	Hazardous Air Pollutant? (Y/N)	Worst-case Percentage of Particulate Matter Emissions[1] (wt.%)	Potential Emission Rate (lb/hr)	Potential Emission Rate (ton/yr)
Manganese (Mn)	Y	0.50%	1.10E-04	4.83E-04
Chromium (Cr)	Y	0.30%	6.61E-05	2.90E-04
Vanadium (V)	Y	0.20%	4.41E-05	1.93E-04
Total HAPs (Sum of Mn, Cr)	Y	0.80%	1.76E-04	7.73E-04

[1] Novelis has conservatively assumed all PM emitted from the Melting & Casting Ingot Saw is in the form of aluminum alloy fines as opposed to the other forms of PM that are likely to comprise the PM emissions profile of the ingot saw (e.g., lubricant particles, dirt, rust, grit, etc.). To determine the worst-case content of each trace metal regulated as a HAP within the aluminum alloys processed by the ingot saw, Novelis compiled specification data for all aluminum alloys planned to be processed by the ingot saw. The maximum individual trace metal content for each alloy was compiled into a data table, and the maximum overall content for the specific trace metal was used as a worst-case approximation for the amount of the trace metal that could be found in the PM emissions from the ingot saw. This selective approach produces a worst-case emissions profile of HAP emissions which could never be achieved in practice on an annual basis because Novelis would never process a single alloy on a continuous basis through the ingot saw.

19. Emissions Associated with Generac SG080 Generator Engine - Cast Pit Sump

19.1 Generator Power and Fuel Consumption Data

> Pertinent data on engine power and fuel usage taken from the technical data sheet and statement of exhaust for the Generac SG080 generator.

Engine Output in hp (100% load, standby):	132.0	bhp
Generator Output in kW (100% load, standby):	80.0	kW
Fuel Consumption Rate in scf/hr (100% load, standby):	1,063.0	scf/hr
Annual Operating Hours:	500	hrs
Heat Content of Natural Gas (HHV):	1,020	Btu/scf

19.2 Source Classification Code

> Emissions are tied to the SCC code for natural gas fueled engines listed below.

SCC:	20200202
SCC Description:	Internal Combustion Engines, Industrial (2-02), Natural Gas (2-02-002), Reciprocating (2-02-002-02)
SCC Units:	Million Cubic Feet Natural Gas Burned

19.3 Rich/Lean Burn Engine Determination

> Emissions for natural gas/propane-fired engines are directly linked to the air-to-fuel ratio and as such, emission factors in AP-42 are delineated into separate tables for rich and lean burn engines. The air-to-fuel ratio is calculated below to determine which of these emission factor sets are more appropriate.

	Value	Units	Basis
Combustion Air in cfh:	10,680	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	1,063.0	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	18.17	--	= (10,680 cfh * 0.076 lb/cf) / (1063.0 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.50	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio:	1.25	--	= (18.17 / 14.50)

> According to 40 CFR 60.4248, rich-burn engines are defined as any four-stroke spark ignited engine where the operating air/fuel ratio divided by the stoichiometric air/fuel ratio at full load conditions is less than or equal to 1.1. Lean-burn engines are defined as any two-stroke or four-stroke spark ignited engine that does not meet the definition of a rich burn engine. Therefore, the engine integral to this generator set is classified as a lean-burn engine when combusting natural gas fuel and the emission factors for AP-42 Table 3.2-2 apply.

19.4 Emission Calculation Methodology and Emission Factors

> Emission factors are from the manufacturer emissions data sheet as well as AP-42 Section 3.2 (10/2024) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines. Conservatively over-estimating VOC emissions by assuming THC is equal to VOC and conservatively over-estimating PM by assuming PM is equal to PM10/PM2.5.

19.4.1 NOX

Emission factor for NOX:	0.17	g/bhp-hr	Manufacturer Emissions Data Sheet
NOX emission factor in terms of SCC units:	46.54	lb/MMscf	= 0.17 g/bhp-hr * 0.0022046 lb/g * 132.0 bhp / 1,063 scf/hr * 1E06

19.4.2 CO

Emission factor for CO:	0.16	g/bhp-hr	Manufacturer Emissions Data Sheet
CO emission factor in terms of SCC units:	43.80	lb/MMscf	= 0.16 g/bhp-hr * 0.0022046 lb/g * 132.0 bhp / 1,063 scf/hr * 1E06

19.4.3 VOC

Emission factor for VOC:	0.11	g/bhp-hr	Manufacturer Emissions Data Sheet (as THC)
VOC emission factor in terms of SCC units:	30.11	lb/MMscf	= 0.11 g/bhp-hr * 0.0022046 lb/g * 132.0 bhp / 1,063 scf/hr * 1E06

19.4.4 PM/PM10/PM2.5

Emission factor for PM:	9.99E-03	lb/MMBtu	AP-42 Table 3.2-2, 10/2024
PM emission factor in terms of SCC units:	10.19	lb/MMscf	= 9.99E-03 lb/MMBtu * 1,020 Btu/scf

19.4.5 SO2

Emission factor for SO2:	5.88E-04	lb/MMBtu	AP-42 Table 3.2-2, 10/2024
SO2 emission factor in terms of SCC units:	0.60	lb/MMscf	= 5.88E-04 lb/MMBtu * 1,020 Btu/scf

19.4.6 HAP Emission Estimates

> The ammonia emission factor is from South Coast Air Quality Management District (SCAQMD) *Reporting Procedures for AB2588 Facilities for Reporting Their Quadrennial Air Toxics Emissions Inventory* from 12/2016, the lead emission factor is from AP-42 Section 1.4 Table 1.4-2, and all other HAP emission factors are from AP-42 Section 3.2 (10/2024) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines.

	CAS #	HAP?	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMscf)	Emission Factor Basis
Formaldehyde	50-00-0	Y	0.053	53.86	AP-42 Table 3.2-2, 07/2000
Ammonia	7664-41-7	N	0.018	18	SCAQMD Document, 12/2016
Lead	7439-92-1	Y	4.90E-07	5.00E-04	AP-42 Table 1.4-2
1,1,2,2-Tetrachloroethane	79-34-5	Y	4.00E-05	0.041	AP-42 Table 3.2-2, 07/2000
1,1,2-Trichloroethane	79-00-5	Y	3.18E-05	0.032	AP-42 Table 3.2-2, 07/2000
1,3-Butadiene	106-99-0	Y	2.67E-04	0.27	AP-42 Table 3.2-2, 07/2000
1,3-Dichloropropene	542-75-6	Y	2.64E-05	0.027	AP-42 Table 3.2-2, 07/2000
2-Methylnaphthalene	91-57-6	Y	3.32E-05	0.034	AP-42 Table 3.2-2, 07/2000
2,2,4-Trimethylpentane	540-84-1	Y	2.50E-04	0.26	AP-42 Table 3.2-2, 07/2000
Acenaphthene	83-32-9	Y	1.25E-06	1.28E-03	AP-42 Table 3.2-2, 07/2000
Acenaphthylene	208-96-8	Y	5.53E-06	5.64E-03	AP-42 Table 3.2-2, 07/2000
Acetaldehyde	75-07-0	Y	8.36E-03	8.53	AP-42 Table 3.2-2, 07/2000
Acrolein	107-02-8	Y	5.14E-03	5.24	AP-42 Table 3.2-2, 07/2000
Benzene	71-43-2	Y	4.40E-04	0.45	AP-42 Table 3.2-2, 07/2000
Benzo(b)fluoranthene	205-99-2	Y	1.66E-07	1.69E-04	AP-42 Table 3.2-2, 07/2000
Benzo(e)pyrene	50-32-8	Y	4.15E-07	4.23E-04	AP-42 Table 3.2-2, 07/2000
Benzo(g,h,i)perylene	191-24-2	Y	4.14E-07	4.22E-04	AP-42 Table 3.2-2, 07/2000
Biphenyl	92-52-4	Y	2.12E-04	0.22	AP-42 Table 3.2-2, 07/2000
Carbon Tetrachloride	56-23-5	Y	3.67E-05	0.037	AP-42 Table 3.2-2, 07/2000
Chlorobenzene	108-90-7	Y	3.04E-05	0.031	AP-42 Table 3.2-2, 07/2000
Chloroform	67-66-3	Y	2.85E-05	0.029	AP-42 Table 3.2-2, 07/2000
Chrysene	218-01-9	Y	6.93E-07	7.07E-04	AP-42 Table 3.2-2, 07/2000
Ethylbenzene	100-41-4	Y	3.97E-05	0.040	AP-42 Table 3.2-2, 07/2000
Ethylene Dibromide	106-93-4	Y	4.43E-05	0.045	AP-42 Table 3.2-2, 07/2000
Fluoranthene	206-44-0	Y	1.11E-06	1.13E-03	AP-42 Table 3.2-2, 07/2000
Fluorene	86-73-7	Y	5.67E-06	5.78E-03	AP-42 Table 3.2-2, 07/2000
Methanol	67-56-1	Y	2.50E-03	2.55	AP-42 Table 3.2-2, 07/2000
Methylene Chloride	75-09-2	Y	2.00E-05	0.020	AP-42 Table 3.2-2, 07/2000
n-Hexane	110-54-3	Y	1.11E-03	1.13	AP-42 Table 3.2-2, 07/2000
Naphthalene	91-20-3	Y	7.44E-05	0.076	AP-42 Table 3.2-2, 07/2000
PAH	na	Y	2.69E-05	0.027	AP-42 Table 3.2-2, 07/2000
Phenanthrene	85-01-8	Y	1.04E-05	0.011	AP-42 Table 3.2-2, 07/2000
Phenol	108-95-2	Y	2.40E-05	0.024	AP-42 Table 3.2-2, 07/2000
Pyrene	129-00-0	Y	1.36E-06	1.39E-03	AP-42 Table 3.2-2, 07/2000
Styrene	100-42-5	Y	2.36E-05	0.024	AP-42 Table 3.2-2, 07/2000
Toluene	108-88-3	Y	4.08E-04	0.42	AP-42 Table 3.2-2, 07/2000
Vinyl Chloride	75-01-4	Y	1.49E-05	0.015	AP-42 Table 3.2-2, 07/2000
Xylene	1330-20-7	Y	1.84E-04	0.19	AP-42 Table 3.2-2, 07/2000
Total HAP				73.64	Sum of individual HAP

19.4.7 GHG Emission Factors

> CO2, CH4 and N2O emissions for natural gas combustion are estimated using the natural gas emission factors published in 40 CFR 98, Subpart C, Table C-1 and C-2.

Global Warming Potentials of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	28
N2O	265

CO2 Emission Factor	53.06	kg CO2/MMBtu	40 CFR 98, Subpart C, Table C-1; Natural Gas (weighted U.S. average)
CH4 Emission Factor	1.0E-03	kg CH4/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas
N2O Emission Factor	1.0E-04	kg N2O/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas

Pollutant	Emission Factor (kg/MMBtu)	Equivalent Factor (lb/MMscf)
CO2	53.06	119,317
CH4	1.00E-03	2.25
N2O	1.00E-04	0.22
CO2e	53.11	119,439

19.5 Summary of Engine Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Potential Emissions (lb/hr)	Potential Emissions (tpy)
NOX	46.54	Manufacturer Emissions Data Sheet	1.06E-03	0.049	0.012
CO	43.80	Manufacturer Emissions Data Sheet	1.06E-03	0.047	0.012
VOC	30.11	Manufacturer Emissions Data Sheet (as THC)	1.06E-03	0.032	8.00E-03
PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 10/2024	1.06E-03	0.011	2.71E-03
SO2	0.60	AP-42 Table 3.2-2, 10/2024	1.06E-03	6.38E-04	1.59E-04
Formaldehyde	53.86	AP-42 Table 3.2-2, 07/2000	1.06E-03	0.057	0.014
Ammonia	18.00	SCAQMD Document, 12/2016	1.06E-03	0.019	4.78E-03
Lead	5.00E-04	AP-42 Table 1.4-2	1.06E-03	5.32E-07	1.33E-07
Total HAP	73.64	Sum of individual HAP	1.06E-03	0.078	0.020
CO2	119,317	40 CFR 98, Subpart C, Table C-1	1.06E-03	126.83	31.71
CH4	2.25	40 CFR 98, Subpart C, Table C-2	1.06E-03	2.39E-03	5.98E-04
N2O	0.22	40 CFR 98, Subpart C, Table C-2	1.06E-03	2.39E-04	5.98E-05
CO2e	119,439	40 CFR 98, Subpart C	1.06E-03	126.96	31.74

SG080 | 4.5L | 80 kW

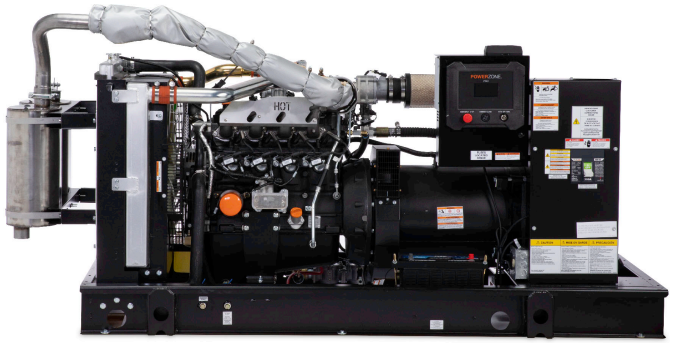
INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary

Standby Power Rating

80 kW, 100 kVA, 60 Hz

*Assembled in the USA using domestic and foreign parts



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Codes and Standards

Not all codes and standards apply to all configurations. Contact factory for details.

UL2200, UL6200, UL1236, UL489

CSA C22.2

BS5514 and DIN 6271

SAE J1349

NFPA 37, 70, 99, 110

NEC700, 701, 702, 708

NEMA ICS10, MG1, 250, ICS6, AB1

ANSI C62.41

IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering a Smarter World

For over 65 years, Generac has been at the forefront of power generation, pioneering innovative solutions and unparalleled manufacturing excellence. At the heart of our reputation for superior quality lies our commitment to meticulously designing and manufacturing key components of our generators—ranging from alternators and enclosures to base tanks, control systems, and cutting-edge communications software.

Generac's gensets stand out for their unparalleled versatility and reliability. Engineered to offer a wide range of options and configurations, they are tailored to meet the unique demands of virtually any application, seamlessly adapting to its complexity. Our commitment to reliability drives us to globally source only the most dependable engines, selected through stringent criteria for optimal performance under the toughest industrial conditions.

Beyond the sale, Generac's dedication to our customers extends to comprehensive service support, for peace of mind and reliability long after your purchase. Our commitment is to not only provide state-of-the-art power solutions but also enduring success and satisfaction of our customers through ongoing support and service excellence.

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary

STANDARD FEATURES

ENGINE SYSTEM
- Oil Drain Extension
- Heavy Duty Air Cleaner
- Level 1 Fan and Belt Guards (Open Set Only)
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Critical Silencer
- Oil Temperature Sender with Alarm
- Air Filter Restriction Indicator

FUEL SYSTEM
- NPT Fuel Connection on Frame
- Primary and Secondary Fuel Shutoff

COOLING SYSTEM
- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- Radiator Drain Extension

ELECTRICAL SYSTEM
- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM
- UL2200 GENprotect™
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Brushless Excitation
- Sealed Bearing
- Full Load Capacity Alternator

GENERATOR SET
- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Separation of Circuits - Multiple Breakers
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Year Limited Warranty (Standby and Demand Response Rated Units)

ENCLOSURE (IF SELECTED)
- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuated Enclosures)
- Gasketed Doors
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

CONTROL SYSTEM

Power Zone® Pro Controller
- NFPA 110 Level 1 Compliant
- Engine Protective Functions
- Alternator Protective Functions
- Digital Engine Governor Control
- Digital Voltage Regulator
- Multiple Programmable Inputs and Outputs
- Remote Display Capability

Power Zone® Pro Controller Continued
- Remote Communication via Modbus® RTU, Modbus TCP/IP, and Ethernet 10/100
- Alarm and Event Logging with Real Time Stamping
- Expandable Analog and Digital Inputs and Outputs
- Remote Wireless Software Update Capable
- Built-In Programmable Logic Eliminates the Need for External Controllers Under Most Conditions
- Programmable I/O Channel Properties
- Built-In Diagnostics

Alarms and Warnings
- High/Low Oil Pressure
- High/Low Coolant Level
- High/Low Coolant Temperature
- Sender/Sensor Failure
- High/Low Oil Temperature
- Over Total kW
- Over/Under Speed
- Over/Under Voltage
- Over/Under Frequency
- Over Current
- High/Low Battery Voltage

Alarms and Warnings Continued
- Battery Charger Current
- Phase to Phase and Phase to Neutral Short Circuits (I^2T Algorithm)

4.3 Inch Color Touch Screen Display
- Resistive Color Touch Screen
- Easily Identifiable Icons
- Multi-Lingual
- On Screen Editable Parameters
- Key Function Monitoring
- Three Phase Voltage, Amperage, kW, kVA, and kVAr
- Selectable Line to Line or Line to Neutral Measurements
- Frequency
- Engine Speed
- Engine Coolant Temperature
- Engine Oil Temperature
- Battery Voltage
- Hourmeter
- Warning and Alarm Indication
- Diagnostics
- Maintenance Events/Information

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary

CONFIGURABLE OPTIONS

ENGINE SYSTEM
- Heater with Shutoff Valves
- Engine Coolant Heater
- Oil Heater
- Level 1 Fan and Belt Guards (Enclosed Units Only)
- Radiator Duct Adapter (Open Set Only)
- Two-Stage Heavy Duty Air Cleaner
- Critical Grade Silencer
- Baseframe Cover/Rodent Guard

ELECTRICAL SYSTEM
- 10A UL Battery Charger
- Battery Warmer

ALTERNATOR SYSTEM
- Permanent Magnet Excitation
- Alternator Upsizing
- Anti-Condensation Heater
- Tropical Coating

CIRCUIT BREAKER OPTIONS
- Main Line Circuit Breaker
- 2nd Main Line Circuit Breaker
- 3rd Main Line Circuit Breaker
- Shunt Trip and Auxiliary Contact
- Electronic Trip Breakers

FUEL SYSTEM
- NPT Flexible Fuel Line

GENERATOR SET
- Extended Factory Testing (3-Phase Only)
- 8 Position Load Center
- IBC Seismic Certification (Contact Factory for Availability)
- OSHPD Seismic Certification (Contact Factory or Availability)
- Elevated Stand

ENCLOSURE
- Level 0 Sound Attenuated
- Level 1 Sound Attenuated
- Level 2 Sound Attenuated
- Level 2 Sound Attenuated with Motorized Dampers
- Steel Enclosure
- Aluminum Enclosure
- Up to 200 MPH Wind Load Rating (Contact Factory for Availability)
- AC/DC Enclosure Lighting Kit
- Enclosure Heaters (with Motorized Dampers Only)
- Door Alarm Switch
- Spring Vibration Isolators
- Pad Vibration Isolators

CONTROL SYSTEM
- NFPA 110 Compliant 21-Light Remote Annunciator
- Remote Relay Assembly (8 or 16)
- Remote E-Stop (Break Glass-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Flush Mount)
- 10A Engine Run Relay
- Ground Fault Annunciator
- 120 V GFCI and 240 V Outlets
- 100 dB Alarm Horn
- Damper Alarm Contacts (with Motorized Dampers Only)

WARRANTY (EMERGENCY STANDBY POWER)
- 2 Year Extended Limited Warranty
- 5 Year Extended Limited Warranty
- 7 Year Extended Limited Warranty
- 10 Year Extended Limited Warranty

ENGINEERED OPTIONS

CONTROL SYSTEM
- Spare Inputs (x4) / Outputs (x4)
- Battery Disconnect Switch

GENERATOR SET
- Special Testing
- Battery Box

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
Cylinder #	4
Type	In-Line
Displacement - in^3 (L)	270.4 (4.43)
Bore - in (mm)	4.5 (114.3)
Stroke - in (mm)	4.25 (107.95)
Compression Ratio	9.1:1
Intake Air Method	Turbocharged
Number of Main Bearings	5
Connecting Rods	Forged Steel, Fractured Split, Bushingless
Cylinder Head	Cast Iron
Cylinder Liners	Cast Iron
Ignition	Coil Near Plug Solid State Inductive
Piston Type	Cast Aluminum Flat Top
Crankshaft Type	Forged Steel
Lifter Type	Hydraulic
Intake Valve Material	Stainless Steel
Exhaust Valve Material	Stainless Steel
Hardened Valve Seats	High Steel Iron Alloy

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	± 0.25

Lubrication System

Oil Pump	Gear Driven
Oil Filter Type	Full-Flow Spin-On Cartridge
Engine Oil Capacity: qt (L)	21 (20)

Cooling System

Cooling System Type	Pressurized Closed
Fan Type	Pusher
Fan Speed (rpm)	2,100
Fan Diameter - in (mm)	22 (533)

Fuel System

Fuel Type	Natural Gas
Fuel Control	Electronic
Fuel Shut Off	Generac
Operating Fuel Pressure - in H_2O (kPa)	5 - 14 (1.2 - 3.5)

*When designing the external fuel system, assume a 20% safety factor to the upper and lower limit of the specified fuel pressure range to account for site variation and measurement at the generator test port. Refer to Generac document 1000004620, latest rev. for proper gas supply design guidelines. (Contact Factory for Details)

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative (-)

ALTERNATOR SPECIFICATIONS

Standard Model	K0080124Y21
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion (THD)	<5% (3-Phase Only)
Telephone Interference Factor (TIF)	<50

Standard Excitation	Synchronous Brushless
Bearings	Sealed Ball
Coupling	Direct via Flexible Disc
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary

OPERATING DATA

POWER RATINGS

	Standby	
Single-Phase 120/240 VAC @1.0pf	80 kW/80 kVA	Amps: 333
Three-Phase 120/208 VAC @0.8pf	80 kW/100 kVA	Amps: 278
Three-Phase 120/240 VAC @0.8pf	80 kW/100 kVA	Amps: 241
Three-Phase 277/480 VAC @0.8pf	80 kW/100 kVA	Amps: 120
Three-Phase 346/600 VAC @0.8pf	80 kW/100 kVA	Amps: 96

STARTING CAPABILITIES (skVA)

		skVA vs. Voltage Dip			
120/240 VAC 1Ø	30%	277/480 VAC 3Ø	30%	208/240 VAC 3Ø	30%
A0080044N21	58	K0080124Y21	172	K0080124Y21	132
A0130044N21	105	K0130124Y21	327	K0130124Y21	327

FUEL CONSUMPTION RATES*

	Natural Gas – scfh (m^3/hr)
Percent Load	Standby
25%	290 (8.2)
50%	538 (15.2)
75%	795 (22.5)
100%	1,063 (30.1)

*1.5X maximum site rated fuel consumption should be used for gas supply design practices. Refer to Generac 1000046207, latest rev, or contact factory for details.

COOLING

		Standby
Air Flow (Fan Air Flow Across Radiator) - Open Set	cfm (m^3/min)	4,343 (123)
Coolant Flow	gpm (Lpm)	24 (90)
Coolant System Capacity	gal (L)	9 (34)
Maximum Operating Ambient Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)		See Bulletin No. 0199270SSD
Maximum Radiator Backpressure	in H_2O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power cfm (m^3/min)	178 (5.0)

ENGINE

		Standby
Rated Engine Speed	RPM	1,800
Horsepower at Rated kW**	hp	128
Piston Speed	ft/min (m/min)	1,275 (389)
BMEP	psi (kPa)	214 (1,473)

** Refer to “Emissions Data Sheet” for maximum bHP for EPA and SCAQMD permitting purposes.

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m^3/min)	456 (13.0)
Maximum Allowable Exhaust Backpressure (Post Silencer)	in Hg (Kpa)	0.75 (2.54)
Exhaust Temperature (Rated Output)	°F (°C)	1,425 (774)

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.

Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with BS5514 and DIN6271 standards.

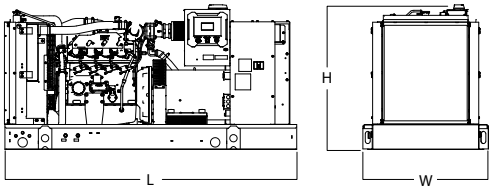
Standby - See Bulletin 0187500SSB

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

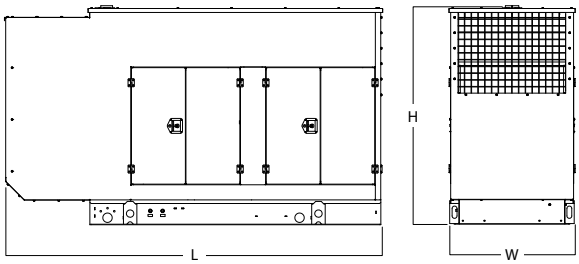
EPA Certified Stationary

DIMENSIONS AND WEIGHTS*



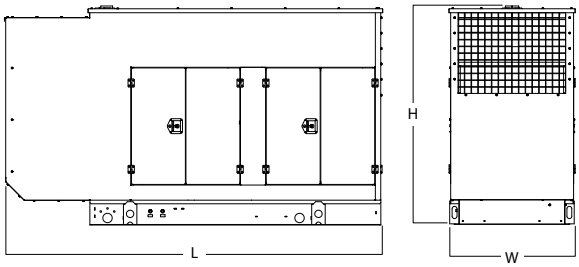
OPEN SET

L x W x H - in (mm)	92.9 (2,360) x 39.9 (1,014) x 46.0 (1,170)
Weight - lbs (kg)	2,192 - 2,250 (994 - 1,021)



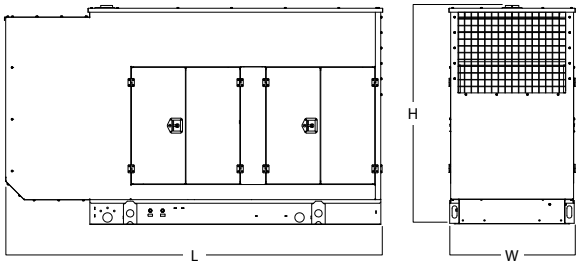
LEVEL 0 SOUND ATTENUATED ENCLOSURE

L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)
Weight - lbs (kg)	Steel: 2,932 - 2,989 (1,330 - 1,356) Aluminum: 2,580 - 2,638 (1,170 - 1,196)



LEVEL 1 SOUND ATTENUATED ENCLOSURE

L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)
Weight - lbs (kg)	Steel: 3,022 - 3,080 (1,371 - 1,397) Aluminum: 2,671 - 2,729 (1,211 - 1,238)



LEVEL 2 SOUND ATTENUATED ENCLOSURE

L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)
Weight - lbs (kg)	Steel: 3,100 - 3,158 (1,406 - 1,433) Aluminum: 2,727 - 2,785 (1,237 - 1,263)

* All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings

Generac Power Systems, Inc. | S45 W29290 HWY. 59 | Waukesha, WI 53189 | generac.com
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Part No. A0000317173
Rev. F 02/17/2025

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Generac Power Systems, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: RGNXB04.5MJJ-043

Effective Date: 11/16/2023

Expiration Date: 12/31/2024

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 11/16/2023

Revision Date: N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: RGNXB04.5MJJ
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
LPG/Propane
Emission Standards :
Part 60 Subpart JJJJ Table 1

Part 90 Phase 1
CO (g/kW-hr) : 519.0
HC + NOx (g/kW-hr) : 13.4
NMHC + NOx (g/kW-hr) : 13.4
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60, 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60, 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

GENERAC | INDUSTRIAL POWER

STATEMENT OF EXHAUST EMISSIONS
2024 Spark-Ignited Generators
Industrial Series - SCAQMD Certified, Stationary Emergency

	Model	Engine (L)	Engine Emissions Designation	EPA Engine Family	Fuel	Catalyst Required	SCAQMD CEP #	EPA Certificate #	Grams/bhp-hr.				Rated RPM	BHP	Fuel Flow (lb/hr)
									THC	NMHC	NOx	CO			
Small Spark Ignited Engine (SSIE) Small Off-Road Engines (SORE)	QTA25	2.4	A02.4GCN029A0	RGNXB02.4MDI	NG	No	Not Required	RGNXB02.4MDI-046	1.40	N/A	4.32	85.00	1,800	38	16.52
	QTA25	2.4	A02.4GCV032A0	RGNXB02.4MDI	LPG			RGNXB02.4MDI-046	N/A	2.11	2.33	92.66	1,800	43	17.59
	SG035, 40, 45, 50NA	4.5	C04.5SPN054A0	RGNXB04.5MJJ	NG		618432	RGNXB04.5MJJ-043	0.20	0.02	0.05	0.92	1,800	76	23.7
	SG035, 40, 45, 50NA	4.5	C04.5SPV054A0	RGNXB04.5MJJ	LPG		618432	RGNXB04.5MJJ-043	0.02	0.01	0.17	0.13	1,800	76	26
	SG050T, 60, 70, 80	4.5	C04.5SPN099A0	RGNXB04.5MJJ	NG		623270	RGNXB04.5MJJ-043	0.11	0.01	0.17	0.16	1,800	132	43.68
	RG04845	4.5	C04.5DPN060NL	RGNXB04.5MLB	NG/LP		TBD	RGNXB04.5MLB-049	0.37	0.02	0.01	1.80	1,800	76.7	24.3
	SG050T, 60, 70, 80	4.5	C04.5SPV099A0	RGNXB04.5MJJ	LPG		623270	RGNXB04.5MJJ-043	0.03	N/A	0.13	0.20	1,800	132	46.61
Large Spark Ignited Engines (LSIE)	SG080, 100	9.0	E08.9GSN111A1	RGNXB08.92O1	NG	Yes	598551	RGNXB08.92O1-047	0.18	0.00	0.01	0.25	1,800	153	53.1
	SG080, 100 (LPF)	9.0	E08.9MSN116A1	RGNXB08.92O1	NG		598558	RGNXB08.92O1-047	0.11	0.00	0.12	0.03	1,800	153	53.24
	SG080, 100	9.0	F08.9GSV106A0	RGNXB08.92O2	LPV		642064	RGNXB08.92O2-028	0.01	N/A	0.21	0.22	1,800	156	54.36
	SG080, 100	9.0	F08.9GSV106A0	RGNXB08.92O2	LPL		642064	RGNXB08.92O2-028	0.03	N/A	0.00	0.36	1,800	156	55.27
	SG/MG130, 150	9.0	E08.9MSN170A0	RGNXB08.92O3	NG		618434	RGNXB08.92O3-029	0.14	0.00	0.10	0.74	1,800	229	86.37
	SG/MG130, 150	9.0	F08.9MSV169A0	RGNXB08.92O4	LPV		606652	RGNXB08.92O4-030	0.02	N/A	0.03	0.09	1,800	230	85.37
	SG/MG150, 175, 200	14.2	E14.2MSN227A3	RGNXB14.22C1	NG		618436	RGNXB14.22C1-031	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG/MG230, 250	14.2	E14.2MSN279A3	RGNXB14.22C1	NG		618438	RGNXB14.22C1-031	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG/MG275,300	14.2	E14.2MSN343A3	RGNXB14.22C1	NG		618440	RGNXB14.22C1-031	0.03	0.00	0.04	0.32	1,800	460	140.33
	SG/MG350, 400	21.9	E21.9MSN474A4	RGNXB21.92C1	NG		618441	RGNXB21.92C1-032	0.07	0.00	0.26	0.21	1,800	636	176
	SG/MG350,400 (LPF)	21.9	E21.9MSN474A5	RGNXB21.92C1	NG		618442	RGNXB21.92C1-032	0.30	0.00	0.06	0.12	1,800	636	214
	SG/MG400,450	21.9	E21.9MSN0502A4	RGNXB21.92C3	NG		606656	RGNXB21.92C3-033	0.08	0.00	0.06	0.10	1,800	673	209
	SG/MG400,450 (LPF)	21.9	E21.9MSN0502A5	RGNXB21.92C3	NG		618444	RGNXB21.92C3-033	0.19	0.00	0.05	0.17	1,800	673	224
	SG/MG500	25.8	E25.8MSN580A4	RGNXB25.82C1	NG		593192	RGNXB25.82C1-034	0.16	0.00	0.03	0.60	1,800	778	280
	SG/MG500 (LPF)	25.8	E25.8MSN580A5	RGNXB25.82C1	NG		606658	RGNXB25.82C1-034	0.19	0.00	0.06	0.57	1,800	778	280
	SG/MG625	33.9	E33.9MSN677A0	RGNXB33.92C1	NG		601949	RGNXB33.92C1-035	0.13	0.00	0.01	0.22	1,800	909	325
	SG/MG750	33.9	E33.9MSN803A0	RGNXB33.92C1	NG		606655	RGNXB33.92C1-035	0.18	0.00	0.15	0.92	1,800	1077	417
	SG/MG1000	49.0	E49.0ASN1100A0	RGNXB49.02C1	NG		625240	RGNXB49.02C1-036	0.11	0.00	0.03	0.65	1,800	1475	427

NG/LP: Natural Gas
LPV: Liquid Propane Vapor
LPL: Liquid Propane Liquid

LPG: Liquid Propane Vapor or Liquid Propane Liquid
LPF: Units with Optional Low Pressure Fuel System
Refer to Page 2 for Definitions and Advisory Notes

N/A: Not Applicable
Engine BHP is taken from Engine Emissions Certification Results

Part No. A0005031827
Rev. F 12/5/24

STATEMENT OF EXHAUST EMISSIONS
2024 Spark-Ignited Generators
Industrial Series - SCAQMD Certified, Stationary Emergency

2024 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Generac spark-ignited gensets, including SG, MG, QTA, QT and RG series gensets that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve covers.

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family
The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required
Indicates whether a three-way catalyst (TWC) and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a TWC to meet EPA certification requirements. Please note that some units that do not require a TWC to meet EPA requirements do need one if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst
SG and MG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many QT and RG series generator sets use the same engines as SG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number
Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr
Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number
A separate low-emissions option is available on many Generac gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers
The information provided here is proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc.

Advisory Notes on Emissions Actuals
- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems, Inc. cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.

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20. Emissions Associated with Generac QT025A Generator Engine - Decoater

20.1 Generator Power and Fuel Consumption Data

> Pertinent data on engine power and fuel usage taken from the technical data sheet and statement of exhaust for the Generac QT025A generator.

Engine Output in hp (100% load, standby):	38.0	bhp
Generator Output in kW (100% load, standby):	25.0	kW
Fuel Consumption Rate in scf/hr (100% load, standby):	380.0	scf/hr
Annual Operating Hours:	500	hrs
Heat Content of Natural Gas (HHV):	1,020	Btu/scf

20.2 Source Classification Code

> Emissions are tied to the SCC code for natural gas fueled engines listed below.

SCC:	20200202
SCC Description:	Internal Combustion Engines, Industrial (2-02), Natural Gas (2-02-002), Reciprocating (2-02-002-02)
SCC Units:	Million Cubic Feet Natural Gas Burned

20.3 Rich/Lean Burn Engine Determination

> Emissions for natural gas/propane-fired engines are directly linked to the air-to-fuel ratio and as such, emission factors in AP-42 are delineated into separate tables for rich and lean burn engines. The air-to-fuel ratio is calculated below to determine which of these emission factor sets are more appropriate.

	Value	Units	Basis
Combustion Air in cfh:	4,200	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	380.0	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	19.99	--	= (4,200 cfh * 0.076 lb/cf) / (380.0 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.50	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio:	1.38	--	= (19.99 / 14.50)

> According to 40 CFR 60.4248, rich-burn engines are defined as any four-stroke spark ignited engine where the operating air/fuel ratio divided by the stoichiometric air/fuel ratio at full load conditions is less than or equal to 1.1. Lean-burn engines are defined as any two-stroke or four-stroke spark ignited engine that does not meet the definition of a rich burn engine. Therefore, the engine integral to this generator set is classified as a lean-burn engine when combusting natural gas fuel and the emission factors for AP-42 Table 3.2-2 apply.

20.4 Emission Calculation Methodology and Emission Factors

> Emission factors are from the manufacturer emissions data sheet as well as AP-42 Section 3.2 (10/2024) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines. Conservatively over-estimating VOC emissions by assuming THC is equal to VOC and conservatively over-estimating PM by assuming PM is equal to PM10/PM2.5.

20.4.1 NOX

Emission factor for NOX:	1.77	g/bhp-hr	Manufacturer Emissions Data Sheet
NOX emission factor in terms of SCC units:	390.21	lb/MMscf	= 1.77 g/bhp-hr * 0.0022046 lb/g * 38.0 bhp / 380 scf/hr * 1E06

20.4.2 CO

Emission factor for CO:	70.06	g/bhp-hr	Manufacturer Emissions Data Sheet
CO emission factor in terms of SCC units:	15,445.43	lb/MMscf	= 70.06 g/bhp-hr * 0.0022046 lb/g * 38.0 bhp / 380 scf/hr * 1E06

20.4.3 VOC

Emission factor for VOC:	1.60	g/bhp-hr	Manufacturer Emissions Data Sheet (as THC)
VOC emission factor in terms of SCC units:	352.74	lb/MMscf	= 1.60 g/bhp-hr * 0.0022046 lb/g * 38.0 bhp / 380 scf/hr * 1E06

20.4.4 PM/PM10/PM2.5

Emission factor for PM:	9.99E-03	lb/MMBtu	AP-42 Table 3.2-2, 10/2024
PM emission factor in terms of SCC units:	10.19	lb/MMscf	= 9.99E-03 lb/MMBtu * 1,020 Btu/scf

20.4.5 SO2

Emission factor for SO2:	5.88E-04	lb/MMBtu	AP-42 Table 3.2-2, 10/2024
SO2 emission factor in terms of SCC units:	0.60	lb/MMscf	= 5.88E-04 lb/MMBtu * 1,020 Btu/scf

20.4.6 HAP Emission Estimates

> The ammonia emission factor is from South Coast Air Quality Management District (SCAQMD) *Reporting Procedures for AB2588 Facilities for Reporting Their Quadrennial Air Toxics Emissions Inventory* from 12/2016, the lead emission factor is from AP-42 Section 1.4 Table 1.4-2, and all other HAP emission factors are from AP-42 Section 3.2 (10/2024) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines.

	CAS #	HAP?	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMscf)	Emission Factor Basis
Formaldehyde	50-00-0	Y	0.053	53.86	AP-42 Table 3.2-2, 10/2024
Ammonia	7664-41-7	N	0.018	18.00	SCAQMD Document, 12/2016
Lead	7439-92-1	Y	4.90E-07	5.00E-04	AP-42 Table 1.4-2
1,1,2,2-Tetrachloroethane	79-34-5	Y	4.00E-05	0.041	AP-42 Table 3.2-2, 10/2024
1,1,2-Trichloroethane	79-00-5	Y	3.18E-05	0.032	AP-42 Table 3.2-2, 10/2024
1,3-Butadiene	106-99-0	Y	2.67E-04	0.27	AP-42 Table 3.2-2, 10/2024
1,3-Dichloropropene	542-75-6	Y	2.64E-05	0.027	AP-42 Table 3.2-2, 10/2024
2-Methylnaphthalene	91-57-6	Y	3.32E-05	0.034	AP-42 Table 3.2-2, 10/2024
2,2,4-Trimethylpentane	540-84-1	Y	2.50E-04	0.26	AP-42 Table 3.2-2, 10/2024
Acenaphthene	83-32-9	Y	1.25E-06	1.28E-03	AP-42 Table 3.2-2, 10/2024
Acenaphthylene	208-96-8	Y	5.53E-06	5.64E-03	AP-42 Table 3.2-2, 10/2024
Acetaldehyde	75-07-0	Y	8.36E-03	8.53	AP-42 Table 3.2-2, 10/2024
Acrolein	107-02-8	Y	5.14E-03	5.24	AP-42 Table 3.2-2, 10/2024
Benzene	71-43-2	Y	4.40E-04	0.45	AP-42 Table 3.2-2, 10/2024
Benzo(b)fluoranthene	205-99-2	Y	1.66E-07	1.69E-04	AP-42 Table 3.2-2, 10/2024
Benzo(e)pyrene	50-32-8	Y	4.15E-07	4.23E-04	AP-42 Table 3.2-2, 10/2024
Benzo(g,h,i)perylene	191-24-2	Y	4.14E-07	4.22E-04	AP-42 Table 3.2-2, 10/2024
Biphenyl	92-52-4	Y	2.12E-04	0.22	AP-42 Table 3.2-2, 10/2024
Carbon Tetrachloride	56-23-5	Y	3.67E-05	0.037	AP-42 Table 3.2-2, 10/2024
Chlorobenzene	108-90-7	Y	3.04E-05	0.031	AP-42 Table 3.2-2, 10/2024
Chloroform	67-66-3	Y	2.85E-05	0.029	AP-42 Table 3.2-2, 10/2024
Chrysene	218-01-9	Y	6.93E-07	7.07E-04	AP-42 Table 3.2-2, 10/2024
Ethylbenzene	100-41-4	Y	3.97E-05	0.040	AP-42 Table 3.2-2, 10/2024
Ethylene Dibromide	106-93-4	Y	4.43E-05	0.045	AP-42 Table 3.2-2, 10/2024
Fluoranthene	206-44-0	Y	1.11E-06	1.13E-03	AP-42 Table 3.2-2, 10/2024
Fluorene	86-73-7	Y	5.67E-06	5.78E-03	AP-42 Table 3.2-2, 10/2024
Methanol	67-56-1	Y	2.50E-03	2.55	AP-42 Table 3.2-2, 10/2024
Methylene Chloride	75-09-2	Y	2.00E-05	0.020	AP-42 Table 3.2-2, 10/2024
n-Hexane	110-54-3	Y	1.11E-03	1.13	AP-42 Table 3.2-2, 10/2024
Naphthalene	91-20-3	Y	7.44E-05	0.076	AP-42 Table 3.2-2, 10/2024
PAH	na	Y	2.69E-05	0.027	AP-42 Table 3.2-2, 10/2024
Phenanthrene	85-01-8	Y	1.04E-05	0.011	AP-42 Table 3.2-2, 10/2024
Phenol	108-95-2	Y	2.40E-05	0.024	AP-42 Table 3.2-2, 10/2024
Pyrene	129-00-0	Y	1.36E-06	1.39E-03	AP-42 Table 3.2-2, 10/2024
Styrene	100-42-5	Y	2.36E-05	0.024	AP-42 Table 3.2-2, 10/2024
Toluene	108-88-3	Y	4.08E-04	0.42	AP-42 Table 3.2-2, 10/2024
Vinyl Chloride	75-01-4	Y	1.49E-05	0.015	AP-42 Table 3.2-2, 10/2024
Xylene	1330-20-7	Y	1.84E-04	0.19	AP-42 Table 3.2-2, 10/2024
Total HAP				73.64	Sum of individual HAP

20.4.7 GHG Emission Factors

> CO2, CH4 and N2O emissions for natural gas combustion are estimated using the natural gas emission factors published in 40 CFR 98, Subpart C, Table C-1 and C-2.

Global Warming Potentials of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	28
N2O	265

CO2 Emission Factor	53.06	kg CO2/MMBtu	40 CFR 98, Subpart C, Table C-1; Natural Gas (weighted U.S. average)
CH4 Emission Factor	1.0E-03	kg CH4/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas
N2O Emission Factor	1.0E-04	kg N2O/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas

Pollutant	Emission Factor (kg/MMBtu)	Equivalent Factor (lb/MMscf)
CO2	53.06	119,317
CH4	1.00E-03	2.25
N2O	1.00E-04	0.22
CO2e	53.11	119,439

20.5 Summary of Engine Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Potential Emissions (lb/hr)	Potential Emissions (tpy)
NOX	390.21	Manufacturer Emissions Data Sheet	3.80E-04	0.15	0.037
CO	15,445.43	Manufacturer Emissions Data Sheet	3.80E-04	5.87	1.47
VOC	352.74	Manufacturer Emissions Data Sheet (as THC)	3.80E-04	0.13	0.034
PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 10/2024	3.80E-04	3.87E-03	9.68E-04
SO2	0.60	AP-42 Table 3.2-2, 10/2024	3.80E-04	2.28E-04	5.70E-05
Formaldehyde	53.86	AP-42 Table 3.2-2, 10/2024	3.80E-04	0.020	5.12E-03
Ammonia	18.00	SCAQMD Document, 12/2016	3.80E-04	0.007	1.71E-03
Lead	5.00E-04	AP-42 Table 1.4-2	3.80E-04	1.90E-07	4.75E-08
Total HAP	73.64	Sum of individual HAP	3.80E-04	2.80E-02	7.00E-03
CO2	119,317	40 CFR 98, Subpart C, Table C-1	3.80E-04	45.34	11.34
CH4	2.25	40 CFR 98, Subpart C, Table C-2	3.80E-04	8.55E-04	2.14E-04
N2O	0.22	40 CFR 98, Subpart C, Table C-2	3.80E-04	8.55E-05	2.14E-05
CO2e	119,439	40 CFR 98, Subpart C	3.80E-04	45.39	11.35

QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

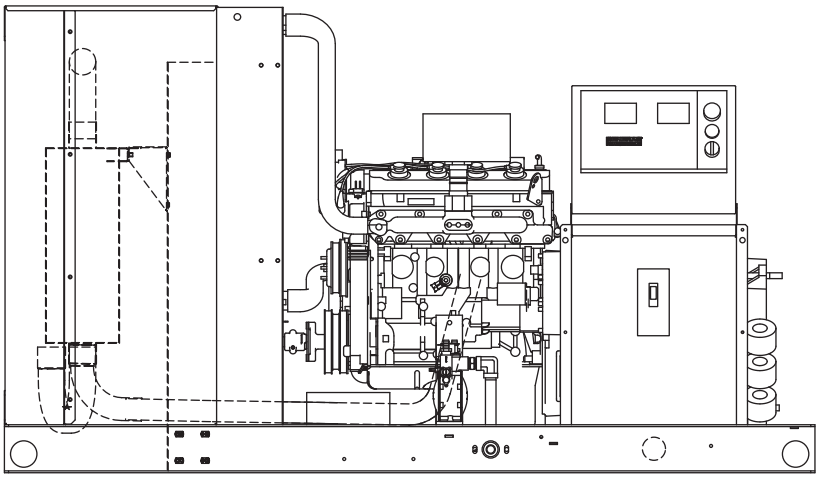
EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

Standby Power Rating

25 kW, 31 kVA, 60 Hz

*Assembled in the USA using domestic and foreign parts



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Codes and Standards

Generac products are designed to the following standards:

UL2200, UL508, UL489

CSA 22.2

BS5514 and DIN 6271

SAE J1349

NFPA 37, 70, 99, 110

NEC700, 701, 702, 708

ISO 3046, 7637, 8528, 9001

NEMA ICS10, MG1, 250, ICS6, AB1

ANSI C62.41

IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering Ahead

Generac ensures superior quality by designing and manufacturing most of its generator components, such as alternators, enclosures, control systems and communications software. Generac also makes its own spark-ignited engines, and you'll find them on every Generac gaseous-fueled generator. We engineer and manufacture them from the block up — all at our facilities throughout Wisconsin. Applying natural gas and LP-fueled engines to generators requires advanced engineering expertise to ensure reliability, durability and necessary performance. By designing specifically for these dry, hotter-burning fuels, the engines last longer and require less maintenance. Building our own engines also means we control every step of the supply chain and delivery process, so you benefit from single-source responsibility.

Plus, Generac Industrial Power's distribution network provides all parts and service so you don't have to deal with third-party suppliers. It all leads to a positive owner experience and higher confidence level. Generac spark-ignited engines give you more options in commercial and industrial generator applications as well as extended run time from utility-supplied natural gas.

QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

STANDARD FEATURES

ENGINE SYSTEM

- Oil Drain Extension
- Heavy Duty Air Cleaner
- Fan Guard
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Radiator Duct Adapter (Open Set Only)
- Critical Exhaust Silencer (Enclosed Only)

Fuel System

- Fuel Lockoff Solenoid
- Secondary Fuel Regulator
- Flexible Fuel Lines
- Fuel Line - NPT Connection
- Primary and Secondary Fuel Shutoff

Cooling System

- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- 120VAC Coolant Heater

Electrical System

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM

- GENprotect™
- Fault Protection
- 10A UL Float/Equalize Battery Charger
- Main Line Circuit Breaker
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Brushless Excitation
- Sealed Bearing
- Amortisseur Winding
- Full Load Capacity Alternator

GENERATOR SET

- Internal Genset Vibration Isolation
- Separation of Circuits-High/Low Voltage
- Separation of Circuits-Multiple Breakers
- Wrapped Exhaust Piping (Enclosed Only)
- Standard Factory Testing
- 2 Year Limited Warranty
- Silencer Mounted in the Discharge Hood (Enclosed Only)

ENCLOSURE (If Selected)

- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuation Enclosures)
- Gasketed Doors
- Stamped Air-Intake Louvers
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

CONFIGURABLE OPTIONS

ENCLOSURE

- ○ Level 1 Sound Attenuation
- ○ Steel Enclosure
- ○ Aluminum Enclosure
- ○ Up to 200 MPH Wind Load Rating (Contact Factory for Availability)

CONTROL SYSTEM

- ○ Compliant 21-Light Remote Annunciator
- ○ Remote Relay Assembly (8 or 16)

CONTROL SYSTEM

Digital H Control Panel—Dual 4x20 Display

Program Functions

- Programmable Crank Limiter
- 7-Day Programmable Exerciser
- Special Applications Programmable Logic Controller
- RS-232/485 Communications
- 3-Phase Sensing Digital Voltage Regulator
- 2-Wire Start Capability
- Date/Time Fault History (Event Log)
- Isochronous Governor Control
- Waterproof/Sealed Connectors
- Audible Alarms and Shutdowns
- Not in Auto (Flashing Light)
- Auto/Off/Manual Switch
- E-Stop (Red Mushroom-Type)
- NFPA110 Level I and II (Programmable)
- Customizable Alarms, Warnings, and Events
- Modbus® Protocol
- Predictive Maintenance Algorithm
- Sealed Boards
- Password Parameter Adjustment Protection
- Single Point Ground
- 16 Channel Remote Trending
- 0.2 msec High Speed Remote Trending
- Alarm Information Automatically Annunciated on the Display

Full System Status Display

- Power Output (kW)
- Power Factor
- kW Hours, Total, and Last Run
- Real/Reactive/Apparent Power
- All Phase AC Voltage
- All Phase Currents
- Oil Pressure
- Coolant Temperature
- Coolant Level
- Engine Speed
- Battery Voltage
- Frequency

Alarms and Warnings

- Oil Pressure
- Coolant Temperature
- Coolant Level
- Low Fuel Pressure Alarm
- Engine Overspeed
- Battery Voltage
- Alarms and Warnings Time and Date Stamped
- Snap Shots of Key Operation Parameters During Alarms and Warnings
- Alarms and Warnings Spelled Out (No Alarm Codes)

QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
EPA Emissions Compliance	Stationary Emergency
EPA Emissions Engine Reference	See Emissions Data Sheet
Cylinder #	4
Type	In-Line
Displacement - in^3 (L)	146.4 (2.4)
Bore - in (mm)	3.41 (86.61)
Stroke - in (mm)	3.94 (100.08)
Compression Ratio	9.5:1
Intake Air Method	Naturally Aspirated
Number of Main Bearings	5
Connecting Rods	Forged Steel
Cylinder Head	Aluminum
Cylinder Liners	No
Ignition	High Energy
Piston Type	Aluminum Alloy
Crankshaft Type	Cast Steel
Lifter Type	Overhead Cam
Intake Valve Material	Steel Alloy
Exhaust Valve Material	Hardened Steel
Hardened Valve Seats	Yes

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	±0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full-Flow Spin-On Cartridge
Crankcase Capacity - qt (L)	4 (3.8)

Cooling System

Cooling System Type	Pressurized Closed Recovery
Fan Type	Pusher
Fan Speed - rpm	1,980
Fan Diameter - in (mm)	18 (457)

Fuel System

Fuel Type	Natural Gas, Propane Vapor
Carburetor	Down Draft
Secondary Fuel Regulator	Standard
Fuel Shut Off Solenoid	Standard
Operating Fuel Pressure - in H_2O (kPa)	5 - 14 (1.2 - 3.5)

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	Generac 390 mm
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<5% (3-Phase)
Telephone Interference Factor (TIF)	<50
Standard Excitation	Synchronous Brushless

Bearings	Sealed Ball
Coupling	Flexible Disc
Load Capacity - Standby	100%
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

GENERAC® | INDUSTRIAL POWER

OPERATING DATA

POWER RATINGS—Natural Gas/Propane Vapor

		Standby
Single-Phase 120/240 VAC @1.0pf	25 kW	Amps: 104
Three-Phase 120/208 VAC @0.8pf	25 kW	Amps: 87
Three-Phase 120/240 VAC @0.8pf	25 kW	Amps: 75
Three-Phase 277/480 VAC @0.8pf	25 kW	Amps: 38

STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip

277/480 VAC							
Alternator	kW	10%	15%	20%	25%	30%	35%
Standard	25	16	25	33	41	49	57

208/240 VAC							
Alternator	kW	10%	15%	20%	25%	30%	35%
Standard	25	12	19	25	31	37	43

FUEL CONSUMPTION RATES*

Natural Gas – ft³/hr (m³/hr)

Percent Load	Standby
25%	140 (3.9)
50%	220 (6.2)
75%	300 (8.5)
100%	380 (10.8)

Propane Vapor - ft³/hr (m³/hr)

Percent Load	Standby
25%	56 (1.6)
50%	87 (2.5)
75%	119 (3.4)
100%	151 (4.3)

* Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

		Standby
Air Flow (Inlet Air Combustion and Radiator)	ft³/min (m³/min)	1,500 (42.48)
Coolant Flow	gal/min (l/min)	42 (160)
Coolant System Capacity	gal (l)	2.5 (9.5)
Heat Rejection to Coolant	BTU/hr (kPa)	95,000 (27.8)
Maximum Operating Ambient Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)	See Bulletin No. 0199270SSD	
Maximum Radiator Backpressure	in H_2O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power cfm (m³/min)	70 (2.0)

ENGINE

		Standby
Rated Engine Speed	rpm	1,800
Horsepower at Rated kW**	hp	40
Piston Speed	ft/min (m/min)	1,182 (360.3)
BMEP	psi (kPa)	120 (827)

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m³/min)	220 (6.2)
Maximum Exhaust Backpressure	inHg (kPa)	1.5 (5.1)
Exhaust Temp (Rated Output - Post Silencer)	°F (°C)	975 (524)

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

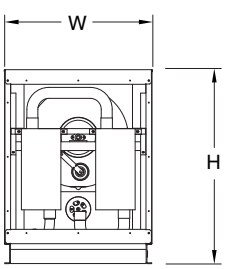
Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.
Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528, and DIN6271 standards.
Standby - See Bulletin 0187500SSB

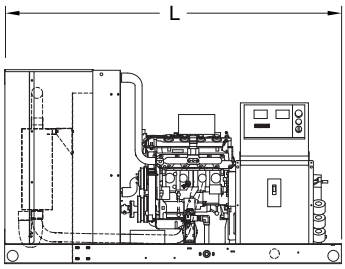
QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

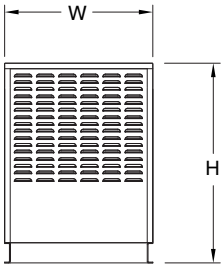
DIMENSIONS AND WEIGHTS*

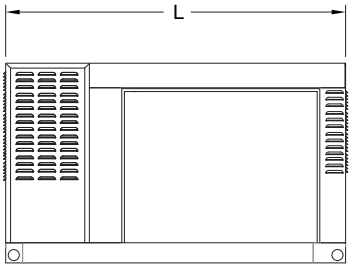




OPEN SET (Includes Exhaust Flex)

L x W x H - in (mm)	77 (1,956) x 34 (864) x 43 (1,092)
Weight - lbs (kg)	1,163 (528)





LEVEL 1 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	77 (1,956) x 34 (864) x 46 (1,168)
Weight - lbs (kg)	1,414 (641)

* All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

SPEC SHEET

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53189
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Part No. 0173110SBY
Rev. E 11/15/17

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Generac Power Systems, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: PGNXB02.42NN-019

Effective Date: 09/01/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 09/01/2022

Revision Date: N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: PGNXB02.42NN
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
Emission Standards :
Part 90 Phase 1
NMHC + NOx (g/kW-hr) : 13.4
CO (g/kW-hr) : 519.0
HC + NOx (g/kW-hr) : 13.4
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

STATEMENT OF EXHAUST EMISSIONS
2023 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

	Model	Engine (L)	EPA Engine Family	Fuel	Catalyst Required	Combination Catalyst or Separate Catalyst	EPA Certification #	Grams/bhp-hr.				Rated RPM	BHP	Fuel Flow (lb/hr)
								THC	NMHC	NOx	CO			
Small Spark Ignited Engine (SSIE) Small Off-Road Engines (SORE)	QTA25	2.4	PGNXB02.42NN	NG	No	Not Required	PGNXB02.42NN-019	1.60	1.56	1.77	70.06	1,800	38	16.52
	QTA25	2.4	PGNXB02.42NL	LPG			PGNXB02.42NL-020	1.43	N/A	4.38	86.18	1,800	43	17.59
	SG035, 40, 45, 50NA	4.5	PGNXB04.52NN	NG			PGNXB04.52NN-015	0.64	0.10	4.48	35.10	1,800	75	25.89
	SG035, 40, 45, 50NA	4.5	PGNXB04.52NL	LPG			PGNXB04.52NL-016	0.84	N/A	5.27	64.25	1,800	76	29.51
	SG050T, 60, 70, 80	4.5	PGNXB04.52NN	NG			PGNXB04.52NN-015	0.49	0.12	3.36	42.88	1,800	129	45.22
	SG050T, 60, 70, 80	4.5	PGNXB04.52NL	LPG			PGNXB04.52NL-016	0.47	N/A	3.27	59.64	1,800	129	48.96
	SG080	9.0	PGNXB08.92U1	NG			PGNXB08.92U1-017	0.60	0.06	1.07	93.19	1,800	125	62.37
	SG080 (DF)	9.0	PGNXB08.92U1	NG/LPV			PGNXB08.92U1-017	0.42	0.05	1.89	52.04	1,800	125	57.18
	SG080 (DF)	9.0	PGNXB08.92U1	NG/LPL			PGNXB08.92U1-017	0.68	0.11	1.61	82.22	1,800	128	55.82
	SG080	9.0	PGNXB08.92U2	LPV			PGNXB08.92U2-018	0.71	N/A	1.54	124.79	1,800	128	61.52
	SG080	9.0	PGNXB08.92U2	LPL			PGNXB08.92U2-018	0.75	N/A	1.33	127.68	1,800	128	60.23
Large Spark Ignited Engines (LSIE)	SG080, 100	9.0	PGNXB08.92O1	NG	Yes	Catalyst Muffler	PGNXB08.92O1-021	0.18	0.00	0.01	0.25	1,800	153	53.10
	SG080, 100 (LPF)	9.0	PGNXB08.92O1	NG			PGNXB08.92O1-021	0.11	0.00	0.12	0.03	1,800	153	53.24
	SG080, 100	9.0	PGNXB08.92O2	LPV			PGNXB08.92O4-024	0.01	N/A	0.21	0.22	1,800	142	54.36
	SG080, 100	9.0	PGNXB08.92O2	LPL			PGNXB08.92O2-022	0.03	N/A	0.00	0.36	1,800	142	55.27
	SG080, 100 (DF)	9.0	PGNXB08.92O1	NG/LPV			PGNXB08.92O1-021	0.14	0.00	0.00	0.17	1,800	148	53.20
	SG080, 100 (DF)	9.0	PGNXB08.92O1	NG/LPL			PGNXB08.92O1-021	0.17	0.00	0.01	1.03	1,800	151	51.86
	SG080, 100 (DF, LPF)	9.0	PGNXB08.92O1	NG/LPV			PGNXB08.92O1-021	0.11	0.00	0.00	0.18	1,800	152	46.90
	SG080, 100 (DF, LPF)	9.0	PGNXB08.92O1	NG/LPL			PGNXB08.92O1-021	0.08	0.00	0.00	0.09	1,800	151	51.58
	SG/MG130, 150	9.0	PGNXB08.92O3	NG			PGNXB08.92O3-023	0.14	0.00	0.10	0.74	1,800	228	86.37
	SG/MG130, 150 (DF)	9.0	PGNXB08.92O3	NG/LPV			PGNXB08.92O3-023	0.18	0.00	0.08	0.56	1,800	229	88.01
	SG/MG130, 150 (DF)	9.0	PGNXB08.92O3	NG/LPL			PGNXB08.92O3-023	0.06	0.00	0.09	0.19	1,800	228	84.82
	SG/MG130, 150	9.0	PGNXB08.92O4	LPV			PGNXB08.92O4-024	0.02	N/A	0.03	0.09	1,800	230	85.37
	SG/MG130, 150	9.0	PGNXB08.92O4	LPL			PGNXB08.92O4-024	0.01	N/A	0.28	0.20	1,800	230	86.38
	SG175	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG/MG150, 200	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG230	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG/MG250	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG275, 300	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.03	0.00	0.04	0.32	1,800	460	140.33
	MG300	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.03	0.00	0.04	0.32	1,800	460	140.33
	SG/MG350, 400	21.9	PGNXB21.92C1	NG			PGNXB21.92C1-026	0.07	0.00	0.26	0.21	1,800	636	175.68
	SG/MG350, 400 (LPF)	21.9	PGNXB21.92C1	NG			PGNXB21.92C1-026	0.30	0.00	0.06	0.12	1,800	636	213.96
	SGMG350, 400, 450	21.9	PGNXB21.92C3	NG			PGNXB21.92C3-027	0.15	0.00	0.008	0.33	1,800	673	280.37
	SG/MG350, 400, 450 (LPF)	21.9	PGNXB21.92C3	NG			PGNXB25.82C1-028	0.19	0.00	0.05	0.17	1,800	673	224.29
	SG/MG500	25.8	PGNXB25.82C1	NG			PGNXB25.82C1-028	0.16	0.00	0.03	0.60	1,800	777	280.37
	SG/MG500 (LPF)	25.8	PGNXB25.82C1	NG			PGNXB25.82C1-028	0.19	0.00	0.06	0.57	1,800	777	279.64
	SG/MG625	33.9	PGNXB33.92C1	NG			PGNXB33.92C1-029	0.13	0.00	0.01	0.22	1,800	908	324.88
	SG/MG750	33.9	PGNXB33.92C1	NG			PGNXB33.92C1-029	0.18	0.00	0.15	0.92	1,800	1,077	416.90
	SG/MG1000	49.0	PGNXB49.02C1	NG			PGNXB49.02C1-030	0.12	0	0.03	0.65	1,800	1,475	426.67

NG: Natural Gas
LPV: Liquid Propane Vapor
LPL: Liquid Propane Liquid

DF: Dual Fuel
LPG: Liquid Propane Vapor or Liquid Propane Liquid
LPF: Units with Option Low Pressure Fuel System

N/A: Not Applicable
Refer to Page 2 for Definitions and Advisory Notes.

Part No. A0003951583
Rev. B 2/2/23

STATEMENT OF EXHAUST EMISSIONS
2023 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

2023 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Generac spark-ignited gensets, including SG, MG, QTA, QT and RG series gensets that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve covers.

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family

The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required

Indicates whether a three-way catalyst (TWC) and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a TWC to meet EPA certification requirements. Please note that some units that do not require a TWC to meet EPA requirements do need one if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst

SG and MG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many QT and RG series generator sets use the same engines as SG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number

Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr

Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number

A separate low-emissions option is available on many Generac gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers

The information provided here is proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc.

Advisory Notes on Emissions Actuals

- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems, Inc. cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.

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21. Potential Emission Calculations: Fire Pump Engines

> Novelis operates an emergency fire water pumping station driven by two (2) identical diesel engines. These emergency engines are used to power the fire pump to provide water in the case of a fire. Emissions will exhaust to dedicated, uncontrolled stacks for release to the atmosphere.

21.1 Engine Power and Fuel Consumption Data

Title V Unit ID	Process Description	Engine Rating (hp)	Engine Rating (kw)	Hourly Fuel Usage Rate (Mgal/hr)	Annual Operating Hours (hr/yr)	Annual Fuel Usage Rate (Mgal/yr)	Heating Value of Diesel Fuel (Btu/gal)
049	Diesel Burned	327.0	244.0	0.0148	500	7.40	138,500
050	Diesel Burned	327.0	244.0	0.0148	500	7.40	138,500

21.1 Emission Factors for Criteria Pollutants from Diesel Combustion

> Potential emissions of PM, CO, NOX, and HC are based on the manufacturer's emissions-related specification sheet associated with the fire pump engine. Potential PM10 and PM2.5 emissions are conservatively assumed to be equivalent to emissions of PM. To take into account the lower sulfur content of the diesel fuel burned, for purposes of representing potential SO2 emissions from the engines, the factor in AP-42 Table 3.4-1 (Large Stationary Diesel Engines, 4/2025 edition) is used as shown below. This factor expresses SO2 as a function of sulfur content.

> Emission factors for GHGs are estimated using the Distillate Fuel Oil No. 2 emission factors published in 40 CFR 98, Subpart C, Table C-1 & 2.

21.1.1 PM/PM10/PM2.5 Emission Factor

Parameter	Value	Basis
PM Emission Factor	0.11 g/kw-hr	Manufacturer's emissions-related specification sheet
(Power Output Basis)	2.43E-04 lb/kw-hr	= 0.11 g/kw-hr x 1 lb/453.59 g
PM/PM10/PM2.5 Emission Factor (Fuel Usage Basis)	4.00 lb/Mgal	= 2.43E-04 lb/kw-hr x 244 kW / 0.0148 Mgal/hr; Assume emissions of particulate matter across all size fractions are equivalent.

21.1.2 CO Emission Factor

Parameter	Value	Basis
CO Emission Factor	0.90 g/kw-hr	Manufacturer's emissions-related specification sheet
(Power Output Basis)	1.98E-03 lb/kw-hr	= 0.90 g/kw-hr x 1 lb/453.59 g
CO Emission Factor (Fuel Usage Basis)	32.71 lb/Mgal	= 1.98E-03 lb/kw-hr x 244 kW / 0.0148 Mgal/hr

21.1.3 NOX Emission Factor

Parameter	Value	Basis
NOX Emission Factor	3.80 g/kw-hr	Manufacturer's emissions-related specification sheet
(Power Output Basis)	8.38E-03 lb/kw-hr	= 3.80 g/kw-hr x 1 lb/453.59 g
NOX Emission Factor (Fuel Usage Basis)	138.12 lb/Mgal	= 8.38E-03 lb/kw-hr x 244 kW / 0.0148 Mgal/hr

21.1.4 VOC Emission Factor

Parameter	Value	Basis
VOC Emission Factor	0.05 g/kw-hr	Manufacturer's emissions-related specification sheet. Conservatively assume all HC is VOC.
(Power Output Basis)	1.10E-04 lb/kw-hr	= 0.05 g/kw-hr x 1 lb/453.59 g
VOC Emission Factor (Fuel Usage Basis)	1.82 lb/Mgal	= 1.10E-04 lb/kw-hr x 244 kW / 0.0148 Mgal/hr

21.1.5 SO2 Emission Factor

Parameter	Value	Basis
SO2 Emission Factor (Heat Input Basis)	1.01 S lb/MMBtu	AP-42 Table 3.4-1, 4/2025 (S is sulfur content in %)
	1.52E-03 lb/MMBtu	= 1.01 x 15 ppm x 100 / 1,000,000
SO2 Emission Factor (Fuel Usage Basis)	0.21 lb/Mgal	= 1.52E-03 lb/MMBtu x 138,500 Btu/gal x 1,000 / 1,000,000

21.1.5 HAP Emission Factors

> Emission factors for organic HAP compounds expected to be emitted are based on emission factors in AP-42 Table 3.3-2 (4/25 Edition). Emission factors are converted from lb/MMBtu as provided in AP-42 to lb/Mgal as applicable to the SCC designation.

Pollutant	CAS #	HAP?	Emission Factor (lb/MMBtu)	Emission Factor (lb/hp-hr)	Emission Factor (lb/Mgal)	Emission Factor Basis
Benzene	71-43-2	Y	9.33E-04	5.85E-06	0.13	AP-42 Table 3.3-2, 4/2025
Toluene	108-88-3	Y	4.09E-04	2.56E-06	0.057	AP-42 Table 3.3-2, 4/2025
Xylene	1330-20-7	Y	2.85E-04	1.79E-06	0.039	AP-42 Table 3.3-2, 4/2025
1,3-Butadiene	106-99-0	Y	3.91E-05	2.45E-07	0.005	AP-42 Table 3.3-2, 4/2025
Formaldehyde	50-00-0	Y	1.18E-03	7.40E-06	0.163	AP-42 Table 3.3-2, 4/2025
Acetaldehyde	75-07-0	Y	7.67E-04	4.81E-06	0.106	AP-42 Table 3.3-2, 4/2025
Acrolein	107-02-8	Y	9.25E-05	5.80E-07	0.013	AP-42 Table 3.3-2, 4/2025
PAH	--	Y	1.68E-04	1.05E-06	0.023	AP-42 Table 3.3-2, 4/2025
Arsenic compounds	7440-38-2	Y	4.00E-06	2.51E-08	5.54E-04	AP-42 Table 1.3-10, 5/2010
Beryllium and compounds	7440-41-7	Y	3.00E-06	1.88E-08	4.16E-04	AP-42 Table 1.3-10, 5/2010
Cadmium and compounds	7440-43-9	Y	3.00E-06	1.88E-08	4.16E-04	AP-42 Table 1.3-10, 5/2010
Chromium and compounds	7440-47-3	Y	3.00E-06	1.88E-08	4.16E-04	AP-42 Table 1.3-10, 5/2010
Lead and compounds	7439-92-1	Y	9.00E-06	5.64E-08	1.25E-03	AP-42 Table 1.3-10, 5/2010
Manganese and compounds	7439-96-5	Y	6.00E-06	3.76E-08	8.31E-04	AP-42 Table 1.3-10, 5/2010
Mercury and compounds	7439-97-6	Y	3.00E-06	1.88E-08	4.16E-04	AP-42 Table 1.3-10, 5/2010
Nickel and compounds	7440-02-0	Y	3.00E-06	1.88E-08	4.16E-04	AP-42 Table 1.3-10, 5/2010
Selenium and compounds	7782-49-2	Y	1.50E-05	9.40E-08	2.08E-03	AP-42 Table 1.3-10, 5/2010
Total HAPs			3.92E-03	2.46E-05	5.43E-01	

21.1.6 GHG Emission Factors for Diesel Combustion

> Emission factors for GHGs from diesel fuel combustion are based on 40 CFR 98 Subpart C Tables C-1 and C-2. CO2e emissions for diesel fuel combustion are estimated using the global warming potentials published in 40 CFR 98, Subpart A, Table A-1.

CO2	73.96 kg/MMBtu	40 CFR 98 Subpart C, Table C-1 for Distillate Fuel Oil No. 2
	22,583 lb/Mgal	= 73.96 kg/MMBtu x 2.2046 lb/kg x 138.50 MMBtu/Mgal
CH4	3.00E-03 kg/MMBtu	40 CFR 98 Subpart C, Table C-2 for Petroleum
	0.92 lb/Mgal	= 3.00E-03 kg/MMBtu x 2.2046 lb/kg x 138.50 MMBtu/Mgal
N2O	6.00E-04 kg/MMBtu	40 CFR 98 Subpart C, Table C-2 for Petroleum
	0.18 lb/Mgal	= 6.00E-04 kg/MMBtu x 2.2046 lb/kg x 138.50 MMBtu/Mgal
CO2e		
CO2e Factor:	22,657 lb/Mgal	40 CFR 98 Subpart A

21.2 Summary of Fire Pump Engine Future Potential Emissions

> The potential emissions for the fire pump engines is tallied below.

	Diesel Combustion Emission Factor		Hourly Diesel Usage Rate		Potential Emission Rate per Fire Pump		Total Potential Emission Rate for Both Fire Pumps		
Pollutant	Value	Units	Value	Units	(lb/hr)	(tpy)	(lb/hr)	(tpy)	Emission Factor Basis
PM	4.00	lb/Mgal	0.015	Mgal/hr	0.059	0.015	0.12	0.030	Vendor estimate
PM10	4.00	lb/Mgal	0.015	Mgal/hr	0.059	0.015	0.12	0.030	Vendor estimate
PM2.5	4.00	lb/Mgal	0.015	Mgal/hr	0.059	0.015	0.12	0.030	Vendor estimate
NOX	138.12	lb/Mgal	0.015	Mgal/hr	2.04	0.51	4.09	1.02	Vendor estimate
CO	32.71	lb/Mgal	0.015	Mgal/hr	0.48	0.12	0.97	0.24	Vendor estimate
SO2	0.21	lb/Mgal	0.015	Mgal/hr	3.11E-03	7.76E-04	6.21E-03	1.55E-03	AP-42 Table 3.4-1
VOC	1.82	lb/Mgal	0.015	Mgal/hr	0.027	6.72E-03	0.054	0.013	Vendor estimate
Benzene	0.13	lb/Mgal	0.015	Mgal/hr	1.91E-03	4.78E-04	3.82E-03	9.56E-04	AP-42 Table 3.3-2, 4/2025
Toluene	0.057	lb/Mgal	0.015	Mgal/hr	8.38E-04	2.10E-04	1.68E-03	4.19E-04	AP-42 Table 3.3-2, 4/2025
Xylene	0.039	lb/Mgal	0.015	Mgal/hr	5.84E-04	1.46E-04	1.17E-03	2.92E-04	AP-42 Table 3.3-2, 4/2025
Lead	1.25E-03	lb/Mgal	0.015	Mgal/hr	1.84E-05	4.61E-06	3.69E-05	9.22E-06	AP-42 Table 3.3-2, 4/2025
Total HAP	0.543	lb/Mgal	0.015	Mgal/hr	8.04E-03	2.01E-03	1.61E-02	4.02E-03	AP-42 Table 3.3-2, 4/2025
CO2	22,583	lb/Mgal	0.015	Mgal/hr	334.22	83.56	668.45	167.11	40 CFR 98 Subpart C
CH4	0.92	lb/Mgal	0.015	Mgal/hr	0.014	3.39E-03	0.027	6.78E-03	40 CFR 98 Subpart C
N2O	0.18	lb/Mgal	0.015	Mgal/hr	2.71E-03	6.78E-04	5.42E-03	1.36E-03	40 CFR 98 Subpart C
CO2e	22,657	lb/Mgal	0.015	Mgal/hr	335.32	83.83	670.65	167.66	40 CFR 98 Subpart C

CLARKE®

FIRE PUMP ENGINES

MODELS

JW6H-UFADF0 JW6H-UFAD80
JW6H-UFADJ0 JW6H-UFAA60
JW6H-UFAD70 JW6H-UFAA80

FM-UL-cUL APPROVED RATINGS BHP/*KW*

JW6H MODEL ♦	RATED SPEED 1760	1900	2100	2350	US-EPA (NSPS) Available until ●
UFADF0	**327** *244*		**311** *232*		*No Expiration*
UFADJ0	**350** *261*		**332** *247.5*		*No Expiration*
UFAD70	**376** *280*		**399** *297.5*		*No Expiration*
UFAD80	**422** *315*	***400*** *298*	**400** *298*		*No Expiration*
UFAA60				**360** 268	*NA* λ
UFAA80	**422** *315*		**400** *298*		*NA* λ

● USA EPA (NSPS) Tier 3 Emissions Certified Off-Road (40 CFR Part 89) and NSPS Stationary (40 CFR Part 60 Sub Part IIII). Meet EU Stage IIA emission level

λ N/A = Not Applicable / Non-Emissionized

♦ All Models are available for Export

Picture represents JW6H-TRWA Power Tech E Engine Series

SPECIFICATIONS

ITEM	JW6H MODELS UFADF0	UFADJ0	UFAD70	UFAD80	UFAA60	UFAA80
Number of Cylinders	6					
Aspiration	TRWA					
Rotation*	CW					
Overall Dimensions – in. (mm)	66.9 (1699) H X 61.1 (1553) L X 38.2 (971) W					
Crankshaft Centerline Height – in. (mm)	17.7 (449)					
Weight – lb (kg)	2094 (948)					
Compression Ratio	16.0:1					
Displacement – cu. in. (L)	549 (9.0)					
Engine Type	4 Stroke Cycle – Inline Construction					
Bore & Stroke – in. (mm)	4.66 x 5.35 (118 x 136)					
Installation Drawing	D627					D636
Wiring Diagram AC	C07651					
Wiring Diagram DC	C072146, C071361, C071369					
Engine Series	John Deere 6090 Series Power Tech E					
Speed Interpolation	N/A					

Abbreviations: CW – Clockwise TRWA – Turbocharged with Raw Water Aftercooling N/A – Not Available L – Length W – Width H - Height

*Rotation viewed from Heat Exchanger / Front of engine

CERTIFIED POWER RATING

- Each engine is factory tested to verify power and performance.
- FM-UL power ratings are shown at specific speeds, Clarke engines can be applied at a single rated RPM setting ± 50 RPM.

ENGINE RATINGS BASELINES

- Engines are to be used for stationary emergency standby fire pump service only. Engines are to be tested in accordance with NFPA 25.
- Engines are rated at standard SAE conditions of 29.61 in. (752.1 mm) Hg barometer and 77°F (25°C) inlet air temperature [approximates 300 ft. (91.4 m) above sea level] by the testing laboratory (see SAE Standard J 1349).
- A deduction of 3 percent from engine horsepower rating at standard SAE conditions shall be made for diesel engines for each 1000 ft. (305 m) altitude above 300 ft. (91.4 m)
- A deduction of 1 percent from engine horsepower rating as corrected to standard SAE conditions shall be made for diesel engines for every 10°F (5.6°C) above 77°F (25°C) ambient temperature.

CLARKE®

FIRE PUMP ENGINES

MODELS

JW6H-UFADF0 JW6H-UFAD80
JW6H-UFADJ0 JW6H-UFAA60
JW6H-UFAD70 JW6H-UFAA80

ENGINE EQUIPMENT

EQUIPMENT	STANDARD	OPTIONAL
Air Cleaner	Direct Mounted, Washable, Indoor Service with Drip Shield	Disposable, Drip Proof, Indoor Service Outdoor Type, Single or Two Stage (Cyclonic)
Alarms	Overspeed Alarm & Shutdown, Low Oil Pressure, Low & High Coolant Temperature, Low Raw Water Flow, High Raw Water Temperature, Alternate ECM Warning, Fuel Injection Malfunction, ECM Warning and Failure with Automatic Switching	Low Coolant Level, Low Oil Level, Oil Filter Differential Pressure, Fuel Filter Differential Pressure, Air Filter Restriction
Alternator	12V-DC, 42 Amps with Poly-Vee Belt and Guard	24V-DC, 40 Amps with Poly-Vee Belt and Guard
Coupling	Bare Flywheel	UL Listed Driveshaft and Guard, UFADD0/F0/J0/70-CDS50-SC; UFAD80 – CDS50-SC AT 2100 RPM only
Electronic Control Module	12V-DC, Energized to Stop, Primary ECM always Powered on	24V-DC, Energized to Stop, Primary ECM always Powered on
Engine Heater	230V-AC, 2500 Watt	
Exhaust Flex Connection	SS Flex, 150# ANSI Flanged Connection, 6”	SS Flex, 150# ANSI Flanged Connection, 8”
Exhaust Protection	Metal Guards on Manifolds and Turbocharger	
Flywheel Housing	SAE #3	
Flywheel Power Take Off	11.5” SAE Industrial Flywheel Connection	
Fuel Connections	Fire Resistant, Flexible, USA Coast Guard Approved, Supply and Return Lines	SS, Braided, cUL Listed, Supply and Return Lines
Fuel Filter	Primary and Secondary Filter with Priming Pump	
Fuel Injection System	High Pressure Common Rail	
Governor, Speed	Dual Electronic Control Modules	
Heat Exchanger	Tube and Shell Type, 60 PSI (4 BAR), NPT(F) Connections – Sea Water Compatible	
Instrument Panel	Multimeter to Display English and Metric, Tachometer, Hourmeter, Water Temperature, Oil Pressure and One (1) Voltmeter with Toggle Switch, Front Opening	
Junction Box	Integral with Instrument Panel; For DC Wiring Interconnection to Engine Controller	
Lube Oil Cooler	Engine Water Cooled, Plate Type	
Lube Oil Filter	Full Flow with By-Pass Valve	
Lube Oil Pump	Gear Driven, Gear Type	
Manual Start Control	On Instrument Panel with Control Position Warning Light	
Overspeed Control	Electronic, Factory Set, Not Field Adjustable	
Raw Water Cooling Loop w/Alarms	Galvanized	Seawater, All 316SS, High Pressure
Raw Water Cooling Loop Solenoid Operation	Automatic from Fire Pump Controller and from Engine Instrument Panel (for Horizontal Fire Pump Applications)	Not Supplied (for Vertical Turbine Fire Pump Applications)
Run – Stop Control	On Instrument Panel with Control Position Warning Light	
Starters	One (1) 12V-DC with Two (2) Start Contactors	One (1) 24V-DC with Two (2) Start Contactors
Throttle Control	Adjustable Speed Control by Increase/Decrease Button, Tamper Proof in Instrument Panel	
Water Pump	Centrifugal Type, Gear Driven	

Abbreviations : DC – Direct Current, AC – Alternating Current, SAE – Society of Automotive Engineers, NPT(F) – National Pipe Tapered Thread (Female), NPT(M) – National Pipe Tapered Thread (Male), ANSI – American National Standards Institute, SS – Stainless Steel

MODEL NOMENCLATURE (10 Digit Models)

JW 6 H - UF A D F0

- JW: John Deere Base Engine
- 6: 450 Series
- H: 6 Cylinder
- UF: Heat Exchanger Cooled
- A: Built in USA
- D: UL Listed and FM Approved
- F0: Power Curve Number, EPA Tier 3 Certified

CLARKE®

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C133422 revT
01FEB18

Specifications and information contained in this brochure subject to change without notice.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Deere & Company**
(U.S. Manufacturer or Importer)

Certificate Number: PJDXL09.0114-011

Effective Date: 06/16/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 06/16/2022

Revision Date: N/A

Model Year: 2023
Manufacturer Type: Original Engine Manufacturer
Engine Family: PJDXL09.0114

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 225<=kW<450
Fuel Type: Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control, Smoke Puff Limiter, Engine Design Modification, Non-standard Non-After Treatment Device Installed

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

Rating Specific Emissions Data

Nameplate Rating Information

Clarke Model	**JW6H-UFADF0**
Power Rating (BHP/kW)	**327/244**
Certified Speed (RPM)	**1760**

Refer to **Rating Data** section on page 2 for emissions output values

Rating Specific Emissions Data - John Deere Power Systems

Rating Data

Rating	6090HFC47A	
Certified Power(kW)	315	
Rated Speed	1760	
Vehicle Model Number	OEM (Clarke Fire Pump-Emergency)	
Units	g/kW-hr	g/hp-hr
NOx	3.54	2.64
HC	0.12	0.09
NOx + HC	N/A	N/A
Pm	0.14	0.11
CO	0.9	0.7

Certificate Data

Engine Model Year	2023
EPA Family Name	PJDXL09.0114
EPA JD Name	450HAB
EPA Certificate Number	PJDXL09.0114-011
CARB Executive Order	
Parent of Family	6090HFG84A
Units	g/kW-hr
NOx	3.80
HC	0.05
NOx + HC	N/A
Pm	0.11
CO	0.9

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

This information is property of Deere & Company. It is provided solely for the purpose of obtaining certification or permits of Deere powered equipment. Unauthorized distribution of this information is prohibited.

Emissions Results by Rating run on Feb-14-2023

APPENDIX D. APPLICATION FORMS

- DEP7007 AI – Administrative Information
- DEP7007 N – Source Emissions Profile
- DEP7007 V – Applicable Requirements and Compliance Activities
- DEP7007 EE – Internal Combustion Engine

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

None

___ Additional Documentation attached

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: April-25

Section AI.1: Source Information

Physical Location Address:
Street: 8155 Old Railroad Lane
City: Guthrie **County:** Todd **Zip Code:** 42234

Mailing Address:
Street or P.O. Box: Same as above
City: **State:** KY **Zip Code:**

Standard Coordinates for Source Physical Location

Longitude: -87.17463 (decimal degrees) **Latitude:** 36.66469 (decimal degrees)

Primary (NAICS) Category: Aluminum Sheet, Plate, and Foil Manufacturing/Secondary Smelting and Alloying of Aluminum **Primary NAICS #:** 331315/331314

Classification (SIC) Category: Aluminum Sheet, Plate, and Foil/Secondary Smelting and Refining of Nonferrous Metal **Primary SIC #:** 3353/3341

Briefly discuss the type of business conducted at this site: Aluminum processing for automotive parts in coil finishing plant. Aluminum ingot casting from primary and secondary aluminum inputs.

Description of Area Surrounding Source: ☑ Rural Area ☐ Industrial Park ☐ Residential Area ☐ Urban Area ☐ Industrial Area ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 250

Approximate distance to nearest residence or commercial property: *0.10 miles*

Property Area: 304 acres

Is this source portable? ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☑ Currently Hold	☐ Need	☐ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:

☐ Mixed Waste Generator ☐ Generator ☐ Recycler ☐ Other: _____

☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility ☑ N/A

Section AI.2: Applicant Information

Applicant Name: Novelis Corporation

Title: (if individual)

Mailing Address:
Street or P.O. Box: 8155 Old Railroad Lane
City: Guthrie **State:** KY **Zip Code:** 42234

Email: (if individual)

Phone:

Technical Contact

Name: Arantxa Espinoza

Title: Environmental Engineer

Mailing Address:
Street or P.O. Box: 8155 Old Railroad Lane
City: Guthrie **State:** KY **Zip Code:** 42234

Email: Arantxa.EspinozaDelAngel@novelis.adityabirla.com

Phone: 270-878-0664

Air Permit Contact for Source

Name: Same as technical contact

Title:

Mailing Address:
Street or P.O. Box:
City: **State:** **Zip Code:**

Email:

Phone:

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name: _____

Title: _____

Mailing Address: **Street or P.O. Box:** _____

City: _____ **State:** _____ **Zip Code:** _____

Email: _____

Phone: _____

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position

Section AI.4: Type of Application

Current Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☑ Significant Revision	☐ Administrative Permit Amendment
☐ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide OperatingPermit
☐ 502(b)(10)Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: _____

Is the source requesting a limitation of potential emissions? ☐ Yes ☑ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☐ Volatile Organic Compounds (VOC)		☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* na

Proposed Operation Start-Up Date: *(MM/YYYY)* na

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* na

Proposed Operation Start-Up Date: *(MM/YYYY)* na

Applicant is seeking coverage under a permit shield. ☐ **Yes** ☑ **No**

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- ☐ DEP7007A Indirect Heat Exchangers and Turbines
- ☐ DEP7007B Manufacturing or Processing Operations
- ☐ DEP7007C Incinerators and Waste Burners
- ☐ DEP7007F Episode Standby Plan
- ☐ DEP7007J Volatile Liquid Storage
- ☐ DEP7007K Surface Coating or Printing Operations
- ☐ DEP7007L Mineral Processes
- ☐ DEP7007M Metal Cleaning Degreasers
- ☑ DEP7007N Source Emissions Profile
- ☐ DEP7007P Perchloroethylene Dry Cleaning Systems
- ☐ DEP7007R Emission Offset Credit
- ☐ DEP7007S Service Stations
- ☐ DEP7007T Metal Plating and Surface Treatment Operations
- ☑ DEP7007V Applicable Requirements and Compliance Activities
- ☐ DEP7007Y Good Engineering Practice and Stack Height Determination
- ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units
- ☐ DEP7007BB Certified Progress Report
- ☐ DEP7007CC Compliance Certification
- ☐ DEP7007DD Insignificant Activities
- ☑ DEP7007EE Internal Combustion Engines
- ☐ DEP7007FF Secondary Aluminum Processing
- ☐ DEP7007GG Control Equipment
- ☐ DEP7007HH Haul Roads
- ☐ Confidentiality Claim
- ☐ Ownership Change Form
- ☐ Secretary of State Certificate
- ☐ Flowcharts or diagrams depicting process
- ☐ Digital Line Graphs (DLG) files of buldings, roads, etc.
- ☐ Site Map
- ☐ Map or drawing depicting location of facility
- ☐ Safety Data Sheet (SDS)
- ☐ Emergency Response Plan
- ☐ Other: _____

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Authorized Signature

4/28/2025

Date

Thomas A. Lilienthal

Type or Printed Name of Signatory

Plant Manager

Title of Signatory

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007N

Source Emissions Profile

__ Section N.1: Emission Summary

__ Section N.2: Stack Information

__ Section N.3: Fugitive Information

__ Section N.4: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: Apr-25

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
045	Ingot Saw	1	Aluminum Production	na	na	S14	72.27	PM	3.05E-04	Engineering Estimate	na	na	0.022	na	0.097	na
045	Ingot Saw	1	Aluminum Production	na	na	S14	72.27	PM10	3.05E-04	Engineering Estimate	na	na	0.022	na	0.097	na
045	Ingot Saw	1	Aluminum Production	na	na	S14	72.27	PM2.5	3.05E-04	Engineering Estimate	na	na	0.022	na	0.097	na
045	Ingot Saw	1	Aluminum Production	na	na	S14	72.27	VOC	0.014	Engineering Estimate	na	na	0.99	na	4.35	na
045	Ingot Saw	1	Aluminum Production	na	na	S14	72.27	THAP	2.44E-06	Engineering Estimate	na	na	1.76E-04	na	7.73E-04	na

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 10/2024	na	na	0.011	na	2.71E-03	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	NOx	46.54	Manufacturer Emissions Data Sheet	na	na	0.049	na	0.012	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	SO2	0.60	AP-42 Table 3.2-2, 10/2024	na	na	6.38E-04	na	1.59E-04	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	VOC	30.11	Manufacturer Emissions Data Sheet (as THC)	na	na	0.032	na	8.00E-03	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	CO	43.80	Manufacturer Emissions Data Sheet	na	na	0.047	na	0.012	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	CO2	119,317	40 CFR 98, Subpart C, Table C-1	na	na	126.83	na	31.71	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	N2O	0.22	40 CFR 98, Subpart C, Table C-2	na	na	2.39E-04	na	5.98E-05	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	CH4	2.25	40 CFR 98, Subpart C, Table C-2	na	na	2.39E-03	na	5.98E-04	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Formaldehyde	53.86	AP-42 Table 3.2-2, 07/2000	na	na	0.057	na	0.014	na

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Ammonia	18.00	SCAQMD Document, 12/2016	na	na	0.019	na	4.78E-03	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Lead	5.00E-04	AP-42 Table 1.4-2	na	na	5.32E-07	na	1.33E-07	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Total HAP	73.64	Sum of individual HAP	na	na	0.078	na	0.020	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 10/2024	na	na	3.87E-03	na	9.68E-04	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	NOx	390.21	Manufacturer Emissions Data Sheet	na	na	0.15	na	0.037	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	SO2	0.60	AP-42 Table 3.2-2, 10/2024	na	na	2.28E-04	na	5.70E-05	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	VOC	352.74	Manufacturer Emissions Data Sheet (as THC)	na	na	0.13	na	0.034	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	CO	15,445	Manufacturer Emissions Data Sheet	na	na	5.87	na	1.47	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	CO2	119,317	40 CFR 98, Subpart C, Table C-1	na	na	45.34	na	11.34	na

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	N2O	0.22	40 CFR 98, Subpart C, Table C-2	na	na	8.55E-05	na	2.14E-05	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	CH4	2.25	40 CFR 98, Subpart C, Table C-2	na	na	8.55E-04	na	2.14E-04	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Formaldehyde	53.86	AP-42 Table 3.2-2, 10/2024	na	na	0.020	na	5.12E-03	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Ammonia	18.00	SCAQMD Document, 12/2016	na	na	6.84E-03	na	1.71E-03	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Lead	5.00E-04	AP-42 Table 1.4-2	na	na	1.90E-07	na	4.75E-08	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Total HAP	73.64	Sum of individual HAP	na	na	0.028	na	7.00E-03	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	NOX	138.12	Vendor estimate	na	na	2.04	na	0.51	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	PM	4.00	Vendor estimate	na	na	0.059	na	0.015	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	PM10	4.00	Vendor estimate	na	na	0.059	na	0.015	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	PM2.5	4.00	Vendor estimate	na	na	0.059	na	0.015	na

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	SO2	0.21	AP-42 Table 3.4-1	na	na	3.11E-03	na	7.76E-04	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	VOC	1.82	Vendor estimate	na	na	0.027	na	6.72E-03	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	Benzene	0.13	AP-42 Table 3.3-2, 4/2025	na	na	1.91E-03	na	4.78E-04	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	Toluene	0.057	AP-42 Table 3.3-2, 4/2025	na	na	8.38E-04	na	2.10E-04	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	Xylene	0.039	AP-42 Table 3.3-2, 4/2025	na	na	5.84E-04	na	1.46E-04	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	CO2	22,583	40 CFR 98 Subpart C	na	na	334.22	na	83.56	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	CH4	0.92	40 CFR 98 Subpart C	na	na	0.014	na	3.39E-03	na
049	Emergency Fire Pump #3	1	Diesel Fuel Usage	na	na	S18	0.015	N2O	0.18	40 CFR 98 Subpart C	na	na	2.71E-03	na	6.78E-04	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	NOX	138.12	Vendor estimate	na	na	2.04	na	0.51	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	PM	4.00	Vendor estimate	na	na	0.059	na	0.015	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	PM10	4.00	Vendor estimate	na	na	0.059	na	0.015	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	PM2.5	4.00	Vendor estimate	na	na	0.059	na	0.015	na

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	SO2	0.21	AP-42 Table 3.4-1	na	na	3.11E-03	na	7.76E-04	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	VOC	1.82	Vendor estimate	na	na	0.027	na	6.72E-03	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	Benzene	0.13	AP-42 Table 3.3-2, 4/2025	na	na	1.91E-03	na	4.78E-04	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	Toluene	0.057	AP-42 Table 3.3-2, 4/2025	na	na	8.38E-04	na	2.10E-04	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	Xylene	0.039	AP-42 Table 3.3-2, 4/2025	na	na	5.84E-04	na	1.46E-04	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	CO2	22,583	40 CFR 98 Subpart C	na	na	334.22	na	83.56	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	CH4	0.92	40 CFR 98 Subpart C	na	na	0.014	na	3.39E-03	na
050	Emergency Fire Pump #4	1	Diesel Fuel Usage	na	na	S19	0.015	N2O	0.18	40 CFR 98 Subpart C	na	na	2.71E-03	na	6.78E-04	na

Section N.2: Stack Information

UTM Zone: 16

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter *(ft)*	Height *(ft)*	Base Elevation *(ft)*	Northing *(m)*	Easting *(m)*	Flowrate *(acfm)*	Temperature *(° F)*	Exit Velocity *(ft/sec)*
S14	Ingot Saw - Process ID(s) 1 - na	1.8	42.6	568.5	4,057,975	483,843	2,943	80.0	19.3
S16	047-1, Cast Pit Sump Emergency Generator	3.1	6.0	568.5	4,058,014	483,790	4,914	110.0	10.9
~~S17~~	~~048-1, Decoater Backup Emergency Generator~~	~~2.5~~	~~3.6~~	~~568.5~~	~~4,058,138~~	~~483,928~~	~~220~~	~~975.0~~	~~0.7~~
S18	049-1, Emergency Fire Pump #3	0.5	8.8	568.5	4,058,042	483,739	1,867	842.0	158.5
S19	050-1, Emergency Fire Pump #4	0.5	8.8	568.5	4,058,040	483,737	1,867	842.0	158.5

Section N.3: Fugitive Information

UTM Zone: 16

Emission Unit #	Emission Unit Name	Process ID	Area Physical Data		Area UTM Coordinates		Area Release Data	
			Length of the X Side *(ft)*	Length of the Y Side *(ft)*	Northing *(m)*	Easting *(m)*	Release Temperature *(°F)*	Release Height *(ft)*
048	Decoater Backup Emergency Generator	1	Fugitive source parameters vary by emission unit and building/roof vent location					

Section N.4: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)

___ Section V.2: Monitoring Requirements

___ Section V.3: Recordkeeping Requirements

___ Section V.4: Reporting Requirements

___ Section V.5: Testing Requirements

___ Section V.6: Notes, Comments, and Explanations

Additional Documentation
__ Complete DEP7007AI

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: Apr-25

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NESHAP ZZZZ: 40 CFR 63.6590(c)(6)	na	na	na	Meet the requirements of NESHAP ZZZZ by complying with NSPS JJJJ.	Comply with NSPS JJJJ.

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJ: 40 CFR 60.4234	na	na	na	Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in § 60.4233 over the entire life of the engine.	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4243(b)).
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4233(d)-(e)	NOX for EU047 HC + NOX for EU048	Per Table 1 to this subpart, NOX shal not exceed 2.0 g/hp-hr for EU047, and HC + NOX shall not exceed 10 g/HP-hr for EU048	na	na	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4243(b)).
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4233(d)-(e)	CO	Per Table 1 to this subpart, CO shall not exceed 4.0 g/hp-hr for EU047, and CO shall not exceed 387 g/HP-hr for EU048	na	na	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4243(b)).
047	Cast Pit Sump Emergency Generator	NSPS JJJJ: 40 CFR 60.4233(e)	VOC	Per Table 1 to this subpart, VOC shall not exceed 1.0 g/hp-hr	na	na	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4243(b)).

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4243(b)	na	na	na	Operate and maintain the certified stationary SI internal combustion engine and control device according to the manufacturer's emission-related written instructions. Meet requirements as specified in 40 CFR part 1068, subpart A through D	Keep records of conducted maintenance to demonstrate compliance with the manufacturer's instruction (60.4245(a)).
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4243(d)	na	na	na	Operate according to the requirements in (d)(1) through (3) to be considered an emergency stationary ICE.	Monitor hours of operation in emergency and non-emergency service and the reason the engine was in operation during that time.

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	NSPS JJJJ: 40 CFR 60.4237(c)	Operating Hours	Install a non-resettable hour meter prior to startup of the engine.
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	401 KAR 52:020, Section 10	Operating Hours and Purpose	Monitor the hours of operation and the purpose of operation.

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	NSPS JJJJ: 40 CFR 60.4245(a)	Maintenance Records	Keep records of conducted maintenance to demonstrate compliance with the manufacturer's instruction
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	NSPS JJJJ: 40 CFR 60.4245(b)	Operating Hours	Maintain records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	401 KAR 52:020, Section 10	Operating Hours	Maintain the records of the monhtly hours of operation and purpose of operation

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
047	Cast Pit Sump Emergency Generator	na	NSPS JJJ: 40 CFR 60.4245(e)	na	If the permittee operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in 40 CFR 60.4243(d)(2)(ii) and (iii) or that operates for the purposes specified in 40 CFR 60.4243(d)(3)(i), the permittee must submit an annual report according to the requirements in 40 CFR 60.4245(e)(1) through (3).

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	na	na	na

Section V.6: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)

___ Section V.2: Monitoring Requirements

___ Section V.3: Recordkeeping Requirements

___ Section V.4: Reporting Requirements

___ Section V.5: Testing Requirements

___ Section V.6: Notes, Comments, and Explanations

Additional Documentation
___ Complete DEP7007AI

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: Apr-25

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	40 CFR 63.6590(c)(6)	na	na	na	The permittee shall meet the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart IIII, for compression ignition engines.	Comply with NSPS IIII.
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	40 CFR 60.4206	na	na	na	The permittee shall operate and maintain each emergency fire pump such it achieves the emission standards as required in 40 CFR 60.4205 over the entire life of the engine.	Monitoring and recordkeeping requirements.
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	40 CFR 60.4207(b)	na	na	na	The permittee shall use diesel fuel that meets the requirements of 40 CFR 1090.305 for nonroad diesel fuel.	Monitoring and recordkeeping requirements.

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	40 CFR 60.4209(a)	na	na	na	If the emergency stationary CI internal combustion engine that does not meet the standards applicable to non-emergency engines, the permittee shall install a non-resettable hour meter prior to startup of the engine.	Monitoring and recordkeeping requirements.
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	40 CFR 60.4211(f)	na	na	na	The permittee shall operate the emergency stationary ICE according to the requirements in 40 CFR 60.4211(f)(1) through (3). In order for the engine to be considered an emergency stationary ICE under 40 CFR 60, Subpart IIII, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in non emergency situations for 50 hours per year, as described in 40 CFR 60.4211(f)(1) through (3), is prohibited. If the permittee does not operate the engine according to the requirements in 40 CFR 60.4211(f)(1) through (3), the engine will not be considered an emergency engine under 40 CFR 60, Subpart IIII and shall meet all requirements for non-emergency engines	Monitoring and recordkeeping requirements.
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	40 CFR 60.4205(c) referencing Table 4 of NSPS IIII	CO NMHC + NOx PM	Tthe owner or operator of fire pump engines must comply with the emission standards: 2.6 g/HP-hr CO 3.0 g/HP-hr NMHC + NOx 0.15 g/HP-hr PM	na	na	The permittee shall comply with the emission standards specified in 40 CFR 60.4205(c) by purchasing an engine certified to the emission standards in 40 CFR 60.4205(c) for the same model year and maximum engine power. The engine shall be installed and configured according to the manufacturer's emission-related specifications, except as permitted in 40 CFR 60.4211(g). [40 CFR 60.4211(c)]

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	na	401 KAR 52:020	na	For each emission unit, the permittee shall monitor the monthly hours of operation and purpose of operation.

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	na	401 KAR 52:020, Section 10	na	For each emission unit, the permittee shall maintain records of the monthly hours of operation and purpose of operation.
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	na	40 CFR 60.4214(b)	na	If the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the permittee shall keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The permittee shall record the time of operation of the engine and the reason the engine was in operation during that time.

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	na	40 CFR 60.4214(d)	na	If the permittee operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in 40 CFR 60.4211(f)(2)(ii) and (iii) or that operates for the purposes specified in 40 CFR 60.4211(f)(3)(i), the permittee must submit an annual report according to the requirements in 40 CFR 60.4214(d)(1) through (3).

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
049, 050	Emergency Fire Pump #3, Emergency Fire Pump #4	na	401 KAR 50:045, Section 1	na	Performance testing using the Reference Methods specified in 401 KAR 50:015 if required by the Cabinet.

Section V.6: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007EE

Internal Combustion Engines

___ Section EE.1: General Information
___ Section EE.2: Operating Information
___ Section EE.3: Design Information
___ Section EE.4: Fuel Information
___ Section EE.5: Emission Factor Information
___ Section EE.6: Notes, Comments, and Explanations

Additional Documentation

__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG

__ Attach EPA certification of the engine

Source Name: Novelis Corporation
KY EIS (AFS) #: 21- 219-00039
Permit #: V-22-011 R1
Agency Interest (AI) ID: 136118
Date: Apr-25

Section EE.1: General Information

Emission Unit #	Emission Unit Name	Control Device ID	Stack ID	Manufacturer	Model Number	Model Year	Date of Manufacture	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Date Reconstructed / Modified	List Applicable Regulations
047	Cast Pit Sump Emergency Generator	na	S16	Generac	SG080	2024	2024	10/2024	na	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart JJJJ
048	Decoater Backup Emergency Generator	na	S17	Generac	QT025A	2023	2023	10/2024	na	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart JJJJ

Emission Unit #	Emission Unit Name	Control Device ID	Stack ID	Manufacturer	Model Number	Model Year	Date of Manufacture	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Date Reconstructed / Modified	List Applicable Regulations
049	Emergency Fire Pump #3	na	S18	John Deere	6090HFC47	2023	10/2023	07/2023	na	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII
050	Emergency Fire Pump #4	na	S19	John Deere	6090HFC47	2023	9/2023	07/2023	na	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart IIII

Section EE.2: Operating Information

Emission Unit #	Engine Purpose (Identify if Non-Emergency, Emergency,Fire/Water Pump, Black-start engine for combustion turbine, Engine Testing)	Hours Operated	Is this engine a rental? *(Yes/No)*	Rental Time Period *(hrs)*	Alternate Operating Scenarios (Describe any operating scenarios in which the engine may be used in a different configuration)
047	Emergency	500	No	na	
048	Emergency	500	No	na	
049	Emergency	500	No	na	
050	Emergency	500	No	na	

Section EE.3: Design Information

Emission Unit #	Engine Type (Identify all that apply: Commercial, Institutional, Stationary, Non-Road)	Ignition Type (Identify if either Compression or Spark Ignition)	Engine Family (Identify all that apply: 2-stroke, 4-stroke, Rich Burn, Lean Burn)	Maximum Engine Power *(bhp)*	Maximum Engine Speed *(rpm)*	Total Displacement *(L)*	Number of Cylinders
047	Stationary	Spark Ignition	4-Stroke Lean Burn	132	1,800	4.4	4
048	Stationary	Spark Ignition	4-Stroke Lean Burn	38	1,800	2.4	4
049	Stationary	Compression Ignition	4-Stroke	327	1,760	9.0	6
050	Stationary	Compression Ignition	4-Stroke	327	1,760	9.0	6

Section EE.4: Fuel Information

Emission Unit #	Identify if Primary, Secondary, or Tertiary Fuel	Fuel Type (Identify if Diesel, Gasoline, Natural Gas, Liquefied Petroleum Gas (LPG), Landfill/Digester Gas, or Other)	Fuel Grade	Percent Time Used *(%)*	Maximum Fuel Consumption	Heat Content	Sulfur Content *(%)*	SCC Code	SCC Units
047	Primary	Natural Gas	na	100	1.06E-03 MMscf/hr	1020 Btu/scf	Neg.	20200202	MMscf
048	Primary	Natural Gas	na	100	3.80E-04 MMscf/hr	1020 Btu/scf	Neg.	20200202	MMscf
049	Primary	Diesel	na	100	0.0148 Mgal/hr	138,500 Btu/gal	0.0015%	20200102	Mgal
050	Primary	Diesel	na	100	0.0148 Mgal/hr	138,500 Btu/gal	0.0015%	20200102	Mgal

Section EE.5: Emission Factor Information

Emission factors expressed here are based on the potential to emit.

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
047	Primary	PM/PM10/PM2.5	10.19	lb/MMscf	AP-42 Table 3.2-2, 10/2024
047	Primary	NOx	46.54	lb/MMscf	Manufacturer Emissions Data Sheet
047	Primary	SO2	0.60	lb/MMscf	AP-42 Table 3.2-2, 10/2024
047	Primary	VOC	30.11	lb/MMscf	Manufacturer Emissions Data Sheet (as THC)
047	Primary	CO	43.8	lb/MMscf	Manufacturer Emissions Data Sheet
047	Primary	CO2	119,316.9	lb/MMscf	40 CFR 98, Subpart C, Table C-1
047	Primary	N2O	0.22	lb/MMscf	40 CFR 98, Subpart C, Table C-2
047	Primary	CH4	2.25	lb/MMscf	40 CFR 98, Subpart C, Table C-2
047	Primary	Formaldehyde	53.86	lb/MMscf	AP-42 Table 3.2-2, 07/2000
047	Primary	Ammonia	18.00	lb/MMscf	SCAQMD Document, 12/2016
047	Primary	Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-2
047	Primary	Total HAP	73.64	lb/MMscf	Sum of individual HAP
048	Primary	PM/PM10/PM2.5	10.19	lb/MMscf	AP-42 Table 3.2-2, 10/2024
048	Primary	NOx	390.21	lb/MMscf	Manufacturer Emissions Data Sheet

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
048	Primary	SO2	0.60	lb/MMscf	AP-42 Table 3.2-2, 10/2024
048	Primary	VOC	352.74	lb/MMscf	Manufacturer Emissions Data Sheet (as THC)
048	Primary	CO	15,445.4	lb/MMscf	Manufacturer Emissions Data Sheet
048	Primary	CO2	119,316.9	lb/MMscf	40 CFR 98, Subpart C, Table C-1
048	Primary	N2O	0.22	lb/MMscf	40 CFR 98, Subpart C, Table C-2
048	Primary	CH4	2.25	lb/MMscf	40 CFR 98, Subpart C, Table C-2
048	Primary	Formaldehyde	53.86	lb/MMscf	AP-42 Table 3.2-2, 10/2024
048	Primary	Ammonia	18.00	lb/MMscf	SCAQMD Document, 12/2016
048	Primary	Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-2
048	Primary	Total HAP	7.36E+01	lb/MMscf	Sum of individual HAP
049	Primary	PM	4.00	lb/Mgal	Vendor estimate
049	Primary	PM10	4.00	lb/Mgal	Vendor estimate
049	Primary	PM2.5	4.00	lb/Mgal	Vendor estimate
049	Primary	NOX	138	lb/Mgal	Vendor estimate
049	Primary	CO	32.71	lb/Mgal	Vendor estimate
049	Primary	SO2	0.21	lb/Mgal	AP-42 Table 3.4-1

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
049	Primary	VOC	1.82	lb/Mgal	Vendor estimate
049	Primary	Benzene	0.13	lb/Mgal	AP-42 Table 3.3-2, 4/2025
049	Primary	Toluene	0.057	lb/Mgal	AP-42 Table 3.3-2, 4/2025
049	Primary	Xylene	0.039	lb/Mgal	AP-42 Table 3.3-2, 4/2025
049	Primary	CO2	22,583	lb/Mgal	40 CFR 98 Subpart C
049	Primary	CH4	0.92	lb/Mgal	40 CFR 98 Subpart C
049	Primary	N2O	0.18	lb/Mgal	40 CFR 98 Subpart C
049	Primary	CO2e	22,657	lb/Mgal	40 CFR 98 Subpart C
050	Primary	PM	4.00	lb/Mgal	Vendor estimate
050	Primary	PM10	4.00	lb/Mgal	Vendor estimate
050	Primary	PM2.5	4.00	lb/Mgal	Vendor estimate
050	Primary	NOX	138.12	lb/Mgal	Vendor estimate
050	Primary	CO	32.71	lb/Mgal	Vendor estimate
050	Primary	SO2	0.21	lb/Mgal	AP-42 Table 3.4-1
050	Primary	VOC	1.82	lb/Mgal	Vendor estimate
050	Primary	Benzene	0.13	lb/Mgal	AP-42 Table 3.3-2, 4/2025

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
050	Primary	Toluene	0.057	lb/Mgal	AP-42 Table 3.3-2, 4/2025
050	Primary	Xylene	0.039	lb/Mgal	AP-42 Table 3.3-2, 4/2025
050	Primary	CO2	22,583	lb/Mgal	40 CFR 98 Subpart C
050	Primary	CH4	0.92	lb/Mgal	40 CFR 98 Subpart C
050	Primary	N2O	0.18	lb/Mgal	40 CFR 98 Subpart C
050	Primary	CO2e	22,657	lb/Mgal	40 CFR 98 Subpart C

Section EE.6: Notes, Comments, and Explanations

APPENDIX E. BACT SUPPORTING DOCUMENTATION

Table E-1. Casting Project Emergency Generator (SI ICE) SCR Control Cost per Ton NO_X Removed[1]

Engine Size	NO_X PTE Uncontrolled Emissions[2]	Capital Cost[3]	Annualized Cost[4]	Annualized Control Costs ($/ton of NO_X removed)[5]
(hp)	(ton/year)	($)	($/year)	($/ton)
132	0.012	82,950	48,161	4,326,696
38	0.037	7,475	33,242	996,377

1. Costs from reference are in 2001 dollars are adjusted for inflation using the Chemical Engineering Plant Cost Index (CEPCI) (https://www.chemengonline.com/pci)

CEPCI 2001 = 394.30

CEPCI Prelim. Jan 2025 = 791.50

2. Uncontrolled NO_X emissions consistent with annual PTE calculations in Sections 19 and 20 of Appendix C.

3. *EPA Office of Air Quality Planning and Standards (OAQPS),* Final Technical Support Document (TSD) for the Cross-State Air Pollution Rule for the 2008 Ozone NAAQS, *Docket ID No. EPA-HQ-OAR-2015-0500,* Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance Final TSD*, August 2016, Appendix A* at pg. 5-11 to 5-12.

Calculated as follows: Capital Cost ($) = 107.1 x Engine Size (hp) + 27,186

Costs scaled up for inflation based on CEPCI values noted in Footnote 1.

4. Linear curve fit of Annualized Cost Data from Table 13 of Oil and Gas Sector Reasonable Progress Four-Factor Analysis of Controls for Five Source Categories: Natural Gas-Fired Engines…Prepared for National Parks Conservation Association by Vicki Stamper & Megan Williams March 5, 2020, Docket ID. EPA-R04-OAR-2023-0220-0115, Attachment 16.

Calculated as follows: Annual Cost ($) = 79.061 x Engine Size (hp) +13,556

Costs scaled up for inflation based on CEPCI values noted in Footnote 1.

5. The cost/ton was calculated assuming a 90% NOX reduction by the SCR.

Table E-2. Casting Project Emergency Fire Pump Engine (CI ICE) SCR Control Cost per Ton NO_X Removed per Engine[1]

Engine Size	NO_X PTE Uncontrolled Emissions[2]	Capital Cost[3]	Annualized Cost[4]	Annualized Control Costs ($/ton of NO_X removed)[5]
(hp)	(ton/year)	($)	($/year)	($/ton)
327	0.51	54,174	22,112	48,077

1. Costs from reference are in 2005 dollars are adjusted for inflation using the Chemical Engineering Plant Cost Index (CEPCI) (https://www.chemengonline.com/pci)

CEPCI 2005 = 468.20

CEPCI Prelim. Jan 2025 = 791.50

2. Uncontrolled NO_X emissions consistent with annual PTE calculations in Section 21 of Appendix C.

3. EPA Final Report, Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010. Section 5.2.1.1 for Control Costs for Diesel Engines; Control Costs for SCR - Capital Costs.

Calculated as follows: Capital Cost ($) = 98 x Engine Size (hp)

Costs scaled up for inflation based on CPI values noted in Footnote 1.

4. EPA Final Report, Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010. Section 5.2.1.2 for Control Costs for Diesel Engines; Control Costs for SCR - Annual Costs. Annualized cost is calculated assuming a 15 year equipment life and 7% interest.

Calculated as follows: Annual Cost ($) = 40 x Engine Size (hp)

Costs scaled up for inflation based on CEPCI values noted in Footnote 1.

5. The cost/ton was calculated assuming a 90% NOX reduction by the SCR.

Table E-3. Casting Project Emergency Generator (SI ICE) CatOx Control Cost per Ton CO & VOC Removed[1]

Engine Size	CO PTE Uncontrolled Emissions[2]	VOC PTE Uncontrolled Emissions[2]	Total Capital Cost[3]	Annualized Cost[4]	Annualized Control Costs ($/ton of CO removed)[5]	Annualized Control Costs ($/ton of CO removed)[5]
(hp)	(ton/year)	(ton/year)	($)	($/year)	($/ton)	($/ton)
38	1.47	0.034	5,392	5,324	4,032	176,543

1. Costs from reference are in 2009 dollars are adjusted for inflation using the Chemical Engineering Plant Cost Index (CEPCI) (https://www.chemengonline.com/pci)

CEPCI 2009 = 521.90

CEPCI Prelim. Jan 2025 = 791.50

2. Uncontrolled CO and VOC emissions consistent with annual PTE calculations in Section 20 of Appendix C.

3. Memorandum from Bradley Nelson, EC/R, Inc. to Melanie King, EPA OAQPS/SPPD/ESG, SUBJECT: Control Costs for Existing Stationary SI RICE, June 29, 2010, available at https://www.epa.gov/sites/default/files/2014-02/documents/5_2011_ctrlcostmemo_exist_si.pdf

Calculated as follows: Capital Cost ($) = 12.8 x Engine Size (hp) + 3,069

Costs scaled up for inflation based on CEPCI values noted in Footnote 1.

4. Memorandum from Bradley Nelson, EC/R, Inc. to Melanie King, EPA OAQPS/SPPD/ESG, SUBJECT: Control Costs for Existing Stationary SI RICE, June 29, 2010, available at https://www.epa.gov/sites/default/files/2014-02/documents/5_2011_ctrlcostmemo_exist_si.pdf. Annualized cost is calculated assuming a 10 year equipment life and 7% interest.

Calculated as follows: Annual Cost ($) = 1.81 x Engine Size (hp) + 3,442

Costs scaled up for inflation based on CEPCI values noted in Footnote 1.

5. The cost/ton was calculated assuming a 90% CO/VOC reduction by the CatOx.

Table E-4. Casting Project Emergency Fire Pump Engine (CI ICE) DOC Control Cost per Ton CO & VOC Removed per Engine[1]

Engine Size	CO PTE Uncontrolled Emissions[2]	VOC PTE Uncontrolled Emissions[2]	Total Capital Cost[3]	Annualized Cost[4]	Annualized Control Costs ($/ton of CO removed)[5]	Annualized Control Costs ($/ton of VOC removed)[5]
(hp)	(ton/year)	(ton/year)	($)	($/year)	($/ton)	($/ton)
327	0.12	6.72E-03	11,033	2,905	26,667	480,007

1. Costs from reference are in 2008 dollars are adjusted for inflation using the Chemical Engineering Plant Cost Index (CEPCI) (https://www.chemengonline.com/pci)

CEPCI 2008 = 575.40

CEPCI Prelim. Jan 2025 = 791.50

2. Uncontrolled CO and VOC emissions consistent with annual PTE calculations in Section 21 of Appendix C.

3. EPA Final Report, Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010. Section 5.2.3.1 for Control Costs for Diesel Engines; Control Costs for DOC - Capital Costs.

Calculated as follows: Capital Cost ($) = 27.4 x Engine Size (hp) - 939

Costs scaled up for inflation based on CPI values noted in Footnote 1.

4. EPA Final Report, Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010. Section 5.2.3.2 for Control Costs for Diesel Engines; Control Costs for DOC - Annual Costs. Annualized cost is calculated assuming a 10 year equipment life and 7% interest.

Calculated as follows: Annual Cost ($) = 4.99 x Engine Size (hp) + 480

Costs scaled up for inflation based on CEPCI values noted in Footnote 1.

5. The cost/ton was calculated assuming a 90% CO/VOC reduction by the DOC.

Table E-5. Casting Project Emergency Fire Pump Engine (CI ICE) CDPF Control Cost per Ton Pollutant Removed per Engine[1]

Engine Size	PM PTE Uncontrolled Emissions[2]	CO PTE Uncontrolled Emissions[2]	VOC PTE Uncontrolled Emissions[2]	Total Capital Cost[3]	Annualized Cost[4]	Annualized Control Costs ($/ton of PM removed)[5]	Annualized Control Costs ($/ton of CO removed)[5]	Annualized Control Costs ($/ton of VOC removed)[5]
(hp)	(ton/year)	(ton/year)	(ton/year)	($)	($/year)	($/ton)	($/ton)	($/ton)
327	0.015	0.12	6.72E-03	36,357	7,163	$ 530,581	$ 66,323	$ 1,184,332

1. Costs from reference are in 2008 dollars are adjusted for inflation using the Chemical Engineering Plant Cost Index (CEPCI) (https://www.chemengonline.com/pci)

CEPCI 2008 = 575.40

CEPCI Prelim. Jan 2025 = 791.50

2. Uncontrolled PM, CO, and VOC emissions consistent with annual PTE calculations in Section 21 of Appendix C.

3. EPA Final Report, Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010. Section 5.2.2.1 for Control Costs for Diesel Engines; Control Costs for CDPF - Capital Costs.

Calculated as follows: Capital Cost ($) = 63.4 x Engine Size (hp) + 5,699

Costs scaled up for inflation based on CPI values noted in Footnote 1.

4. EPA Final Report, Alternative Control Techniques Document: Stationary Diesel Engines, March 5, 2010. Section 5.2.2.2 for Control Costs for Diesel Engines; Control Costs for CDPF - Annual Costs. Annualized cost is calculated assuming a 10 year equipment life and 7% interest.

Calculated as follows: Annual Cost ($) = 11.6 x Engine Size (hp) + 1,414

Costs scaled up for inflation based on CEPCI values noted in Footnote 1.

5. The cost/ton was calculated assuming a 90% PM, CO, and VOC reduction by the CDPF.

APPENDIX F. RBLC SEARCH RESULTS

Table F-1.1 Summary of NOx BACT Determination for Natural Gas Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18A - PVC Emergency Combustion Equipment A	10/20/2022	NOx	100	hp	2.45	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII using Non-Methane hydrocarbon + NOx as a surrogate to VOC and NOx
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18C - PVC Emergency Combustion Equipment C	10/20/2022	NOx	50	hp	1.23	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII using Non-Methane hydrocarbon + NOx as a surrogate to VOC and NOx
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18E - Emergency Combustion Equipment E	10/20/2022	NOx	268	hp	10.52	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII using Non-Methane hydrocarbon + NOx as a surrogate to VOC and NOx

Table F-1.2 Summary of CO BACT Determination for Natural Gas Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18A - PVC Emergency Combustion Equipment A	10/20/2022	CO	100	hp	2.87	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18C - PVC Emergency Combustion Equipment C	10/20/2022	CO	50	hp	7.68	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18E - Emergency Combustion Equipment E	10/20/2022	CO	268	hp	7.68	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
IN-0288	WAUPACA FOUNDRY, INC. PLANT 5	100 KW emergency generator	6/25/2018	CO	1.12	MMBTU/hr	0.317	lb/MMBTU	-	-
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	Two 25-kW propane emergency generators	3/9/2016	CO	33.5	hp	387	g/hp-hr	-	-

Table F-1.3 Summary of VOC BACT Determination for Natural Gas Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18A - PVC Emergency Combustion Equipment A	10/20/2022	VOC	100	hp	0.28	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII using Non-Methane hydrocarbon + NOx as a surrogate to VOC and NOx
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18C - PVC Emergency Combustion Equipment C	10/20/2022	VOC	50	hp	0.14	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII using Non-Methane hydrocarbon + NOx as a surrogate to VOC and NOx
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18E - Emergency Combustion Equipment E	10/20/2022	VOC	268	hp	0.75	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII using Non-Methane hydrocarbon + NOx as a surrogate to VOC and NOx
WI-0267	GREEN BAY PACKAGING, INC. - MILL DIVISION	Two Emergency Generators (P38 and P39)	9/6/2018	VOC	50	kW	0	hp	-	Meet 40 CFR 60, Subpart JJJJ, limit operation to no more than 200 hr/yr
IN-0288	WAUPACA FOUNDRY, INC. PLANT 5	100 KW emergency generator	6/25/2018	VOC	1.12	MMBTU/hr	0.36	lb/MMBTU	-	-
LA-0276	BATON ROUGE JUNCTION FACILITY	Emergency Generators (2 units)	12/15/2016	VOC	104.8	hp	0	hp	-	Comply with standards of NSPS Subpart JJJJ

Table F-1.4 Summary of Particulate Matter BACT Determination for Natural Gas Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18A - PVC Emergency Combustion Equipment A	10/20/2022	Total PM2.5	100	hp	0.16	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18A - PVC Emergency Combustion Equipment A	10/20/2022	Total PM10	100	hp	0.17	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18C - PVC Emergency Combustion Equipment C	10/20/2022	Total PM2.5	50	hp	0.08	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0389	SHINTECH PLAQUEMINE PLANT 3	2P-18C - PVC Emergency Combustion Equipment C	10/20/2022	Total PM10	50	hp	0.08	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII

Table F-2.1 Summary of NOx BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
IL-0134	CRONUS CHEMICALS	Firewater Pump Engine	12/21/2023	NOx	369	hp	4	g/kW-hr	3-Hour	-
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-01 - Firewater Pump Engine No. 1	12/20/2023	NOx	422	hp	3.96	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-02 - Firewater Pump Engine No. 2	12/20/2023	NOx	422	hp	3.96	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-03 - Firewater Pump Engine No. 3	12/20/2023	NOx	237	hp	1.49	lb/hr	-	Compliance with the requirements of 40 CFR 60 Subpart IIII
MI-0454	LBWL-ERICKSON STATION	EUFPRICE--A 315 HP diesel-fueled emergency engine	12/20/2022	NOx	2.5	MMBTU/hr	3	g/hp-hr	Hourly	Good combustion practices.
OH-0387	INTEL OHIO SITE	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	9/20/2022	NOx	275	hp	4	g/kW-hr	NMHC & NOx Standard	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
IL-0133	LINCOLN LAND ENERGY CENTER	Fire Water Pump Engine	7/29/2022	NOx	320	hp	4	grams	kW-hr	-
AK-0088	LIQUEFACTION PLANT	Auxiliary Air Compressor Engine	7/7/2022	NOx	14.6	gal/hr	0.45	g/hp-hr	-	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
MI-0451	MEC NORTH, LLC	EUFPENGINE (North Plant): Fire Pump Engine	6/23/2022	NOx	300	hp	3	g/bhp-hr	Hourly	Good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0452	MEC SOUTH, LLC	EUFPENGINE (South Plant): Fire pump engine	6/23/2022	NOx	300	hp	3	g/bhp-hr	Hourly	Good Combustion Practices and meeting NSPS Subpart IIII requirements
LA-0391	MAGNOLIA POWER GENERATING STATION UNIT 1	Emergency Diesel Fired Water Pump Engine	6/3/2022	NOx	355	hp	3	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, and use of ultra-low sulfur diesel fuel.
FL-0371	SHADY HILLS COMBINED CYCLE FACILITY	Emergency Fire Pump Engine (347 HP)	6/7/2021	NOx	2.46	MMBTU/hr	4	g/kW-hr	NMHC & NOx Standard	-
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment B	5/4/2021	NOx	375	hp	4.41	lb/MMBTU	-	Good combustion practices/gaseous fuel burning.
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment 2A and 2B	5/4/2021	NOx	300	hp	0.4	g/kW-hr	-	Compliance with 40 CFR 60 Subpart IIII.
KY-0115	NUCOR STEEL GALLATIN, LLC	Cold Mill Complex Emergency Generator (EP 09-05)	4/19/2021	NOx	350	hp	0	hp	-	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan
AK-0086	KENAI NITROGEN OPERATIONS	Diesel Fired Well Pump	3/26/2021	NOx	2.7	MMBTU/hr	4.41	lb/MMBTU	3-Hour	Good Combustion Practices and Limited Use
WI-0300	NEMADJI TRAIL ENERGY CENTER	Emergency Diesel Fire Pump (P06)	9/1/2020	NOx	282	hp	3	g/hp-hr	-	Operation limited to 500 hours/year and shall be operated and maintained according to the manufacturerâ€™s recommendations.
AK-0085	GAS TREATMENT PLANT	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	8/13/2020	NOx	19.4	gal/hr	3.6	g/hp-hr	3-Hour	Good combustion practices, limit operation to 500 hours per year per engine

Table F-2.1 Summary of NOx BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
KY-0110	NUCOR STEEL BRANDENBURG	EP 11-01 - Melt Shop Emergency Generator	7/23/2020	NOx	260	hp	2.98	g/hp-hr	NMHC & NOx Standard	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.
WI-0302	WPL- RIVERSIDE ENERGY CENTER	Diesel-Fired Fire Pump Engine (P04)	2/28/2020	NOx	290	hp	3.64	lb/hr	-	Only use diesel fuel oil with a sulfur content of no greater than 0.0015% by weight
*MI-0445	INDECK NILES, LLC	EUFPENGINE (Emergency engine-diesel fire pump	11/26/2019	NOx	1.66	MMBTU/hr	3	g/bhp-hr	Hourly	Good Combustion Practices and meeting NSPS Subpart IIII requirements
IL-0130	JACKSON ENERGY CENTER	Firewater Pump Engine	12/31/2018	NOx	420	hp	4	g/kW-hr	-	-
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	Firewater Pumps (P005 and P006)	12/21/2018	NOx	402	hp	2.64	lb/hr	See Notes	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII and employ good combustion practices per the manufacturerâ€™s operating manual
TX-0846	MOTOR VEHICLE ASSEMBLY PLANT	FIRE PUMP DIESEL ENGINE	9/23/2018	NOx	214	kW	0.4	g/kW	Hourly	Meets EPA Tier 4 requirements
IL-0129	CPV THREE RIVERS ENERGY CENTER	Firewater Pump Engine	7/30/2018	NOx	422	hp	0	hp	-	-
FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	Emergency Fire Pump Engine (347 HP)	7/27/2018	NOx	8700	gal/yr	4	g/kW-hr	-	Operate and maintain the engine according to the manufacturer's written instructions
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	EUFPENGINE: Fire pump engine	7/16/2018	NOx	399	bhp	4	g/kW-hr	Hourly	State of the art combustion design.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (South Plant): Fire pump engine	6/29/2018	NOx	300	hp	3	g/bhp-hr	Hourly	Good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (North Plant): Fire pump engine	6/29/2018	NOx	300	hp	3	g/bhp-hr	Hourly	Good combustion practices and meeting NSPS Subpart IIII requirements.
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39A	5/2/2018	NOx	375	hp	4	g/kW-hr	-	Good combustion practices and NSPS IIII
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39B	5/2/2018	NOx	300	hp	4	g/kW-hr	-	Good combustion practices and NSPS Subpart IIII
VA-0328	C4GT, LLC	Emergency Fire Water Pump	4/26/2018	NOx	500	hr/yr	3	g/hp-hr	-	Good combustion practices and the use of ultra low sulfur diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.
OH-0377	HARRISON POWER	Emergency Fire Pump (P004)	4/19/2018	NOx	320	hp	2.12	lb/hr	NMHC & NOx Standard	Good combustion practices (ULSD) and compliance with 40 CFR Part 60, Subpart IIII
MI-0434	FLAT ROCK ASSEMBLY PLANT	EUFIREPUMPENGS (2 emergency fire pump engines)	3/22/2018	NOx	250	bhp	3	g/bhp-hr	Hourly (per unit); NMHC & NOx Standard	Good combustion practices.

Table F-2.1 Summary of NOx BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	Emergency Diesel Generators	2/23/2018	NOx	150	hp	14.06	g/hp-hr	-	-
OH-0376	IRONUNITS LLC - TOLEDO HBI	Emergency diesel-fueled fire pump (P006)	2/9/2018	NOx	250	hp	1.6	lb/hr	-	Comply with NSPS 40 CFR 60 Subpart IIII
OH-0374	GUERNSEY POWER STATION LLC	Emergency Fire Pump (P006)	10/23/2017	NOx	410	hp	2.7	lb/hr	NMHC & NOx Standard	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII. Good combustion practices per the manufacturerâ€™s operating manual
OH-0372	OREGON ENERGY CENTER	Emergency fire pump engine (P004)	9/27/2017	NOx	300	hp	1.97	lb/hr	-	State-of-the-art combustion design
OH-0370	TRUMBULL ENERGY CENTER	Emergency fire pump engine (P004)	9/7/2017	NOx	300	hp	1.97	lb/hr	-	State-of-the-art combustion design
AK-0084	DONLIN GOLD PROJECT	Fire Pump Diesel Internal Combustion Engines	6/30/2017	NOx	252	hp	3.7	g/kW-hr	3-Hour	Good Combustion Practices
LA-0323	MONSANTO LULING PLANT	Standby Generator No. 9 Engine	1/9/2017	NOx	400	hp	0	hp	-	Proper operation and limits on hours of operation for emergency engines and compliance with 40 CFR 60 Subpart IIII
MI-0423	INDECK NILES, LLC	EUFPENGINE (Emergency engine--diesel fire pump)	1/4/2017	NOx	1.66	MMBTU/hr	3	g/bhp-hr	Test Protocol Will Specify	Good combustion practices and meeting NSPS Subpart IIII requirements.
OH-0367	SOUTH FIELD ENERGY LLC	Emergency fire pump engine (P004)	9/23/2016	NOx	311	hp	1.79	lb/hr	-	State-of-the-art combustion design
LA-0313	ST. CHARLES POWER STATION	SCPS Emergency Diesel Firewater Pump 1	8/31/2016	NOx	282	hp	1.87	lb/hr	Hourly Maximum	Compliance with NESHAP 40 CFR 63 Subpart ZZZZ and NSPS 40 CFR 60 Subpart IIII, and good combustion practices (use of ultra-low sulfur diesel fuel).
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel Firewater pump engines (6 units)	8/3/2016	NOx	425	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel emergency generator engine - EGEN	8/3/2016	NOx	350	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	EMERGENCY DIESEL FIRE PUMP	7/19/2016	NOx	100	hr/yr	2.05	lb/hr	-	Use of Ultra Low Sulfur Diesel (ULSD) Oil a clean burning fuel and limited hours of operation
VA-0325	GREENSVILLE POWER STATION	DIESEL-FIRED WATER PUMP 376 bph (1)	6/17/2016	NOx	376	hp	0	hp	-	Good Combustion Practices/Maintenance
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	Emergency Diesel Fire Pump	3/10/2016	NOx	100	hr/yr	1.7	lb/hr	-	use of ULSD a clean burning fuel, and limited hours of operation
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	Fire pump engine	12/23/2015	NOx	15	gal/hr	3	g/hp-hr	-	-
IN-0234	GRAIN PROCESSING CORPORATION	EMERGENCY FIRE PUMP ENGINE	12/8/2015	NOx	425	hp	9.5	g/hp-hr	-	GOOD COMBUSTION PRACTICES

Table F-2.1 Summary of NOx BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
MD-0045	MATTAWOMAN ENERGY CENTER	EMERGENCY DIESEL ENGINE FOR FIRE WATER PUMP	11/13/2015	NOx	305	hp	4	g/kW-hr	-	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES
FL-0354	LAUDERDALE PLANT	Emergency fire pump engine, 300 HP	8/25/2015	NOx	29	MMBTU/hr	4	g/kW-hr	NMHC & NOx Standard	Low-emitting fuel and certified engine
LA-0309	BENTELER STEEL TUBE FACILITY	Firewater Pump Engines	6/4/2015	NOx	288	hp	3	g/bhp-hr	-	Complying with 40 CFR 60 Subpart IIII

Table F-2.2 Summary of CO BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
IL-0134	CRONUS CHEMICALS	Firewater Pump Engine	12/21/2023	CO	369	hp	3.5	g/kW-hr	3-Hour	-
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-01 - Firewater Pump Engine No. 1	12/20/2023	CO	422	hp	3.44	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-02 - Firewater Pump Engine No. 2	12/20/2023	CO	422	hp	3.44	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-03 - Firewater Pump Engine No. 3	12/20/2023	CO	237	hp	0.5	lb/hr	-	Compliance with the requirements of 40 CFR 60 Subpart IIII
MI-0454	LBWL-ERICKSON STATION	EUFPRICE--A 315 HP diesel-fueled emergency engine	12/20/2022	CO	2.5	MMBTU/hr	2.6	g/hp-hr	Hourly	Good combustion practices.
OH-0387	INTEL OHIO SITE	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	9/20/2022	CO	275	hp	3.5	g/kW-hr	-	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
IL-0133	LINCOLN LAND ENERGY CENTER	Fire Water Pump Engine	7/29/2022	CO	320	hp	3.5	grams	kW-hr	-
AK-0088	LIQUEFACTION PLANT	Auxiliary Air Compressor Engine	7/7/2022	CO	14.6	gal/hr	3.3	g/hp-hr	-	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
MI-0451	MEC NORTH, LLC	EUFPENGINE (North Plant): Fire Pump Engine	6/23/2022	CO	300	hp	2.6	g/bhp-hr	Hourly	Good combustion practices and meeting NSPS Subpart IIII requirements
MI-0452	MEC SOUTH, LLC	EUFPENGINE (South Plant): Fire pump engine	6/23/2022	CO	300	hp	2.6	g/bhp-hr	Hourly	Good Combustion Practices and meeting NSPS Subpart IIII requirements
LA-0391	MAGNOLIA POWER GENERATING STATION UNIT 1	Emergency Diesel Fired Water Pump Engine	6/3/2022	CO	355	hp	2.6	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, and the use of ultra-low sulfur diesel fuel.
FL-0371	SHADY HILLS COMBINED CYCLE FACILITY	Emergency Fire Pump Engine (347 HP)	6/7/2021	CO	2.46	MMBTU/hr	3.5	g/kW-hr	-	-
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment B	5/4/2021	CO	375	hp	0.95	lb/MMBTU	-	Good combustion practices/gaseous fuel burning.
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment 2A and 2B	5/4/2021	CO	300	hp	2.6	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII.
KY-0115	NUCOR STEEL GALLATIN, LLC	Cold Mill Complex Emergency Generator (EP 09-05)	4/19/2021	CO	350	hp	0	hp	-	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan
AK-0086	KENAI NITROGEN OPERATIONS	Diesel Fired Well Pump	3/26/2021	CO	2.7	MMBTU/hr	0.95	lb/MMBTU	3-Hour	Good Combustion Practices and Limited Use
MI-0447	LBWL--ERICKSON STATION	EUFPRICE--A 315 HP diesel fueled emergency engine	1/7/2021	CO	2.5	MMBTU/hr	2.6	g/hp-hr	Hourly	Good combustion practices
WI-0300	NEMADJI TRAIL ENERGY CENTER	Emergency Diesel Fire Pump (P06)	9/1/2020	CO	282	hp	2.6	g/hp-hr	-	Operation limited to 500 hours/year and shall be operated and maintained according to the manufacturerâ€™s recommendations.
AK-0085	GAS TREATMENT PLANT	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	8/13/2020	CO	19.4	gal/hr	3.3	g/hp-hr	3-Hour	Good combustion practices, limit operation to 500 hours per year per engine

Table F-2.2 Summary of CO BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
KY-0110	NUCOR STEEL BRANDENBURG	EP 11-01 - Melt Shop Emergency Generator	7/23/2020	CO	260	hp	2.61	g/hp-hr	-	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.
WI-0302	WPL- RIVERSIDE ENERGY CENTER	Diesel-Fired Fire Pump Engine (P04)	2/28/2020	CO	290	hp	0.33	lb/hr	-	Good combustion practices
*MI-0445	INDECK NILES, LLC	EUFPENGINE (Emergency engine-diesel fire pump	11/26/2019	CO	1.66	MMBTU/hr	2.6	g/bhp-hr	Hourly	Good Combustion Practices and meeting NSPS Subpart IIII requirements
IL-0130	JACKSON ENERGY CENTER	Firewater Pump Engine	12/31/2018	CO	420	hp	3.5	g/kW-hr	-	-
MI-0441	LBWL--ERICKSON STATION	EUFPRICE--A 315 HP diesel fueled emergency engine	12/21/2018	CO	2.5	MMBTU/hr	2.6	g/hp-hr	Hourly	Good combustion practices.
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	Firewater Pumps (P005 and P006)	12/21/2018	CO	402	hp	2.31	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII and employ good combustion practices per the manufacturerâ€™s operating manual
TX-0846	MOTOR VEHICLE ASSEMBLY PLANT	FIRE PUMP DIESEL ENGINE	9/23/2018	CO	214	kW	3.58	g/kW	Hourly	Meets EPA Tier 4 requirements
IL-0129	CPV THREE RIVERS ENERGY CENTER	Firewater Pump Engine	7/30/2018	CO	422	hp	0	hp	-	-
FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	Emergency Fire Pump Engine (347 HP)	7/27/2018	CO	8700	gal/yr	3.5	g/kW-hr	-	Operate and maintain the engine according to the manufacturer's written instructions
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	EUFPENGINE: Fire pump engine	7/16/2018	CO	399	bhp	3.5	g/kW-hr	Hourly	State of the art combustion design.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (South Plant): Fire pump engine	6/29/2018	CO	300	hp	2.6	g/bhp-hr	Hourly	Good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (North Plant): Fire pump engine	6/29/2018	CO	300	hp	2.6	g/bhp-hr	Hourly	Good combustion practices and meeting NSPS Subpart IIII requirements.
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39A	5/2/2018	CO	375	hp	3.5	g/kW-hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39B	5/2/2018	CO	300	hp	3.5	g/kW-hr	-	Compliance with 40 CFR 60 Subpart IIII
VA-0328	C4GT, LLC	Emergency Fire Water Pump	4/26/2018	CO	500	hr/yr	2.6	g/hp-hr	-	good combustion practices and the use of ultra low sulfur diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.
OH-0377	HARRISON POWER	Emergency Fire Pump (P004)	4/19/2018	CO	320	hp	1.83	lb/hr	-	Good combustion practices (ULSD) and compliance with 40 CFR Part 60, Subpart IIII
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	Emergency Diesel Generators	2/23/2018	CO	150	hp	3.08	g/kW-hr	-	-

Table F-2.2 Summary of CO BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
OH-0376	IRONUNITS LLC - TOLEDO HBI	Emergency diesel-fueled fire pump (P006)	2/9/2018	CO	250	hp	1.4	lb/hr	-	Comply with NSPS 40 CFR 60 Subpart IIII
FL-0363	DANIA BEACH ENERGY CENTER	Emergency Fire Pump Engine (422 hp)	12/4/2017	CO	422	hp	3.5	g/kW-hr	-	Certified engine
OH-0374	GUERNSEY POWER STATION LLC	Emergency Fire Pump (P006)	10/23/2017	CO	410	hp	2.36	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII. Good combustion practices per the manufacturerâ€™s operating manual.
OH-0372	OREGON ENERGY CENTER	Emergency fire pump engine (P004)	9/27/2017	CO	300	hp	1.73	lb/hr	-	state of the art combustion design
OH-0370	TRUMBULL ENERGY CENTER	Emergency fire pump engine (P004)	9/7/2017	CO	300	hp	1.73	lb/hr	-	State-of-the-art combustion design
AK-0084	DONLIN GOLD PROJECT	Fire Pump Diesel Internal Combustion Engines	6/30/2017	CO	252	hp	3.3	g/kW-hr	3-Hour	Good Combustion Practices
LA-0323	MONSANTO LULING PLANT	Standby Generator No. 9 Engine	1/9/2017	CO	400	hp	0	hp	-	Proper operation and limits on hours of operation for emergency engines and compliance with 40 CFR 60 Subpart IIII
MI-0423	INDECK NILES, LLC	EUFPENGINE (Emergency engine--diesel fire pump)	1/4/2017	CO	1.66	MMBTU/hr	2.6	g/bhp-hr	Test Protocol Will Specify	Good combustion practices and meeting NSPS Subpart IIII requirements.
OH-0367	SOUTH FIELD ENERGY LLC	Emergency fire pump engine (P004)	9/23/2016	CO	311	hp	1.79	lb/hr	-	State-of-the-art combustion design
LA-0313	ST. CHARLES POWER STATION	SCPS Emergency Diesel Firewater Pump 1	8/31/2016	CO	282	hp	1.62	lb/hr	Hourly Maximum	Compliance with NESHAP 40 CFR 63 Subpart ZZZZ and NSPS 40 CFR 60 Subpart IIII, and good combustion practices (use of ultra-low sulfur diesel fuel).
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel Firewater pump engines (6 units)	8/3/2016	CO	425	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel emergency generator engine - EGEN	8/3/2016	CO	350	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	EMERGENCY DIESEL FIRE PUMP	7/19/2016	CO	100	hr/yr	1.87	lb/hr	-	Use of Ultra Low Sulfur Diesel (ULSD) Oil a clean burning fuel and limited hours of operation
VA-0325	GREENSVILLE POWER STATION	DIESEL-FIRED WATER PUMP 376 bph (1)	6/17/2016	CO	376	hp	2.6	g/hp-hr	Hourly	Good Combustion Practices/Maintenance
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	Emergency Diesel Fire Pump	3/10/2016	CO	100	hr/yr	1.1	lb/hr	-	use of ULSD a clean burning fuel, and limited hours of operation
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	One 422-hp emergency fire pump engine	3/9/2016	CO	422	hp	3.5	g/kW-hr	-	Use of clean engine technology
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	Fire pump engine	12/23/2015	CO	15	gal/hr	0.5	g/hp-hr	-	-
IN-0234	GRAIN PROCESSING CORPORATION	EMERGENCY FIRE PUMP ENGINE	12/8/2015	CO	425	hp	2.01	g/hp-hr	-	GOOD COMBUSTION PRACTICES

Table F-2.2 Summary of CO BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
MD-0045	MATTAWOMAN ENERGY CENTER	EMERGENCY DIESEL ENGINE FOR FIRE WATER PUMP	11/13/2015	CO	305	hp	3.5	g/kW-hr	-	USE OF ULTRA LOW SULFUR DIESEL AND GOOD COMBUSTION PRACTICES
FL-0354	LAUDERDALE PLANT	Emergency fire pump engine, 300 HP	8/25/2015	CO	29	MMBTU/hr	3.5	g/kW-hr	-	Low-emitting fuel and certified engine
LA-0309	BENTELER STEEL TUBE FACILITY	Firewater Pump Engines	6/4/2015	CO	288	hp	0	hp	-	Complying with 40 CFR 60 Subpart IIII

Table F-2.3 Summary of VOC BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
IL-0134	CRONUS CHEMICALS	Firewater Pump Engine	12/21/2023	VOC	369	hp	4	g/kW-hr	3-Hour	-
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-01 - Firewater Pump Engine No. 1	12/20/2023	VOC	422	hp	1.47	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-02 - Firewater Pump Engine No. 2	12/20/2023	VOC	422	hp	1.47	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-03 - Firewater Pump Engine No. 3	12/20/2023	VOC	237	hp	0.61	lb/hr	-	Compliance with the requirements of 40 CFR 60 Subpart IIII
OH-0387	INTEL OHIO SITE	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	9/20/2022	VOC	275	hp	0.7	lb/hr	-	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
AK-0088	LIQUEFACTION PLANT	Auxiliary Air Compressor Engine	7/7/2022	VOC	14.6	gal/hr	0.22	g/hp-hr	-	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
MI-0451	MEC NORTH, LLC	EUFPENGINE (North Plant): Fire Pump Engine	6/23/2022	VOC	300	hp	0.75	lb/hr	Hourly	Good combustion practices.
MI-0452	MEC SOUTH, LLC	EUFPENGINE (South Plant): Fire pump engine	6/23/2022	VOC	300	hp	0.75	lb/hr	Hourly	Good Combustion Practices
LA-0391	MAGNOLIA POWER GENERATING STATION UNIT 1	Emergency Diesel Fired Water Pump Engine	6/3/2022	VOC	355	hp	3	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, and the use of ultra-low sulfur diesel fuel.
*LA-0387	TAYLOR SAWMILL	Firewater Pump Engine (FIR)	4/12/2022	VOC	274	hp	0.02	tons/yr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment 2A and 2B	5/4/2021	VOC	300	hp	0.19	g/kW-hr	-	Compliance with 40 CFR 60 Subpart IIII.
AK-0086	KENAI NITROGEN OPERATIONS	Diesel Fired Well Pump	3/26/2021	VOC	2.7	MMBTU/hr	0.36	lb/MMBTU	3-Hour	Good Combustion Practices and Limited Use
WI-0300	NEMADJI TRAIL ENERGY CENTER	Emergency Diesel Fire Pump (P06)	9/1/2020	VOC	282	hp	1.1	g/hp-hr	-	Operation limited to 500 hours/year and operate and maintain according to the manufacturerâ€™s recommendations.
AK-0085	GAS TREATMENT PLANT	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	8/13/2020	VOC	19.4	gal/hr	0.19	g/hp-hr	3-Hour	Good combustion practices, ULSD, and limit operation to 500 hours per year.
KY-0110	NUCOR STEEL BRANDENBURG	EP 11-01 - Melt Shop Emergency Generator	7/23/2020	VOC	260	hp	0	hp	-	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.
WI-0302	WPL- RIVERSIDE ENERGY CENTER	Diesel-Fired Fire Pump Engine (P04)	2/28/2020	VOC	290	hp	0.26	lb/hr	-	Good combustion practices
OK-0181	WILDHORSE TERMINAL	EMERGENCY USE ENGINES < 500 HP	9/11/2019	VOC	275	hp	3	g/hp-hr	-	Good Combustion Practices. Certified to meet EPA Tier 3 engine standards. Gen-1 and FP-1 shall be limited to operate not more than 500 hours per year. SP-1 shall be limited to operate not more than 876 hours per year.

Table F-2.3 Summary of VOC BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
WI-0292	GREEN BAY PACKAGING INC. â€“MILL DIVISION	P37 Diesel-Fired Emergency Fire Pump	4/1/2019	VOC	350	hp	200	hr	12-Month Period	Hours of Operation
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	Firewater Pumps (P005 and P006)	12/21/2018	VOC	402	hp	2.64	lb/hr	See Notes	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII and employ good combustion practices per the manufacturerâ€™s operating manual
TX-0846	MOTOR VEHICLE ASSEMBLY PLANT	FIRE PUMP DIESEL ENGINE	9/23/2018	VOC	214	kW	0.19	g/kW	Hourly	Meets EPA Tier 4 requirements
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	EUFPENGINE: Fire pump engine	7/16/2018	VOC	399	bhp	0.13	lb/hr	Hourly	State of the art combustion design.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (South Plant): Fire pump engine	6/29/2018	VOC	300	hp	0.75	lb/hr	Hourly	Good combustion practices.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (North Plant): Fire pump engine	6/29/2018	VOC	300	hp	0.75	lb/hr	Hourly	Good combustion practices
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39A	5/2/2018	VOC	375	hp	4	g/kW-hr	-	Good combustion practices and NSPS Subpart IIII
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39B	5/2/2018	VOC	300	hp	4	g/kW-hr	-	Good combustion practices and NSPS Subpart IIII
VA-0328	C4GT, LLC	Emergency Fire Water Pump	4/26/2018	VOC	500	hr/yr	0	hp	-	good combustion practices and the use of ultra low sulfur diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.
OH-0377	HARRISON POWER	Emergency Fire Pump (P004)	4/19/2018	VOC	320	hp	2.12	lb/hr	NMHC & NOx Standard	Good combustion practices (ULSD) and compliance with 40 CFR Part 60, Subpart IIII
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	Emergency Diesel Generators	2/23/2018	VOC	150	hp	1.134	g/hp-hr	-	-
OH-0374	GUERNSEY POWER STATION LLC	Emergency Fire Pump (P006)	10/23/2017	VOC	410	hp	2.7	lb/hr	NMHC & NOx Standard	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII. Good combustion practices per the manufacturerâ€™s operating manual.
OH-0372	OREGON ENERGY CENTER	Emergency fire pump engine (P004)	9/27/2017	VOC	300	hp	0.24	lb/hr	-	State-of-the-art combustion design
OH-0370	TRUMBULL ENERGY CENTER	Emergency fire pump engine (P004)	9/7/2017	VOC	300	hp	0.24	lb/hr	-	State-of-the-art combustion design
OK-0176	BPV GATHERING AND MARKETING CUSHING STATION	Emergency Generator	7/19/2017	VOC	400	hp	217.24	tons/yr	12-Month	Equipped with non-resettable hour meter. Fired with ultra-low sulfur diesel fuel (0.015 % or less by wt. sulfur.

Table F-2.3 Summary of VOC BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
OK-0175	WILDHORSE TERMINAL	Emergency Use Engine less than or equal to 500 HP	6/29/2017	VOC	275	hp	3	g/hp-hr	-	Good combustion practices, certified to meet EPA Tier 3 engine standards. Gen-1, FP-1, and FP-2 shall be limited to operate no more than 500 hr/yr.
MI-0423	INDECK NILES, LLC	EUFPENGINE (Emergency engine--diesel fire pump)	1/4/2017	VOC	1.66	MMBTU/hr	0.64	lb/hr	Test Protocol Will Specify	Good combustion practices
OH-0367	SOUTH FIELD ENERGY LLC	Emergency fire pump engine (P004)	9/23/2016	VOC	311	hp	0.25	lb/hr	-	State-of-the-art combustion design
LA-0313	ST. CHARLES POWER STATION	SCPS Emergency Diesel Firewater Pump 1	8/31/2016	VOC	282	hp	1.87	lb/hr	Hourly Maximum	Good combustion practices
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel Firewater pump engines (6 units)	8/3/2016	VOC	425	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel emergency generator engine - EGEN	8/3/2016	VOC	350	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	EMERGENCY DIESEL FIRE PUMP	7/19/2016	VOC	100	hr/yr	0.117	lb/hr	-	Use of Ultra Low Sulfur Diesel (ULSD) Oil a clean burning fuel and limited hours of operation
VA-0325	GREENSVILLE POWER STATION	DIESEL-FIRED WATER PUMP 376 bph (1)	6/17/2016	VOC	376	hp	3	g/hp-hr	Hourly	Good Combustion Practices/Maintenance
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	Emergency Diesel Fire Pump	3/10/2016	VOC	100	hr/yr	0.1	lb/hr	-	use of ULSD a clean burning fuel, and limited hours of operation
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	Fire pump engine	12/23/2015	VOC	15	gal/hr	0.12	g/hp-hr	-	-
IN-0234	GRAIN PROCESSING CORPORATION	EMERGENCY FIRE PUMP ENGINE	12/8/2015	VOC	425	hp	0.05	g/hp-hr	-	GOOD COMBUSTION PRACTICES
LA-0309	BENTELER STEEL TUBE FACILITY	Firewater Pump Engines	6/4/2015	VOC	288	hp	0	hp	-	Complying with 40 CFR 60 Subpart IIII
OK-0164	MIDWEST CITY AIR DEPOT	Diesel-Fueled Fire Pump Engines	1/8/2015	VOC	300	hp	0.15	g/hp-hr	Total for 3 Engines	1. Good Combustion Practices.

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
IL-0134	CRONUS CHEMICALS	Firewater Pump Engine	12/21/2023	Total PM10	369	hp	0.2	g/kW-hr	3-Hour	-
IL-0134	CRONUS CHEMICALS	Firewater Pump Engine	12/21/2023	Total PM2.5	369	hp	0.2	g/kW-hr	3-Hour	-
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-01 - Firewater Pump Engine No. 1	12/20/2023	Total PM2.5	422	hp	0.2	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-01 - Firewater Pump Engine No. 1	12/20/2023	Total PM10	422	hp	0.2	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-02 - Firewater Pump Engine No. 2	12/20/2023	Total PM2.5	422	hp	0.2	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-02 - Firewater Pump Engine No. 2	12/20/2023	Total PM10	422	hp	0.2	lb/hr	-	Compliance with 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-03 - Firewater Pump Engine No. 3	12/20/2023	Total PM2.5	237	hp	0.06	lb/hr	-	Compliance with the requirements of 40 CFR 60 Subpart IIII
*LA-0401	KOCH METHANOL (KME) FACILITY	FWP-03 - Firewater Pump Engine No. 3	12/20/2023	Total PM10	237	hp	0.06	lb/hr	-	Compliance with the requirements of 40 CFR 60 Subpart IIII
MI-0454	LBWL-ERICKSON STATION	EUFPRICE--A 315 HP diesel-fueled emergency engine	12/20/2022	Total PM10	2.5	MMBTU/hr	0.69	lb/hr	Hourly	Ultra low sulfur diesel fuel and good combustion practices.
MI-0454	LBWL-ERICKSON STATION	EUFPRICE--A 315 HP diesel-fueled emergency engine	12/20/2022	Total PM2.5	2.5	MMBTU/hr	0.69	lb/hr	Hourly	Ultra low sulfur diesel fuel and good combustion practices.
OH-0387	INTEL OHIO SITE	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	9/20/2022	Total PM	275	hp	0.2	g/kW-hr	-	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
OH-0387	INTEL OHIO SITE	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	9/20/2022	Total PM10	275	hp	0.6	lb/hr	-	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
OH-0387	INTEL OHIO SITE	275 hp (205 kW) Diesel-Fired Emergency Fire Pump Engine	9/20/2022	Total PM2.5	275	hp	0.6	lb/hr	-	Certified to meet the standards in Table 4 of 40 CFR Part 60, Subpart IIII and good combustion practices
IL-0133	LINCOLN LAND ENERGY CENTER	Fire Water Pump Engine	7/29/2022	Total PM	320	hp	0.2	grams	kW-hr	-
AK-0088	LIQUEFACTION PLANT	Auxiliary Air Compressor Engine	7/7/2022	Total PM	14.6	gal/hr	0.022	g/hp-hr	-	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
AK-0088	LIQUEFACTION PLANT	Auxiliary Air Compressor Engine	7/7/2022	Total PM10	14.6	gal/hr	0.022	g/hp-hr	-	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
AK-0088	LIQUEFACTION PLANT	Auxiliary Air Compressor Engine	7/7/2022	Total PM2.5	14.6	gal/hr	0.022	g/hp-hr	-	Good Combustion Practices; Limited Operation; 40 CFR 60 Subpart IIII
MI-0451	MEC NORTH, LLC	EUFPENGINE (North Plant): Fire Pump Engine	6/23/2022	Total PM2.5	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0451	MEC NORTH, LLC	EUFPENGINE (North Plant): Fire Pump Engine	6/23/2022	Filterable PM	300	hp	0.15	g/bhp-hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
MI-0451	MEC NORTH, LLC	EUFPENGINE (North Plant): Fire Pump Engine	6/23/2022	Total PM10	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0452	MEC SOUTH, LLC	EUFPENGINE (South Plant): Fire pump engine	6/23/2022	Filterable PM	300	hp	0.15	g/bhp-hr	Hourly	Diesel particulate filter, Good Combustion Practices and meeting NSPS Subpart IIII requirements
MI-0452	MEC SOUTH, LLC	EUFPENGINE (South Plant): Fire pump engine	6/23/2022	Total PM10	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, Good Combustion Practices and meeting NSPS Subpart IIII requirements
MI-0452	MEC SOUTH, LLC	EUFPENGINE (South Plant): Fire pump engine	6/23/2022	Total PM2.5	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, Good Combustion Practices and meeting NSPS Subpart IIII requirements
LA-0391	MAGNOLIA POWER GENERATING STATION UNIT 1	Emergency Diesel Fired Water Pump Engine	6/3/2022	Total PM10	355	hp	0.15	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII standards, good combustion practices, and the use of ultra-low sulfur diesel fuel.
LA-0391	MAGNOLIA POWER GENERATING STATION UNIT 1	Emergency Diesel Fired Water Pump Engine	6/3/2022	Total PM2.5	355	hp	0.15	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII, good combustion practices, and the use of ultra-low sulfur diesel fuel.
FL-0371	SHADY HILLS COMBINED CYCLE FACILITY	Emergency Fire Pump Engine (347 HP)	6/7/2021	Total PM	2.46	MMBTU/hr	0.2	g/kW-hr	-	-
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment B	5/4/2021	Total PM	375	hp	0.31	lb/MMBTU	-	Good combustion practices/gaseous fuel burning.
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment B	5/4/2021	Total PM10	375	hp	0.31	lb/MMBTU	-	Good combustion practices/gaseous fuel burning.
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment 2A and 2B	5/4/2021	Total PM10	300	hp	0.15	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII.
LA-0379	SHINTECH PLAQUEMINES PLANT 1	PVC Emergency Combustion Equipment 2A and 2B	5/4/2021	Total PM2.5	300	hp	0.15	g/hp-hr	-	Compliance with 40 CFR 60 Subpart IIII.
KY-0115	NUCOR STEEL GALLATIN, LLC	Cold Mill Complex Emergency Generator (EP 09-05)	4/19/2021	Filterable PM	350	hp	0.15	g/hp-hr	-	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan
KY-0115	NUCOR STEEL GALLATIN, LLC	Cold Mill Complex Emergency Generator (EP 09-05)	4/19/2021	Total PM10	350	hp	0.15	g/hp-hr	-	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan
KY-0115	NUCOR STEEL GALLATIN, LLC	Cold Mill Complex Emergency Generator (EP 09-05)	4/19/2021	Total PM2.5	350	hp	0.15	g/hp-hr	-	The permittee must develop a Good Combustion and Operating Practices (GCOP) Plan
AK-0086	KENAI NITROGEN OPERATIONS	Diesel Fired Well Pump	3/26/2021	Total PM	2.7	MMBTU/hr	0.31	lb/MMBTU	3-Hour	Good Combustion Practices and Limited Use
AK-0086	KENAI NITROGEN OPERATIONS	Diesel Fired Well Pump	3/26/2021	Total PM10	2.7	MMBTU/hr	0.31	lb/MMBTU	3-Hour	Good Combustion Practices and Limited Use
AK-0086	KENAI NITROGEN OPERATIONS	Diesel Fired Well Pump	3/26/2021	Total PM2.5	2.7	MMBTU/hr	0.31	lb/MMBTU	3-Hour	Good Combustion Practices and Limited Use
MI-0447	LBWL--ERICKSON STATION	EUFPRICE--A 315 HP diesel fueled emergency engine	1/7/2021	Total PM10	2.5	MMBTU/hr	0.12	lb/hr	Hourly	Ultra low sulfur diesel fuel and good combustion practices

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
MI-0447	LBWL--ERICKSON STATION	EUFPRICE--A 315 HP diesel fueled emergency engine	1/7/2021	Total PM2.5	2.5	MMBTU/hr	0.12	lb/hr	Hourly	Ultra low sulfur diesel fuel and good combustion practices.
WI-0300	NEMADJI TRAIL ENERGY CENTER	Emergency Diesel Fire Pump (P06)	9/1/2020	Total PM	282	hp	0.15	g/hp-hr	-	Operation limited to 500 hours/year, sulfur content of diesel fuel oil fired may not exceed 15 ppm, and shall be operated and maintained according to the manufacturerâ€™s recommendations.
WI-0300	NEMADJI TRAIL ENERGY CENTER	Emergency Diesel Fire Pump (P06)	9/1/2020	Total PM10	282	hp	0.15	g/hp-hr	-	Operation limited to 500 hours/year, sulfur content of diesel fuel oil fired may not exceed 15 ppm, and operate and maintain according to the manufacturerâ€™s recommendations.
WI-0300	NEMADJI TRAIL ENERGY CENTER	Emergency Diesel Fire Pump (P06)	9/1/2020	Total PM2.5	282	hp	0.15	g/hp-hr	-	Operation limited to 500 hours/year, sulfur content of diesel fuel oil fired may not exceed 15 ppm, and shall be operated and maintained according to the manufacturerâ€™s recommendations.
AK-0085	GAS TREATMENT PLANT	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	8/13/2020	Total PM	19.4	gal/hr	0.19	g/hp-hr	3-Hour	Good combustion practices, ULSD, and limit operation to 500 hours per year per engine
AK-0085	GAS TREATMENT PLANT	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	8/13/2020	Total PM10	19.4	gal/hr	0.19	g/hp-hr	3-Hour	Good combustion practices, ULSD, and limit operation to 500 hours per year per engine
AK-0085	GAS TREATMENT PLANT	Three (3) Firewater Pump Engines and two (2) Emergency Diesel Generators	8/13/2020	Total PM2.5	19.4	gal/hr	0.19	g/hp-hr	3-Hour	Good combustion practices, ULSD, and limit operation to 500 hours per year per engine
KY-0110	NUCOR STEEL BRANDENBURG	EP 11-01 - Melt Shop Emergency Generator	7/23/2020	Filterable PM	260	hp	0.15	g/hp-hr	-	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.
KY-0110	NUCOR STEEL BRANDENBURG	EP 11-01 - Melt Shop Emergency Generator	7/23/2020	Total PM10	260	hp	0.15	g/hp-hr	-	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.
KY-0110	NUCOR STEEL BRANDENBURG	EP 11-01 - Melt Shop Emergency Generator	7/23/2020	Total PM2.5	260	hp	0.15	g/hp-hr	-	This EP is required to have a Good Combustion and Operating Practices (GCOP) Plan.
WI-0302	WPL- RIVERSIDE ENERGY CENTER	Diesel-Fired Fire Pump Engine (P04)	2/28/2020	Total PM10	290	hp	0.11	lb/hr	-	Good combustion practices, use diesel fuel oil with sulfur content of no greater than 0.0015% by weight.

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
WI-0302	WPL- RIVERSIDE ENERGY CENTER	Diesel-Fired Fire Pump Engine (P04)	2/28/2020	Total PM	290	hp	0.11	lb/hr	-	Good combustion practices, use diesel fuel oil with sulfur content of no greater than 0.0015% by weight
*MI-0445	INDECK NILES, LLC	EUFPENGINE (Emergency engine-diesel fire pump	11/26/2019	Filterable PM	1.66	MMBTU/hr	0.15	g/bhp-hr	Hourly	Good Combustion Practices and meeting NSPS Subpart IIII requirements
*MI-0445	INDECK NILES, LLC	EUFPENGINE (Emergency engine-diesel fire pump	11/26/2019	Total PM10	1.66	MMBTU/hr	0.57	lb/hr	Hourly	Good combustion practices
*MI-0445	INDECK NILES, LLC	EUFPENGINE (Emergency engine-diesel fire pump	11/26/2019	Total PM2.5	1.66	MMBTU/hr	0.57	lb/hr	Hourly	Good combustion practices
IL-0130	JACKSON ENERGY CENTER	Firewater Pump Engine	12/31/2018	Total PM	420	hp	0.2	g/kW-hr	-	-
MI-0441	LBWL--ERICKSON STATION	EUFPRICE--A 315 HP diesel fueled emergency engine	12/21/2018	Total PM10	2.5	MMBTU/hr	0.12	lb/hr	Hourly	Ultra low sulfur diesel fuel and good combustion practices.
MI-0441	LBWL--ERICKSON STATION	EUFPRICE--A 315 HP diesel fueled emergency engine	12/21/2018	Total PM2.5	2.5	MMBTU/hr	0.12	lb/hr	Hourly	Ultra low sulfur diesel fuel and good combustion practices.
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	Firewater Pumps (P005 and P006)	12/21/2018	Total PM	402	hp	0.13	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII and employ good combustion practices per the manufacturerâ€™s operating manual
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	Firewater Pumps (P005 and P006)	12/21/2018	Total PM10	402	hp	0.13	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII and employ good combustion practices per the manufacturerâ€™s operating manual
OH-0378	PTTGCA PETROCHEMICAL COMPLEX	Firewater Pumps (P005 and P006)	12/21/2018	Total PM2.5	402	hp	0.13	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII and employ good combustion practices per the manufacturerâ€™s operating manual
TX-0846	MOTOR VEHICLE ASSEMBLY PLANT	FIRE PUMP DIESEL ENGINE	9/23/2018	Total PM10	214	kW	0.02	g/kW	Hourly	Meets EPA Tier 4 requirements
TX-0846	MOTOR VEHICLE ASSEMBLY PLANT	FIRE PUMP DIESEL ENGINE	9/23/2018	Total PM2.5	214	kW	0.02	g/kW	Hourly	Meets EPA Tier 4 requirements
IL-0129	CPV THREE RIVERS ENERGY CENTER	Firewater Pump Engine	7/30/2018	Total PM	422	hp	0	hp	-	-
FL-0367	SHADY HILLS COMBINED CYCLE FACILITY	Emergency Fire Pump Engine (347 HP)	7/27/2018	Filterable PM	8700	gal/yr	0.2	g/kW-hr	-	Operate and maintain the engine according to the manufacturer's written instructions
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	EUFPENGINE: Fire pump engine	7/16/2018	Filterable PM	399	bhp	0.2	g/kW-hr	Hourly	State of the art combustion design
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	EUFPENGINE: Fire pump engine	7/16/2018	Total PM10	399	bhp	0.13	lb/hr	Hourly	State of the art combustion design.

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
MI-0435	BELLE RIVER COMBINED CYCLE POWER PLANT	EUFPENGINE: Fire pump engine	7/16/2018	Total PM2.5	399	bhp	0.13	lb/hr	Hourly	State of the art combustion design.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (South Plant): Fire pump engine	6/29/2018	Filterable PM	300	hp	0.15	g/bhp-hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (South Plant): Fire pump engine	6/29/2018	Total PM10	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (South Plant): Fire pump engine	6/29/2018	Total PM2.5	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (North Plant): Fire pump engine	6/29/2018	Filterable PM	300	hp	0.15	g/bhp-hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (North Plant): Fire pump engine	6/29/2018	Total PM10	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0433	MEC NORTH, LLC AND MEC SOUTH LLC	EUFPENGINE (North Plant): Fire pump engine	6/29/2018	Total PM2.5	300	hp	0.66	lb/hr	Hourly	Diesel particulate filter, good combustion practices and meeting NSPS Subpart IIII requirements.
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39A	5/2/2018	Total PM10	375	hp	0.2	g/kW-hr	-	Compliance with 40 CFR 60 Subpart IIII.
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39A	5/2/2018	Total PM2.5	375	hp	0.2	g/kW-hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39B	5/2/2018	Total PM10	300	hp	0.2	g/kW-hr	-	Compliance with 40 CFR 60 Subpart IIII
LA-0328	PLAQUEMINES PLANT 1	Emergency Diesel Engine Pump P-39B	5/2/2018	Total PM2.5	300	hp	0.2	g/kW-hr	-	Compliance with 40 CFR 60 Subpart III
VA-0328	C4GT, LLC	Emergency Fire Water Pump	4/26/2018	Filterable PM	500	hr/yr	15	g/hp/hr	-	good combustion practices and the use of ultra low sulfur diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.
VA-0328	C4GT, LLC	Emergency Fire Water Pump	4/26/2018	Total PM10	500	hr/yr	0.15	g/hp-hr	-	good combustion practices and the use of ultra low sulfur diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.
VA-0328	C4GT, LLC	Emergency Fire Water Pump	4/26/2018	Total PM2.5	500	hr/yr	0.15	g/hp-hr	-	good combustion practices and the use of ultra low sulfur diesel (S15 ULSD) fuel oil with a maximum sulfur content of 15 ppmw.
OH-0377	HARRISON POWER	Emergency Fire Pump (P004)	4/19/2018	Total PM	320	hp	0.11	lb/hr	-	Good combustion practices (ULSD) and compliance with 40 CFR Part 60, Subpart IIII

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
OH-0377	HARRISON POWER	Emergency Fire Pump (P004)	4/19/2018	Total PM10	320	hp	0.11	lb/hr	-	Good combustion practices (ULSD) and compliance with 40 CFR Part 60, Subpart IIII
OH-0377	HARRISON POWER	Emergency Fire Pump (P004)	4/19/2018	Total PM2.5	320	hp	0.11	lb/hr	-	Good combustion practices (ULSD) and compliance with 40 CFR Part 60, Subpart IIII
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	Emergency Diesel Generators	2/23/2018	Filterable PM	150	hp	1.34	g/kW-hr	-	-
IN-0295	STEEL DYNAMICS, INC. - ENGINEERED BAR PRODUCTS DIVISION	Emergency Diesel Generators	2/23/2018	Filterable PM10	150	hp	1.34	g/kW-hr	-	-
OH-0376	IRONUNITS LLC - TOLEDO HBI	Emergency diesel-fueled fire pump (P006)	2/9/2018	Total PM10	250	hp	0.1	lb/hr	-	Comply with NSPS 40 CFR 60 Subpart IIII
OH-0376	IRONUNITS LLC - TOLEDO HBI	Emergency diesel-fueled fire pump (P006)	2/9/2018	Total PM2.5	250	hp	0.1	lb/hr	-	Comply with NSPS 40 CFR 60 Subpart IIII
FL-0363	DANIA BEACH ENERGY CENTER	Emergency Fire Pump Engine (422 hp)	12/4/2017	Filterable PM	422	hp	0.2	g/kW-hr	-	Certified engine
OH-0374	GUERNSEY POWER STATION LLC	Emergency Fire Pump (P006)	10/23/2017	Total PM	410	hp	0.13	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII. Good combustion practices per the manufacturerâ€™s operating manual.
OH-0374	GUERNSEY POWER STATION LLC	Emergency Fire Pump (P006)	10/23/2017	Total PM10	410	hp	0.13	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII. Good combustion practices per the manufacturerâ€™s operating manual.
OH-0374	GUERNSEY POWER STATION LLC	Emergency Fire Pump (P006)	10/23/2017	Total PM2.5	410	hp	0.13	lb/hr	-	Certified to the meet the emissions standards in Table 4 of 40 CFR Part 60, Subpart IIII. Good combustion practices per the manufacturerâ€™s operating manual.
OH-0372	OREGON ENERGY CENTER	Emergency fire pump engine (P004)	9/27/2017	Total PM10	300	hp	0.1	lb/hr	-	Ultra low sulfur diesel fuel
OH-0372	OREGON ENERGY CENTER	Emergency fire pump engine (P004)	9/27/2017	Total PM2.5	300	hp	0.1	lb/hr	-	Ultra low sulfur diesel fuel
OH-0370	TRUMBULL ENERGY CENTER	Emergency fire pump engine (P004)	9/7/2017	Total PM10	300	hp	0.1	lb/hr	-	Ultra low sulfur diesel fuel
OH-0370	TRUMBULL ENERGY CENTER	Emergency fire pump engine (P004)	9/7/2017	Total PM2.5	300	hp	0.1	lb/hr	-	Ultra low sulfur diesel fuel
AK-0084	DONLIN GOLD PROJECT	Fire Pump Diesel Internal Combustion Engines	6/30/2017	Total PM	252	hp	0.19	g/kW-hr	3-Hour	Clean Fuel and Good Combustion Practices
AK-0084	DONLIN GOLD PROJECT	Fire Pump Diesel Internal Combustion Engines	6/30/2017	Total PM10	252	hp	0.19	g/kW-hr	3-Hour	Clean Fuel and Good Combustion Practices

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
AK-0084	DONLIN GOLD PROJECT	Fire Pump Diesel Internal Combustion Engines	6/30/2017	Total PM2.5	252	hp	0.19	g/kW-hr	3-Hour	Clean Fuel and Good Combustion Practices
LA-0323	MONSANTO LULING PLANT	Standby Generator No. 9 Engine	1/9/2017	Total PM10	400	hp	0	hp	-	Proper operation and limits on hours of operation for emergency engines and compliance with 40 CFR 60 Subpart IIII
LA-0323	MONSANTO LULING PLANT	Standby Generator No. 9 Engine	1/9/2017	Total PM2.5	400	hp	0	hp	-	Proper operation and limits on hours of operation for emergency engines and compliance with 40 CFR 60 Subpart IIII
MI-0423	INDECK NILES, LLC	EUFPENGINE (Emergency engine--diesel fire pump)	1/4/2017	Filterable PM	1.66	MMBTU/hr	0.15	g/bhp-hr	Test Protocol Will Specify	Good combustion practices and meeting NSPS Subpart IIII requirements.
MI-0423	INDECK NILES, LLC	EUFPENGINE (Emergency engine--diesel fire pump)	1/4/2017	Total PM10	1.66	MMBTU/hr	0.57	lb/hr	Hourly	Good combustion practices
MI-0423	INDECK NILES, LLC	EUFPENGINE (Emergency engine--diesel fire pump)	1/4/2017	Total PM2.5	1.66	MMBTU/hr	0.57	lb/hr	Hourly	Good combustion practices
OH-0367	SOUTH FIELD ENERGY LLC	Emergency fire pump engine (P004)	9/23/2016	Total PM10	311	hp	0.1	lb/hr	-	State-of-the-art combustion design
OH-0367	SOUTH FIELD ENERGY LLC	Emergency fire pump engine (P004)	9/23/2016	Total PM2.5	311	hp	0.1	lb/hr	-	State-of-the-art combustion design
LA-0313	ST. CHARLES POWER STATION	SCPS Emergency Diesel Firewater Pump 1	8/31/2016	Filterable PM10	282	hp	0.09	lb/hr	Hourly Maximum	Compliance with NESHAP 40 CFR 63 Subpart ZZZZ and NSPS 40 CFR 60 Subpart IIII, and good combustion practices (use of ultra-low sulfur diesel fuel).
LA-0313	ST. CHARLES POWER STATION	SCPS Emergency Diesel Firewater Pump 1	8/31/2016	Filterable PM2.5	282	hp	0.09	lb/hr	Hourly Maximum	Compliance with NESHAP 40 CFR 63 Subpart ZZZZ and NSPS 40 CFR 60 Subpart IIII, and good combustion practices (use of ultra-low sulfur diesel fuel).
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel Firewater pump engines (6 units)	8/3/2016	Total PM10	425	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel Firewater pump engines (6 units)	8/3/2016	Total PM2.5	425	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel emergency generator engine - EGEN	8/3/2016	Total PM10	350	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
LA-0314	INDORAMA LAKE CHARLES FACILITY	Diesel emergency generator engine - EGEN	8/3/2016	Total PM2.5	350	hp	0	hp	-	complying with 40 CFR 63 subpart ZZZZ
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	EMERGENCY DIESEL FIRE PUMP	7/19/2016	Filterable PM	100	hr/yr	0.108	lb/hr	-	Use of Ultra Low Sulfur Diesel (ULSD) Oil a clean burning fuel and limited hours of operation
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	EMERGENCY DIESEL FIRE PUMP	7/19/2016	Total PM10	100	hr/yr	0.108	lb/hr	-	Use of Ultra Low Sulfur Diesel (ULSD) Oil a clean burning fuel and limited hours of operation
NJ-0085	MIDDLESEX ENERGY CENTER, LLC	EMERGENCY DIESEL FIRE PUMP	7/19/2016	Total PM2.5	100	hr/yr	0.108	lb/hr	-	Use of ULSD a clean burning fuel and limited hours of operation

Table F-2.4 Summary of Particulate Matter BACT Determination for Diesel Engines

RBLC ID	Facility	Process Name	Permit Date	Pollutant	Capacity	Capacity Units	Permitted Limit	Units	Averaging Period	Control
VA-0325	GREENSVILLE POWER STATION	DIESEL-FIRED WATER PUMP 376 bph (1)	6/17/2016	Total PM10	376	hp	0.3	g/hp-hr	Hourly	Ultra Low Sulfur Diesel/Fuel (15 ppm max)
VA-0325	GREENSVILLE POWER STATION	DIESEL-FIRED WATER PUMP 376 bph (1)	6/17/2016	Total PM2.5	376	hp	0.3	g/hp-hr	Hourly	Ultra Low Sulfur Diesel/Fuel (15 ppm max)
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	Emergency Diesel Fire Pump	3/10/2016	Filterable PM	100	hr/yr	0.1	lb/hr	-	use of ULSD a clean burning fuel, and limited hours of operation
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	Emergency Diesel Fire Pump	3/10/2016	Total PM10	100	hr/yr	0.1	lb/hr	-	use of ULSD a clean burning fuel, and limited hours of operation
NJ-0084	PSEG FOSSIL LLC SEWAREN GENERATING STATION	Emergency Diesel Fire Pump	3/10/2016	Total PM2.5	100	hr/yr	0.1	lb/hr	-	use of ULSD a clean burning fuel, and limited hours of operation
FL-0356	OKEECHOBEE CLEAN ENERGY CENTER	One 422-hp emergency fire pump engine	3/9/2016	Total PM	422	hp	0.2	g/kW-hr	-	Use of clean fuel
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	Fire pump engine	12/23/2015	Filterable PM	15	gal/hr	0.11	g/hp-hr	-	-
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	Fire pump engine	12/23/2015	Total PM10	15	gal/hr	0.11	g/hp-hr	-	-
PA-0309	LACKAWANNA ENERGY CTR/JESSUP	Fire pump engine	12/23/2015	Total PM2.5	15	gal/hr	0.11	g/hp-hr	-	-
IN-0234	GRAIN PROCESSING CORPORATION	EMERGENCY FIRE PUMP ENGINE	12/8/2015	Filterable PM	425	hp	0.16	g/hp-hr	-	GOOD COMBUSTION PRACTICES
IN-0234	GRAIN PROCESSING CORPORATION	EMERGENCY FIRE PUMP ENGINE	12/8/2015	Total PM10	425	hp	0.16	g/hp-hr	-	GOOD COMBUSTION PRACTICES
MD-0045	MATTAWOMAN ENERGY CENTER	EMERGENCY DIESEL ENGINE FOR FIRE WATER PUMP	11/13/2015	Total PM10	305	hp	0.18	g/hp-hr	-	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES.
MD-0045	MATTAWOMAN ENERGY CENTER	EMERGENCY DIESEL ENGINE FOR FIRE WATER PUMP	11/13/2015	Total PM2.5	305	hp	0.18	g/hp-hr	-	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES
MD-0045	MATTAWOMAN ENERGY CENTER	EMERGENCY DIESEL ENGINE FOR FIRE WATER PUMP	11/13/2015	Filterable PM	305	hp	0.2	g/kW-hr	-	EXCLUSIVE USE OF ULTRA LOW SULFUR FUEL AND GOOD COMBUSTION PRACTICES
FL-0354	LAUDERDALE PLANT	Emergency fire pump engine, 300 HP	8/25/2015	Total PM	29	MMBTU/hr	0.2	g/kW-hr	-	Low-emitting fuel and certified engine
LA-0309	BENTELER STEEL TUBE FACILITY	Firewater Pump Engines	6/4/2015	Total PM10	288	hp	0.15	g/bhp-hr	-	Complying with 40 CFR 60 Subpart IIII
LA-0309	BENTELER STEEL TUBE FACILITY	Firewater Pump Engines	6/4/2015	Total PM2.5	288	hp	0.15	g/bhp-hr	-	Complying with 40 CFR 60 Subpart IIII

SUPPLEMENTAL AIR DISPERSION MODELING REPORT

Casting Expansion Project - Guthrie, KY

Volume 2 of 2 – As-Built Emergency Engine Additions and Existing Source Changes

Novelis

Not just aluminum, Novelis Aluminum.™

Novelis Corporation

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August 2025
Project 241801.0153

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1. INTRODUCTION

Novelis Corporation in association with our air quality contractor, Trinity Consultants (Trinity), is pleased to submit this supplemental dispersion modeling report for the "As-Built" configuration of the casting expansion project at the Guthrie, Kentucky facility (Guthrie facility). The original Prevention of Significant Deterioration (PSD) application for the existing Guthrie site casting expansion project was submitted to the Kentucky Division for Air Quality (KDAQ or Division) on November 10, 2021. A revision to the original modeling report (Volume 2 of the application) was submitted on April 29, 2022. Following discussions with KDAQ, an "as-designed" modeling report was submitted on October 26, 2023, to ensure that the air permit basis was reflective of the final engineering design of buildings, equipment, utilities, and site layout that enabled construction of the casting operations. As discussed in Volume 1 of this Title V significant permit revision package, an as-built design change to the firewater supply system resulted in the addition of two new Emergency Fire Pumps #3 and #4 (EU 049 and EU 050) each equipped with a 327 hp diesel-driven engine. The addition of these new emergency engines to the Guthrie facility has triggered the need for a "re-opening" of the prior as-designed PSD permit action including this supplement to the prior air dispersion modeling analysis.

Novelis has also conservatively chosen to include two small natural gas-fired emergency engines used to supply backup power to the casting pit sump pump and the Decoater (EU029) and other minor as-built changes affecting previously permitted sources. Following a similar approach to the prior as-designed PSD air quality analysis reconciliation effort, Novelis has prepared this supplemental as-built modeling report to account for further equipment and facility layout changes impacting the building downwash analysis for a small group of previously modeled sources (i.e., Hot Baghouse #3 and #4 stacks), changing the source locations and stack parameters for two sources added with the previous as-designed modeling updates [Ingot Saw (EU045) and DBF Preheater (EU046b)], and adding new sources not previously considered in the most recent modeling analysis [i.e., four emergency engines and Molten Metal Utility Heaters (IA-15)].

The modeling methodologies presented in this report are consistent with guidance provided at both the Commonwealth and Federal level for completing updates/supplements to prior PSD modeling projects. This report also fully adheres to the procedures and proposed modeling options outlined in the as-designed dispersion modeling report submitted to the Division on October 26, 2023. This as-built modeling analysis supplemental report generally summarizes the key highlights of the modeling objectives, selected models, options to meet the air quality modeling objectives, and meteorological data resources and use from the as-designed modeling report. A high-level overview of the new and modified sources at the site covered by the as-built changes is presented. A supplemental set of modeling results has been developed to be used in conjunction with the prior as-designed modeling results to demonstrate that the as-built changes do not alter the key conclusions of the most recently completed PSD air quality analysis covering the full Novelis Guthrie casting expansion project.

1.1 Background

Novelis Corporation (Novelis) owns and operates an automotive coil finishing facility located at 8155 Old Railroad Lane in Guthrie, Kentucky (Todd County). **Figure 1-1** shows a general map of the area surrounding the facility showing roads and general boundaries of towns and other nearby municipalities. The boundary of the facility is also shown. As can be seen in **Figure 1-1**, the Novelis facility lies about 22 km northeast of Clarksville, TN. **Figure 1-2** shows a closer, more detailed view of the facility, its boundaries, and the land use in the immediate surrounding area. As can be seen from **Figure 1-2**, the land use near the facility is generally rural with many adjacent farms and scattered groups of trees.

The facility is classified currently as a major source and currently operates in accordance with Title V permit V-22-011 R1, initially issued by the Division on July 25, 2022 and most recently revised on June 7, 2024. Novelis currently operates an aluminum casting operation expansion as a new greenfield expansion at the Guthrie site. The aluminum ingots cast at the new facility are used at other Novelis locations and will not be utilized at the existing automotive coil finishing plant currently located at the site.

Construction of the casting expansion project is subject to preconstruction review as part of the PSD permitting program because the calculated emission increases associated with the proposed project exceed the major source threshold for a regulated NSR pollutant [e.g., carbon monoxide (CO)] and the applicable PSD significant emission rate (SER) thresholds for additional regulated NSR pollutants [i.e., nitrogen oxides (NO_X), particulate matter (PM, PM_{10}, and $PM_{2.5}$), volatile organic compounds (VOC), and greenhouse gases (GHG)]. Therefore, air quality dispersion modeling for NO_X, CO, PM_{10}, and $PM_{2.5}$ emissions was completed at various levels to demonstrate compliance with applicable standards initially in November 2021 for the first PSD permit issuance in July 2022 and again under the as-designed configuration in October 2023 for the first revision to the PSD permit in June 2024. Due to the very minor nature of the project emissions changes attributable to the new as-built sources (refer to Table 3-1 of Volume 1) and the general expectation of negligible maximum off-site modeled impacts from New Source Performance Standards (NSPS) certified emergency engines of the size/configuration for the Guthrie casting operation, Novelis has pursued a more streamlined and conservative modeling approach for the as-built updates than the full "re-analysis" that was performed to address the much more significant/substantive as-designed project changes.

In addition, the emissions increases of NO_X and VOC exceed 100 tpy for the casting expansion project as a whole. Thus, an ozone ambient impact analysis was required for the initial and as-designed modeling analysis, which has been updated including the as-built changes as indicated in **Section 6**. An air quality analysis was not performed for GHGs because there are no ambient concentration based thresholds for which a compliance demonstration is needed and the United States Environmental Protection Agency (EPA) does not have a regulatory model designed to simulate GHG pollutant dispersion. No modeling was performed for sulfur dioxide (SO_2) or lead as the project emissions changes for these pollutants are less than the applicable SERs.

This report primarily relates to the requirements for Class II air quality areas. The area immediately surrounding the Novelis facility and within the general ambient air quality airsheds in which nearfield modeling is conducted (within 50 km) are all designated as Class II areas. With regard to Class II impacts, this report describes the as-built modeling performed for each PSD triggering pollutant and the conservative screening approach used to combined the prior as-designed modeling results with the supplemental as-built modeling results. Novelis' Guthrie plant is located in Todd County, which has been designated by EPA as an unclassified/attainment area for all criteria pollutants.[1] Therefore, with respect to the federal New Source Review permitting program, only PSD requirements could potentially apply to the source. Christian County, Kentucky within the Clarksville metropolitan statistical area (MSA) shares a border with the western boundary of Todd County and was a former Subpart 1 ozone nonattainment area with respect to the 1997 8-hr ozone NAAQS (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years). However, the Clarksville-Hopkinsville, TN-KY ozone nonattainment area was redesignated to maintenance on January 25, 2006.[2] The previous ozone NAAQS nonattainment status of Christian County

[1] 401 KAR 51:010 Section 2.

[2] 71 FR 4047, *Approval and Promulgation of Implementation Plans and Designation of Areas for Air Quality Planning Purposes; Kentucky; Redesignation of the Christian County, KY, Portion of the Clarksville-Hopkinsville 8-Hour Ozone Nonattainment Area to Attainment for Ozone, January 25, 2006.*

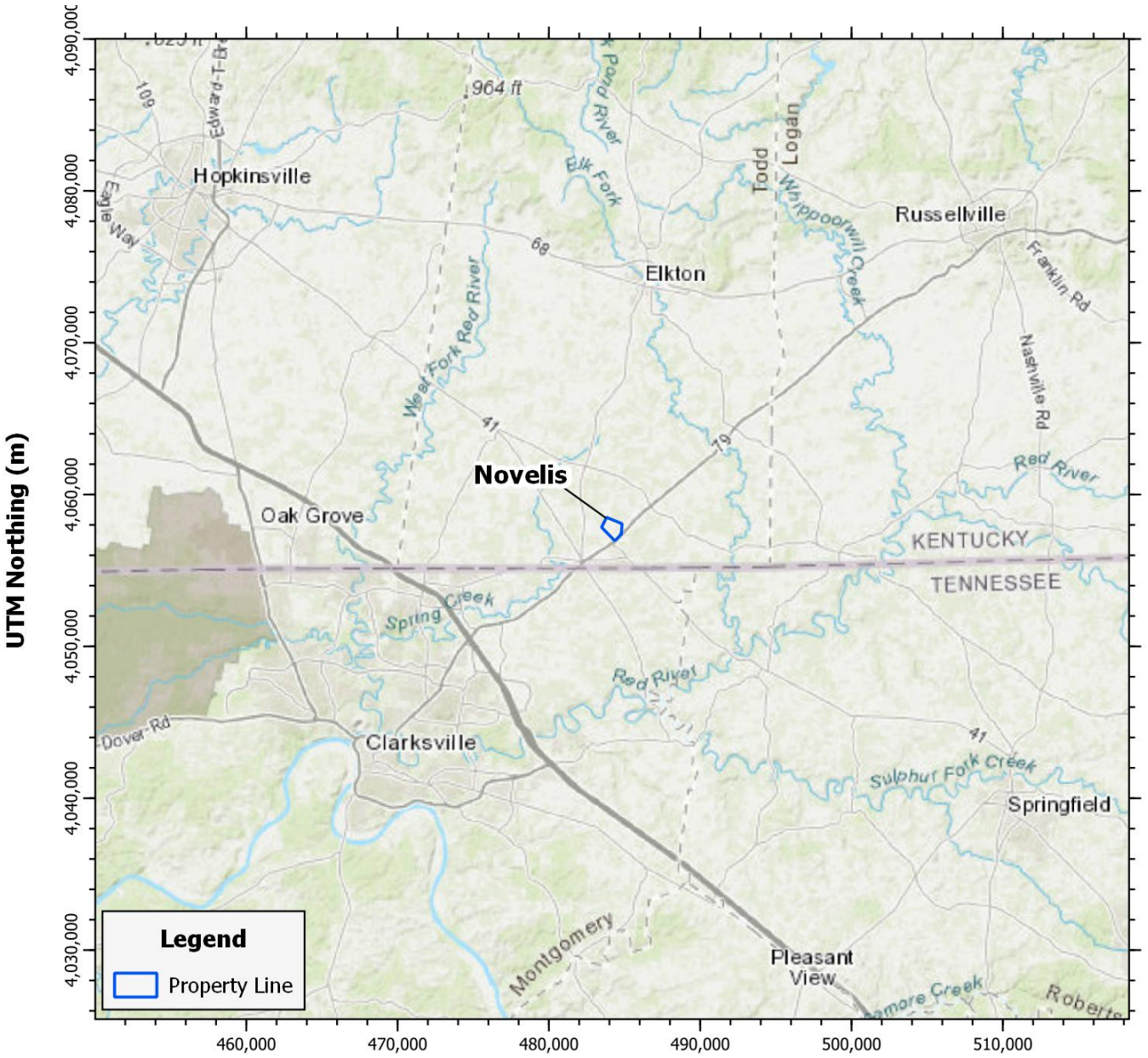
will be a consideration for the ozone impact analysis as portions of the county are included within the regional airshed centered on the Guthrie facility.

With respect to potential air quality impacts on Class I areas, Mammoth Cave National Park (MCNP) is the closest Class I area to the Guthrie facility and is located about 101 km northeast of the site. Because the distance from the facility to MCNP exceeds 50 km, Novelis is using screening methodologies to demonstrate the proposed project after the as-built changes will not result in adverse impacts at Class I areas .

Based on the as-built air toxics risk assessment performed using source-wide potential emissions of toxic air pollutants, no adverse impacts are expected to the health and welfare of humans, animals, and plants in the area surrounding the Novelis Guthrie facility. The air toxics risk assessment considered all relevant emission units currently designated within Title V permit V-22-011 R1 as being subject to 401 KAR 63:020 and newly added emission units that were determined to be subject to the requirements of 401 KAR 63:020 as part of the as-built air permit reconciliation process.

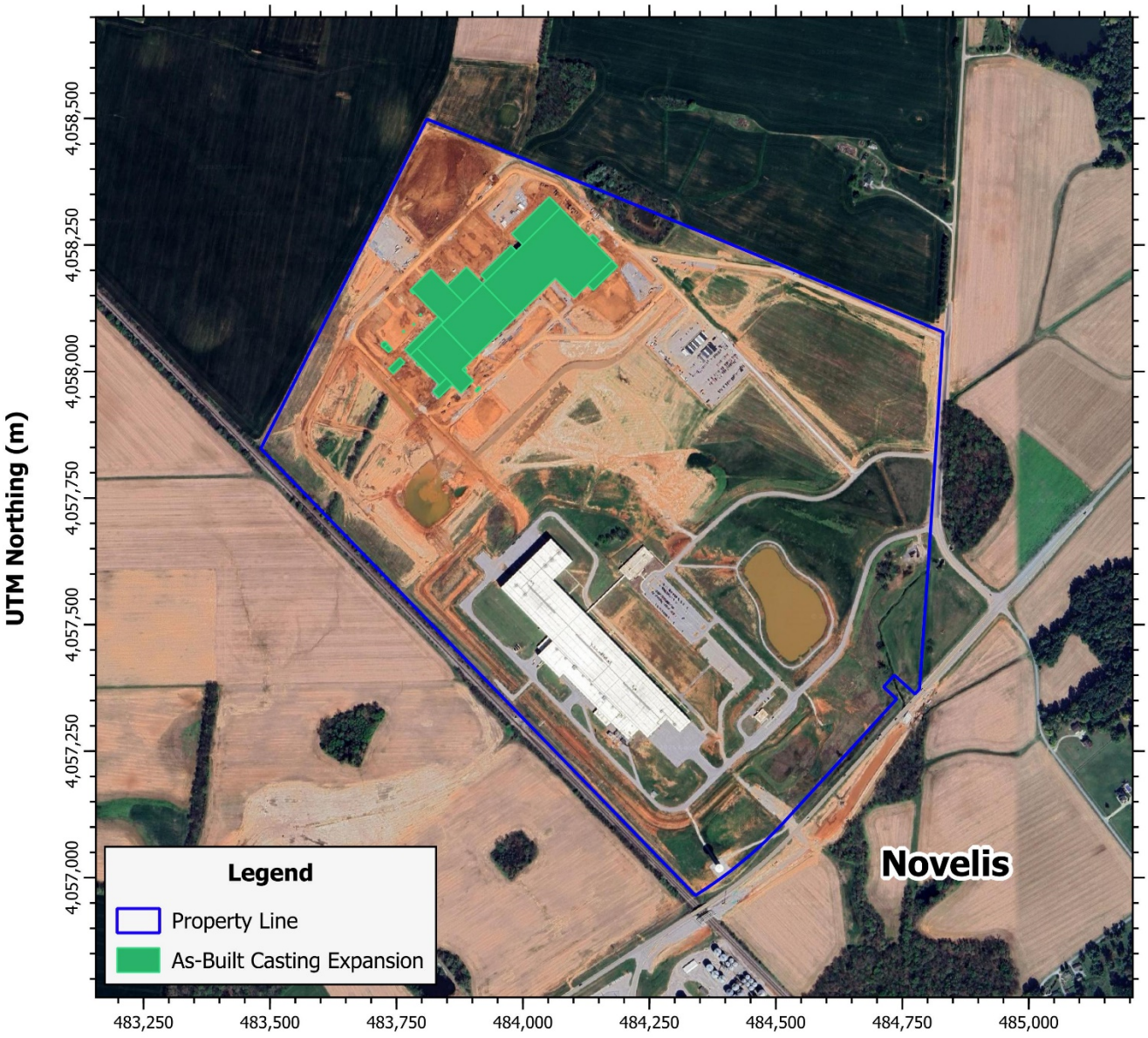
As provided in the October 2023 dispersion modeling report, the as-designed Novelis Guthrie facility is in compliance with the gaseous fluoride Kentucky Ambient Air Quality Standards (KYAAQS). None of the as-built changes affected gaseous fluoride emitting sources at the Novelis Guthrie facility. As such, a revised KYAAQS modeling analysis was unnecessary and is not being provided as part of this as-built modeling report.

Figure 1-1. Area Map Showing Novelis' Guthrie Facility Property



All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

Figure 1-2. Site Layout and Nearby Land Use at Novelis' Guthrie Facility



All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

2. CLASS II DISPERSION MODELING REQUIREMENTS

Because sources and emissions in the proposed project are subject to the ambient air quality assessment requirements of the PSD program, modeling is required to meet specific objectives. Modeling is used to demonstrate that emissions of NO_X, PM_{10}, $PM_{2.5}$, and CO pollutants after the proposed project is completed will not:

1) cause or significantly contribute to a violation of the NAAQS,

2) cause or significantly contribute to ambient concentrations that are greater than allowable PSD Increments, or

3) cause any other additional adverse impacts to the surrounding area (i.e., impairment to visibility, soils and vegetation and air quality impacts from general commercial, residential, industrial, and other growth associated with the facility expansion).

To facilitate this analysis (and allow it to be commensurate with the requirements to which the Division adheres), dispersion modeling methodologies are followed that are consistent with EPA procedures specified in the *Guideline on Air Quality Models* (herein referred to as the "*Guideline*"). These guidelines are cited by reference in the Kentucky Administrative Regulations (refer to 401 KAR 51:017 Section 10).[3] The purpose of this supplemental as-built report is to ensure that each of the modeling objectives for each required element of the PSD air quality analysis is met by providing updated results of a modeling analysis that has been reconciled with the most up to date as-built configuration of the facility.

Novelis completed all supplemental dispersion modeling and air impact assessments required under the regulations for PSD, including all Class II area modeling analyses as required. The Class I area modeling analysis demonstrates that more detailed regional scale modeling will not be needed and that only screening modeling will need to be considered. Class I area screening techniques include the use of the so-called Q/D analysis for the Air Quality Related Value (AQRV) demonstrations, and an AERMOD analysis with receptors positioned at the extent of the nearfield analysis (50 km) for the Class I PSD Increment demonstration.

For the Class II analysis, the various stages of modeling that are performed are dependent on compliance at each step. Refer to Section 2 of the October 2023 as-designed modeling report submitted to the Division for a detailed discussion on each stage of Class II area PSD air quality analysis and a detailed overview of the tools and methods that are employed to conduct Class II dispersion modeling. Key highlights of these Class II area modeling methodologies carried forward into this supplemental as-built modeling analysis are summarized below.

- Applicable Significant Impact Levels (SIL), NAAQS, PSD Class II Increments, and Significant Monitoring Concentrations (SMC) for Applicable Criteria Air Pollutants
  - As discussed in Section 3.4.1 of Volume 1 to this as-built reconciliation application, Novelis considers this permit action to qualify as a minor change under EPA's applicable guidance for preparing PSD permit revisions.

[3] 40 CFR 51, Appendix W, *Guideline on Air Quality Models* cited in 401 KAR 51:017 at http://www.lrc.ky.gov/kar/401/051/017.htm.

- Such a minor change qualifies for more streamlined permitting procedures including not being subject to new PSD rules if construction on the original source or emission unit has commenced (as is the case for the Novelis Guthrie casting expansion project).
- Therefore, Novelis considers the SIL, NAAQS, PSD Increment and SMC documented in Table 2-1 of the October 2023 as-designed modeling report to be the applicable standards for this supplemental as-built modeling analysis.

► Model Selection

- To provide continuity with the most recent, full-scale modeling analysis performed in October 2023 for the as-designed changes, Novelis used the same EPA-recommended AERMOD Model Version 22112 released in June 2022.
- Any AERMOD model version changes that have occurred since the prior modeling study was completed in October 2023 are not expected to substantively influence the modeling results for the types of sources considered in this supplemental as-built modeling analysis.
- Novelis has reviewed the specific details of AERMOD code updates reflected in the "Model Change Bulletins (MCB) Archive" published on EPA's Air Quality Dispersion Modeling - Preferred and Recommended Models webpage associated with the release of AERMOD Model Version 23132 in May 2023 (MCB 17) and AERMOD Model Version 24142 in May 2024 (MCB 18). In all cases the Bug Fixes, Enhancements, Formulation Updates noted in these applicable MCB either involve key words/switch settings not used in either the as-designed or as-built modeling analysis or involve portions of the AERMOD code that are not expected to substantively affect the modeled concentrations for the source types covered in the Novelis Guthrie casting expansion project.

► Tiered NO_2 Dispersion Modeling Methodology

- To enable consideration of negative modeled emission rates for assessing the change in modeled impacts from sources with different input parameters between the as-designed and as-built modeling setup, Novelis has conservatively chosen to apply the Tier 1 screening level where all NO_X emitted is modeled as NO_2 (i.e., assumed total conversion of any NO in NO_X to NO_2).
- Under this Tier 1 NO_2 modeling methodology, the as-designed configuration of the contributing sources to the Hot Baghouse #3 and #4 stacks can be modeled with negative NO_X emission rates, representative stack parameters, and the prior building downwash parameters without the influence of the added buildings from the as-built changes. The same contributing sources to the Hot Baghouse #3 and #4 stacks can then be modeled in their as-built configuration with the same positive NO_X emission rates, equivalent stack parameters, and the as-built building downwash parameters. For the contributing sources to the Hot Baghouses #3 and #4, this "negative/positive" emissions approach enables AERMOD to predict the change in modeled impacts attributable to the change in building downwash parameters from the addition of the fire water tank, fire water pump house, and cast pit sump emergency generator enclosures.

► Rural/Urban Option Selection in AERMOD

- The area surrounding the Novelis Guthrie site continues to be overwhelmingly rural with no appreciable changes in land use classifications since the 2016 National Land Cover Data (NLCD) was generated and the prior rural/urban dispersion coefficient selection was made in the October 2023 modeling report. Therefore, Novelis has continued to apply the rural option in determining the applicable atmospheric boundary layer characteristics that affect the model calculations of ambient concentrations for the supplemental, as-built modeling analysis.

- Building Downwash
  - For all newly added and otherwise impacted sources included in the as-built modeling analysis, direction-specific equivalent building dimensions used as input to the AERMOD model to simulate the impacts of downwash are calculated using the U.S. EPA-sanctioned Building Profile Input Program (BPIPPRIME), version 04274 (same version from as-designed modeling analysis and the current version) and used in the AERMOD Model. All modeled source stacks at the Guthrie facility are less than 65 meters tall and therefore meet the requirements of good engineering practice (GEP) and credit for the entire actual height of each stack is used in this modeling analysis.
- Elevated Terrain
  - As shown in the updated set of point source stack parameters presented in Table B-2.1 of Appendix B, the base elevations for the newly added or otherwise impacted as-built sources are set to the same plant grade elevations applied for the casting expansion project sources in the as-designed modeling report.
  - Base elevations for select sources and buildings, terrain elevations for receptors, and other regional source base elevations (if required in the NAAQS modeling analysis) input to the model were read and interpolated from 1 arc second (approximately 30 meter resolution) National Elevation Dataset (NED) data obtained from the U.S. Geological Survey (USGS) using the AERMOD terrain preprocessor called AERMAP (latest version 18081) as part of the as-designed modeling analysis. No updates to this source, building, and receptor terrain analysis were necessary with the as-built supplement because no substantive changes to the Guthrie site terrain has occurred since the prior analysis and recent AERMAP updates associated with v24142 are not expected to impact the calculated base elevations. Specifically, AERMAP Model Change Bulletin #5 published with the v24142 release included minor bug fixes and enhancements which are not relevant or applicable to the elevated terrain analysis for the casting project's modeling analysis.
- Meteorological Data
  - Selection of the most representative surface meteorological data stations [Bowling Green Warren County Airport (KBWG, WBAN# 93808)] and upper air stations [Nashville International Airport (KBNA, WBAN# 13897)] from the as-designed modeling analysis continues to be applicable for this supplement, as-built modeling analysis.
  - The same KDAQ supplied 2018-2022 meteorological data set processed using the AERMET processor (Version 22112) along with nearby sets of National Weather Service (NWS) data from surface and upper air stations is applied in this supplemental, as-built modeling analysis.
  - Pursuant to Section 8.4.2.e. of the *Guideline*, the meteorological data set for a regulatory near-field air dispersion modeling analysis requires "enough meteorological data to ensure that worst-case meteorological conditions are adequately represented in the model results", where the "use of 5 years of adequately representative NWS or comparable meteorological data" is required for the casting expansion project PSD air quality analysis. While KDAQ generally offers the most recent, quality assured 5-year dataset on their website, a historical 5-year period can be used as long as this historical data set is considered to be adequately representative of the current climatological conditions at the site.
  - Between the 5-year meteorological data period used in the prior as-designed modeling analysis (2018-2022) and the most recent 5-year dataset published on KDAQ's website (2020-2024), Novelis is not aware of any "year-to-year variations in weather conditions" in the Bowling Green area that would affect the "appropriateness of the data for constructing realistic boundary layer profiles" for the Novelis Guthrie site [quotes from Section 8.4.1.b.(4) of the *Guideline*]. The prior 2018 to 2022

meteorological dataset was reviewed and approved by KDAQ as being adequately representative of the Novelis Guthrie site. No substantive changes to the location of the surface meteorological instruments at the KBWG station have occurred in the available data years after 2022 (i.e., 2023 and 2024).[4] The prior 2018-2022 data period is sufficiently recent to be considered climatologically representative of both the weather patterns occurring at the Bowling Green airport and the Novelis Guthrie site. Finally, the surface characteristics supplied as outputs from AERSURFACE supplied to AERMET as inputs for the prior 2018-2022 data period were deemed adequately representative of the area surrounding the KBWG station at the time that the raw surface observations were collected and thereby adequately ensures that the boundary layer profiles affected by these surface characteristics are also representative in the AERMET output files for this 5-year data period.

- Novelis has reviewed the AERSURFACE MCB #4 covering the enhancements and miscellaneous updates and bug fixes in moving from the prior Version 20060 to the current Version 24142. Based on the timing of the release of the KDAQ supplied meteorological data, the applicable AERSURFACE version that supported the 2018-2022 data period AERMET processing by KDAQ would have been Version 20060. None of the enhancements pertaining to the file checks associated with the RUNORNOT keywords settings in the Version 24142 release would impact the surface characteristics output by AERSURFACE. The decoupling of the datatype and year parts of the DATAFILE keyword only impacts compatibility with future time-based releases of NLCD data and would not impact any AERSURFACE outputs/results. Redesignating the Airport (AP) and Non-Airport (NONAP) flags to LOWZ0 (for low surface roughness) and HIGHZ0 (for high surface roughness), respectively, does not impact the aspects of the AERSURFACE model code which use the inputs for these keywords and does not impact AERSURFACE outputs/results. Increasing the resolution tolerance of the NLCD files does not impact the AERSURFACE results as the prior NLCD data used by KDAQ in generating the 2018-2022 meteorological data was and continues to be adequately compatible with the AERSURFACE pre-processor. User limitations on the grid size of the NLCD are not applicable as KDAQ's AERSURFACE runs would have included an NLCD file with an extent equal to or exceeding 10 km by 10 km. Removal of unused warning and error messages does not affect the user of AERSURFACE.
- Similar to the AERSURFACE MCB review, Novelis has completed a similar review of the AERMET updates from prior Version 22112 to the current Version 24142 addressed in MCB #13 and #14. Many of the bug fixes, enhancements, and miscellaneous updates involve AERMET keywords which are not applicable to standard use of NWS based surface and upper air observations. Furthermore, the core functionality of AERMET with respect to the use of 1-minute Automated Surface Observing Stations (ASOS) processed by AERMINUTE for Version 15272 for the key wind speed and direction data and the specific AERMET Stage 1 and 2 calculation algorithms used to produce the .SFC and .PFL input files to AERMOD did not change between AERMET Version 22112 and Version 24142. Therefore, for the sake of consistency and adhering to the prior meteorological data representativeness determination carried by the approval of the as-designed modeling report, Novelis considers use of the 2018-2022 data period for the KBWG surface and KBNA upper air station processed using AERMET Version 22112 to be adequate for the supplemental, as-built modeling analysis.

► Coordinate System

- In all modeling analyses conducted by Novelis, the location of emission sources, structures, and receptors continues to be represented in the Universal Transverse Mercator (UTM) coordinate system, North American Datum 1983 (NAD 83) Zone 16.

[4] https://www.ncei.noaa.gov/access/homr/#ncdcstnid=20008171&tab=LOCATIONS

- Receptor Grids
  - The fenceline, fine, medium, coarse, and very coarse receptor grids included in the Significance Analysis and described in Section 2.8 of the October 2023 as-designed modeling report are carried forward directly into the as-built Significance Analysis component of this supplemental modeling analysis.
  - The full NAAQS and PSD Increment analyses continue to be conducted using only receptor locations from the as-designed modeling analysis at which impacts calculated for the sources related to the facility modification exceed or equal the SIL for the respective pollutant and averaging time in the as-designed configuration of the casting expansion project.
    - Any changes to the locations and number of significant receptors that could theoretically be caused by the as-built changes are not expected to have any substantive influence on the conclusions of the modeling analysis because additional significant receptors at the edges of the NAAQS/PSD Increment grids are by definition the lowest impacts from the project under review and could only be new locations of "hot spots" if the added receptors overlapped with maximum impacts from a nearby source. Novelis has confirmed any limited numbers of additional significant receptors that could be potentially associated with the full, as-built configuration of the casting expansion project would not create any new nearby source-driven maximum impact locations or otherwise introduce higher impacts from the Novelis Guthrie sources (i.e., "edge of grid" impacts from Novelis Guthrie are far lower than maximum impacts occurring at or near the Guthrie facility fenceline).
    - In addition, Novelis is adopting a conservative NAAQS and PSD Increment modeling results analysis technique where the prior as-designed NAAQS/PSD Increment results are added to the as-built Significance Analysis results irrespective of temporal pairing and without consideration of the changes in the form of the standard. Basically, the as-built Significance Analysis results for each pollutant and averaging period are added to the NAAQS or PSD Increment results at as-designed significant receptors on a receptor-by-receptor basis (i.e., spatial pairing) to create a conservatively high estimate for the total impacts that would be associated with the as-designed configuration plus the as-built changes to the casting expansion project. This streamlined technique for merging Significance Analysis and NAAQS/PSD Increment results tend to overpredict the "true" NAAQS/PSD Increment impacts from a full-scale modeling analysis that considered the final, as-built configuration of the casting expansion project.
- Source Emissions and Release Inventories
  - A list of all new and existing sources at the Guthrie facility included in the as-designed dispersion modeling analysis was previously included in Appendix B of the October 2023 modeling report along with the corresponding cross-referenced source names used in the modeling files.
  - As shown in Table B-1.1 of **Appendix B** to this supplemental modeling analysis, Novelis has indicated all of the as-built changes to the modeled source list in light green highlights and dark red text. These new or otherwise impacted emissions sources included the following:
    - Ingot Saw modeled in both its as-designed (Model ID = ISAW_AD) and as-built (ISAW_AB) configuration to determine the impact of changing from a vertical unobstructed stack to a capped stack with slightly different stack height and diameter.
    - DBF Preheater modeled in both its as-designed (DBFPH_AD) and as-built (DBFPH_AB) configuration to determine the impact of changing the source location, stack orientation (from unobstructed vertical to horizontal), and release parameters.

- New Cast Pit Sump Emergency Generator (CPSGEN) modeled as a point source with a vertical, unobstructed release.
- New Emergency Fired Pumps #3 and #4 (FPENG3 and FPENG4) modeled as point sources with a horizontal release.
- Casting Area and Hot End building fugitive sources for the new Decoater Backup Generator and Molten Metal Utility Heaters (CASTRF_D, HTENDF_D, CASTRF_U, and HTENDF_U) modeled as elevated area sources representing the expected roof-level discharge of these interior venting emission units within the Casting Area and Hot End buildings.

- **Appendix B** also provides a complete inventory of emission rates and source parameters for the as-built sources modeled in the updated Significance Analysis. Specific details regarding the basis of the modeled emission rates and source parameters are included as footnotes to Table B-2.1 for point source stack parameters, Table B-2.2 for area source parameters, Table B-3.1 for point source modeled emission rates, and Table B-3.2 for area source modeled emission rates. Additional details regarding the basis of the modeled emission rates for select sources is provided below in any instances where the maximum hourly and annual potential emissions from the as-built Title V significant permit revision were not used directly.
  - As discussed previously with respect to the NO_2 modeling methodology, negative emission rates for the as-designed configuration and positive emission rates of an equivalent magnitude were used for the contributing sources to Hot Baghouse #3 and #4 stacks (NDC and FLF for Hot Baghouse #3 and HF1 and ILD for Hot Baghouse #4), Ingot Saw, and DBF Preheater. In this manner, the modeling output predicts the change in modeled concentration that is attributable to as-built updates for each of these sources for each applicable pollutant and averaging period.
  - As documented in Table B-3.1 of Appendix B, for the deterministic 1-hour CO standard, new emergency engines covered in this as-built modeling analysis are modeled at their maximum hourly potential CO emission rate with no accommodation for their intermittent use. For the deterministic 8-hour CO standard, a scaling factor of 1/8 is used to account for operation of up to the equivalent of 1-hour at full load of the engine to reflect the maintenance and readiness testing schedule that could fall within the 8-hour averaging period and to ensure the modeled emission rate is not underpredicted by using the annualized hourly potential CO emission rate [i.e., maximum hourly potential emission rate multiplied by the 500 hr/yr emergency engine potential to emit (PTE) basis and divided by the 8,760 hr/yr in the annual period]. For the probabilistic 1-hr NO_2 and 24-hr $PM_{2.5}$ standards and the multi-year 24-hr PM_{10} standard, Novelis has applied the 500/8,760 scaling factor to the maximum hourly potential emission rates for each pollutant as described in EPA's guidance on how to appropriately derive modeled emission rates for intermittently used emergency engines that do not follow a specific maintenance and readiness testing schedule (i.e., only during daylight hours, certain days of the week, etc.). This annualized hourly emission rate approach avoids producing modeled impacts which "significantly overestimate actual impacts" for these emergency engines if they were otherwise assumed to operate continuously (as is assumed for all other, non-intermittent sources).[5] Finally, for the NO_2, PM_{10}, and $PM_{2.5}$ annual standards, the annualized hourly potential emission rate is used which has been a common practice under both deterministic and probabilistic standards for any modeled source type which does not operate continuously (i.e., limited use, intermittent, and emergency sources).

[5] U.S. EPA Memorandum from Tyler Fox, *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-Hour NO2 National Ambient Air Quality Standard*, March 1, 2011.

- Nearby Regional Inventory
  - As discussed in Section 2.8.1 of the October 2023 as-designed modeling report, Novelis applied a Q/d-based and subsequent subjective screening methodology to select specific nearby regional inventory sources to include in the NO_2, PM_{10}, and $PM_{2.5}$ NAAQS and PSD Increment analyses. The raw emissions inventory data for this prior nearby source screening process was based on the 2017 National Emissions Inventory (NEI) for the Tennessee Department of Environment & Conservation Division of Air Pollution Control (TNDEC) supplied data and the state-wide 2019 Kentucky Emissions Inventory System (KyEIS) export for the KDAQ supplied data.
  - To address any potentially significant changes in the Tennessee and Kentucky nearby source inventory, Novelis has reviewed more recent 2022 NEI data for Tennessee sources and 2023 KyEIS data for Kentucky sources for any new emission units at existing source or entirely new sources added to the regional inventory since the prior analysis. Key findings from this updated nearby regional inventory screening analysis are documented for each applicable pollutant/averaging period in the list below:
    - 1-hr NO_2 NAAQS Inventory
      - After applying the same Q/d screening procedure at the as-designed 1-hr NO_2 significant impact area (SIA) distance of 14.0 km, Novelis identified the following sources at existing facilities previously considered for the nearby regional inventory and new facilities added since the prior emissions inventory data was transmitted by KDAQ are described below.
      - Six new sources at Logan Aluminum (AI ID# 2761) located 37.5 km northeast of the Novelis Guthrie facility [relative to the 14 km] added with combined annual potential NO_X emissions of 37.61 tpy. Logan Aluminum's other existing NO_2 emissions sources were included in the nearby regional inventory as documented in Tables E-1.1 and E-1.2 of Appendix E to the October 2023 as-designed modeling report. These newly added sources have a combined Q/d of approximately 1.0 relative to distance from Logan to Novelis Guthrie and 2.7 relative to the distance from Logan to the 1-hr NO_2 SIA. Newly added sources at Logan Aluminum include a small natural gas-fired Sow Dryer (Source ID 195), 22 MMBtu/hr natural gas-fired Boiler #4 (Source ID 200), small natural gas-fired duct burner (Source ID 022), emergency use diesel-driven fire water pump engine (Source ID 188), and two diesel engine-drive mobile bale breakers (Source IDs 193 and 199) all with low-level/short stack release heights. These relatively small NO_X emissions sources spread across the Logan Aluminum facility are not expected to cause NO_2 modeled impacts which would alter the maximum impact location for the casting expansion project or lead to new modeled exceedances at the edges of the NAAQS receptor gird closest to Logan Aluminum.
      - The 2023 KyEIS inventory includes 3 additional emergency engines co-located with cellular phone towers operated by AT&T Mobility and Verizon Wireless at distances ranging from approximately 2.2 to 11.7 km from the Novelis Guthrie site and with combined annual potential NO_X emissions of only 0.35 tpy. Similar to the subjective screening criteria noted for other similar cell tower emergency engines previously noted in Appendix E of the as-designed modeling report, Novelis would screen out these additional cell tower locations on the basis of only included low-emitting emergency engines operated on an intermittent basis which are not expected to cause a significant concentration gradient at any of Novelis Guthrie's maximum 1-hr NO_2 NAAQS impact locations.
      - Within the 2022 NEI data used to characterize new Tennessee nearby regional inventory sources, a new data center location designated as Foxman LLC dba Foxman - Clarksville Data Center (NEI ID 19018211) was identified as a new source within Novelis Guthrie's 1-hr NO_2

SIA distance. The Foxman data center is located approximately 8.9 km southwest of the Novelis Guthrie site. The operations at the Foxman data center include small natural gas-fired boilers, diesel-driven emergency fire water pump engines, and diesel-driven emergency generator engines with 2022 source-wide actual NO_X emissions of only approximately 20 tpy. The Foxman data center lies at the edge of Novelis Guthrie's 1-hr NO_2 NAAQS receptor grid in an area where spatial and temporal overlap of maximum 1-hr NO_2 impacts are very unlikely such that Novelis Guthrie would not cause or contribute to the maximum impact locations of the Foxman data center and vice versa. Furthermore, the vast majority of the potential NO_X emissions from the Foxman data center are associated with emergency engines which can be readily excluded from 1-hr NO_2 NAAQS modeling analysis in accordance with EPA's intermittent source guidance. Therefore, Novelis does not consider the addition of the Foxman data center after the completion of the as-designed modeling effort in October 2023 as likely to substantively change the conclusions of the prior 1-hr NO_2 NAAQS modeling analysis.

- Annual NO_2 NAAQS and PSD Increment Inventory
  - After applying the same Q/d screening procedure at the annual NO_2 significant impact area (SIA) distance of 1.64 km, Novelis identified only the same Logan Aluminum sources previously addressed in the prior 1-hr NO_2 NAAQS nearby regional inventory review. Following the same rationale as presented for the 1-hr NO_2 review and in consideration of the much shorter SIA distance for annual NO_2 impacts, Novelis would not expect these added Logan sources to substantively influence the conclusions or modeled impacts presented in the prior annual NO_2 NAAQS and PSD Increment analyses associated with the October 2023 as-designed modeling report.
- 24-hr and Annual $PM_{2.5}$ NAAQS and PSD Increment Inventory
  - After applying the same Q/d screening procedure at the worst-case as-designed 24-hr and annual $PM_{2.5}$ significant impact area (SIA) distance of 3.3 km, Novelis identified only a single Verizon Wireless cell tower site (Verizon Wireless - Guthrie Cell Tower Engine located 2.2 km from the Novelis Guthrie site with annual potential $PM_{2.5}$ emissions of 0.01 tpy) addressed previously in the prior 1-hr NO_2 NAAQS nearby regional inventory review. Following the same rationale as presented for the 1-hr NO_2, Novelis would be able to reasonably screen out this new cell tower location from the $PM_{2.5}$ NAAQS inventory in a similar manner to other cell towers previously excluded from the as-designed $PM_{2.5}$ NAAQS inventory (i.e., AT&T Mobility - Guthrie Cell Tower Engine AI ID# 127786 located 0.9 km from the Novelis Guthrie site).
- 24-hr and Annual PM_{10} NAAQS and PSD Increment Inventory
  - After applying the same Q/d screening procedure at the worst-case as-designed 24-hr and annual significant impact area (SIA) distance of 1.6 km, Novelis did not identify any new sources that could be candidates for updating the PM_{10} NAAQS and PSD Increment inventory as any newly added sources or facilities within the 50 km initial screening distance would be screened out on the basis of the Q/d screening procedure.

- Background Concentrations
  - As discussed in the October 2023 as-designed modeling report, nominations for candidate monitors for NO_2, PM_{10}, $PM_{2.5}$, and ozone background concentrations were made in the revised modeling report submitted to the Division on April 29, 2022.[6] The selections of monitoring stations for

[6] Volume 2 - Air Dispersion Modeling Report for Casting Expansion Project – Guthrie, KY, prepared by Trinity Consultants, April 2022.

establishing background concentrations were based on monitor sites with data for the required pollutants, period of data collection, adherence to Federal EPA QA/QC procedures, proximity, and representativeness (based on similar land use and geographical setting between Novelis and the monitor site). Refer to Section 2.9 of the October 2023 as-designed modeling report for additional details on the background concentration selection analysis.

- A comparison of the background concentrations that were previously approved in the initial, April 2022 modeling report (2018-2020 Design Values), the background concentrations for the as-designed analysis (2020-2022 Design Values), and the most recent 3-year design values are shown in **Table 2-1** below.
- The 1-hr and annual NO_2 design values from the Daviess County monitor (21-059-0005) continue to offer the most recent and representative data for Novelis Guthrie NO_2 background concentration data because no more recent ambient monitoring data has been collected at this monitoring station. For the same reasons noted in Section 2.9.1 of the initial November 2021 PSD modeling report, Novelis continues to assert the design values from the Daviess County monitoring station for any 3-year design value period should provide conservatively high estimates for the background concentrations at the Novelis Guthrie site due to the significant sources of NO_X which likely impact the more urban/suburban Daviess County monitor to a greater extent than the Novelis airshed.
- For 24-hr and annual $PM_{2.5}$, the prior 2020-2022 design values used in the as-designed modeling report are higher than the most recent 2022-2024 design values meaning the prior background concentration selection would offer a conservatively high estimate of the current/most recent $PM_{2.5}$ air quality in the area surrounding the Guthrie site.
- For 24-hr PM_{10}, the background concentration for the Davidson County monitor has increased slightly (~18%) from the 2020-2022 design value from the as-designed modeling effort to the current 2022-2024 design value. However, this relatively small absolute change in background concentration (~9 $\mu g/m^3$ and ~6% of the 24-hr PM_{10} NAAQS) would have no substantive influence on the prior PM_{10} NAAQS demonstration because the cumulative 24-hr PM_{10} impacts with the background concentration included fell far below the applicable 24-hr PM_{10} NAAQS.
- For 8-hr ozone, the current 2022-2024 design value (65 ppb or 127.2 $\mu g/m^3$) from the Christian County monitor is slightly higher (~10%) than the 2020-2022 design value (59 ppb or 115.5 $\mu g/m^3$) used in the as-designed modeling report. However, the ozone ambient impact analysis presented in **Section 6** demonstrates that the cumulative ozone impacts from the casting expansion project in its as-built configuration and the current ozone design value from the selected Christian County ozone monitoring station would not exceed the 8-hr ozone NAAQS.
- Similar to the request made in the October 2023 as-designed modeling report, Novelis requests that KDAQ waive the pre-construction monitoring requirements of 401 KAR 51:017, Section 11 for the casting expansion project in its as-built configuration based on the availability of representative monitoring data from the selected background monitor stations.

Table 2-1. Design Value Trends at Selected Background Monitor Locations

Pollutant	Averaging Time	AQS Site ID	2018-2020 Design Value ($\mu g/m^3$)	2019-2021 Design Value ($\mu g/m^3$)	2020-2022 Design Value ($\mu g/m^3$)	2021-2023 Design Value ($\mu g/m^3$)	2022-2024 Design Value ($\mu g/m^3$)	Note
NO_2	Annual	210590005	7.5	9.4	9.4	--	--	1
NO_2	1-Hour	210590005	50.8	50.8	52.6	--	--	1,2
$PM_{2.5}$	24-Hour	210470006	19.0	22.0	22.0	22.0	19.0	--
$PM_{2.5}$	Annual	210470006	8.0	8.4	8.3	8.6	7.9	--
PM_{10}	24-Hour	470370023	34.0	49.0	51.9	58.0	61.0	3
Ozone	8-Hour	210470006	113.5	113.5	115.5	123.3	127.2	--

[1] The Daviess County monitor (21-059-0005) was shutdown in August 2023. A new Daviess County monitor (21-059-0015) began operation in November 2024. As such, there were no valid design values for Daviess County, KY for the 2021-2023 and 2022-2024 design value periods.

[2] The 1-hour NO2 NAAQS Analysis involved temporal pairing of monitored and modeled concentrations consistent with recent EPA guidance. Seasonal hour-of-day background concentrations were calculated and used in the modeling analysis.

[3] PM10 measurements at the Davidson County monitor for 2020 were not included in the background concentrations because only 50% of data was reported for that year due to Quality Assurance issues, so reported values covering the 2020 data year use the 3 most recent data years excluding 2020 (i.e., 2018, 2019, and 2021 for the reported 2019-2021 design value column). The calculated "design value" is fourth highest 24-hr PM10 concentration over the 3-year period.

3. CLASS II MODELING RESULTS

This section summarizes the results of the Class II dispersion modeling analyses accounting for the reconciled, as-built configuration of the Guthrie facility. As discussed in Section 2 of the October 2023 modeling report, the Class II modeling analyses are conducted in three steps: the SIL analysis, the NAAQS Analysis, and the PSD Increment Analysis. The following subsections present as-built dispersion modeling results from modeling NO_X, CO, PM_{10}, and $PM_{2.5}$ emissions for the SIL analysis. In addition, for those pollutants and averaging times where further NAAQS and PSD Increment evaluations are required, Novelis has demonstrated that the proposed project will not cause or contribute to any exceedances of the NAAQS or PSD Increment by conservatively adding, on a per receptor basis, the maximum 1st high as-built SIL emissions impact to the as-designed NAAQS and PSD impacts demonstrated in the October 2023 as-designed modeling report.

3.1 SIL Analysis

As shown in **Table 3-1** below, the combined as-designed (AD) plus as-built (AB) impacts for the project causes impacts above the NO_2 SIL for the 1-hour and annual averaging periods as was the case for the October 2023 as-designed modeling results. Because these impacts are greater than the NO_2 SILs, further NAAQS and PSD increment consideration is required. The radius of the SIA for NO_2 under the AD+AB combined impacts case was determined to be 14.2 km and 1.82 km for the 1-hr and annual averaging periods, respectively (as compared to 14.0 km and 1.64 km 1-hr and annual NO_2 SIA from the October 2023 as-designed modeling report). The minimal change in the SIA distance from the October 2023 as-designed case to the current as-built case demonstrates that the as-built changes to the casting expansion project does not have a substantive effect on the profile of significant receptors for either the 1-hr or annual NO_2 SIL analysis.

Table 3-1. NO_2 SIL Modeling Analysis Results

Averaging Period	Year for Met. Data	SIL (µg/m³)	"As-Designed (AD)" Maximum 1st High SIL Impact (µg/m³)	"As-Built (AB)" Maximum 1st High Impact (µg/m³)	Combined AD+AB Maximum Impact (µg/m3)	AD+AB Exceeds SIL?
1-hr	2018		111.8	41.4	120.8	
	2019		110.7	41.1	119.7	
	2020		107.2	41.6	115.9	
	2021		103.8	41.3	112.7	
	2022		111.9	41.2	120.7	
	Max. 5-yr Avg.	**7.5**	**109.1**	**41.3**	**118.0**	**Yes**
Annual	2018		3.16	0.58	3.31	
	2019		3.72	0.60	3.88	
	2020		3.43	0.57	3.58	
	2021		3.50	0.63	3.71	
	2022		3.57	0.54	3.71	
	Max. of 5 Years	**1**	**3.72**	**0.63**	**3.88**	**Yes**

As shown in **Table 3-2**, the AD+AB combined impacts for the project causes impacts above the PM_{10} SIL for both the 24-hour and annual averaging periods as was the case for the October 2023 as-designed modeling results. Because these combined impacts are greater than the PM_{10} SILs, further NAAQS and PSD increment consideration is required. However, on an absolute/individual basis, the maximum PM_{10} SIL impacts from the as-built changes are shown to fall far below the 24-hr and annual PM_{10} SIL, which demonstrates the negligible effects on the primary conclusions of the PM_{10} NAAQS and PSD Increment analysis expected from the as-built changes when viewed on a stand-alone basis. The radius of the SIA for PM_{10} under the AD+AB combined impacts case was determined to be 1.63 km and 1.22 km for the 24-hr and annual averaging periods, respectively (effectively equivalent to the 24-hr and annual PM_{10} SIA from the October 2023 as-designed modeling report). The negligible contribution from the as-built modeling impacts on the combined AD+AB 24-hr and annual PM_{10} SIL modeling results demonstrates that the as-built changes do substantively change the conclusions of the prior as-designed PM_{10} SIL analysis either with respect to the maximum impact values or the significant receptor profile.

Table 3-2. PM_{10} SIL Modeling Analysis Results

Averaging Period	Year for Met. Data	SIL ($\mu g/m^3$)	"As-Designed (AD)" Maximum 1st High SIL Impact ($\mu g/m^3$)	"As-Built (AB)" Maximum 1st High Impact ($\mu g/m^3$)	Combined AD+AB Maximum Impact ($\mu g/m3$)	AD+AB Exceeds SIL?
24-hr	2018		12.4	0.12	12.4	
	2019		12.3	0.13	12.4	
	2020		11.6	0.15	11.6	
	2021		11.1	0.20	11.1	
	2022		13.1	0.16	13.2	
	Max. of 5 Years	**5.0**	**13.1**	**0.20**	**13.2**	**Yes**
Annual	2018		1.80	0.02	1.80	
	2019		1.91	0.02	1.92	
	2020		1.96	0.02	1.96	
	2021		2.03	0.02	2.03	
	2022		1.88	0.02	1.89	
	Max. of 5 Years	**1.0**	**2.03**	**0.02**	**2.03**	**Yes**

As shown in **Table 3-3**, the combined AD+AB impacts for the project causes impacts above the $PM_{2.5}$ SIL for both the 24-hour and annual averaging periods as was the case for the October 2023 as-designed modeling results. Because these combined impacts are greater than the $PM_{2.5}$ SILs, further NAAQS and PSD increment consideration is required. However, similar to the situation for as-built PM_{10} SIL impacts, the maximum $PM_{2.5}$ SIL impacts from the as-built changes are shown to fall far below the 24-hr and annual $PM_{2.5}$ SIL, which demonstrates the negligible effects on the primary conclusions of the $PM_{2.5}$ NAAQS and PSD Increment analysis expected from the as-built changes when viewed on a stand-alone basis. The radius of the SIA for $PM_{2.5}$ under the AD+AB combined impacts case with secondary $PM_{2.5}$ impacts also included via the modeled emission rates for precusors (MERP) approach discussed in **Section 7** was determined to be 3.47 km and 2.33 km for the 24-hr and annual averaging periods, respectively (as compared to 3.26 km and 2.33 km 24-hr and annual $PM_{2.5}$ SIA from the October 2023 as-designed modeling report). The negligible contribution from the as-built modeling impacts on the combined AD+AB 24-hr and annual $PM_{2.5}$ SIL modeling results demonstrates that the as-built changes do substantively change the conclusions of the prior as-designed PM_{10} SIL analysis either with respect to the maximum impact values or the significant receptor profile.

Table 3-3. $PM_{2.5}$ SIL Modeling Analysis Results

Averaging Period	Year for Met. Data	SIL ($\mu g/m^3$)	"As-Designed (AD)" Maximum 1st High SIL Impact ($\mu g/m^3$)	"As-Built (AB)" Maximum 1st High Impact ($\mu g/m^3$)	Combined AD+AB Maximum Impact[1] ($\mu g/m3$)	AD+AB Exceeds SIL?
24-hr	2018		8.98	0.12	9.08	
	2019		8.96	0.13	9.03	
	2020		7.99	0.15	8.07	
	2021		7.31	0.20	7.41	
	2022		9.64	0.16	9.71	
	Max. of 5 Years	**1.2**	**9.64**	**0.20**	**9.71**	**Yes**
Annual	2018		1.14	0.02	1.15	
	2019		1.36	0.02	1.36	
	2020		1.20	0.02	1.21	
	2021		1.18	0.02	1.19	
	2022		1.29	0.02	1.29	
	Max. of 5 Years	**0.2**	**1.36**	**0.02**	**1.36**	**Yes**

[1] Inclusive of MERPs

As shown in **Table 3-4** the combined AD+AB impacts for the project do not cause impacts above the CO SIL for both the 1-hour and 8-hour averaging periods as was the case for the October 2023 as-designed modeling results. Because these impacts are less than the SILs, further NAAQS and PSD Increment consideration is not required.

Table 3-4. CO SIL Modeling Analysis Results

Averaging Period	Year for Met. Data	SIL ($\mu g/m^3$)	"As-Designed (AD)" Maximum 1st High SIL Impact ($\mu g/m^3$)	"As-Built (AB)" Maximum 1st High Impact ($\mu g/m^3$)	Combined AD+AB Maximum Impact ($\mu g/m3$)	AD+AB Exceeds SIL?
1-hr	2018		128.2	172.6	226.2	
	2019		125.8	171.5	238.5	
	2020		130.9	192.2	319.4	
	2021		136.7	189.2	325.9	
	2022		127.9	171.9	255.6	
	Max. of 5 Years	**2,000**	**136.7**	**192.2**	**325.9**	**No**
8-hr	2018		49.2	5.43	51.4	
	2019		45.8	6.60	48.5	
	2020		49.3	8.08	51.7	
	2021		46.2	6.80	48.4	
	2022		46.2	8.76	49.0	
	Max. of 5 Years	**500**	**49.3**	**8.76**	**52.0**	**No**

Results of the combined AD+AB SIL analysis presented in **Table 3-1** through **Table 3-4** indicate that annual NO_2 and 8-hour CO impacts are less than the applicable SMCs. EPA's 24-hour $PM_{2.5}$ SMC level was vacated on January 22, 2013 by the U.S. Court of Appeals for the District of Columbia Circuit resulting in a current de minimis concentration threshold of 0 $\mu g/m^3$.[7] The modeled AD+AB impacts of 24-hr PM_{10} and 24-hr $PM_{2.5}$ exceed its applicable SMC (10 $\mu g/m^3$ and 0 $\mu g/m^3$). Therefore, a pre-construction monitoring waiver is being requested from the Division consistent with the prior October 2023 modeling report.

3.2 NAAQS Analysis

In lieu of performing modeling using the techniques described in the as-designed modeling report, Novelis has conservatively added that the maximum 1st high (or 5-year average 1st high, where applicable) as-built SIL impacts to the maximum NAAQS as-designed impacts on a per receptor basis for each applicable NO_2, PM_{10}, and $PM_{2.5}$ averaging time to evaluate against each applicable NAAQS.

The modeling results presented in **Table 3-5** show that on both the 1-hour and annual average basis combined maximum air impacts due to NO_2 emissions from Novelis and regional sources with a background concentration added are less than the applicable NAAQS under the as-built configuration of the Novelis Guthrie facility. Concentration plots for the NAAQS modeling analysis for the 1-hr and annual NO_2 modeling are presented in **Appendix EAppendix E**. These figures show the general areas where maximum impacts occur and the gradient of concentrations across the modeling domain due to all sources.

Similarly, the modeling results presented in **Table 3-6** show that on a 24-hour average basis, combined maximum air impacts due to PM_{10} emissions from Novelis and regional sources with a background concentration added are less than the applicable NAAQS under the as-built configuration of the Novelis Guthrie facility. Concentration plots for the NAAQS modeling analysis for the 24-hr PM_{10} modeling are also presented in **Appendix EAppendix E** for reference.

Similarly, the modeling results presented in **Table 3-7** show that on both a 24-hour and annual average basis combined maximum air impacts due to $PM_{2.5}$ emissions from Novelis and regional sources with a background concentration added are less than the applicable NAAQS under the as-built configuration of the Novelis Guthrie facility. The as-built SIL impacts included in **Table 3-7** are conservatively based on the highest 1st high 24-hour and maximum annual impacts over the 5-year meteorological data period versus the 5-year averaging that was applied for the as-designed $PM_{2.5}$ NAAQS modeling results to match the form of the underlying standard. Concentration plots for the NAAQS modeling analysis for the 24-hr and annual $PM_{2.5}$ modeling are also presented in **Appendix EAppendix E** for reference.

[7] *Sierra Club v. EPA*, No. 10-1413 (D.C. Circuit), 2013 WL 216018.

Table 3-5. NO_2 NAAQS Analysis Results

Averaging Period	Year for Met. Data	NAAQS (µg/m^3)	"As-Designed" Maximum NAAQS Impact[3] (µg/m^3)	"As-Built" Maximum SIL Impact (µg/m^3)	Background Concentration[3] (µg/m^3)	Combined Maximum Impact (µg/m3)	Exceeds NAAQS?
1-hr[1]	Max. 5-yr Avg.	188	127.9	41.3	-	136.8	**No**
Annual[2]	Max. of 5 Years	100	7.46	0.63	9.4	16.90	**No**

[1] Evaluated the five-year average 8th highest daily maximum 1-hour output for comparison against the NAAQS.

[2] Evaluated maximum modeled annual arithmetic mean impact from among the five years modeled for comparison against the NAAQS.

[3] The 1-hour NO_2 NAAQS Analysis involved temporal pairing of monitored and modeled concentrations consistent with recent EPA guidance. Maximum impacts shown include the background concentration. The 1-hour background concentrations are based on ambient monitoring data from the Daviess County, Kentucky site (Site ID 21-059-0005) for the five year period from 2018 to 2022. The annual average background concentration is the maximum annual arithmetic mean concentration from the Daviess County monitor from 2020 to 2022.

Table 3-6. PM_{10} NAAQS Analysis Results

Averaging Period	Year for Met. Data	NAAQS (µg/m^3)	"As-Designed" Maximum NAAQS Impact (µg/m^3)	"As-Built" Maximum SIL Impact (µg/m^3)	Background Concentration[2] (µg/m^3)	Combined Maximum Impact (µg/m^3)	Exceeds NAAQS?
24-hr[1]	Max 5-yr H6H	150	22.4	0.20	51.9	74.3	**No**

[1] Evaluated the five-year maximum 6th highest 24-hour output for comparison against the NAAQS.

[2] The 24-hour background concentration is based on ambient monitoring data from the Davidson County, TN site (Site ID 47-037-0023) for the three year period from 2019, 2021, and 2022. The calculated background concentration is the fourth highest 24-hr PM10 concentration over the 3-year period.

Table 3-7. $PM_{2.5}$ NAAQS Analysis Results

Averaging Period	Year for Met. Data	NAAQS (µg/m^3)	"As-Designed" Maximum NAAQS Impact (µg/m3)	"As-Built" Maximum SIL Impact (µg/m3)	Background Concentration[3] (µg/m^3)	Combined Maximum Impact[4] (µg/m^3)	Exceeds NAAQS?
24-hr[1]	Max. 5-yr Avg.	35	6.87	0.20	22.0	28.9	**No**
Annual[2]	Avg. of 5 Years	12	2.37	0.02	8.3	10.7	**No**

[1] Evaluated the five-year average 8th highest maximum 24-hour output for comparison against the NAAQS.

[2] Evaluated average modeled annual arithmetic mean impact over the five years modeled for comparison against the NAAQS.

[3] The 24-hour and annual average background concentrations are based on ambient monitoring data from the Hopkinsville, Kentucky site (Site ID 21-047-0006) for the three year period from 2020 to 2022. The 24-hour average background concentration is the average 8th highest daily maximum concentration over the 2020 to 2022 period, consistent with the form of the 24-hour $PM_{2.5}$ NAAQS. The annual average background concentration is the average annual arithmetic mean concentration from 2020 to 2022. The 2020 to 2022 background concentrations for 24-hr and annual PM2.5 are obtained from the 2024 EPA Design Value Report for PM2.5 (https://www.epa.gov/air-trends/air-quality-design-values) dated 6/3/2025.

[4] Inclusive of secondary PM2.5 impact contributions (MERP values) for both as-designed and as-built impacts from Table 7-1.

3.3 PSD Increment Analysis

Similarly to the techniques used for the NAAQS results, Novelis has conservatively added that the maximum 1st high as-built SIL impacts to the maximum PSD Increment as-designed impacts on a per receptor basis for each applicable NO_2, PM_{10}, and $PM_{2.5}$ averaging time to evaluate against each applicable PSD Increment standard. The modeling results presented in **Table 3-8**, **Table 3-9**, and **Table 3-10** demonstrate that the proposed project will not cause or contribute to an exceedance of the PSD Increment standards for NO_2, PM_{10}, and $PM_{2.5}$, respectively, under the as-built configuration of the Novelis Guthrie facility.

Table 3-8. NO_2 PSD Increment Analysis Results

Averaging Period	Year for Met. Data	Class II PSD Increment (µg/m³)	"As-Designed" Maximum PSD INC Impact (µg/m³)	"As-Built" Maximum SIL Impact (µg/m³)	Combined Maximum Impact (µg/m3)	Exceeds Increment ?
Annual[1]	Max. of 5 Years	25	7.39	0.63	7.43	**No**

[1] Evaluated highest impacts for each year modeled since annual NO_2 PSD Increment is not to be exceeded.

Table 3-9. PM_{10} PSD Increment Analysis Results

Averaging Period	Year for Met. Data	Class II PSD Increment (µg/m³)	"As-Designed" Maximum PSD INC Impact (µg/m³)	"As-Built" Maximum SIL Impact (µg/m³)	Combined Maximum Impact (µg/m3)	Exceeds Increment ?
24-Hour[1]	Max of 5 Years	30	24.68	0.20	24.70	**No**
Annual[2]	Max of 5 Years	17	3.09	0.02	3.09	**No**

[1] Evaluated the 2nd highest 24-hour average modeled impact over the five years modeled for comparison against the PSD Increment.

[2] Evaluated highest modeled annual arithmetic mean impact over the five years modeled for comparison against the PSD Increment.

Table 3-10. $PM_{2.5}$ PSD Increment Analysis Results

Averaging Period	Year for Met. Data	Class II PSD Increment (µg/m³)	"As-Designed" Maximum PSD INC Impact[3] (µg/m³)	"As-Built" Maximum SIL Impact (µg/m³)	Combined Maximum Impact[3] (µg/m3)	Exceeds Increment?
24-Hour[1]	Max of 5 Years	9	8.55	0.20	8.64	**No**
Annual[2]	Max of 5 Years	4	1.71	0.02	1.71	**No**

[1] Evaluated the 2nd highest 24-hour average modeled impact over the five years modeled for comparison against the PSD Increment.

[2] Evaluated highest modeled annual arithmetic mean impact over the five years modeled for comparison against the PSD Increment.

[3] Inclusive of secondary PM2.5 impact contributions (MERP) from Novelis Guthrie for both as-designed and as-built impacts from Table 7-1.

4. CLASS I AREA DISPERSION MODELING ANALYSIS

As shown in **Table 4-1**, there are four (4) Class I areas within 300 km of the Novelis facility and two additional Class I areas just beyond the 300 km screening distance. The closest Class I area to Novelis is Mammoth Cave National Park located about 101 km from the center of Novelis' property to the nearest boundary of the park in the northeast downwind direction. Class I areas are federally protected areas for which more stringent air quality standards apply to protect unique natural, cultural, recreational, and/or historic values. The Federal Land Managers (FLM) of these Class I areas have the authority to protect AQRV and to consider, in consultation with the permitting authority, whether a proposed major emitting facility will have an adverse impact on such values. AQRVs for which PSD modeling is typically conducted include visibility and surface deposition of sulfur and nitrogen.

Table 4-1. Distances to Class I Areas within about 300 km of the Novelis Facility

Class I Area	Distance from Novelis Guthrie (km)
Mammoth Cave (KY)	**101**
Sipsey (AL)	**253**
Mingo (MO)	**267**
Cohutta (GA)	**295**
Great Smoky Mountains (NC/TN)	310
Joyce Kilmer/Slickrock (NC)	313

Based on project emission increases for pollutants that would be considered in the AQRV analysis, the ratio (Q/D) of the project emissions changes (total emissions of SO_2, NO_X, and PM_{10} are 308.7 tpy) to the distance of the nearest Class I area, MCNP (101 km), is 3.09. Consistent with the October 2023 modeling report, the reconciled project contributions to the emissions increases in an as-built configuration of the Novelis Guthrie casting project are based on the maximum hourly potential emission rates (considering operating limitations) extrapolated to an annual basis assuming continuous operation, and thus, are consistent with FLM guidance for establishing the Q/d ratio based on the maximum daily emission rate extrapolated to an annual basis rather than the annual potential emission rates which may consider inherent constraints on annual production of fuel usage. The FLM's AQRV Work Group (FLAG) guidance states that a Q/D value of ten (10) or less indicates that AQRV analyses will generally not be required.[8] Therefore, it is unlikely the proposed project would lead to adverse impacts at MCNP or any of the other Class I areas listed in **Table 4-1**. Based on the minimal difference in the Q/d ratio for the final as-built configuration to the prior as-designed configuration, Novelis continues to presume that the FLMs for all Class I areas within 300 km of the Guthrie facility will not require a full AQRV analysis for this project. To confirm this, Novelis will provide the final Q/D analysis and contact the FLMs in consultation with the Division to seek formal concurrence that a Class I area AQRV analysis is not warranted.

[8] National Park Service, U.S. Department of the Interior, Federal Land Mangers' Air Quality Related Values Work Group (FLAG), Phase I Report-Revised (2010), National Resource Report NPS/NRPC/NRR_2010/232, October 2010.

In addition to the AQRV analysis, Novelis is required to assess PSD Increment consumption at the affected Class I areas. Novelis has performed this evaluation using a screening methodology that is commonly applied and that is consistent with the methodology applied in the October 2023 as-designed modeling report. This methodology relies on the same Significance Analysis model input parameters applied for the Class II area assessments. Modeling in AERMOD is performed by placing an arc of receptors at a distance of 50 km in the direction each Class I area within 300 km, to demonstrate that impacts are below the Class I SILs. This Class I increment screening procedure was originally proposed by EPA Region 4 and has been used in several recent PSD applications to fulfill the Class I increment modeling requirements. The Class I SILs for the pollutants that exceed their respective SERs and for which there is a SIL are presented in **Table 4-2**.

Similar to the Class II SIL results, Novelis has calculated the combined 1st high impact of the Novelis Guthrie casting expansion project by conservatively adding the maximum as-designed 1st high impact to the maximum as-built 1st high impact irrespective of impact location and meteorological data period (i.e., time and space independent impact calculation) to demonstrate compliance with the Class I SIL. Class I as-designed, as-built, and combined SIL results, shown in **Table 4-2** below, demonstrate that the impacts from each pollutant are well below the SIL thresholds.

Table 4-2. Class I PSD SILs

Pollutant	Averaging Period	SIL ($\mu g/m^3$)	"As-Designed" Maximum 1st High Impact (µg/m3)	"As-Built" Maximum 1st High Impact ($\mu g/m^3$)	Combined Maximum 1st High Impact ($\mu g/m^3$)	Exceeds CI SIL?
NO_2	1-Hour	--	N/A	N/A	N/A	N/A
	Annual	0.10	0.014	0.0005	0.015	**No**
PM_{10}	24-Hour	0.30	0.194	0.0003	0.194	**No**
	Annual	0.20	0.009	0.0000	0.009	**No**
$PM_{2.5}$	24-Hour	0.27	0.132	0.0003	0.132	**No**
	Annual	0.05	0.007	0.00001	0.007	**No**

5. ADDITIONAL IMPACTS ANALYSIS

Pursuant to 401 KAR 51:017 Section 13, three additional impacts analyses are performed as part of the PSD permitting action. These are: 1) a growth analysis, 2) a soil and vegetation analysis, and 3) a visibility analysis. The changes from the as-designed facility configuration to the as-built configuration will not result in changes to the growth analysis or the visibility analysis. As such, refer to the October 2023 as-designed modeling report for the additional impacts analysis pertaining to economic growth and visibility.

5.1 Soils and Vegetation Analysis

In accordance with U.S. EPA guidance and consistent with the October 2023 as-designed modeling report, secondary NAAQS impacts were considered for the Novelis casting expansion project. The comparisons for the as-built facility configuration are shown in **Table 5-1**. The table shows that no combined impacts exceed the secondary NAAQS or the EPA screening levels. Thus, there are no adverse impacts expected on soils or vegetation as a result of the casting expansion project.

Table 5-1. Soil and Vegetation Impacts for Proposed Project

Pollutant	Averaging Period	"As-Designed" Maximum Impact[1] ($\mu g/m^3$)	Note	"As-Built" Maximum Impact[1] ($\mu g/m^3$)	Note	Combined Maximum Impact ($\mu g/m^3$)	Screening Concentrations for Exposure to Ambient Air Concentrations[2] Sensitive ($\mu g/m^3$)	Intermediate ($\mu g/m^3$)	Resistant ($\mu g/m^3$)	Secondary NAAQS ($\mu g/m^3$)	Selected Soils and Vegetation Screening Threshold ($\mu g/m^3$)	Threshold Exceeded?
NO_2	4-Hour	149.7	A	41.6	A	191.3	3,760	6,400	16,920	N/A	3,760	No
	8-Hour	149.7	A	41.6	A	191.3	3,760	7,520	15,040	N/A	3,760	No
	1-Month	149.7	A	41.6	A	191.3	-	564	-	N/A	564	No
	Annual	16.9	A	0.63	Ab	17.5	-	94	-	100	94	No
CO	1-wk	49.3	B	8.76	B	58.0	1,800,000	-	18,000,000	N/A	1,800,000	No
PM_{10}	24-hour	74.3	C	0.20	C	74.5	-	-	-	150	150	No
$PM_{2.5}$	24-hour	28.9	D	0.20	D	29.1	-	-	-	35	35	No
	Annual	10.7	E	0.02	E	10.7	-	-	-	15	15	No

[1] Results from the NAAQS Analysis where modeled impacts exceeded the SIL, and results from Significance Analysis if the SIL was not exceeded. Additional notes explaining the basis of the modeled impacts are listed below.

A = Maximum single year 1-hr NO_2 impact used to approximate the 4-hour and 8-hour concentrations, and maximum annual NO_2 impact used to approximate the monthly NO_2 concentration and used directly for the annual NO_2 concentration. NO_2 impacts for the 4-hr, 8-hr, and monthly averaging periods were not generated in the Significance or NAAQS analyses, so the 1-hr results are used as a conservative estimate for the 4-hr, 8-hr, and 1-month impacts.

Ab = Maximum "As-Built" NO2 annual SIL impact conservatavely used to approximate the annual NO2 concentration.

B = Maximum 8-hr average CO impact from the Significance Analysis. No 1-week averaging period is available in AERMOD, so the 8-hr results were used as a conservative estimate for the weekly impacts for both the as-built and as-designed scenarios. Given the Significance Analysis impacts were negligible in comparison to the corresponding screening threshold, it can be reasonably concluded that Novelis will not cause or contribute to any deleterious soils or vegetation impacts due to air quality.

C = "As-Designed" impacts include the maximum 24-hr average PM_{10} impact from the as-designed NAAQS Analysis and "As-Built" impacts include the maximum 24-hr PM10 impact from the as-built SIL Analysis.

D = "As-Designed" impacts include three-year average 24-hr 8th-highest PM2.5 impact plus the three-year average 98th percentile background concentration from the Hopkinsville, Kentucky site (Site ID 21-047-0006) for the three year period from 2020 to 2022 (based on 6/3/25 design value report). "As-Built" impacts include the maximum 24-hr PM2.5 impact from the "As-Built" SIL Analysis.

E = "As-designed" impacts include the maximum five-year average annual $PM_{2.5}$ impacts from the NAAQS Analysis and "As-Built" impacts include the maximum annual PM2.5 impact from the "As-Built" SIL Analysis.

[2] Screening concentrations based on Table 3.1 in *A Screening Procedure for Impact of Air Pollution Sources on Plants, Soil and Animals*, EPA, December 12, 1980. Minimum values noted if range listed.

6. OZONE AMBIENT IMPACT ANALYSIS

In accordance with U.S. EPA guidance and consistent with the October 2023 as-designed modeling report, secondary ozone formation was considered for the Novelis casting expansion project.[9] The as-built configuration introduces only minor changes in NO_X and VOC emissions in comparison to the as-designed configuration. As summarized in **Table 6-1** below, the calculated ozone impacts associated with the as-designed to as-built configuration changes represent less than 1% of the 8-hour ozone SIL. As such, the as-built changes do not significantly contribute to ambient ozone impacts in the area surrounding the Guthrie facility. Accordingly, the October 2023 as-designed ozone ambient impact analysis continues to demonstrate compliance with the 8-hour ozone NAAQS and no revised ozone ambient impact analysis is provided in this as-built modeling report supplement.

Table 6-1. As-Built Ozone Secondary Formation Calculations

Project Phase	Averaging Period	Precursor	Modeled ER from Hypo. Source[a] (tpy)	Modeled Impact from Hypo. Source[a] (ppb)	Net Emissions Increase[b] (tpy)	Ozone Project Impact (ppb)	SIL (ppb)
As-Designed	8-hour	NO_X	500	2.908	199.8	1.16	
		VOC	500	0.060	91.7	0.01	
						1.17	**1.0**
As-Built	8-hour	NO_X	500	2.908	1.071	0.01	
		VOC	500	0.060	0.068	8E-06	
						0.006	**1.0**

[a] Hypothetical source is lower release height source located in Barren County, Kentucky from the spreadsheet referenced in the Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program, April 30, 2019. Hypothetical source emission rate represents the closest value available in the MERPs guidance to the post-project source-wide PTE for NO_X and VOC for the expansion project.

[b] The net emissions increase for the "As-Designed" phase of the project represents the total project net emissions increase as represented in the October 2023 "As-Designed" PSD Permit Application. The net emissions increase for the "As-Built" phase of the project represents only the emissions increase in comparison to the "As-Designed" net emissions increase.

[9] U.S. EPA, *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program*, EPA-454/R-19-003 (April 30, 2019). Office of Air Quality Planning and Standards, Research Triangle Park, NC.

7. SECONDARY $PM_{2.5}$ IMPACT ASSESSMENT

In accordance with U.S. EPA guidance and consistent with the October 2023 as-designed modeling report, secondary $PM_{2.5}$ formation was evaluated for the Novelis casting expansion project. The as-built configuration introduces only minor changes in NO_X and SO_2 emissions compared to the as-designed configuration. As shown in **Table 7-1**, the resulting change in calculated $PM_{2.5}$ impacts represents less than 1% of the $PM_{2.5}$ 24-hour and Annual SILs. Therefore, the as-built modifications do not result in a significant contribution to ambient $PM_{2.5}$ concentrations in the vicinity of the Guthrie facility. The small change in secondary $PM_{2.5}$ impacts attributable to the as-built NO_X and SO_2 emissions increase are captured in the $PM_{2.5}$ NAAQS and PSD Increment results tables presented in **Sections 3.2 and 3.3**.

Table 7-1. As-Built $PM_{2.5}$ Secondary Formation Calculations

Project Phase	Averaging Period	Precursor	Modeled ER from Hypo. Source[a] (tpy)	Modeled Impact from Hypo. Source[a] ($\mu g/m^3$)	Net Emissions Increase[b] (tpy)	$PM_{2.5}$ Project Impact ($\mu g/m^3$)	SIL (mg/m^3)
As-Designed	24-hour	NO_X	500	0.107	199.8	0.04276	
	24-hour	SO_2	500	0.129	0.8	0.00020	
						0.04295	**1.2**
	Annual	NO_X	500	0.007	199.8	2.87E-03	
	Annual	SO_2	500	0.004	0.8	6.00E-06	
						0.00288	**0.2**
As-Built	24-hour	NO_X	500	0.107	1.071	2.29E-04	
	24-hour	SO_2	500	0.129	0.003	8.57E-07	
						0.00023	**1.2**
	Annual	NO_X	500	0.007	1.071	1.54E-05	
	Annual	SO_2	500	0.004	0.003	2.61E-08	
						0.00002	**0.2**

[a] Hypothetical source is lower release height source located in Barren County, Kentucky from the spreadsheet referenced in the Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program, April 30, 2019. Hypothetical source emission rate represents the closest value available in the MERPs guidance to the post-project source-wide PTE for NO_X and SO_2 for the expansion project.

[b] The net emissions increase for the "As-Designed" phase of the project represents the total project net emissions increase as represented in the October 2023 "As-Designed" PSD Permit Application. The net emissions increase for the "As-Built" phase of the project represents only the emissions increase in comparison to the "As-Designed" net emissions increase.

8. AIR TOXICS RISK ASSESSMENT

8.1 Air Toxics Requirements

An air toxics human health risk assessment for the Novelis Guthrie facility was conducted using EPA's Regional Screening Levels (RSLs) to evaluate chronic exposure risk from Toxic Air Pollutants (TAPs). The methodology, as documented in the October 2023 as-designed modeling report, involved estimating 5-year annual average concentrations of TAPs using the AERMOD dispersion model and comparing those concentrations to carcinogenic and noncarcinogenic screening levels from EPA's RSL list for residential air. Risk characterization was based on two key metrics: the carcinogenic risk ratio and the noncarcinogenic hazard quotient. Both metrics were calculated by dividing modeled concentrations by their respective screening levels. A value below 1.0 for either metric indicated that adverse health effects were unlikely, even over a lifetime of exposure.

The October 2023 modeling incorporated emissions from both point and area sources, including existing operations and new equipment associated with the casting expansion project. Based on KDAQ policy, sources regulated under a 40 CFR Part 61 or 63 National Emissions Standard for Hazardous Air Pollutants (NESHAP) are not regulated under 401 KAR 63:020 and as such were excluded from the analysis. To streamline the analysis, a unit emission rate approach was used, whereby each source was modeled at 1 gram per second. Unit modeled concentrations were then scaled by potential emission rates to determine pollutant-specific impacts.

With the exception of the "unit emission rate" approach, the modeling procedures and data resources used in the air toxics modeling analysis for model selection, rural/urban dispersion coefficient, building downwash, terrain, meteorology, coordinate systems, and receptors grids are effectively identical to those described for the Class II modeling for criteria pollutants in **Section 2**.

The "as-built" changes were incorporated into the air toxics risk assessment. Those changes pertaining to the source inventory are shown in light green highlighting and dark red font in **Appendix B**. Due to the "unit emission rate" approach, it was unnecessary to remodel most of the air toxics emissions sources. The exception being the Ingot Saw and DBF Preheater, which needed to be remodeled in consideration of refined downwash parameters and updated stack configurations. Apart from these changes, the only other necessary adjustments to the risk assessment were updating emission rates for some of the building fugitive area sources and use of the latest November 2024 EPA RSLs. Importantly, the modeling framework and assumptions remained consistent with the as-designed modeling report.

As detailed in **Appendix B** and summarized in **Table 8-1**, the "as-built" modeling results demonstrated that predicted TAP concentrations varied only slightly from the original analysis. These differences were attributable to minor adjustments in source characteristics and did not materially affect the overall risk outcomes. Total carcinogenic and noncarcinogenic risks remained well below the EPA RSLs, reaffirming the conclusion that the facility does not pose a significant health risk to off-site populations.

Table 8-1. Maximum Modeled Off-Site Risk Summary

Risk Type	Cumulative Modeled Risk Over All TAPs (per million for Cancer)	EPA Acceptable Risk Threshold[1,2] (per million for Cancer)	Modeled Risk Below Threshold?
Combined Carcinogenic Risk	0.26	100.0	Yes
Combined Noncarcinogenic Risk	0.065	1.0	Yes

Notes:

1 Unlike other pollutants that EPA regulates, air toxics have no universally-applicable, pre-defined risk levels that clearly represent acceptable or unacceptable thresholds. However, EPA has made case-specific determinations and described certain general presumptions. The 1989 Benzene NESHAP rule set up a two-step, risk-based decision framework for the NESHAP program. This rule and framework are described in more detail in EPA's 1999 Residual Risk Report to Congress. The rule sets an upper limit of risk acceptability of about 1-in-10,000 (or 100-in-1 million) lifetime cancer risk for the most exposed individual.
[https://www.epa.gov/national-air-toxics-assessment/nata-frequent-questions (Risk Background Questions: Question 2)]

2 Unlike cancer risk, there currently is no framework for determining the acceptability of noncancer risks. Aggregate exposures equal to or below a hazard index (HI) of 1.0 derived using target organ specific hazard quotients likely will not result in adverse noncancer health effects over a lifetime of exposure and would ordinarily be considered acceptable. However, an HI greater than 1.0 does not necessarily suggest a likelihood of adverse effects nor does it imply an unacceptable level of effect.
[https://www.epa.gov/national-air-toxics-assessment/nata-frequent-questions (Risk Background Questions:Question 2)]

APPENDIX A. SITE LAYOUT DRAWING

SCHEDULE OF CONTROL POINTS - NAD83 KY SOUTH ZONE				
POINT NO.	ELEVATION	NORTHING	EASTING	DESCRIPTION
201	571.903	1765395.091	1220964.294	CP-BRAVO
202	571.914	1766081.938	1221436.086	CP-CHARLIE
203	571.571	1765838.854	1221032.488	CP-ALPHA
503	553.490	1762223.743	1222965.913	DBS 3
504	568.870	1761856.714	1222523.394	DBS 4
509	568.122	1764370.572	1222759.370	FIXED POLE
1002	565.275	1763817.755	1220488.275	MONUMENT 02
1004	545.107	1763160.109	1223563.258	MONUMENT 04
1005	569.409	1766815.874	1220704.646	MONUMENT 05
1006	566.974	1765349.777	1222107.756	MONUMENT 06
1007	561.092	1764668.507	1221498.804	MONUMENT 07
1008	568.945	1765263.111	1219863.533	MONUMENT 08

NOTES

1. ALL MATERIALS FOR CONSTRUCTION ARE TO BE IN ACCORDANCE WITH CURRENT KENTUCKY TRANSPORTATION CABINET (KYTC) REQUIREMENTS.
2. ALL EROSION AND SEDIMENTATION CONTROL BEST MANAGEMENT PRACTICES SHALL BE IN ACCORDANCE WITH E&S - KENTUCKY EROSION PREVENTION & SEDIMENT CONTROL (KEPSC).
3. ALL POST CONSTRUCTION STORMWATER BEST MANAGEMENT PRACTICES SHALL BE IN ACCORDANCE WITH KENTUCKY DEPARTMENT OF ENVIRONMENTAL PROTECTION.
4. ALL RAIL/TRACK SYSTEMS SHALL BE CONSIDERED CONCEPT LEVEL AND FOR INFORMATIONAL PURPOSES ONLY. REFER TO AMERICAN TRACK DRAWINGS FOR TRACK ALIGNMENTS AND DETAILS.
5. REFER TO THERMALTECH DRAWINGS FOR INFORMATION REGARDING NEW SITE UTILITIES.
6. REFER TO SHEETS CV-0122 TO CV-0129 FOR MORE INFORMATION REGARDING STORM SEWER AND EROSION CONTROL MEASURES.
7. REFER TO THERMALTECH DRAWINGS FOR CONTINUATION OF SANITARY SEWER LINE PAST LIFT STATION.

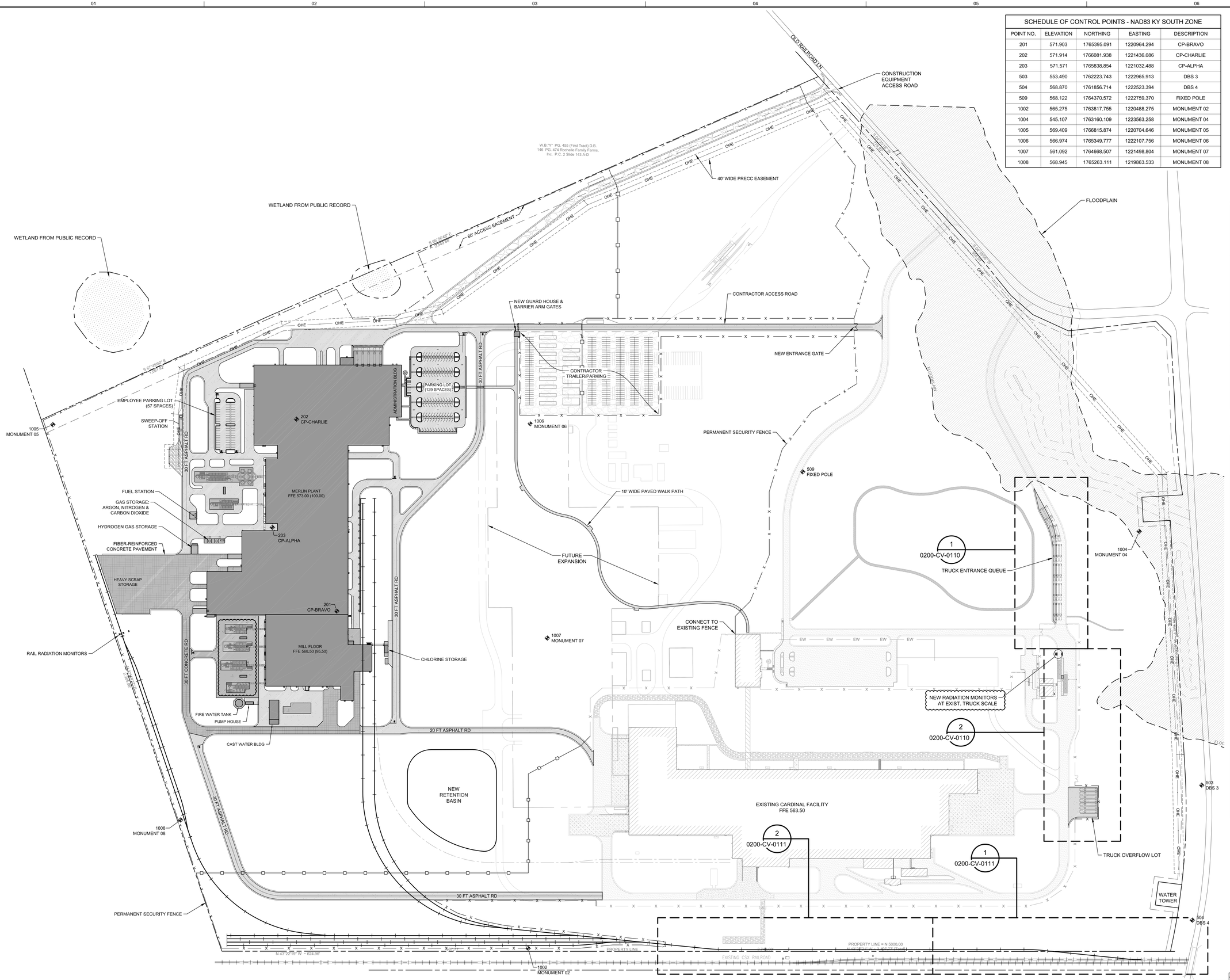
ABBREVIATIONS

AC	ACRE
ARCH	ARCHITECTURAL
A.S.T.M.	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BLDG	BUILDING
BM	BENCHMARK
BMP	BEST MANAGEMENT PRACTICE
CB	CATCH BASIN
CL	CENTERLINE
CONC	CONCRETE
CMP	CORRUGATED METAL PIPE
CP	CONTROL POINT
CULV	CULVERT
D.B.	DEED BOOK
DGA	DENSE GRADED AGGREGATE
DIA	DIAMETER
DOT	DEPARTMENT OF TRANSPORTATION
DS	DOWNSPOUT
DWG	DRAWING
ELEV	ELEVATION
EPSC	EROSION PREVENTION & SEDIMENT CONTROL
ESMT	EASEMENT
EXST	EXISTING
FH	FIRE HYDRANT
FFE	FINISHED FLOOR ELEVATION
HC	HANDICAP
HDPE	HIGH DENSITY POLYETHYLENE
HW	HEADWALL
I.D.	INSIDE DIAMETER
INV	INVERT
LF	LINEAR FOOT
LP	LIGHT POLE
ME	MATCH EXISTING
MH	MANHOLE
PIV	POST INDICATOR VALVE
PVC	POLYVINYL CHLORIDE
ROW	RIGHT OF WAY
RCP	REINFORCED CONCRETE PIPE
ST	STORM
TYP	TYPICAL
WM	WATER METER

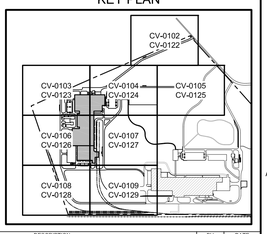
CIVIL LEGEND

NOTE: ALL SYMBOLS MAY NOT APPEAR ON THESE DRAWINGS

	EXISTING	PROPOSED
CONTROL POINT/ BENCHMARK	✥	
SPOT ELEVATION	100	(100)
POWER POLE	∅	OHE ∅ OHE
GUY WIRE	⟵	⟵
LIGHT POLE	⊠	⊠
FIRE HYDRANT		
WATER VALVE	⋈	⋈
WATER METER	Ⓦ	Ⓦ
STORM MANHOLE	SD SD	Ⓢ
SANITARY MANHOLE	SS SS	Ⓢ
CATCH BASIN		
HEADWALL		
HANDICAP PARKING		
TREE		
FENCE	X X	X X
OBJECT REMOVAL		
SURFACE REMOVAL		
LIGHT DUTY ASPHALT		
HEAVY DUTY ASPHALT		
CONCRETE		
CONTOUR	100	100
STORM SEWER	SD	
SANITARY SEWER	SS	SAN
GAS	EGAS	GAS
WATER	EW	W
UNDERGROUND ELEC.	EUGE	UGE
OVERHEAD ELEC.	EOHE	OHE
FIRE PROTECTION	EFP	FP
FLOW PATH/DITCH CL		



KEY PLAN



1 0200-CV-0101
OVERALL SITE PLAN
SCALE: 1" = 150'

GRAPHIC SCALE: 1"=150' (0, 75, 150, 300)

PLANT NORTH (STATE PLANE NORTH 46° 36')

Know what's Call before you dig. 811

REV	DESCRIPTION	BY	DATE
10	HOT END BAGHOUSE FOUNDATIONS	PM	04.21.23

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES [MM]

DRAWN BY: PM 04.21.23
APPROVED BY: PG -

TOLERANCES:

ANGLE: ±0°-30'	FRACTIONS: ± 1/32
DECIMAL: .XX ± .01 .XXX ± .005 .XXXX ± .0002	METRIC: .X ± .2 .XX ± .13 .XXX ± .005

MATERIAL: –
FINISH: –

DENHAM BLYTHE design/build
Lexington KY 859.255.7405
Louisville KY 270.791.1105
Nashville TN 615.855.2244
Greenville SC 864.485.6992

THERMALTECH ENGINEERING
FACILITY AND UTILITY SYSTEMS ANALYSIS/DESIGN/CONSTRUCTION
513-561-2271 • WWW.THERMALTECH.COM

Novelis Corporation
GUTHRIE PLANT, KY

PROJECT: MERLIN

DESCRIPTION: OVERALL SITE PLAN

DWG NO. DBC-1280RCL-0200-CV-0101 REV 10

SIZE E1 SCALE 1"=150'

APPENDIX B. EMISSION SOURCE INVENTORY

B-1. Modeled Source ID Index

Table B-1.1. Complete List of Modeled Novelis Guthrie Site Sources

Model ID	Title V Emission Unit ID#	Emission Unit Description	Emission Point Description	Include in Significance Analysis?	Include in NAAQS Analysis?	Include in Air Toxics Analysis?
001_1	EU001	HTL - Pre-Cleaner	Scrubber Stack	N	Y	N
002_1	EU002	Heat Treat Furnace	Heat Treat Furnace Stack	N	Y	Y
003_1	EU003	Reheater Furnace	Reheater Furnace Stack	N	Y	Y
004_1	EU004A EU004B EU004C	PTL - Alkaline Etch and Rinse PTL - Acid Etch and Rinse PTL - Pretreatment and Rinse	Scrubber Stack	N	Y	Y
005_1	EU005	Batch Annealing Furnace 1	Annealing Furnace Stack	N	Y	N
006_1	EU006	Batch Annealing Furnace 2	Annealing Furnace Stack	N	Y	N
007_1	EU007	Boiler #1	Boiler Stack	N	Y	N
008_1	EU008	Boiler #2	Boiler Stack	N	Y	N
009_1	EU009	Boiler #3	Boiler Stack	N	Y	N
010_1	EU010	Lime Storage Silo	Bin Vent Filter (Passive Sock)	N	Y	N
012_1	EU012	Emergency Fire Pump #1	Fire Pump Stack	N	Y	N
022_1	EU022	Emergency Fire Pump #2	Fire Pump Stack	N	Y	N
011_1	EU011	Emergency Generator #1 - (Security	Emergency Engine Stack	N	Y	N
021_1	EU021	Emergency Generator #2 - (Administrative	Emergency Engine Stack	N	Y	N
023_1A	EU023	Cooling Tower	Cooling Tower Cells 1 and 2 Stacks	N	Y	N
023_1B	EU023	Cooling Tower	Cooling Tower Cells 1 and 2 Stacks	N	Y	N
EXISMAIN	Multiple	Existing Main Building	Building Fugitives	N	Y	Y
EXISSOU	Multiple	Existing Southwest Building	Building Fugitives	N	Y	Y
R01V001-017	EU020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R02V001-008	EU020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R03V001-007	EU020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R04V001-009	EU020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R05V001-003	EU020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R06V001-007	EU020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R07V001-026	EU020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R08V001-004	EU020	Paved Haul Roads	Haul Road Fugitives	N	Y	N
R09V001-009	020	Paved Haul Roads	Haul Road Fugitives	N	Y	N
SPS1	026	Scrap Processing Line #1	Cold Baghouse #1 Stack	Y	Y	N
DCTR	029	Decoater	Hot Baghouse #1 Stack	Y	Y	N
SW1	030	Sidewell Melting Furnace #1	Hot Baghouse #2 Stack	Y	Y	N
SW2	031	Sidewell Melting Furnace #2	Hot Baghouse #2 Stack	Y	Y	N
NDC	032	Novelis Dual Chamber (NDC) Recycle	Hot Baghouse #3 Stack	Y	Y	N
FLF	033	Front-Load Tilting Melting Furnace	Hot Baghouse #3 Stack	Y	Y	N
HF1	034	Holding Furnace #1	Hot Baghouse #4 Stack	Y	Y	N
ILD	036	In-Line Degasser	Hot Baghouse #4 Stack	Y	Y	N
DRSH	038	Dross House	Dross House Baghouse Stack	Y	Y	N
SWDRY	037	Sow Dryer	Sow Dryer Stack	Y	Y	Y
ISAW_AD	045	**Ingot Saw (As-Designed)**	**Ingot Saw(As-Designed)**	Y	Y	Y
ISAW_AB	**045**	**Ingot Saw (As-Built)**	**Ingot Saw (As-Built)**	**Y**	**Y**	**Y**
DBFPH_AD	046b	**Casting Process Emission Sources - DBF Preheater (As-Designed)**	**Casting Process Emission Sources - DBF Preheater(As-Designed)**	Y	Y	Y
DBFPH_AB	**046b**	**Casting Process Emission Sources - DBF Preheater (As-Built)**	**Casting Process Emission Sources - DBF Preheater (As-Built)**	**Y**	**Y**	**Y**
LMES1	042	Hot Baghouses Lime Silos (3)	Hot Baghouses Lime Silo Integral Filter Vents #1-#3	Y	Y	N
LMES2	042	Hot Baghouses Lime Silos (3)	Hot Baghouses Lime Silo Integral Filter Vents #1-#3	Y	Y	N
LMES3	042	Hot Baghouses Lime Silos (3)	Hot Baghouses Lime Silo Integral Filter Vents #1-#3	Y	Y	N
CT1	043	Cooling Tower #1	Cooling Tower #1 Cells 1-4 Stacks	Y	Y	N
CT2	043	Cooling Tower #1	Cooling Tower #1 Cells 1-4 Stacks	Y	Y	N
CT3	043	Cooling Tower #1	Cooling Tower #1 Cells 1-4 Stacks	Y	Y	N
CT4	043	Cooling Tower #1	Cooling Tower #1 Cells 1-4 Stacks	Y	Y	N
CPSEGEN	**047**	**Cast Pit Sump Emergency Generator**	**Cast Pit Sump Emergency Generator**	**Y**	**Y**	**N**
FPENG3	**049**	**Emergency Fire Pump #3**	**Emergency Fire Pump #3**	**Y**	**Y**	**N**
FPENG4	**050**	**Emergency Fire Pump #4**	**Emergency Fire Pump #4**	**Y**	**Y**	**N**
HTENDF	na	Hot End Building	Building Fugitives	Y	Y	Y
CDENDF	na	Cold End Building	Building Fugitives	Y	Y	Y
DROSSF	na	Dross House Building	Building Fugitives	Y	Y	Y

B-1. Modeled Source ID Index

Table B-1.1. Complete List of Modeled Novelis Guthrie Site Sources

Model ID	Title V Emission Unit ID#	Emission Unit Description	Emission Point Description	Include in Significance Analysis?	Include in NAAQS Analysis?	Include in Air Toxics Analysis?
ADMNF	na	Administration Building	Building Fugitives	Y	Y	Y
HVSCPF	na	Heavy Scrap Storage Building	Building Fugitives	Y	Y	Y
COOLF	na	Cooling Water Building	Building Fugitives	Y	Y	Y
MOLDF	na	Mold Room Buildings	Building Fugitives	Y	Y	Y
HTERF	na	Hot End Electrical Room	Building Fugitives	Y	Y	Y
HEMAINTF	na	Hot End Maintenance Building	Building Fugitives	Y	Y	Y
CASTRF	na	Caster Area	Building Fugitives	Y	Y	Y
CEELECF	na	Cold End Electrical Room	Building Fugitives	Y	Y	Y
CEMAINTF	na	Cold End Maintenance Building	Building Fugitives	Y	Y	Y
CLARSTOF	na	Chlorine & Argon Storage	Building Fugitives	Y	Y	Y
INGSAWF	na	Ingot Saw Building	Building Fugitives	Y	Y	Y
RECOFFF	na	Receiving Office	Building Fugitives	Y	Y	Y
SHIPOFFF	na	Shipping Office	Building Fugitives	Y	Y	Y
CASTRF_D	**048**	**Caster Area Fugitives for Decoater Backup Generator**	**Building Fugitives**	**Y**	**Y**	**N**
HTENDF_D	**048**	**Hot End Fugitives for Decoater Backup Generator**	**Building Fugitives**	**Y**	**Y**	**N**
CASTRF_U	**IA-15**	**Caster Area Fugitives for Molten Metal Utility Heaters**	**Building Fugitives**	**Y**	**Y**	**Y**
HTENDF_U	**IA-15**	**Hot End Fugitives for Molten Metal Utility Heaters**	**Building Fugitives**	**Y**	**Y**	**Y**
R11V001-008	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R12V001-006	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R13V001-002	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R14V001-002	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R15V001-003	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R16V001-004	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R17V001-004	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R18V001-003	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R19V001-008	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R20V001	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R21V001-004	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R22V001-002	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R23V001-002	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R24V001-014	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R25V001-002	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R26V001-011	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R27V001-006	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R28V001-003	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R29V001-004	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N
R30V001-010	020	Paved Haul Roads	Haul Road Fugitives	Y	Y	N

B-2. Modeled Source Parameters - AERMOD Modeling

Table B-2.1. List of Point Source Stack Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
001_1	HTL - Alkaline Pre-Cleaner	484,113	4,057,544	563.5	V	95.4	122.0	4,806	25.5	2.00
002_1	Heat Treat Furnace	484,138	4,057,461	563.5	V	103.0	482.0	31,783	36.5	4.30
003_1	Reheater Furnace	484,225	4,057,370	563.5	V	103.0	482.0	4,120	2.8	5.60
004_1	PTL - Etching & Pre-Treatment	484,108	4,057,415	563.5	V	93.3	122.0	27,303	36.2	4.00
005_1	Batch Annealing Furnace 1	484,019	4,057,586	563.5	V	100.5	464.0	13,500	31.8	3.00
006_1	Batch Annealing Furnace 2	484,024	4,057,581	563.5	V	100.5	464.0	13,500	31.8	3.00
007_1	Boiler No. 1	484,187	4,057,316	563.5	V	72.2	400.0	8,581	45.5	2.00
008_1	Boiler No. 2	484,190	4,057,319	563.5	V	85.0	400.0	8,581	45.5	2.00
009_1	Boiler No. 3	484,193	4,057,322	563.5	V	85.0	400.0	8,581	45.5	2.00
012_1	Fire Pump Engine No. 1	484,264	4,057,167	563.5	H	8.9	885.0	1,198	144.1	0.42
022_1	Fire Pump Engine No. 2	484,266	4,057,170	563.5	H	8.9	885.0	1,198	144.1	0.42
011_1	Emergency Engine No. 1	484,461	4,057,311	563.5	V	5.8	1384.0	1,499	183.2	0.42
021_1	Emergency Engine No. 2	484,193	4,057,603	563.5	V	5.8	1384.0	1,499	183.2	0.42
023_1A	Cooling Tower	484,178	4,057,278	563.5	V	50.0	Amb.+10	150,796	32.0	10.00
023_1B	Cooling Tower	484,175	4,057,281	563.5	V	50.0	Amb.+10	150,796	32.0	10.00
SPS1	Scrap Processing Line #1	483,898	4,058,296	573.0	V	89.1	80.0	319,355	57.74	10.83
DCTR	Decoater	483,784	4,058,131	568.5	V	125.0	350.0	148,500	58.60	7.33
SW1	Sidewell Melting Furnace #1	483,766	4,058,116	568.5	V	125.0	258.0	176,000	58.36	8.00
SW2	Sidewell Melting Furnace #2	483,766	4,058,116	568.5	V	125.0	258.0	176,000	58.36	8.00
NDC	Novelis Dual Chamber (NDC) Recycle Furnace	483,746	4,058,102	568.5	V	125.0	316.0	208,872	59.01	8.67
FLF	Front-Load Tilting Melting Furnace	483,746	4,058,102	568.5	V	125.0	316.0	208,872	59.01	8.67
HF1	Holding Furnace #1	483,733	4,058,077	568.5	V	125.0	218.0	114,000	71.09	5.83
ILD	In-Line Degasser	483,733	4,058,077	568.5	V	125.0	218.0	114,000	71.09	5.83
DRSH	Dross House	483,885	4,058,258	573.0	V	89.1	125	179,630	57.15	8.17
SWDRY	Sow Dryer	483,814	4,058,136	573.0	C	70.0	752.0	10,000	6.61	5.67

B-2. Modeled Source Parameters - AERMOD Modeling

Table B-2.1. List of Point Source Stack Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Stack Orientation	Stack Height[3] (ft)	Stack Temp.[3] (°F)	Flow Rate[3] (acfm)	Exit Velocity[3] (ft/s)	Stack Diameter[3] (ft)
ISAW_AD	Ingot Saw (As-Designed)	483,843	4,057,975	568.5	V	42.1	80.0	2,943	22.48	1.67
ISAW_AB	Ingot Saw (As-Built)	483,843	4,057,975	568.5	C	42.6	80.0	2,943	19.27	1.80
DBFPH_AD	Casting Process Emission Sources - DBF Preheater (As-Designed)	483,806	4,058,029	568.5	V	33.2	650.0	1,365	28.97	1.00
DBFPH_AB	Casting Process Emission Sources - DBF Preheater (As-Built)	483,799	4,058,027	568.5	H	30.5	650.0	1,365	15.06	1.39
LMES1	Hot Baghouses Lime Silos (3)	483,798	4,058,112	568.5	H	36.0	Amb.	1,000	84.88	0.50
LMES2	Hot Baghouses Lime Silos (3)	483,784	4,058,093	568.5	H	36.0	Amb.	1,000	84.88	0.50
LMES3	Hot Baghouses Lime Silos (3)	483,764	4,058,079	568.5	H	36.0	Amb.	1,000	84.88	0.50
CT1	Cooling Tower #1	483,774	4,057,995	568.5	V	31.9	Amb.+10	224,900	39.44	11.00
CT2	Cooling Tower #1	483,776	4,057,992	568.5	V	31.9	Amb.+10	224,900	39.44	11.00
CT3	Cooling Tower #1	483,779	4,057,989	568.5	V	31.9	Amb.+10	224,900	39.44	11.00
CT4	Cooling Tower #1	483,783	4,057,986	568.5	V	31.9	Amb.+10	224,900	39.44	11.00
CPSGEN	Cast Pit Sump Emergency Generator	483,790	4,058,014	568.5	V	6.0	110.0	4,914	10.91	3.09
FPENG3	Fire Pump Engine No. 3	483,739	4,058,042	568.5	H	8.8	842.0	1,867	158.48	0.50
FPENG4	Fire Pump Engine No. 4	483,737	4,058,040	568.5	H	8.8	842.0	1,867	158.48	0.50

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Stack parameters based on a combination of design information and operating data for similar equipment.

B-2. Modeled Source Parameters - AERMOD Modeling

Table B-2.2. List of Area Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Area (ft^2)	Release Height[3] (ft)	Initial Vertical Dimension[3] (ft)
EXISMAIN	Existing Main Building Fugitives	484,247	4,057,276	563.5	424,128	90.0	0.0
EXISSOU	Existing Southwest Building Fugitives	484,061	4,057,469	563.5	86,250	60.0	0.0
ADMNF	Administration Building Fugitives	484,187	4,058,208	573.0	11,713	18.8	0.0
CASTRF	Caster Area Fugitives	483,791	4,058,046	568.5	76,839	59.4	0.0
CDENDF	Cold End Fugitives	483,985	4,058,107	573.0	272,334	58.8	0.0
CEELECF	Cold End Electrical Room Fugitives	483,917	4,058,191	573.0	14,028	22.6	0.0
CEMAINTF	Cold End Maintenance Fugitives	484,000	4,058,250	573.0	34,230	36.7	0.0
CLARSTOF	Chlorine & Argon Storage Fugitives	483,906	4,057,963	568.5	510	14.5	0.0
COOLF	Cooling Water Building Fugitives	483,766	4,058,018	568.5	4,577	24.3	0.0
DROSSF	Dross House Fugitives	483,883	4,058,136	573.0	26,511	54.6	0.0
HEMAINTF	Hot End Maintenance Building Fugitives	483,835	4,057,973	568.5	17,049	23.2	0.0
HTENDF	Hot End Fugitives	483,838	4,058,092	573.0	115,038	77.1	0.0
HTERF	Hot End Electrical Room Building Fugitives	483,833	4,058,108	568.5	6,498	30.7	0.0
HVSCPF	Heavy Scrap Storage Building Fugitives	483,843	4,058,097	573.0	55,038	54.6	0.0
INGSAWF	Ingot Saw Building Fugitives	483,849	4,057,987	568.5	7,060	32.1	0.0
MOLDF	Mold Room Buildings Fugitives	483,804	4,058,080	568.5	8,687	30.7	0.0
RECOFFF	Receiving Office Fugitives	484,138	4,058,271	573.0	1,810	15.9	0.0
SHIPOFFF	Shipping Office Fugitives	483,884	4,058,008	568.5	365	14.5	0.0

B-2. Modeled Source Parameters - AERMOD Modeling

Table B-2.2. List of Area Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Area (ft^2)	Release Height[3] (ft)	Initial Vertical Dimension[3] (ft)
CASTRF_D	Caster Area Fugitives for Decoater Backup Generator	483,791	4,058,046	568.5	76,839	59.4	0.0
HTENDF_D	Hot End Fugitives for Decoater Backup Generator	483,838	4,058,092	573.0	115,038	77.1	0.0
CASTRF_U	Caster Area Fugitives for Molten Metal Utility Heaters	483,791	4,058,046	568.5	76,839	59.4	0.0
HTENDF_U	Hot End Fugitives for Molten Metal Utility Heaters	483,838	4,058,092	573.0	115,038	77.1	0.0

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the plant grade.

[3] Release height set to building height based on expectation of fugitive discharges occurring predominantly at roof level.

Table B-2.3. List of Volume Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Release Height[3] (ft)	Initial Lateral Dimension[4] (ft)	Initial Vertical Dimension[3] (ft)
R01V001	Roadway Fugitives	484,793	4,057,680	551.0	11.56	40.64	10.75
R01V002	Roadway Fugitives	484,767	4,057,674	550.9	11.56	40.64	10.75
R01V003	Roadway Fugitives	484,742	4,057,667	550.1	11.56	40.64	10.75
R01V004	Roadway Fugitives	484,717	4,057,656	549.9	11.56	40.64	10.75
R01V005	Roadway Fugitives	484,698	4,057,638	549.2	11.56	40.64	10.75
R01V006	Roadway Fugitives	484,684	4,057,615	549.0	11.56	40.64	10.75
R01V007	Roadway Fugitives	484,675	4,057,590	549.7	11.56	40.64	10.75
R01V008	Roadway Fugitives	484,667	4,057,565	549.5	11.56	40.64	10.75
R01V009	Roadway Fugitives	484,659	4,057,539	549.0	11.56	40.64	10.75
R01V010	Roadway Fugitives	484,651	4,057,514	548.8	11.56	40.64	10.75
R01V011	Roadway Fugitives	484,643	4,057,489	549.3	11.56	40.64	10.75
R01V012	Roadway Fugitives	484,635	4,057,463	550.4	11.56	40.64	10.75
R01V013	Roadway Fugitives	484,622	4,057,440	551.6	11.56	40.64	10.75
R01V014	Roadway Fugitives	484,604	4,057,421	552.4	11.56	40.64	10.75
R01V015	Roadway Fugitives	484,585	4,057,403	552.6	11.56	40.64	10.75
R01V016	Roadway Fugitives	484,566	4,057,384	552.5	11.56	40.64	10.75
R01V017	Roadway Fugitives	484,546	4,057,366	551.8	11.56	40.64	10.75
R02V001	Roadway Fugitives	484,527	4,057,347	553.1	11.56	40.64	10.75
R02V002	Roadway Fugitives	484,508	4,057,329	554.4	11.56	40.64	10.75
R02V003	Roadway Fugitives	484,489	4,057,310	555.7	11.56	40.64	10.75
R02V004	Roadway Fugitives	484,470	4,057,291	557.0	11.56	40.64	10.75
R02V005	Roadway Fugitives	484,451	4,057,272	558.3	11.56	40.64	10.75
R02V006	Roadway Fugitives	484,435	4,057,252	559.6	11.56	40.64	10.75
R02V007	Roadway Fugitives	484,416	4,057,233	560.9	11.56	40.64	10.75
R02V008	Roadway Fugitives	484,396	4,057,215	562.2	11.56	40.64	10.75
R03V001	Roadway Fugitives	484,377	4,057,196	563.5	11.56	40.64	10.75
R03V002	Roadway Fugitives	484,359	4,057,177	563.5	11.56	40.64	10.75
R03V003	Roadway Fugitives	484,340	4,057,158	563.5	11.56	40.64	10.75
R03V004	Roadway Fugitives	484,320	4,057,140	563.5	11.56	40.64	10.75
R03V005	Roadway Fugitives	484,295	4,057,134	563.5	11.56	40.64	10.75
R03V006	Roadway Fugitives	484,270	4,057,141	563.5	11.56	40.64	10.75
R03V007	Roadway Fugitives	484,251	4,057,159	563.5	11.56	40.64	10.75
R04V001	Roadway Fugitives	484,232	4,057,178	563.5	11.56	40.64	10.75
R04V002	Roadway Fugitives	484,214	4,057,198	563.5	11.56	40.64	10.75
R04V003	Roadway Fugitives	484,195	4,057,217	563.5	11.56	40.64	10.75
R04V004	Roadway Fugitives	484,177	4,057,236	563.5	11.56	40.64	10.75
R04V005	Roadway Fugitives	484,158	4,057,255	563.5	11.56	40.64	10.75
R04V006	Roadway Fugitives	484,140	4,057,274	563.5	11.56	40.64	10.75
R04V007	Roadway Fugitives	484,121	4,057,293	563.5	11.56	40.64	10.75

B-2. Modeled Source Parameters - AERMOD Modeling

Table B-2.3. List of Volume Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Release Height[3] (ft)	Initial Lateral Dimension[4] (ft)	Initial Vertical Dimension[3] (ft)
R04V008	Roadway Fugitives	484,103	4,057,313	563.5	11.56	40.64	10.75
R04V009	Roadway Fugitives	484,084	4,057,332	563.5	11.56	40.64	10.75
R05V001	Roadway Fugitives	484,065	4,057,351	563.5	11.56	40.64	10.75
R05V002	Roadway Fugitives	484,047	4,057,369	563.5	11.56	40.64	10.75
R05V003	Roadway Fugitives	484,028	4,057,388	563.5	11.56	40.64	10.75
R06V001	Roadway Fugitives	484,009	4,057,407	563.5	11.56	40.64	10.75
R06V002	Roadway Fugitives	483,990	4,057,426	563.5	11.56	40.64	10.75
R06V003	Roadway Fugitives	483,972	4,057,445	563.5	11.56	40.64	10.75
R06V004	Roadway Fugitives	483,953	4,057,464	563.5	11.56	40.64	10.75
R06V005	Roadway Fugitives	483,934	4,057,483	563.5	11.56	40.64	10.75
R06V006	Roadway Fugitives	483,916	4,057,502	563.5	11.56	40.64	10.75
R06V007	Roadway Fugitives	483,897	4,057,521	563.5	11.56	40.64	10.75
R07V001	Roadway Fugitives	483,879	4,057,540	563.6	11.56	40.64	10.75
R07V002	Roadway Fugitives	483,860	4,057,560	565.9	11.56	40.64	10.75
R07V003	Roadway Fugitives	483,842	4,057,579	567.9	11.56	40.64	10.75
R07V004	Roadway Fugitives	483,823	4,057,598	569.2	11.56	40.64	10.75
R07V005	Roadway Fugitives	483,805	4,057,617	569.9	11.56	40.64	10.75
R07V006	Roadway Fugitives	483,786	4,057,636	568.3	11.56	40.64	10.75
R07V007	Roadway Fugitives	483,767	4,057,655	566.1	11.56	40.64	10.75
R07V008	Roadway Fugitives	483,749	4,057,674	565.1	11.56	40.64	10.75
R07V009	Roadway Fugitives	483,730	4,057,693	565.4	11.56	40.64	10.75
R07V010	Roadway Fugitives	483,711	4,057,712	566.0	11.56	40.64	10.75
R07V011	Roadway Fugitives	483,693	4,057,731	566.6	11.56	40.64	10.75
R07V012	Roadway Fugitives	483,674	4,057,750	567.3	11.56	40.64	10.75
R07V013	Roadway Fugitives	483,655	4,057,769	568.0	11.56	40.64	10.75
R07V014	Roadway Fugitives	483,637	4,057,788	568.6	11.56	40.64	10.75
R07V015	Roadway Fugitives	483,618	4,057,807	569.0	11.56	40.64	10.75
R07V016	Roadway Fugitives	483,599	4,057,826	569.0	11.56	40.64	10.75
R07V017	Roadway Fugitives	483,581	4,057,845	569.0	11.56	40.64	10.75
R07V018	Roadway Fugitives	483,571	4,057,870	569.0	11.56	40.64	10.75
R07V019	Roadway Fugitives	483,572	4,057,896	569.0	11.56	40.64	10.75
R07V020	Roadway Fugitives	483,583	4,057,920	569.7	11.56	40.64	10.75
R07V021	Roadway Fugitives	483,595	4,057,944	569.8	11.56	40.64	10.75
R07V022	Roadway Fugitives	483,607	4,057,968	570.0	11.56	40.64	10.75
R07V023	Roadway Fugitives	483,619	4,057,992	569.8	11.56	40.64	10.75
R07V024	Roadway Fugitives	483,631	4,058,015	570.6	11.56	40.64	10.75
R07V025	Roadway Fugitives	483,643	4,058,039	571.4	11.56	40.64	10.75
R07V026	Roadway Fugitives	483,655	4,058,063	572.2	11.56	40.64	10.75
R08V001	Roadway Fugitives	484,365	4,057,217	563.5	11.56	40.64	10.75

Table B-2.3. List of Volume Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Release Height[3] (ft)	Initial Lateral Dimension[4] (ft)	Initial Vertical Dimension[3] (ft)
R08V002	Roadway Fugitives	484,347	4,057,236	563.5	11.56	40.64	10.75
R08V003	Roadway Fugitives	484,335	4,057,258	563.5	11.56	40.64	10.75
R08V004	Roadway Fugitives	484,330	4,057,284	563.5	11.56	40.64	10.75
R09V001	Roadway Fugitives	484,229	4,057,191	563.5	11.56	40.64	10.75
R09V002	Roadway Fugitives	484,221	4,057,217	563.5	11.56	40.64	10.75
R09V003	Roadway Fugitives	484,212	4,057,242	563.5	11.56	40.64	10.75
R09V004	Roadway Fugitives	484,203	4,057,267	563.5	11.56	40.64	10.75
R09V005	Roadway Fugitives	484,186	4,057,287	563.5	11.56	40.64	10.75
R09V006	Roadway Fugitives	484,167	4,057,305	563.5	11.56	40.64	10.75
R09V007	Roadway Fugitives	484,148	4,057,324	563.5	11.56	40.64	10.75
R09V008	Roadway Fugitives	484,129	4,057,343	563.5	11.56	40.64	10.75
R09V009	Roadway Fugitives	484,105	4,057,350	563.5	11.56	40.64	10.75
R11V001	Roadway Fugitives	483,899	4,057,555	563.5	11.56	40.64	10.75
R11V002	Roadway Fugitives	483,918	4,057,573	563.5	11.56	40.64	10.75
R11V003	Roadway Fugitives	483,937	4,057,592	563.5	11.56	40.64	10.75
R11V004	Roadway Fugitives	483,956	4,057,610	563.5	11.56	40.64	10.75
R11V005	Roadway Fugitives	483,976	4,057,629	563.5	11.56	40.64	10.75
R11V006	Roadway Fugitives	483,995	4,057,647	563.5	11.56	40.64	10.75
R11V007	Roadway Fugitives	484,014	4,057,665	563.5	11.56	40.64	10.75
R11V008	Roadway Fugitives	484,033	4,057,684	563.5	11.56	40.64	10.75
R12V001	Roadway Fugitives	483,667	4,058,087	573.0	11.56	40.64	10.75
R12V002	Roadway Fugitives	483,684	4,058,106	573.0	11.56	40.64	10.75
R12V003	Roadway Fugitives	483,703	4,058,125	573.0	11.56	40.64	10.75
R12V004	Roadway Fugitives	483,722	4,058,144	573.0	11.56	40.64	10.75
R12V005	Roadway Fugitives	483,741	4,058,162	573.0	11.56	40.64	10.75
R12V006	Roadway Fugitives	483,760	4,058,181	573.0	11.56	40.64	10.75
R13V001	Roadway Fugitives	483,779	4,058,200	573.0	11.56	40.64	10.75
R13V002	Roadway Fugitives	483,799	4,058,218	573.0	11.56	40.64	10.75
R14V001	Roadway Fugitives	483,818	4,058,237	573.0	11.56	40.64	10.75
R14V002	Roadway Fugitives	483,837	4,058,256	573.0	11.56	40.64	10.75
R15V001	Roadway Fugitives	483,856	4,058,274	573.0	11.56	40.64	10.75
R15V002	Roadway Fugitives	483,875	4,058,293	573.0	11.56	40.64	10.75
R15V003	Roadway Fugitives	483,894	4,058,312	573.0	11.56	40.64	10.75
R16V001	Roadway Fugitives	483,913	4,058,330	573.0	11.56	40.64	10.75
R16V002	Roadway Fugitives	483,932	4,058,349	573.0	11.56	40.64	10.75
R16V003	Roadway Fugitives	483,951	4,058,367	573.0	11.56	40.64	10.75
R16V004	Roadway Fugitives	483,970	4,058,386	573.0	11.56	40.64	10.75
R17V001	Roadway Fugitives	483,917	4,058,315	573.0	11.56	40.64	10.75

Table B-2.3. List of Volume Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Release Height[3] (ft)	Initial Lateral Dimension[4] (ft)	Initial Vertical Dimension[3] (ft)
R17V002	Roadway Fugitives	483,935	4,058,297	573.0	11.56	40.64	10.75
R17V003	Roadway Fugitives	483,954	4,058,278	573.0	11.56	40.64	10.75
R17V004	Roadway Fugitives	483,973	4,058,259	573.0	11.56	40.64	10.75
R18V001	Roadway Fugitives	483,821	4,058,226	573.0	11.56	40.64	10.75
R18V002	Roadway Fugitives	483,840	4,058,208	573.0	11.56	40.64	10.75
R18V003	Roadway Fugitives	483,859	4,058,189	573.0	11.56	40.64	10.75
R19V001	Roadway Fugitives	483,799	4,058,237	573.0	11.56	40.64	10.75
R19V002	Roadway Fugitives	483,780	4,058,256	573.0	11.56	40.64	10.75
R19V003	Roadway Fugitives	483,762	4,058,276	573.0	11.56	40.64	10.75
R19V004	Roadway Fugitives	483,743	4,058,274	573.0	11.56	40.64	10.75
R19V005	Roadway Fugitives	483,724	4,058,256	573.0	11.56	40.64	10.75
R19V006	Roadway Fugitives	483,726	4,058,237	573.0	11.56	40.64	10.75
R19V007	Roadway Fugitives	483,745	4,058,218	573.0	11.56	40.64	10.75
R19V008	Roadway Fugitives	483,763	4,058,199	573.0	11.56	40.64	10.75
R20V001	Roadway Fugitives	483,780	4,058,182	573.0	11.56	40.64	10.75
R21V001	Roadway Fugitives	483,668	4,058,062	573.0	11.56	40.64	10.75
R21V002	Roadway Fugitives	483,687	4,058,043	573.0	11.56	40.64	10.75
R21V003	Roadway Fugitives	483,706	4,058,024	573.0	11.56	40.64	10.75
R21V004	Roadway Fugitives	483,724	4,058,005	573.0	11.56	40.64	10.75
R22V001	Roadway Fugitives	483,743	4,057,986	573.0	11.56	40.64	10.75
R22V002	Roadway Fugitives	483,761	4,057,967	573.0	11.56	40.64	10.75
R23V001	Roadway Fugitives	483,780	4,057,948	573.0	11.56	40.64	10.75
R23V002	Roadway Fugitives	483,799	4,057,929	573.0	11.56	40.64	10.75
R24V001	Roadway Fugitives	483,817	4,057,927	573.0	11.56	40.64	10.75
R24V002	Roadway Fugitives	483,836	4,057,946	573.0	11.56	40.64	10.75
R24V003	Roadway Fugitives	483,855	4,057,964	573.0	11.56	40.64	10.75
R24V004	Roadway Fugitives	483,874	4,057,983	573.0	11.56	40.64	10.75
R24V005	Roadway Fugitives	483,893	4,058,002	573.0	11.56	40.64	10.75
R24V006	Roadway Fugitives	483,912	4,058,021	573.0	11.56	40.64	10.75
R24V007	Roadway Fugitives	483,931	4,058,039	573.0	11.56	40.64	10.75
R24V008	Roadway Fugitives	483,950	4,058,058	573.0	11.56	40.64	10.75
R24V009	Roadway Fugitives	483,969	4,058,077	573.0	11.56	40.64	10.75
R24V010	Roadway Fugitives	483,988	4,058,096	573.0	11.56	40.64	10.75
R24V011	Roadway Fugitives	484,006	4,058,114	573.0	11.56	40.64	10.75
R24V012	Roadway Fugitives	484,025	4,058,133	573.0	11.56	40.64	10.75
R24V013	Roadway Fugitives	484,048	4,058,130	573.0	11.56	40.64	10.75
R24V014	Roadway Fugitives	484,067	4,058,111	573.0	11.56	40.64	10.75
R25V001	Roadway Fugitives	484,056	4,058,089	573.0	11.56	40.64	10.75
R25V002	Roadway Fugitives	484,037	4,058,071	573.0	11.56	40.64	10.75

B-2. Modeled Source Parameters - AERMOD Modeling

Table B-2.3. List of Volume Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Release Height[3] (ft)	Initial Lateral Dimension[4] (ft)	Initial Vertical Dimension[3] (ft)
R26V001	Roadway Fugitives	484,018	4,058,052	573.0	11.56	40.64	10.75
R26V002	Roadway Fugitives	483,999	4,058,033	573.0	11.56	40.64	10.75
R26V003	Roadway Fugitives	483,980	4,058,015	573.0	11.56	40.64	10.75
R26V004	Roadway Fugitives	483,961	4,057,996	573.0	11.56	40.64	10.75
R26V005	Roadway Fugitives	483,942	4,057,978	573.0	11.56	40.64	10.75
R26V006	Roadway Fugitives	483,923	4,057,959	573.0	11.56	40.64	10.75
R26V007	Roadway Fugitives	483,904	4,057,940	573.0	11.56	40.64	10.75
R26V008	Roadway Fugitives	483,885	4,057,922	573.0	11.56	40.64	10.75
R26V009	Roadway Fugitives	483,866	4,057,903	573.0	11.56	40.64	10.75
R26V010	Roadway Fugitives	483,846	4,057,885	573.0	11.56	40.64	10.75
R26V011	Roadway Fugitives	483,826	4,057,900	573.0	11.56	40.64	10.75
R27V001	Roadway Fugitives	484,077	4,058,101	573.0	11.56	40.64	10.75
R27V002	Roadway Fugitives	484,095	4,058,082	573.0	11.56	40.64	10.75
R27V003	Roadway Fugitives	484,106	4,058,066	573.0	11.56	40.64	10.75
R27V004	Roadway Fugitives	484,080	4,058,066	573.0	11.56	40.64	10.75
R27V005	Roadway Fugitives	484,053	4,058,066	573.0	11.56	40.64	10.75
R27V006	Roadway Fugitives	484,028	4,058,059	573.0	11.56	40.64	10.75
R28V001	Roadway Fugitives	483,750	4,057,998	573.0	11.56	40.64	10.75
R28V002	Roadway Fugitives	483,771	4,057,984	573.0	11.56	40.64	10.75
R28V003	Roadway Fugitives	483,776	4,057,963	573.0	11.56	40.64	10.75
R29V001	Roadway Fugitives	483,999	4,058,386	573.0	11.56	40.64	10.75
R29V002	Roadway Fugitives	484,000	4,058,367	573.0	11.56	40.64	10.75
R29V003	Roadway Fugitives	484,013	4,058,347	573.0	11.56	40.64	10.75
R29V004	Roadway Fugitives	484,032	4,058,329	573.0	11.56	40.64	10.75
R30V001	Roadway Fugitives	483,993	4,058,395	573.0	11.56	40.64	10.75
R30V002	Roadway Fugitives	484,018	4,058,385	573.0	11.56	40.64	10.75
R30V003	Roadway Fugitives	484,042	4,058,376	573.0	11.56	40.64	10.75
R30V004	Roadway Fugitives	484,067	4,058,366	573.0	11.56	40.64	10.75
R30V005	Roadway Fugitives	484,088	4,058,349	573.0	11.56	40.64	10.75
R30V006	Roadway Fugitives	484,106	4,058,330	573.0	11.56	40.64	10.75
R30V007	Roadway Fugitives	484,125	4,058,311	573.0	11.56	40.64	10.75
R30V008	Roadway Fugitives	484,144	4,058,292	573.0	11.56	40.64	10.75
R30V009	Roadway Fugitives	484,162	4,058,274	573.0	11.56	40.64	10.75

B-2. Modeled Source Parameters - AERMOD Modeling

Table B-2.3. List of Volume Source Parameters for AERMOD Modeling

Stack ID	Description	UTM East[1] (m)	UTM North[1] (m)	Elevation[2] (ft)	Release Height[3] (ft)	Initial Lateral Dimension[4] (ft)	Initial Vertical Dimension[3] (ft)
R30V010	Roadway Fugitives	484,181	4,058,255	573.0	11.56	40.64	10.75

[1] Coordinates taken from a to-scale site plan projected in the UTM NAD83 Zone 16 coordinate system.

[2] Elevation of the facility grade was used for nearly all of the volume sources associated with the haul roads. However, elevations for Haul Routes #1 (road segment for east entryway) and #7 (road segment between existing coiling finishing plant and new ingot casting expansion) volume sources were determined by AERMAP (v18081) based on 1-arc second National Elevation Data (NED). The elevations for haul road volume sources on Route #2 and at the end of Route #7 were adjusted to ensure representative slope (i.e., less than 5%) between the elevations determined by NED and the plant grade.

[3] The release height for haul road fugitives is based on the guidance provided in the EPA Haul Road Work Group Guidance Document (March 2012). As such, the average assumed vehicle height (13.6 ft) was divided by 2 to obtain the average height of the plume and then multiplied by 1.7 to account for the additional plume dispersion generated by vehicle movement. The initial vertical dimension was calculated similarly, however the instead of dividing by 2, the adjusted plume height was divided by 2.15.

[4] The initial lateral dimension for haul road fugitives was calculated by taking the average road width at the Guthrie facility (24 ft) and adding 6-meters (19.69 ft) to account for additional plume dispersion generated by vehicle movement. This adjusted road width was then doubled to account for alternating volume sources and divided by 2.15 consistent with the EPA Haul Road Work Group Guidance.

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.1. Modeled Emission Rates for AERMOD Modeling - Point Sources[1]

Model ID	Emission Point Description	NOX (lb/hr)			CO (lb/hr)			PM10 (lb/hr)			PM2.5 (lb/hr)			HF (lb/hr)		
		[1-hr]	[Ann.]	Basis	[1-hr]	[8-hr]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis
001_1	HTL - Alkaline Pre-Cleaner	-	-	--	--	--	--	0.031	0.031	--	0.031	0.031	--	-	-	--
002_1	Heat Treat Furnace	3.754	3.754	--	--	--	--	0.254	0.254	--	0.254	0.254	--	-	-	--
003_1	Reheater Furnace	0.845	0.845	--	--	--	--	0.057	0.057	--	0.057	0.057	--	-	-	--
004_1	PTL - Etching & Pre-Treatment	-	-	--	--	--	--	0.140	0.140	--	0.140	0.140	--	0.006	0.006	--
005_1	Batch Annealing Furnace 1	1.922	1.922	--	--	--	--	0.130	0.130	--	0.130	0.130	--	-	-	--
006_1	Batch Annealing Furnace 2	1.922	1.922	--	--	--	--	0.130	0.130	--	0.130	0.130	--	-	-	--
007_1	Boiler No. 1	0.932	0.932	--	--	--	--	0.188	0.188	--	0.188	0.188	--	-	-	--
008_1	Boiler No. 2	0.932	0.932	--	--	--	--	0.188	0.188	--	0.188	0.188	--	-	-	--
009_1	Boiler No. 3	0.932	0.932	--	--	--	--	0.188	0.188	--	0.188	0.188	--	-	-	--
012_1	Fire Pump Engine No. 1	0.961	0.055	A	--	--	--	0.385	0.022	A	0.035	0.002	A	-	-	--
022_1	Fire Pump Engine No. 2	0.961	0.055	A	--	--	--	0.385	0.022	A	0.035	0.002	A	-	-	--
011_1	Emergency Engine No. 1	0.034	0.002	A	--	--	--	0.026	0.001	A	0.026	0.001	A	-	-	--
021_1	Emergency Engine No. 2	0.034	0.002	A	--	--	--	0.026	0.001	A	0.026	0.001	A	-	-	--
023_1A	Cooling Tower	-	-	--	-	-	--	0.035	0.035	--	0.022	0.022	--	-	-	--
023_1B	Cooling Tower	-	-	--	-	-	--	0.035	0.035	--	0.022	0.022	--	-	-	--
SPS1	Scrap Processing Line #1	-	-	--	-	-	--	2.792	2.792	--	0.821	0.821	--	-	-	--
DCTR	Decoater	8.818	8.818	--	7.776	7.776	--	5.394	5.394	--	5.120	5.120	--	-	-	--
SW1	Sidewell Melting Furnace #1	6.388	6.388	--	6.352	6.352	--	2.591	2.591	--	1.848	2.197	B	0.033	0.033	--
SW2	Sidewell Melting Furnace #2	6.388	6.388	--	6.352	6.352	--	2.591	2.591	--	1.848	2.197	B	0.033	0.033	--
NDC	Novelis Dual Chamber (NDC) Recycle Furna	12.280	10.356	--	8.627	8.627	--	3.393	3.393	--	2.302	2.736	B	0.038	0.038	--
FLF	Front-Load Tilting Melting Furnace	7.354	7.354	--	6.085	6.085	--	2.005	2.005	--	1.380	1.972	B	-	-	--
HF1	Holding Furnace #1	1.875	1.875	--	2.520	2.520	--	1.860	1.860	--	1.759	1.759	--	0.020	0.020	--
ILD	In-Line Degasser	-	-	--	-	-	--	0.223	0.223	--	0.083	0.083	--	-	-	--
DRSH	Dross House	-	-	--	-	-	--	2.555	2.555	--	1.272	2.120	B	-	-	--
SWDRY	Sow Dryer	1.748	1.748	--	2.365	2.365	--	0.056	0.056	--	0.056	0.056	--	-	-	--
ISAW_AD	**Ingot Saw (As-Designed)**	-	-	--	-	-	--	**(0.022)**	**(0.022)**	**C**	**(0.022)**	**(0.022)**	**C**	-	-	--
ISAW_AB	**Ingot Saw (As-Built)**	-	-	--	-	-	--	**0.022**	**0.022**	--	**0.022**	**0.022**	--	-	-	--
DBFPH_AD	**Casting Process Emission Sources - DBF Preheater (As-Designed)**	**(0.289)**	**(0.289)**	**C**	**(0.319)**	**(0.319)**	**C**	**(0.013)**	**(0.013)**	**C**	**(0.013)**	**(0.013)**	**C**	-	-	--
DBFPH_AB	**Casting Process Emission Sources - DBF Preheater (As-Built)**	**0.289**	**0.289**	--	**0.319**	**0.319**	--	**0.013**	**0.013**	--	**0.013**	**0.013**	--	-	-	--

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.1. Modeled Emission Rates for AERMOD Modeling - Point Sources[1]

Model ID	Emission Point Description	NOX (lb/hr)			CO (lb/hr)			PM10 (lb/hr)			PM2.5 (lb/hr)			HF (lb/hr)		
		[1-hr]	[Ann.]	Basis	[1-hr]	[8-hr]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis
LMES1	Hot Baghouses Lime Silos (3)	-	-	--	-	-	--	0.001	0.001	--	0.001	0.001	--	-	-	--
LMES2	Hot Baghouses Lime Silos (3)	-	-	--	-	-	--	0.001	0.001	--	0.001	0.001	--	-	-	--
LMES3	Hot Baghouses Lime Silos (3)	-	-	--	-	-	--	0.001	0.001	--	0.001	0.001	--	-	-	--
CT1	Cooling Tower #1	-	-	--	-	-	--	0.003	0.003	--	1.40E-05	1.40E-05	--	-	-	--
CT2	Cooling Tower #1	-	-	--	-	-	--	0.003	0.003	--	1.40E-05	1.40E-05	--	-	-	--
CT3	Cooling Tower #1	-	-	--	-	-	--	0.003	0.003	--	1.40E-05	1.40E-05	--	-	-	--
CT4	Cooling Tower #1	-	-	--	-	-	--	0.003	0.003	--	1.40E-05	1.40E-05	--	-	-	--
CPSGEN	**Cast Pit Sump Emergency Generator**	**2.82E-03**	**2.82E-03**	**D**	**0.047**	**5.82E-03**	**E**	**6.18E-04**	**6.18E-04**	**D**	**6.18E-04**	**6.18E-04**	**D**	**-**	**-**	**--**
FPENG3	**Fire Pump Engine No. 3**	**0.117**	**0.117**	**D**	**0.484**	**0.061**	**E**	**3.38E-03**	**3.38E-03**	**D**	**3.38E-03**	**3.38E-03**	**D**	**-**	**-**	**--**
FPENG4	**Fire Pump Engine No. 4**	**0.117**	**0.117**	**D**	**0.484**	**0.061**	**E**	**3.38E-03**	**3.38E-03**	**D**	**3.38E-03**	**3.38E-03**	**D**	**-**	**-**	**--**

[1] Modeled hourly emission rates shown are based on the relevant averaging periods in brackets, and any clarifying notes to describe the basis of the modeled emission rates are provided below. For modeled emission rates based on maximum hourly or annual potential emissions, no clarifying notes are provided as this information is included within the potential emission calculations provided in the application.

Basis for Modeled Emission Rates

A = As emergency sources, the legacy Guthrie automotive coil finishing plant's fire pump and emergency generator engines are modeled for annual averaging periods at the hourly average emission rate. The hourly average emission rate for annual average periods is derived from an annual potential emission rate assuming up to 500 hr/yr of operation for maintenance, readiness testing, and emergency operation consistent with applicable EPA guidance.

B = Federally enforceable PM2.5 emission limits for Hot Baghouse #2 (SW1 + SW2), Hot Baghouse #3 (NDC+FLF), and Dross House Baghouse (DRSH) expressed on a mass per time basis (lb/hr) over a 24-hour averaging period (calendar day block average) are being proposed at the modeled PM2.5 emission rates specified above to ensure compliance with the Class II 24-hr PM2.5 PSD Increment. Technical and regulatory justification for the magnitude of these PM2.5 modeling-based emission limits relative to the maximum hourly potential emissions reflected by the separately applicable and enforceable short-term BACT limits is provided in Vol. 1 of the as-designed reconciliation Title V significant revision application.

C = To assess the effect on modeled impacts from the change in configuration of the Ingot Saw and DBF Preheater stacks from the as-designed ("_AD") to the as-built ("_AB") configurations, the previously established as-designed source considered in the October 2023 modeling report is modeled with a negative emission rate and the newly considered as-built source is modeled with an equivalent positive emission rate (where both emission rate values represent the PTE of the affected sources). In this manner, the change in modeled impacts directly associated with the change in the Ingot Saw and DBF Preheater stacks can be considered in the as-built modeling supplement.

D = As emergency sources, the casting facility's fire pump and emergency generator engines are modeled for short-term (NO2, PM10, and PM2.5 only) and long-term averaging periods based on the hourly average emission rate accounting for limited and intermittent use. Specifically, emission rates are derived from an annual potential emission rate assuming up to 500 hr/yr of operation for maintenance, readiness testing, and emergency operation consistent with applicable EPA guidance.

E = Based on the not to be exceeded more than once per year deterministic form of the CO NAAQS, short-term CO emissions from the emergency sources are modeled based on the maximum duration of one hour at full load operation for maintenance and readiness testing within the relevant averaging period (i.e., 1/8 scaling factor for 8-hr CO and no scaling factor for 1-hr CO).

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.2. Modeled Emission Rates for AERMOD Modeling - Area Sources[1]

Model ID	Emission Point Description	NOX (lb/hr)			CO (lb/hr)			PM10 (lb/hr)			PM2.5 (lb/hr)			HF (lb/hr)		
		[1-hr]	[Ann.]	Basis	[1-hr]	[8-hr]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis
EXISMAIN	Existing Main Building Fugitives	3.450	3.450	--	2.898	2.898	--	0.262	0.262	--	0.262	0.262	--	-	-	--
EXISSOU	Existing Southwest Building Fugitives	0.702	0.702	--	0.589	0.589	--	0.096	0.096	--	0.096	0.096	--	-	-	--
HTENDF	Hot End Fugitives	0.234	0.234	--	1.598	1.598	--	0.174	0.174	--	0.135	0.135	--	0.015	0.015	--
CDENDF	Cold End Fugitives	0.040	0.040	--	0.034	0.034	--	0.058	0.058	--	0.018	0.018	--	-	-	--
DROSSF	Dross House Fugitives	-	-	--	-	-	--	0.179	0.179	--	0.149	0.149	--	-	-	--
CASTRF	Caster Area Fugitives	1.348	1.348	--	2.068	2.068	--	0.158	0.158	--	0.132	0.132	--	0.010	0.010	--
ADMNF	Administration Building Fugitives	0.062	0.062	--	0.052	0.052	--	2.15E-03	2.15E-03	--	2.15E-03	2.15E-03	--	-	-	--
HVSCPF	Heavy Scrap Storage Building Fugitives	0.006	0.006	--	0.005	0.005	--	2.08E-04	2.08E-04	--	2.08E-04	2.08E-04	--	-	-	--
COOLF	Cooling Water Building Fugitives	0.049	0.049	--	0.041	0.041	--	1.68E-03	1.68E-03	--	1.68E-03	1.68E-03	--	-	-	--
MOLDF	Mold Room Buildings Fugitives	0.019	0.019	--	0.016	0.016	--	6.49E-04	6.49E-04	--	6.49E-04	6.49E-04	--	-	-	--
HEMAINTF	Hot End Maintenance Building Fugitives	0.110	0.110	--	0.092	0.092	--	3.80E-03	3.80E-03	--	3.80E-03	3.80E-03	--	-	-	--
CEELECF	Cold End Electrical Room Fugitives	0.129	0.129	--	0.108	0.108	--	4.48E-03	4.48E-03	--	4.48E-03	4.48E-03	--	-	-	--
CEMAINTF	Cold End Maintenance Fugitives	0.093	0.093	--	0.078	0.078	--	3.23E-03	3.23E-03	--	3.23E-03	3.23E-03	--	-	-	--
CLARSTOF	Chlorine & Argon Storage Fugitives	0.015	0.015	--	0.013	0.013	--	5.22E-04	5.22E-04	--	5.22E-04	5.22E-04	--	-	-	--
HTERF	Hot End Electrical Room Fugitives	0.068	0.068	--	0.057	0.057	--	2.36E-03	2.36E-03	--	2.36E-03	2.36E-03	--	-	-	--
INGSAWF	Ingot Saw Building Fugitives	0.210	0.210	--	0.176	0.176	--	7.29E-03	7.29E-03	--	7.29E-03	7.29E-03	--	-	-	--
RECOFFF	Receiving Office Fugitives	0.011	0.011	--	9.24E-03	9.24E-03	--	3.82E-04	3.82E-04	--	3.82E-04	3.82E-04	--	-	-	--
SHIPOFFF	Shipping Office Fugitives	0.006	0.006	--	0.005	0.005	--	2.08E-04	2.08E-04	--	2.08E-04	2.08E-04	--	-	-	--

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.2. Modeled Emission Rates for AERMOD Modeling - Area Sources[1]

Model ID	Emission Point Description	NOX (lb/hr)			CO (lb/hr)			PM10 (lb/hr)			PM2.5 (lb/hr)			HF (lb/hr)		
		[1-hr]	[Ann.]	Basis	[1-hr]	[8-hr]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis	[24-hr]	[Ann.]	Basis
HTENDF_D	Hot End Fugitives for Decoater Backup Generator	5.07E-03	5.07E-03	A	3.519	0.440	B	1.32E-04	1.32E-04	A	1.32E-04	1.32E-04	A	-	-	--
CASTRF_D	Caster Area Fugitives for Decoater Backup Generator	3.39E-03	3.39E-03	A	2.350	0.294	B	8.85E-05	8.85E-05	A	8.85E-05	8.85E-05	A	-	-	--
HTENDF_U	Hot End Fugitives for Molten Metal Utility Heaters	0.072	0.072	--	0.060	0.060	--	2.50E-03	2.50E-03	--	2.50E-03	2.50E-03	--	-	-	--
CASTRF_U	Caster Area Fugitives for Molten Metal Utility Heaters	0.048	0.048	--	0.040	0.040	--	1.67E-03	1.67E-03	--	1.67E-03	1.67E-03	--	-	-	--

1 Modeled hourly emission rates shown are based on the relevant averaging periods in brackets, and any clarifying notes to describe the basis of the modeled emission rates are provided below. For modeled emission rates based on maximum hourly or annual potential emissions, no clarifying notes are provided as this information is included within the potential emission calculations provided in the application.

Basis for Modeled Emission Rates

A = As an emergency source, the casting facility's emergency generator engine is modeled for short-term (NO2, PM10, and PM2.5 only) and long-term averaging periods based on the hourly average emission rate accounting for limited and intermittent use. Specifically, emission rates are derived from an annual potential emission rate assuming up to 500 hr/yr of operation for maintenance, readiness testing, and emergency operation consistent with applicable EPA guidance.

B = Based on the not to be exceeded more than once per year deterministic form of the CO NAAQS, short-term CO emissions from the emergency sources are modeled based on the maximum duration of one hour at full load operation for maintenance and readiness testing within the relevant averaging period (i.e., 1/8 scaling factor for 8-hr CO and no scaling factor for 1-hr CO).

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.3. Modeled Emission Rates for AERMOD Modeling - Volume Sources[1]

Model ID	Emission Point Description	PM10 (lb/hr) [24-hr]	PM10 (lb/hr) [Ann.]	PM10 Basis	PM2.5 (lb/hr) [24-hr]	PM2.5 (lb/hr) [Ann.]	PM2.5 Basis
R01V001	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V002	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V003	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V004	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V005	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V006	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V007	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V008	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V009	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V010	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V011	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V012	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V013	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V014	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V015	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V016	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R01V017	Roadway Fugitives	7.93E-03	6.07E-03	A	1.95E-03	1.49E-03	A
R02V001	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R02V002	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R02V003	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R02V004	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R02V005	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R02V006	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R02V007	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R02V008	Roadway Fugitives	8.07E-03	6.18E-03	A	1.98E-03	1.52E-03	A
R03V001	Roadway Fugitives	6.66E-03	4.76E-03	A	1.63E-03	1.17E-03	A
R03V002	Roadway Fugitives	6.66E-03	4.76E-03	A	1.63E-03	1.17E-03	A
R03V003	Roadway Fugitives	6.66E-03	4.76E-03	A	1.63E-03	1.17E-03	A
R03V004	Roadway Fugitives	6.66E-03	4.76E-03	A	1.63E-03	1.17E-03	A
R03V005	Roadway Fugitives	6.66E-03	4.76E-03	A	1.63E-03	1.17E-03	A
R03V006	Roadway Fugitives	6.66E-03	4.76E-03	A	1.63E-03	1.17E-03	A
R03V007	Roadway Fugitives	6.66E-03	4.76E-03	A	1.63E-03	1.17E-03	A
R04V001	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R04V002	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R04V003	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R04V004	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.3. Modeled Emission Rates for AERMOD Modeling - Volume Sources[1]

Model ID	Emission Point Description	PM10 (lb/hr) [24-hr]	PM10 (lb/hr) [Ann.]	PM10 Basis	PM2.5 (lb/hr) [24-hr]	PM2.5 (lb/hr) [Ann.]	PM2.5 Basis
R04V005	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R04V006	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R04V007	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R04V008	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R04V009	Roadway Fugitives	5.79E-03	4.13E-03	A	1.42E-03	1.01E-03	A
R05V001	Roadway Fugitives	8.20E-03	5.85E-03	A	2.01E-03	1.44E-03	A
R05V002	Roadway Fugitives	8.20E-03	5.85E-03	A	2.01E-03	1.44E-03	A
R05V003	Roadway Fugitives	8.20E-03	5.85E-03	A	2.01E-03	1.44E-03	A
R06V001	Roadway Fugitives	6.43E-03	4.58E-03	A	1.58E-03	1.12E-03	A
R06V002	Roadway Fugitives	6.43E-03	4.58E-03	A	1.58E-03	1.12E-03	A
R06V003	Roadway Fugitives	6.43E-03	4.58E-03	A	1.58E-03	1.12E-03	A
R06V004	Roadway Fugitives	6.43E-03	4.58E-03	A	1.58E-03	1.12E-03	A
R06V005	Roadway Fugitives	6.43E-03	4.58E-03	A	1.58E-03	1.12E-03	A
R06V006	Roadway Fugitives	6.43E-03	4.58E-03	A	1.58E-03	1.12E-03	A
R06V007	Roadway Fugitives	6.43E-03	4.58E-03	A	1.58E-03	1.12E-03	A
R07V001	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V002	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V003	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V004	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V005	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V006	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V007	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V008	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V009	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V010	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V011	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V012	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V013	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V014	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V015	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V016	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V017	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V018	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V019	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V020	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V021	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.3. Modeled Emission Rates for AERMOD Modeling - Volume Sources[1]

Model ID	Emission Point Description	PM10 (lb/hr) [24-hr]	PM10 (lb/hr) [Ann.]	PM10 Basis	PM2.5 (lb/hr) [24-hr]	PM2.5 (lb/hr) [Ann.]	PM2.5 Basis
R07V022	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V023	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V024	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V025	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R07V026	Roadway Fugitives	4.96E-03	3.00E-03	A	1.22E-03	7.36E-04	A
R08V001	Roadway Fugitives	1.55E-03	1.55E-03	A	3.80E-04	3.80E-04	A
R08V002	Roadway Fugitives	1.55E-03	1.55E-03	A	3.80E-04	3.80E-04	A
R08V003	Roadway Fugitives	1.55E-03	1.55E-03	A	3.80E-04	3.80E-04	A
R08V004	Roadway Fugitives	1.55E-03	1.55E-03	A	3.80E-04	3.80E-04	A
R09V001	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V002	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V003	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V004	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V005	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V006	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V007	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V008	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R09V009	Roadway Fugitives	2.54E-05	2.54E-05	A	6.24E-06	6.24E-06	A
R11V001	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R11V002	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R11V003	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R11V004	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R11V005	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R11V006	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R11V007	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R11V008	Roadway Fugitives	2.00E-03	1.85E-03	A	4.92E-04	4.53E-04	A
R12V001	Roadway Fugitives	3.79E-03	1.85E-03	A	9.31E-04	4.54E-04	A
R12V002	Roadway Fugitives	3.79E-03	1.85E-03	A	9.31E-04	4.54E-04	A
R12V003	Roadway Fugitives	3.79E-03	1.85E-03	A	9.31E-04	4.54E-04	A
R12V004	Roadway Fugitives	3.79E-03	1.85E-03	A	9.31E-04	4.54E-04	A
R12V005	Roadway Fugitives	3.79E-03	1.85E-03	A	9.31E-04	4.54E-04	A
R12V006	Roadway Fugitives	3.79E-03	1.85E-03	A	9.31E-04	4.54E-04	A
R13V001	Roadway Fugitives	2.78E-03	1.37E-03	A	6.82E-04	3.36E-04	A
R13V002	Roadway Fugitives	2.78E-03	1.37E-03	A	6.82E-04	3.36E-04	A
R14V001	Roadway Fugitives	2.55E-03	1.23E-03	A	6.26E-04	3.02E-04	A

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.3. Modeled Emission Rates for AERMOD Modeling - Volume Sources[1]

Model ID	Emission Point Description	PM10 (lb/hr) [24-hr]	PM10 (lb/hr) [Ann.]	PM10 Basis	PM2.5 (lb/hr) [24-hr]	PM2.5 (lb/hr) [Ann.]	PM2.5 Basis
R14V002	Roadway Fugitives	2.55E-03	1.23E-03	A	6.26E-04	3.02E-04	A
R15V001	Roadway Fugitives	2.06E-03	9.89E-04	A	5.05E-04	2.43E-04	A
R15V002	Roadway Fugitives	2.06E-03	9.89E-04	A	5.05E-04	2.43E-04	A
R15V003	Roadway Fugitives	2.06E-03	9.89E-04	A	5.05E-04	2.43E-04	A
R16V001	Roadway Fugitives	2.07E-03	9.61E-04	A	5.08E-04	2.36E-04	A
R16V002	Roadway Fugitives	2.07E-03	9.61E-04	A	5.08E-04	2.36E-04	A
R16V003	Roadway Fugitives	2.07E-03	9.61E-04	A	5.08E-04	2.36E-04	A
R16V004	Roadway Fugitives	2.07E-03	9.61E-04	A	5.08E-04	2.36E-04	A
R17V001	Roadway Fugitives	1.78E-04	1.22E-04	A	4.36E-05	3.00E-05	A
R17V002	Roadway Fugitives	1.78E-04	1.22E-04	A	4.36E-05	3.00E-05	A
R17V003	Roadway Fugitives	1.78E-04	1.22E-04	A	4.36E-05	3.00E-05	A
R17V004	Roadway Fugitives	1.78E-04	1.22E-04	A	4.36E-05	3.00E-05	A
R18V001	Roadway Fugitives	3.51E-04	2.00E-04	A	8.61E-05	4.90E-05	A
R18V002	Roadway Fugitives	3.51E-04	2.00E-04	A	8.61E-05	4.90E-05	A
R18V003	Roadway Fugitives	3.51E-04	2.00E-04	A	8.61E-05	4.90E-05	A
R19V001	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R19V002	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R19V003	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R19V004	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R19V005	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R19V006	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R19V007	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R19V008	Roadway Fugitives	2.79E-04	1.30E-04	A	6.85E-05	3.19E-05	A
R20V001	Roadway Fugitives	7.36E-04	3.49E-04	A	1.81E-04	8.57E-05	A
R21V001	Roadway Fugitives	1.48E-03	1.36E-03	A	3.64E-04	3.35E-04	A
R21V002	Roadway Fugitives	1.48E-03	1.36E-03	A	3.64E-04	3.35E-04	A
R21V003	Roadway Fugitives	1.48E-03	1.36E-03	A	3.64E-04	3.35E-04	A
R21V004	Roadway Fugitives	1.48E-03	1.36E-03	A	3.64E-04	3.35E-04	A
R22V001	Roadway Fugitives	1.15E-03	1.06E-03	A	2.83E-04	2.60E-04	A
R22V002	Roadway Fugitives	1.15E-03	1.06E-03	A	2.83E-04	2.60E-04	A
R23V001	Roadway Fugitives	1.39E-03	1.28E-03	A	3.42E-04	3.14E-04	A
R23V002	Roadway Fugitives	1.39E-03	1.28E-03	A	3.42E-04	3.14E-04	A
R24V001	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V002	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V003	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V004	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.3. Modeled Emission Rates for AERMOD Modeling - Volume Sources[1]

Model ID	Emission Point Description	PM10 (lb/hr) [24-hr]	PM10 (lb/hr) [Ann.]	PM10 Basis	PM2.5 (lb/hr) [24-hr]	PM2.5 (lb/hr) [Ann.]	PM2.5 Basis
R24V005	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V006	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V007	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V008	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V009	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V010	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V011	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V012	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V013	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R24V014	Roadway Fugitives	9.07E-04	8.34E-04	A	2.23E-04	2.05E-04	A
R25V001	Roadway Fugitives	1.33E-03	1.23E-03	A	3.27E-04	3.01E-04	A
R25V002	Roadway Fugitives	1.33E-03	1.23E-03	A	3.27E-04	3.01E-04	A
R26V001	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V002	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V003	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V004	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V005	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V006	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V007	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V008	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V009	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V010	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R26V011	Roadway Fugitives	9.55E-04	8.78E-04	A	2.34E-04	2.16E-04	A
R27V001	Roadway Fugitives	2.54E-06	2.34E-06	A	6.25E-07	5.74E-07	A
R27V002	Roadway Fugitives	2.54E-06	2.34E-06	A	6.25E-07	5.74E-07	A
R27V003	Roadway Fugitives	2.54E-06	2.34E-06	A	6.25E-07	5.74E-07	A
R27V004	Roadway Fugitives	2.54E-06	2.34E-06	A	6.25E-07	5.74E-07	A
R27V005	Roadway Fugitives	2.54E-06	2.34E-06	A	6.25E-07	5.74E-07	A
R27V006	Roadway Fugitives	2.54E-06	2.34E-06	A	6.25E-07	5.74E-07	A
R28V001	Roadway Fugitives	1.86E-06	1.71E-06	A	4.56E-07	4.19E-07	A
R28V002	Roadway Fugitives	1.86E-06	1.71E-06	A	4.56E-07	4.19E-07	A
R28V003	Roadway Fugitives	1.86E-06	1.71E-06	A	4.56E-07	4.19E-07	A
R29V001	Roadway Fugitives	1.47E-06	1.35E-06	A	3.61E-07	3.32E-07	A
R29V002	Roadway Fugitives	1.47E-06	1.35E-06	A	3.61E-07	3.32E-07	A
R29V003	Roadway Fugitives	1.47E-06	1.35E-06	A	3.61E-07	3.32E-07	A
R29V004	Roadway Fugitives	1.47E-06	1.35E-06	A	3.61E-07	3.32E-07	A

B-3. Summary of Modeled Emission Rates - AERMOD Modeling

Table B-3.3. Modeled Emission Rates for AERMOD Modeling - Volume Sources[1]

Model ID	Emission Point Description	PM10 (lb/hr) [24-hr]	PM10 (lb/hr) [Ann.]	PM10 Basis	PM2.5 (lb/hr) [24-hr]	PM2.5 (lb/hr) [Ann.]	PM2.5 Basis
R30V001	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V002	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V003	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V004	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V005	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V006	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V007	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V008	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V009	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A
R30V010	Roadway Fugitives	1.91E-03	8.84E-04	A	4.68E-04	2.17E-04	A

1 Modeled hourly emission rates shown are based on the relevant averaging periods in brackets, and any clarifying notes to describe the basis of the modeled emission rates are provided below. For modeled emission rates based on maximum hourly or annual potential emissions, no clarifying notes are provided as this information is included within the potential emission calculations provided in the application.

Basis for Modeled Emission Rates

A = As shown in Section 16 of Appendix C to Volume 1 for the casting plant paved haul roads, the hourly emission rate modeled for annual averaging periods is based on the "average traffic rate" as opposed to the "maximum traffic rate" used for the 24-hr averaging periods. The average traffic rate reflects maximum annual operating rates for the casting expansion project, whereas the maximum traffic rate reflects peak hourly/daily operating rates for the casting expansion project that account for short-term variations in haul road-related operating variables.

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

CAS No.	Pollutant	Noncancer RSL (µg/m³)	Model ID:	002_1					003_1					004_1				
			Title V Emission Unit ID#:	EU002					EU003					EU004B				
			Emission Unit Description:	Heat Treat Furnace					Reheater Furnace					PTL - Acid Etch and Rinse				
			Emission Point Description:	Heat Treat Furnace Stack					Reheater Furnace Stack					Scrubber Stack				
			Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	5.0903					9.43771					9.11092				
			Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	--					--					--				
			Area Source Dimension (m²):	--					--					--				
			Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m²)]:	--					--					--				
				Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/ton solv.)	Process Rate (ton solv./hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)
Natural Gas Combustion TAPs																		
7440-38-2	Arsenic compounds	0.016		2.00E-04	0.033	8.43E-07	4.29E-06	2.68E-04	2.00E-04	7.53E-03	1.90E-07	1.79E-06	1.12E-04	--	--	--	--	--
7440-39-3	Barium	0.52		4.40E-03	0.033	1.85E-05	9.44E-05	1.82E-04	4.40E-03	7.53E-03	4.17E-06	3.94E-05	7.58E-05	--	--	--	--	--
71-43-2	Benzene	31		2.10E-03	0.033	8.85E-06	4.51E-05	1.45E-06	2.10E-03	7.53E-03	1.99E-06	1.88E-05	6.07E-07	--	--	--	--	--
50-32-8	Benzo(a)pyrene	0.0021		1.20E-06	0.033	5.06E-09	2.58E-08	1.23E-05	1.20E-06	7.53E-03	1.14E-09	1.07E-08	5.12E-06	--	--	--	--	--
7440-41-7	Beryllium and compounds	0.021		1.20E-05	0.033	5.06E-08	2.58E-07	1.23E-05	1.20E-05	7.53E-03	1.14E-08	1.07E-07	5.12E-06	--	--	--	--	--
7440-43-9	Cadmium and compounds	0.01		1.10E-03	0.033	4.64E-06	2.36E-05	2.36E-03	1.10E-03	7.53E-03	1.04E-06	9.85E-06	9.85E-04	--	--	--	--	--
7440-48-4	Cobalt and compounds	0.0063		8.40E-05	0.033	3.54E-07	1.80E-06	2.86E-04	8.40E-05	7.53E-03	7.97E-08	7.52E-07	1.19E-04	--	--	--	--	--
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830		1.20E-03	0.033	5.06E-06	2.58E-05	3.10E-08	1.20E-03	7.53E-03	1.14E-06	1.07E-05	1.29E-08	--	--	--	--	--
50-00-0	Formaldehyde	7.3		0.075	0.033	3.16E-04	1.61E-03	2.20E-04	0.075	7.53E-03	7.12E-05	6.72E-04	9.20E-05	--	--	--	--	--
110-54-3	Hexane	730		1.80	0.033	7.59E-03	3.86E-02	5.29E-05	1.80	7.53E-03	1.71E-03	1.61E-02	2.21E-05	--	--	--	--	--
7439-92-1	Lead and compounds	0.15		5.00E-04	0.033	2.11E-06	1.07E-05	7.15E-05	5.00E-04	7.53E-03	4.74E-07	4.48E-06	2.98E-05	--	--	--	--	--
7439-96-5	Manganese and compounds	0.052		3.80E-04	0.033	1.60E-06	8.15E-06	1.57E-04	3.80E-04	7.53E-03	3.61E-07	3.40E-06	6.54E-05	--	--	--	--	--
7439-97-6	Mercury and compounds	0.31		2.60E-04	0.033	1.10E-06	5.58E-06	1.80E-05	2.60E-04	7.53E-03	2.47E-07	2.33E-06	7.51E-06	--	--	--	--	--
91-20-3	Naphthalene	3.1		6.10E-04	0.033	2.57E-06	1.31E-05	4.22E-06	6.10E-04	7.53E-03	5.79E-07	5.46E-06	1.76E-06	--	--	--	--	--
7440-02-0	Nickel and compounds	0.01		2.10E-03	0.033	8.85E-06	4.51E-05	4.51E-03	2.10E-03	7.53E-03	1.99E-06	1.88E-05	1.88E-03	--	--	--	--	--
7782-49-2	Selenium and compounds	21		2.40E-05	0.033	1.01E-07	5.15E-07	2.45E-08	2.40E-05	7.53E-03	2.28E-08	2.15E-07	1.02E-08	--	--	--	--	--
108-88-3	Toluene	5,200		3.40E-03	0.033	1.43E-05	7.30E-05	1.40E-08	3.40E-03	7.53E-03	3.23E-06	3.04E-05	5.85E-09	--	--	--	--	--
7440-62-2	Vanadium	0.1		2.30E-03	0.033	9.70E-06	4.94E-05	4.94E-04	2.30E-03	7.53E-03	2.18E-06	2.06E-05	2.06E-04	--	--	--	--	--
Coil Finishing Process TAPs																		
7664-93-9	Sulfuric Acid	1		--	--	--	--	--	--	--	--	--	--	0.50	0.048	3.05E-03	0.028	0.028
67-63-0	Isopropanol	210		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Seconday Aluminum Process TAPs																		
7439-96-5	Manganese	0.052		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7440-62-2	Vanadium	0.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
			Source-wide or Site-wide Total Noncancer Risk	**8.65E-03**					**3.61E-03**					**0.028**				

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

		Model ID:	EXISMAIN					EXISSOU					**ISAW_AB**						
		Title V Emission Unit ID#:	**EU016; EU017; EU018; EU024; EU025**					EU024; EU025					045						
		Emission Unit Description:	**Existing Main Building Stencilers and Existing Main Building Heaters**					Existing Southwest Building Heaters					Ingot Saw						
		Emission Point Description:	Fugitive					Heating System Vent					Ingot Saw						
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³)**:**	--					--					**10.58602**						
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³)**:**	1.83803					4.50886					--						
		Area Source Dimension (m^2)**:**	39,403					8,013					--						
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]**:**	2.54E-05					1.25E-04					--						
CAS No.	**Pollutant**	**Noncancer RSL** (µg/m³)	**Emission Factor** (lbMMscf or lb/ton solv.)	**Process Rate** (MMscf/hr or ton solv./hr)	**Emission Rate** ($g/s/m^2$)	**Calc. Amb. Conc.** (µg/m³)	**Noncancer Risk** (--)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** ($g/s/m^2$)	**Calc. Amb. Conc.** (µg/m³)	**Noncancer Risk** (--)	**Emission Factor** (lb/ton)	**Process Rate** (ton/hr)	**Emission Rate** (g/s)	**Calc. Amb. Conc.** (µg/m³)	**Noncancer Risk** (--)		
Natural Gas Combustion TAPs																			
7440-38-2	Arsenic compounds	0.016	2.00E-04	0.034	2.21E-11	1.60E-06	9.99E-05	2.00E-04	7.02E-03	2.21E-11	7.97E-07	4.98E-05	--	--	--	--	--		
7440-39-3	Barium	0.52	4.40E-03	0.034	4.85E-10	3.52E-05	6.76E-05	4.40E-03	7.02E-03	4.85E-10	1.75E-05	3.37E-05	--	--	--	--	--		
71-43-2	Benzene	31	2.10E-03	0.034	2.32E-10	1.68E-05	5.41E-07	2.10E-03	7.02E-03	2.32E-10	8.37E-06	2.70E-07	--	--	--	--	--		
50-32-8	Benzo(a)pyrene	0.0021	1.20E-06	0.034	1.32E-13	9.59E-09	4.57E-06	1.20E-06	7.02E-03	1.32E-13	4.78E-09	2.28E-06	--	--	--	--	--		
7440-41-7	Beryllium and compounds	0.021	1.20E-05	0.034	1.32E-12	9.59E-08	4.57E-06	1.20E-05	7.02E-03	1.32E-12	4.78E-08	2.28E-06	--	--	--	--	--		
7440-43-9	Cadmium and compounds	0.01	1.10E-03	0.034	1.21E-10	8.79E-06	8.79E-04	1.10E-03	7.02E-03	1.21E-10	4.38E-06	4.38E-04	--	--	--	--	--		
7440-48-4	Cobalt and compounds	0.0063	8.40E-05	0.034	9.27E-12	6.71E-07	1.07E-04	8.40E-05	7.02E-03	9.27E-12	3.35E-07	5.31E-05	--	--	--	--	--		
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830	1.20E-03	0.034	1.32E-10	9.59E-06	1.16E-08	1.20E-03	7.02E-03	1.32E-10	4.78E-06	5.76E-09	--	--	--	--	--		
50-00-0	Formaldehyde	**7.3**	7.50E-02	0.034	8.27E-09	5.99E-04	8.21E-05	7.50E-02	7.02E-03	8.27E-09	2.99E-04	4.09E-05	--	--	--	--	--		
110-54-3	Hexane	730	1.80E+00	0.034	1.99E-07	1.44E-02	1.97E-05	1.80E+00	7.02E-03	1.99E-07	7.17E-03	9.83E-06	--	--	--	--	--		
7439-92-1	Lead and compounds	0.15	5.00E-04	0.034	5.52E-11	3.99E-06	2.66E-05	5.00E-04	7.02E-03	5.52E-11	1.99E-06	1.33E-05	--	--	--	--	--		
7439-96-5	Manganese and compounds	0.052	3.80E-04	0.034	4.19E-11	3.04E-06	5.84E-05	3.80E-04	7.02E-03	4.19E-11	1.51E-06	2.91E-05	--	--	--	--	--		
7439-97-6	Mercury and compounds	0.31	2.60E-04	0.034	2.87E-11	2.08E-06	6.70E-06	2.60E-04	7.02E-03	2.87E-11	1.04E-06	3.34E-06	--	--	--	--	--		
91-20-3	Naphthalene	3.1	6.10E-04	0.034	6.73E-11	4.87E-06	1.57E-06	6.10E-04	7.02E-03	6.73E-11	2.43E-06	7.84E-07	--	--	--	--	--		
7440-02-0	Nickel and compounds	0.01	2.10E-03	0.034	2.32E-10	1.68E-05	1.68E-03	2.10E-03	7.02E-03	2.32E-10	8.37E-06	8.37E-04	--	--	--	--	--		
7782-49-2	Selenium and compounds	21	2.40E-05	0.034	2.65E-12	1.92E-07	9.13E-09	2.40E-05	7.02E-03	2.65E-12	9.56E-08	4.55E-09	--	--	--	--	--		
108-88-3	Toluene	5,200	3.40E-03	0.034	3.75E-10	2.72E-05	5.22E-09	3.40E-03	7.02E-03	3.75E-10	1.36E-05	2.61E-09	--	--	--	--	--		
7440-62-2	Vanadium	0.1	2.30E-03	0.034	2.54E-10	1.84E-05	1.84E-04	2.30E-03	7.02E-03	2.54E-10	9.17E-06	9.17E-05	--	--	--	--	--		
Coil Finishing Process TAPs																			
7664-93-9	Sulfuric Acid	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
67-63-0	Isopropanol	210	193.0	2.11E-03	1.30E-06	9.43E-02	4.49E-04	--	--	--	--	--	--	--	--	--	--		
Seconday Aluminum Process TAPs																			
7439-96-5	Manganese	0.052	--	--	--	--	--	--	--	--	--	--	1.53E-06	72.27	1.39E-05	1.47E-04	2.83E-03		
7440-62-2	Vanadium	0.1	--	--	--	--	--	--	--	--	--	--	6.10E-07	72.27	5.56E-06	5.88E-05	5.88E-04		
		Source-wide or Site-wide Total Noncancer Risk	**3.67E-03**					**1.61E-03**					**0.003**						

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

CAS No.	Pollutant	Noncancer RSL (µg/m³)	Model ID:	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m²)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf or lb/ton)	Process Rate (MMscf/hr or lb/ton)	Emission Rate (g/s/m²)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)
			Title V Emission Unit ID#:	037					041a; 041b; IA-15					041a; 041b				
			Emission Unit Description:	Sow Dryer					Hot End Building Building Heating Systems & Hot End Fugitives for Molten Metal Utility Heaters					Cold End Building Heating Systems				
			Emission Point Description:	Sow Dryer Stack					Building Fugitives					Heating System Vent				
			Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	2.78886					--					--				
			Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	--					1.83727					4.26224				
			Area Source Dimension (m²):	--					10,687					25,301				
			Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m²)]:	--					9.36E-05					3.95E-05				
Natural Gas Combustion TAPs																		
7440-38-2	Arsenic compounds	0.016		2.00E-04	0.016	4.03E-07	1.12E-06	7.03E-05	2.00E-04	9.59E-04	2.26E-12	4.44E-08	2.78E-06	2.00E-04	4.00E-04	3.98E-13	4.30E-08	2.69E-06
7440-39-3	Barium	0.52		4.40E-03	0.016	8.87E-06	2.47E-05	4.76E-05	4.40E-03	9.59E-04	4.98E-11	9.77E-07	1.88E-06	4.40E-03	4.00E-04	8.76E-12	9.45E-07	1.82E-06
71-43-2	Benzene	31		2.10E-03	0.016	4.23E-06	1.18E-05	3.81E-07	2.10E-03	9.59E-04	2.38E-11	4.66E-07	1.50E-08	2.10E-03	4.00E-04	4.18E-12	4.51E-07	1.46E-08
50-32-8	Benzo(a)pyrene	0.0021		1.20E-06	0.016	2.42E-09	6.75E-09	3.21E-06	1.20E-06	9.59E-04	1.36E-14	2.67E-10	1.27E-07	1.20E-06	4.00E-04	2.39E-15	2.58E-10	1.23E-07
7440-41-7	Beryllium and compounds	0.021		1.20E-05	0.016	2.42E-08	6.75E-08	3.21E-06	1.20E-05	9.59E-04	1.36E-13	2.67E-09	1.27E-07	1.20E-05	4.00E-04	2.39E-14	2.58E-09	1.23E-07
7440-43-9	Cadmium and compounds	0.01		1.10E-03	0.016	2.22E-06	6.18E-06	6.18E-04	1.10E-03	9.59E-04	1.24E-11	2.44E-07	2.44E-05	1.10E-03	4.00E-04	2.19E-12	2.36E-07	2.36E-05
7440-48-4	Cobalt and compounds	0.0063		8.40E-05	0.016	1.69E-07	4.72E-07	7.50E-05	8.40E-05	9.59E-04	9.50E-13	1.87E-08	2.96E-06	8.40E-05	4.00E-04	1.67E-13	1.80E-08	2.86E-06
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830		1.20E-03	0.016	2.42E-06	6.75E-06	8.13E-09	1.20E-03	9.59E-04	1.36E-11	2.67E-07	3.21E-10	1.20E-03	4.00E-04	2.39E-12	2.58E-07	3.11E-10
50-00-0	Formaldehyde	7.3		0.075	0.016	1.51E-04	4.22E-04	5.78E-05	0.075	9.59E-04	8.48E-10	1.67E-05	2.28E-06	0.075	4.00E-04	1.49E-10	1.61E-05	2.21E-06
110-54-3	Hexane	730		1.80	0.016	3.63E-03	1.01E-02	1.39E-05	1.80	9.59E-04	2.04E-08	4.00E-04	5.48E-07	1.80	4.00E-04	3.59E-09	3.87E-04	5.30E-07
7439-92-1	Lead and compounds	0.15		5.00E-04	0.016	1.01E-06	2.81E-06	1.87E-05	5.00E-04	9.59E-04	5.66E-12	1.11E-07	7.40E-07	5.00E-04	4.00E-04	9.96E-13	1.07E-07	7.16E-07
7439-96-5	Manganese and compounds	0.052		3.80E-04	0.016	7.66E-07	2.14E-06	4.11E-05	3.80E-04	9.59E-04	4.30E-12	8.44E-08	1.62E-06	3.80E-04	4.00E-04	7.57E-13	8.16E-08	1.57E-06
7439-97-6	Mercury and compounds	0.31		2.60E-04	0.016	5.24E-07	1.46E-06	4.72E-06	2.60E-04	9.59E-04	2.94E-12	5.77E-08	1.86E-07	2.60E-04	4.00E-04	5.18E-13	5.59E-08	1.80E-07
91-20-3	Naphthalene	3.1		6.10E-04	0.016	1.23E-06	3.43E-06	1.11E-06	6.10E-04	9.59E-04	6.90E-12	1.35E-07	4.37E-08	6.10E-04	4.00E-04	1.22E-12	1.31E-07	4.23E-08
7440-02-0	Nickel and compounds	0.01		2.10E-03	0.016	4.23E-06	1.18E-05	1.18E-03	2.10E-03	9.59E-04	2.38E-11	4.66E-07	4.66E-05	2.10E-03	4.00E-04	4.18E-12	4.51E-07	4.51E-05
7782-49-2	Selenium and compounds	21		2.40E-05	0.016	4.84E-08	1.35E-07	6.43E-09	2.40E-05	9.59E-04	2.71E-13	5.33E-09	2.54E-10	2.40E-05	4.00E-04	4.78E-14	5.16E-09	2.45E-10
108-88-3	Toluene	5,200		3.40E-03	0.016	6.85E-06	1.91E-05	3.68E-09	3.40E-03	9.59E-04	3.85E-11	7.55E-07	1.45E-10	3.40E-03	4.00E-04	6.77E-12	7.30E-07	1.40E-10
7440-62-2	Vanadium	0.1		2.30E-03	0.016	4.64E-06	1.29E-05	1.29E-04	2.30E-03	9.59E-04	2.60E-11	5.11E-07	5.11E-06	2.30E-03	4.00E-04	4.58E-12	4.94E-07	4.94E-06
Coil Finishing Process TAPs																		
7664-93-9	Sulfuric Acid	1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
67-63-0	Isopropanol	210		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Seconday Aluminum Process TAPs																		
7439-96-5	Manganese	0.052		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7440-62-2	Vanadium	0.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
			Source-wide or Site-wide Total Noncancer Risk	2.27E-03					8.95E-05					8.66E-05				

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

		Model ID:	ADMNF					HVSCPF					COOLF				
		Title V Emission Unit ID#:	041a; 041b					041a; 041b					041a; 041b				
		Emission Unit Description:	Administration Building Heating Systems					Heavy Scrap Storage Building Building Heating Systems					Cooling Water Building Heating Systems				
		Emission Point Description:	Heating System Vent					Heating System Vent					Cooling Water Building Fugitives				
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s ($\mu g/m^3$):	--					--					--				
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. ($\mu g/m^3$):	40.74678					3.56516					40.90323				
		Area Source Dimension (m^2):	1,088					5,113					425				
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	9.19E-04					1.96E-04					2.35E-03				
CAS No.	**Pollutant**	**Noncancer RSL** ($\mu g/m^3$)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** ($g/s/m^2$)	**Calc. Amb. Conc.** ($\mu g/m^3$)	**Noncancer Risk** (--)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** ($g/s/m^2$)	**Calc. Amb. Conc.** ($\mu g/m^3$)	**Noncancer Risk** (--)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** ($g/s/m^2$)	**Calc. Amb. Conc.** ($\mu g/m^3$)	**Noncancer Risk** (--)
Natural Gas Combustion TAPs																	
7440-38-2	Arsenic compounds	0.016	2.00E-04	6.20E-04	1.44E-11	6.37E-07	3.98E-05	2.00E-04	6.00E-05	2.96E-13	5.39E-09	3.37E-07	2.00E-04	4.85E-04	2.87E-11	5.00E-07	3.12E-05
7440-39-3	Barium	0.52	4.40E-03	6.20E-04	3.16E-10	1.40E-05	2.69E-05	4.40E-03	6.00E-05	6.51E-12	1.19E-07	2.28E-07	4.40E-03	4.85E-04	6.32E-10	1.10E-05	2.11E-05
71-43-2	Benzene	31	2.10E-03	6.20E-04	1.51E-10	6.68E-06	2.16E-07	2.10E-03	6.00E-05	3.10E-12	5.66E-08	1.83E-09	2.10E-03	4.85E-04	3.02E-10	5.25E-06	1.69E-07
50-32-8	Benzo(a)pyrene	0.0021	1.20E-06	6.20E-04	8.61E-14	3.82E-09	1.82E-06	1.20E-06	6.00E-05	1.77E-15	3.23E-11	1.54E-08	1.20E-06	4.85E-04	1.72E-13	3.00E-09	1.43E-06
7440-41-7	Beryllium and compounds	0.021	1.20E-05	6.20E-04	8.61E-13	3.82E-08	1.82E-06	1.20E-05	6.00E-05	1.77E-14	3.23E-10	1.54E-08	1.20E-05	4.85E-04	1.72E-12	3.00E-08	1.43E-06
7440-43-9	Cadmium and compounds	0.01	1.10E-03	6.20E-04	7.90E-11	3.50E-06	3.50E-04	1.10E-03	6.00E-05	1.63E-12	2.96E-08	2.96E-06	1.10E-03	4.85E-04	1.58E-10	2.75E-06	2.75E-04
7440-48-4	Cobalt and compounds	0.0063	8.40E-05	6.20E-04	6.03E-12	2.67E-07	4.24E-05	8.40E-05	6.00E-05	1.24E-13	2.26E-09	3.59E-07	8.40E-05	4.85E-04	1.21E-11	2.10E-07	3.33E-05
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830	1.20E-03	6.20E-04	8.61E-11	3.82E-06	4.60E-09	1.20E-03	6.00E-05	1.77E-12	3.23E-08	3.90E-11	1.20E-03	4.85E-04	1.72E-10	3.00E-06	3.61E-09
50-00-0	Formaldehyde	7.3	0.075	6.20E-04	5.38E-09	2.39E-04	3.27E-05	0.075	6.00E-05	1.11E-10	2.02E-06	2.77E-07	0.075	4.85E-04	1.08E-08	1.87E-04	2.57E-05
110-54-3	Hexane	730	1.80	6.20E-04	1.29E-07	5.73E-03	7.85E-06	1.80	6.00E-05	2.66E-09	4.85E-05	6.65E-08	1.80	4.85E-04	2.59E-07	4.50E-03	6.16E-06
7439-92-1	Lead and compounds	0.15	5.00E-04	6.20E-04	3.59E-11	1.59E-06	1.06E-05	5.00E-04	6.00E-05	7.39E-13	1.35E-08	8.98E-08	5.00E-04	4.85E-04	7.19E-11	1.25E-06	8.33E-06
7439-96-5	Manganese and compounds	0.052	3.80E-04	6.20E-04	2.73E-11	1.21E-06	2.33E-05	3.80E-04	6.00E-05	5.62E-13	1.02E-08	1.97E-07	3.80E-04	4.85E-04	5.46E-11	9.50E-07	1.83E-05
7439-97-6	Mercury and compounds	0.31	2.60E-04	6.20E-04	1.87E-11	8.28E-07	2.67E-06	2.60E-04	6.00E-05	3.84E-13	7.01E-09	2.26E-08	2.60E-04	4.85E-04	3.74E-11	6.50E-07	2.10E-06
91-20-3	Naphthalene	3.1	6.10E-04	6.20E-04	4.38E-11	1.94E-06	6.26E-07	6.10E-04	6.00E-05	9.02E-13	1.64E-08	5.30E-09	6.10E-04	4.85E-04	8.77E-11	1.52E-06	4.92E-07
7440-02-0	Nickel and compounds	0.01	2.10E-03	6.20E-04	1.51E-10	6.68E-06	6.68E-04	2.10E-03	6.00E-05	3.10E-12	5.66E-08	5.66E-06	2.10E-03	4.85E-04	3.02E-10	5.25E-06	5.25E-04
7782-49-2	Selenium and compounds	21	2.40E-05	6.20E-04	1.72E-12	7.64E-08	3.64E-09	2.40E-05	6.00E-05	3.55E-14	6.47E-10	3.08E-11	2.40E-05	4.85E-04	3.45E-12	6.00E-08	2.86E-09
108-88-3	Toluene	5,200	3.40E-03	6.20E-04	2.44E-10	1.08E-05	2.08E-09	3.40E-03	6.00E-05	5.03E-12	9.16E-08	1.76E-11	3.40E-03	4.85E-04	4.89E-10	8.50E-06	1.63E-09
7440-62-2	Vanadium	0.1	2.30E-03	6.20E-04	1.65E-10	7.32E-06	7.32E-05	2.30E-03	6.00E-05	3.40E-12	6.20E-08	6.20E-07	2.30E-03	4.85E-04	3.31E-10	5.75E-06	5.75E-05
Coil Finishing Process TAPs																	
7664-93-9	Sulfuric Acid	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
67-63-0	Isopropanol	210	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Seconday Aluminum Process TAPs																	
7439-96-5	Manganese	0.052	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7440-62-2	Vanadium	0.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Source-wide or Site-wide Total Noncancer Risk	**1.28E-03**					**1.09E-05**					**1.01E-03**				

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

CAS No.	Pollutant	Noncancer RSL (µg/m³)	Model ID:	MOLDF					HEMAINTF				
			Title V Emission Unit ID#:	041a; 041b					041a; 041b				
			Emission Unit Description:	Mold Room Buildings Heating Systems					Hot End Maintenance Building Heating Systems				
			Emission Point Description:	Mold Room Buildings Fugitives					Hot End Maintenance Building Fugitives				
			Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--				
			Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	23.00952					33.148				
			Area Source Dimension (m^2):	807					1,584				
			Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	1.24E-03					6.31E-04				
				Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate ($g/s/m^2$)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate ($g/s/m^2$)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)
Natural Gas Combustion TAPs													
7440-38-2	Arsenic compounds	0.016		2.00E-04	1.87E-04	5.84E-12	1.08E-07	6.78E-06	2.00E-04	1.10E-03	1.74E-11	9.15E-07	5.72E-05
7440-39-3	Barium	0.52		4.40E-03	1.87E-04	1.28E-10	2.39E-06	4.59E-06	4.40E-03	1.10E-03	3.83E-10	2.01E-05	3.87E-05
71-43-2	Benzene	31		2.10E-03	1.87E-04	6.13E-11	1.14E-06	3.67E-08	2.10E-03	1.10E-03	1.83E-10	9.60E-06	3.10E-07
50-32-8	Benzo(a)pyrene	0.0021		1.20E-06	1.87E-04	3.50E-14	6.51E-10	3.10E-07	1.20E-06	1.10E-03	1.05E-13	5.49E-09	2.61E-06
7440-41-7	Beryllium and compounds	0.021		1.20E-05	1.87E-04	3.50E-13	6.51E-09	3.10E-07	1.20E-05	1.10E-03	1.05E-12	5.49E-08	2.61E-06
7440-43-9	Cadmium and compounds	0.01		1.10E-03	1.87E-04	3.21E-11	5.96E-07	5.96E-05	1.10E-03	1.10E-03	9.58E-11	5.03E-06	5.03E-04
7440-48-4	Cobalt and compounds	0.0063		8.40E-05	1.87E-04	2.45E-12	4.55E-08	7.23E-06	8.40E-05	1.10E-03	7.32E-12	3.84E-07	6.10E-05
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830		1.20E-03	1.87E-04	3.50E-11	6.51E-07	7.84E-10	1.20E-03	1.10E-03	1.05E-10	5.49E-06	6.61E-09
50-00-0	Formaldehyde	7.3		0.075	1.87E-04	2.19E-09	4.07E-05	5.57E-06	0.075	1.10E-03	6.53E-09	3.43E-04	4.70E-05
110-54-3	Hexane	730		1.80	1.87E-04	5.25E-08	9.76E-04	1.34E-06	1.80	1.10E-03	1.57E-07	8.23E-03	1.13E-05
7439-92-1	Lead and compounds	0.15		5.00E-04	1.87E-04	1.46E-11	2.71E-07	1.81E-06	5.00E-04	1.10E-03	4.36E-11	2.29E-06	1.52E-05
7439-96-5	Manganese and compounds	0.052		3.80E-04	1.87E-04	1.11E-11	2.06E-07	3.96E-06	3.80E-04	1.10E-03	3.31E-11	1.74E-06	3.34E-05
7439-97-6	Mercury and compounds	0.31		2.60E-04	1.87E-04	7.59E-12	1.41E-07	4.55E-07	2.60E-04	1.10E-03	2.26E-11	1.19E-06	3.84E-06
91-20-3	Naphthalene	3.1		6.10E-04	1.87E-04	1.78E-11	3.31E-07	1.07E-07	6.10E-04	1.10E-03	5.31E-11	2.79E-06	9.00E-07
7440-02-0	Nickel and compounds	0.01		2.10E-03	1.87E-04	6.13E-11	1.14E-06	1.14E-04	2.10E-03	1.10E-03	1.83E-10	9.60E-06	9.60E-04
7782-49-2	Selenium and compounds	21		2.40E-05	1.87E-04	7.01E-13	1.30E-08	6.20E-10	2.40E-05	1.10E-03	2.09E-12	1.10E-07	5.23E-09
108-88-3	Toluene	5,200		3.40E-03	1.87E-04	9.93E-11	1.84E-06	3.54E-10	3.40E-03	1.10E-03	2.96E-10	1.55E-05	2.99E-09
7440-62-2	Vanadium	0.1		2.30E-03	1.87E-04	6.71E-11	1.25E-06	1.25E-05	2.30E-03	1.10E-03	2.00E-10	1.05E-05	1.05E-04
Coil Finishing Process TAPs													
7664-93-9	Sulfuric Acid	1		--	--	--	--	--	--	--	--	--	--
67-63-0	Isopropanol	210		--	--	--	--	--	--	--	--	--	--
Seconday Aluminum Process TAPs													
7439-96-5	Manganese	0.052		--	--	--	--	--	--	--	--	--	--
7440-62-2	Vanadium	0.1		--	--	--	--	--	--	--	--	--	--
			Source-wide or Site-wide Total Noncancer Risk	2.18E-04					1.84E-03				

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

CAS No.	Pollutant	Noncancer RSL (µg/m³)	Model ID:	CASTRF					CEELECF					CEMAINTF				
			Title V Emission Unit ID#:	041a; 041b; 046a; IA-15					041a; 041b					041a; 041b				
			Emission Unit Description:	Caster Area Building Heating Systems, Casting Process Emission Sources - CFF Preheater & Caster Area Fugitives for Molten Metal Utility Heaters					Cold End Electrical Room Heating Systems					Cold End Maintenance Building Heating Systems				
			Emission Point Description:	Caster Area Fugitives					Cold End Electrical Room Fugitives					Cold End Maintenance Fugitives				
			Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--					--				
			Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	2.40387					27.07635					13.69247				
			Area Source Dimension (m²):	7,139					1,303					3,180				
			Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m²)]:	1.40E-04					7.67E-04					3.14E-04				
				Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m²)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m²)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m²)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)
Natural Gas Combustion TAPs																		
7440-38-2	Arsenic compounds	0.016		2.00E-04	1.29E-02	4.55E-11	7.80E-07	4.88E-05	2.00E-04	1.29E-03	2.49E-11	8.80E-07	5.50E-05	2.00E-04	9.30E-04	7.37E-12	3.21E-07	2.01E-05
7440-39-3	Barium	0.52		4.40E-03	1.29E-02	1.00E-09	1.72E-05	3.30E-05	4.40E-03	1.29E-03	5.49E-10	1.94E-05	3.72E-05	4.40E-03	9.30E-04	1.62E-10	7.06E-06	1.36E-05
71-43-2	Benzene	31		2.10E-03	1.29E-02	4.77E-10	8.19E-06	2.64E-07	2.10E-03	1.29E-03	2.62E-10	9.24E-06	2.98E-07	2.10E-03	9.30E-04	7.74E-11	3.37E-06	1.09E-07
50-32-8	Benzo(a)pyrene	0.0021		1.20E-06	1.29E-02	2.73E-13	4.68E-09	2.23E-06	1.20E-06	1.29E-03	1.50E-13	5.28E-09	2.51E-06	1.20E-06	9.30E-04	4.42E-14	1.93E-09	9.17E-07
7440-41-7	Beryllium and compounds	0.021		1.20E-05	1.29E-02	2.73E-12	4.68E-08	2.23E-06	1.20E-05	1.29E-03	1.50E-12	5.28E-08	2.51E-06	1.20E-05	9.30E-04	4.42E-13	1.93E-08	9.17E-07
7440-43-9	Cadmium and compounds	0.01		1.10E-03	1.29E-02	2.50E-10	4.29E-06	4.29E-04	1.10E-03	1.29E-03	1.37E-10	4.84E-06	4.84E-04	1.10E-03	9.30E-04	4.05E-11	1.76E-06	1.76E-04
7440-48-4	Cobalt and compounds	0.0063		8.40E-05	1.29E-02	1.91E-11	3.28E-07	5.20E-05	8.40E-05	1.29E-03	1.05E-11	3.70E-07	5.87E-05	8.40E-05	9.30E-04	3.10E-12	1.35E-07	2.14E-05
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830		1.20E-03	1.29E-02	2.73E-10	4.68E-06	5.64E-09	1.20E-03	1.29E-03	1.50E-10	5.28E-06	6.36E-09	1.20E-03	9.30E-04	4.42E-11	1.93E-06	2.32E-09
50-00-0	Formaldehyde	7.3		0.075	1.29E-02	1.71E-08	2.93E-04	4.01E-05	0.075	1.29E-03	9.35E-09	3.30E-04	4.52E-05	0.075	9.30E-04	2.76E-09	1.20E-04	1.65E-05
110-54-3	Hexane	730		1.80	1.29E-02	4.09E-07	7.02E-03	9.62E-06	1.80	1.29E-03	2.24E-07	7.92E-03	1.09E-05	1.80	9.30E-04	6.63E-08	2.89E-03	3.96E-06
7439-92-1	Lead and compounds	0.15		5.00E-04	1.29E-02	1.14E-10	1.95E-06	1.30E-05	5.00E-04	1.29E-03	6.24E-11	2.20E-06	1.47E-05	5.00E-04	9.30E-04	1.84E-11	8.02E-07	5.35E-06
7439-96-5	Manganese and compounds	0.052		3.80E-04	1.29E-02	8.64E-11	1.48E-06	2.85E-05	3.80E-04	1.29E-03	4.74E-11	1.67E-06	3.22E-05	3.80E-04	9.30E-04	1.40E-11	6.10E-07	1.17E-05
7439-97-6	Mercury and compounds	0.31		2.60E-04	1.29E-02	5.91E-11	1.01E-06	3.27E-06	2.60E-04	1.29E-03	3.24E-11	1.14E-06	3.69E-06	2.60E-04	9.30E-04	9.58E-12	4.17E-07	1.35E-06
91-20-3	Naphthalene	3.1		6.10E-04	1.29E-02	1.39E-10	2.38E-06	7.68E-07	6.10E-04	1.29E-03	7.61E-11	2.68E-06	8.66E-07	6.10E-04	9.30E-04	2.25E-11	9.79E-07	3.16E-07
7440-02-0	Nickel and compounds	0.01		2.10E-03	1.29E-02	4.77E-10	8.19E-06	8.19E-04	2.10E-03	1.29E-03	2.62E-10	9.24E-06	9.24E-04	2.10E-03	9.30E-04	7.74E-11	3.37E-06	3.37E-04
7782-49-2	Selenium and compounds	21		2.40E-05	1.29E-02	5.46E-12	9.36E-08	4.46E-09	2.40E-05	1.29E-03	2.99E-12	1.06E-07	5.03E-09	2.40E-05	9.30E-04	8.84E-13	3.85E-08	1.83E-09
108-88-3	Toluene	5,200		3.40E-03	1.29E-02	7.73E-10	1.33E-05	2.55E-09	3.40E-03	1.29E-03	4.24E-10	1.50E-05	2.88E-09	3.40E-03	9.30E-04	1.25E-10	5.46E-06	1.05E-09
7440-62-2	Vanadium	0.1		2.30E-03	1.29E-02	5.23E-10	8.97E-06	8.97E-05	2.30E-03	1.29E-03	2.87E-10	1.01E-05	1.01E-04	2.30E-03	9.30E-04	8.47E-11	3.69E-06	3.69E-05
Coil Finishing Process TAPs																		
7664-93-9	Sulfuric Acid	1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
67-63-0	Isopropanol	210		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Seconday Aluminum Process TAPs																		
7439-96-5	Manganese	0.052		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7440-62-2	Vanadium	0.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
			Source-wide or Site-wide Total Noncancer Risk	1.57E-03					1.77E-03					6.46E-04				

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

CAS No.	Pollutant	Noncancer RSL (µg/m³)	Model ID:	CLARSTOF					HTERF					INGSAWF				
			Title V Emission Unit ID#:	041a; 041b					041a; 041b					041a; 041b				
			Emission Unit Description:	Chlorine & Argon Storage Heating Systems					Hot End Electrical Room Heating Systems					Ingot Saw Building Heating Systems				
			Emission Point Description:	Chlorine & Argon Storage Fugitives					Hot End Electrical Room Fugitives					Ingot Saw Building Fugitives				
			Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--					--				
			Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	33.02659					21.9377					18.79897				
			Area Source Dimension (m^2):	47					604					656				
			Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	2.11E-02					1.66E-03					1.52E-03				
				Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^2)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^2)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^2)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)
Natural Gas Combustion TAPs																		
7440-38-2	Arsenic compounds	0.016		2.00E-04	1.50E-04	7.99E-11	1.25E-07	7.81E-06	2.00E-04	6.80E-04	2.84E-11	3.76E-07	2.35E-05	2.00E-04	2.10E-03	8.07E-11	9.95E-07	6.22E-05
7440-39-3	Barium	0.52		4.40E-03	1.50E-04	1.76E-09	2.75E-06	5.29E-06	4.40E-03	6.80E-04	6.24E-10	8.27E-06	1.59E-05	4.40E-03	2.10E-03	1.78E-09	2.19E-05	4.21E-05
71-43-2	Benzene	31		2.10E-03	1.50E-04	8.39E-10	1.31E-06	4.23E-08	2.10E-03	6.80E-04	2.98E-10	3.95E-06	1.27E-07	2.10E-03	2.10E-03	8.47E-10	1.04E-05	3.37E-07
50-32-8	Benzo(a)pyrene	0.0021		1.20E-06	1.50E-04	4.80E-13	7.50E-10	3.57E-07	1.20E-06	6.80E-04	1.70E-13	2.26E-09	1.07E-06	1.20E-06	2.10E-03	4.84E-13	5.97E-09	2.84E-06
7440-41-7	Beryllium and compounds	0.021		1.20E-05	1.50E-04	4.80E-12	7.50E-09	3.57E-07	1.20E-05	6.80E-04	1.70E-12	2.26E-08	1.07E-06	1.20E-05	2.10E-03	4.84E-12	5.97E-08	2.84E-06
7440-43-9	Cadmium and compounds	0.01		1.10E-03	1.50E-04	4.40E-10	6.88E-07	6.88E-05	1.10E-03	6.80E-04	1.56E-10	2.07E-06	2.07E-04	1.10E-03	2.10E-03	4.44E-10	5.47E-06	5.47E-04
7440-48-4	Cobalt and compounds	0.0063		8.40E-05	1.50E-04	3.36E-11	5.25E-08	8.33E-06	8.40E-05	6.80E-04	1.19E-11	1.58E-07	2.51E-05	8.40E-05	2.10E-03	3.39E-11	4.18E-07	6.63E-05
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830		1.20E-03	1.50E-04	4.80E-10	7.50E-07	9.04E-10	1.20E-03	6.80E-04	1.70E-10	2.26E-06	2.72E-09	1.20E-03	2.10E-03	4.84E-10	5.97E-06	7.19E-09
50-00-0	Formaldehyde	7.3		0.075	1.50E-04	3.00E-08	4.69E-05	6.42E-06	0.075	6.80E-04	1.06E-08	1.41E-04	1.93E-05	0.075	2.10E-03	3.03E-08	3.73E-04	5.11E-05
110-54-3	Hexane	730		1.80	1.50E-04	7.19E-07	1.13E-03	1.54E-06	1.80	6.80E-04	2.55E-07	3.38E-03	4.63E-06	1.80	2.10E-03	7.26E-07	8.95E-03	1.23E-05
7439-92-1	Lead and compounds	0.15		5.00E-04	1.50E-04	2.00E-10	3.13E-07	2.08E-06	5.00E-04	6.80E-04	7.10E-11	9.40E-07	6.27E-06	5.00E-04	2.10E-03	2.02E-10	2.49E-06	1.66E-05
7439-96-5	Manganese and compounds	0.052		3.80E-04	1.50E-04	1.52E-10	2.38E-07	4.57E-06	3.80E-04	6.80E-04	5.39E-11	7.14E-07	1.37E-05	3.80E-04	2.10E-03	1.53E-10	1.89E-06	3.63E-05
7439-97-6	Mercury and compounds	0.31		2.60E-04	1.50E-04	1.04E-10	1.63E-07	5.24E-07	2.60E-04	6.80E-04	3.69E-11	4.89E-07	1.58E-06	2.60E-04	2.10E-03	1.05E-10	1.29E-06	4.17E-06
91-20-3	Naphthalene	3.1		6.10E-04	1.50E-04	2.44E-10	3.81E-07	1.23E-07	6.10E-04	6.80E-04	8.66E-11	1.15E-06	3.70E-07	6.10E-04	2.10E-03	2.46E-10	3.03E-06	9.79E-07
7440-02-0	Nickel and compounds	0.01		2.10E-03	1.50E-04	8.39E-10	1.31E-06	1.31E-04	2.10E-03	6.80E-04	2.98E-10	3.95E-06	3.95E-04	2.10E-03	2.10E-03	8.47E-10	1.04E-05	1.04E-03
7782-49-2	Selenium and compounds	21		2.40E-05	1.50E-04	9.59E-12	1.50E-08	7.14E-10	2.40E-05	6.80E-04	3.41E-12	4.51E-08	2.15E-09	2.40E-05	2.10E-03	9.68E-12	1.19E-07	5.68E-09
108-88-3	Toluene	5,200		3.40E-03	1.50E-04	1.36E-09	2.13E-06	4.09E-10	3.40E-03	6.80E-04	4.83E-10	6.39E-06	1.23E-09	3.40E-03	2.10E-03	1.37E-09	1.69E-05	3.25E-09
7440-62-2	Vanadium	0.1		2.30E-03	1.50E-04	9.19E-10	1.44E-06	1.44E-05	2.30E-03	6.80E-04	3.26E-10	4.32E-06	4.32E-05	2.30E-03	2.10E-03	9.28E-10	1.14E-05	1.14E-04
Coil Finishing Process TAPs																		
7664-93-9	Sulfuric Acid	1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
67-63-0	Isopropanol	210		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Seconday Aluminum Process TAPs																		
7439-96-5	Manganese	0.052		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7440-62-2	Vanadium	0.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
			Source-wide or Site-wide Total Noncancer Risk	**2.52E-04**					**7.57E-04**					**2.00E-03**				

B-4. Air Toxics - Cumulative Noncancer Chronic Risk Assessment Results

CAS No.	Pollutant	Noncancer RSL (µg/m³)	Model ID:	RECOFFF					SHIPOFFF					DBFPH_AB					--	--
			Title V Emission Unit ID#:	041a; 041b					041a; 041b					046a; 046b					--	--
			Emission Unit Description:	Receiving Office Heating Systems					Shipping Office Heating Systems					Casting Process Emission Sources - DBF Preheater (As-Built)					--	--
			Emission Point Description:	Receiving Office Fugitives					Shipping Office Fugitives					Casting Process Emission Sources - DBF Preheater (As-Built)					--	--
			Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--					9.93103					--	--
			Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	89.49537					33.01696					--					--	--
			Area Source Dimension (m²):	168					34					--					--	--
			Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m²)]:	5.95E-03					2.95E-02					--					--	--
				Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m²)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m²)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Noncancer Risk (--)	Hazard Index (--)	Hazard Quotient (--)
Natural Gas Combustion TAPs																				
7440-38-2	Arsenic compounds	0.016		2.00E-04	1.10E-04	1.65E-11	2.48E-07	1.55E-05	2.00E-04	6.00E-05	4.46E-11	4.99E-08	3.12E-06	2.00E-04	3.80E-03	9.58E-08	9.51E-07	5.94E-05	1.04E-03	--
7440-39-3	Barium	0.52		4.40E-03	1.10E-04	3.63E-10	5.46E-06	1.05E-05	4.40E-03	6.00E-05	9.80E-10	1.10E-06	2.11E-06	4.40E-03	3.80E-03	2.11E-06	2.09E-05	4.02E-05	7.01E-04	--
71-43-2	Benzene	31		2.10E-03	1.10E-04	1.73E-10	2.60E-06	8.40E-08	2.10E-03	6.00E-05	4.68E-10	5.24E-07	1.69E-08	2.10E-03	3.80E-03	1.01E-06	9.99E-06	3.22E-07	5.62E-06	--
50-32-8	Benzo(a)pyrene	0.0021		1.20E-06	1.10E-04	9.89E-14	1.49E-09	7.09E-07	1.20E-06	6.00E-05	2.67E-13	3.00E-10	1.43E-07	1.20E-06	3.80E-03	5.75E-10	5.71E-09	2.72E-06	4.74E-05	--
7440-41-7	Beryllium and compounds	0.021		1.20E-05	1.10E-04	9.89E-13	1.49E-08	7.09E-07	1.20E-05	6.00E-05	2.67E-12	3.00E-09	1.43E-07	1.20E-05	3.80E-03	5.75E-09	5.71E-08	2.72E-06	4.74E-05	--
7440-43-9	Cadmium and compounds	0.01		1.10E-03	1.10E-04	9.07E-11	1.36E-06	1.36E-04	1.10E-03	6.00E-05	2.45E-10	2.75E-07	2.75E-05	1.10E-03	3.80E-03	5.27E-07	5.23E-06	5.23E-04	9.12E-03	--
7440-48-4	Cobalt and compounds	0.0063		8.40E-05	1.10E-04	6.92E-12	1.04E-07	1.65E-05	8.40E-05	6.00E-05	1.87E-11	2.10E-08	3.33E-06	8.40E-05	3.80E-03	4.02E-08	3.99E-07	6.34E-05	1.11E-03	--
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	830		1.20E-03	1.10E-04	9.89E-11	1.49E-06	1.79E-09	1.20E-03	6.00E-05	2.67E-10	3.00E-07	3.61E-10	1.20E-03	3.80E-03	5.75E-07	5.71E-06	6.87E-09	1.20E-07	--
50-00-0	Formaldehyde	7.3		0.075	1.10E-04	6.18E-09	9.30E-05	1.27E-05	0.075	6.00E-05	1.67E-08	1.87E-05	2.56E-06	0.075	3.80E-03	3.59E-05	3.57E-04	4.89E-05	8.52E-04	--
110-54-3	Hexane	730		1.80	1.10E-04	1.48E-07	2.23E-03	3.06E-06	1.80	6.00E-05	4.01E-07	4.49E-04	6.15E-07	1.80	3.80E-03	8.62E-04	8.56E-03	1.17E-05	2.04E-04	--
7439-92-1	Lead and compounds	0.15		5.00E-04	1.10E-04	4.12E-11	6.20E-07	4.13E-06	5.00E-04	6.00E-05	1.11E-10	1.25E-07	8.32E-07	5.00E-04	3.80E-03	2.39E-07	2.38E-06	1.58E-05	2.76E-04	--
7439-96-5	Manganese and compounds	0.052		3.80E-04	1.10E-04	3.13E-11	4.71E-07	9.06E-06	3.80E-04	6.00E-05	8.47E-11	9.48E-08	1.82E-06	3.80E-04	3.80E-03	1.82E-07	1.81E-06	3.47E-05	6.06E-04	--
7439-97-6	Mercury and compounds	0.31		2.60E-04	1.10E-04	2.14E-11	3.22E-07	1.04E-06	2.60E-04	6.00E-05	5.79E-11	6.49E-08	2.09E-07	2.60E-04	3.80E-03	1.24E-07	1.24E-06	3.99E-06	6.95E-05	--
91-20-3	Naphthalene	3.1		6.10E-04	1.10E-04	5.03E-11	7.57E-07	2.44E-07	6.10E-04	6.00E-05	1.36E-10	1.52E-07	4.91E-08	6.10E-04	3.80E-03	2.92E-07	2.90E-06	9.36E-07	1.63E-05	--
7440-02-0	Nickel and compounds	0.01		2.10E-03	1.10E-04	1.73E-10	2.60E-06	2.60E-04	2.10E-03	6.00E-05	4.68E-10	5.24E-07	5.24E-05	2.10E-03	3.80E-03	1.01E-06	9.99E-06	9.99E-04	1.74E-02	--
7782-49-2	Selenium and compounds	21		2.40E-05	1.10E-04	1.98E-12	2.98E-08	1.42E-09	2.40E-05	6.00E-05	5.35E-12	5.99E-09	2.85E-10	2.40E-05	3.80E-03	1.15E-08	1.14E-07	5.43E-09	9.47E-08	--
108-88-3	Toluene	5,200		3.40E-03	1.10E-04	2.80E-10	4.22E-06	8.11E-10	3.40E-03	6.00E-05	7.58E-10	8.49E-07	1.63E-10	3.40E-03	3.80E-03	1.63E-06	1.62E-05	3.11E-09	5.42E-08	--
7440-62-2	Vanadium	0.1		2.30E-03	1.10E-04	1.90E-10	2.85E-06	2.85E-05	2.30E-03	6.00E-05	5.12E-10	5.74E-07	5.74E-06	2.30E-03	3.80E-03	1.10E-06	1.09E-05	1.09E-04	1.91E-03	--
Coil Finishing Process TAPs																				
7664-93-9	Sulfuric Acid	1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.78E-02	--
67-63-0	Isopropanol	210		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4.49E-04	--
Seconday Aluminum Process TAPs																				
7439-96-5	Manganese	0.052		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.83E-03	--
7440-62-2	Vanadium	0.1		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.88E-04	--
			Source-wide or Site-wide Total Noncancer Risk	**5.00E-04**					**1.01E-04**					**1.92E-03**					--	**0.065**

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

		Model ID:	002_1					003_1					EXISMAIN				
		Title V Emission Unit ID#:	EU002					EU003					EU016; EU017; EU018; EU024; EU025				
		Emission Unit Description:	Heat Treat Furnace					Reheater Furnace					Existing Main Building Stencilers and Existing Main Building Heaters				
		Emission Point Description:	Heat Treat Furnace Stack					Reheater Furnace Stack					Fugitive				
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	5.0903					9.43771					--				
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	--					--					1.83803				
		Area Source Dimension (m^2):	--					--					39,403				
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	--					--					2.54E-05				
CAS No.	Pollutant	Cancer RSL (µg/m³)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^2)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)
Natural Gas Combustion TAPs																	
7440-38-2	Arsenic compounds	0.00065	2.00E-04	0.033	8.43E-07	4.29E-06	6.60E-03	2.00E-04	7.53E-03	1.90E-07	1.79E-06	2.75E-03	2.00E-04	0.034	2.21E-11	1.60E-06	2.46E-03
71-43-2	Benzene	0.36	2.10E-03	0.033	8.85E-06	4.51E-05	1.25E-04	2.10E-03	7.53E-03	1.99E-06	1.88E-05	5.22E-05	2.10E-03	0.034	2.32E-10	1.68E-05	4.66E-05
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	0.033	7.59E-09	3.86E-08	2.27E-06	1.80E-06	7.53E-03	1.71E-09	1.61E-08	9.48E-07	1.80E-06	0.034	1.99E-13	1.44E-08	8.46E-07
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	0.033	5.06E-09	2.58E-08	1.51E-05	1.20E-06	7.53E-03	1.14E-09	1.07E-08	6.32E-06	1.20E-06	0.034	1.32E-13	9.59E-09	5.64E-06
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	0.033	7.59E-09	3.86E-08	2.27E-06	1.80E-06	7.53E-03	1.71E-09	1.61E-08	9.48E-07	1.80E-06	0.034	1.99E-13	1.44E-08	8.46E-07
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	0.033	7.59E-09	3.86E-08	2.27E-07	1.80E-06	7.53E-03	1.71E-09	1.61E-08	9.48E-08	1.80E-06	0.034	1.99E-13	1.44E-08	8.46E-08
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	0.033	5.06E-08	2.58E-07	2.15E-04	1.20E-05	7.53E-03	1.14E-08	1.07E-07	8.95E-05	1.20E-05	0.034	1.32E-12	9.59E-08	7.99E-05
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	0.033	4.64E-06	2.36E-05	0.015	1.10E-03	7.53E-03	1.04E-06	9.85E-06	6.16E-03	1.10E-03	0.034	1.21E-10	8.79E-06	5.49E-03
218-01-9	Chrysene	1.7	1.80E-06	0.033	7.59E-09	3.86E-08	2.27E-08	1.80E-06	7.53E-03	1.71E-09	1.61E-08	9.48E-09	1.80E-06	0.034	1.99E-13	1.44E-08	8.46E-09
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	0.033	3.54E-07	1.80E-06	5.81E-03	8.40E-05	7.53E-03	7.97E-08	7.52E-07	2.43E-03	8.40E-05	0.034	9.27E-12	6.71E-07	2.16E-03
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	0.033	5.06E-09	2.58E-08	1.51E-05	1.20E-06	7.53E-03	1.14E-09	1.07E-08	6.32E-06	1.20E-06	0.034	1.32E-13	9.59E-09	5.64E-06
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	0.033	5.06E-06	2.58E-05	9.90E-05	1.20E-03	7.53E-03	1.14E-06	1.07E-05	4.13E-05	1.20E-03	0.034	1.32E-10	9.59E-06	3.69E-05
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	0.033	6.75E-08	3.43E-07	0.025	1.60E-05	7.53E-03	1.52E-08	1.43E-07	0.010	1.60E-05	0.034	1.76E-12	1.28E-07	9.13E-03
50-00-0	Formaldehyde	0.14	0.075	0.033	3.16E-04	1.61E-03	1.15E-02	0.075	7.53E-03	7.12E-05	6.72E-04	4.80E-03	0.075	0.034	8.27E-09	5.99E-04	4.28E-03
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	0.033	7.59E-09	3.86E-08	2.27E-06	1.80E-06	7.53E-03	1.71E-09	1.61E-08	9.48E-07	1.80E-06	0.034	1.99E-13	1.44E-08	8.46E-07
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	0.033	7.59E-09	3.86E-08	2.41E-04	1.80E-06	7.53E-03	1.71E-09	1.61E-08	1.01E-04	1.80E-06	0.034	1.99E-13	1.44E-08	8.99E-05
91-20-3	Naphthalene	0.083	6.10E-04	0.033	2.57E-06	1.31E-05	1.58E-04	6.10E-04	7.53E-03	5.79E-07	5.46E-06	6.58E-05	6.10E-04	0.034	6.73E-11	4.87E-06	5.87E-05
7440-02-0	Nickel and compounds	0.011	2.10E-03	0.033	8.85E-06	4.51E-05	4.10E-03	2.10E-03	7.53E-03	1.99E-06	1.88E-05	1.71E-03	2.10E-03	0.034	2.32E-10	1.68E-05	1.53E-03
	Source-wide or Site-wide Total Cancer Risk		6.82E-02					2.84E-02					2.54E-02				

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

		Model ID:	EXISSOU					SWDRY					HTENDF				
		Title V Emission Unit ID#:	EU024; EU025					037					041a; 041b; IA-15				
		Emission Unit Description:	Existing Southwest Building Heaters					Sow Dryer					Hot End Building Building Heating Systems & Hot End Fugitives for Molten Metal Utility Heaters				
		Emission Point Description:	Heating System Vent					Sow Dryer Stack					Building Fugitives				
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					2.78886					--				
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	4.50886					--					1.83727				
		Area Source Dimension (m^2):	8,013					--					10,687				
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	1.25E-04					--					9.36E-05				
CAS No.	Pollutant	Cancer RSL (µg/m³)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^c)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^c)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)
Natural Gas Combustion TAPs																	
7440-38-2	Arsenic compounds	0.00065	2.00E-04	7.02E-03	2.21E-11	7.97E-07	1.23E-03	2.00E-04	0.016	4.03E-07	1.12E-06	1.73E-03	2.00E-04	9.59E-04	2.26E-12	4.44E-08	6.83E-05
71-43-2	Benzene	0.36	2.10E-03	7.02E-03	2.32E-10	8.37E-06	2.32E-05	2.10E-03	0.016	4.23E-06	1.18E-05	3.28E-05	2.10E-03	9.59E-04	2.38E-11	4.66E-07	1.30E-06
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	7.02E-03	1.99E-13	7.17E-09	4.22E-07	1.80E-06	0.016	3.63E-09	1.01E-08	5.95E-07	1.80E-06	9.59E-04	2.04E-14	4.00E-10	2.35E-08
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	7.02E-03	1.32E-13	4.78E-09	2.81E-06	1.20E-06	0.016	2.42E-09	6.75E-09	3.97E-06	1.20E-06	9.59E-04	1.36E-14	2.67E-10	1.57E-07
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	7.02E-03	1.99E-13	7.17E-09	4.22E-07	1.80E-06	0.016	3.63E-09	1.01E-08	5.95E-07	1.80E-06	9.59E-04	2.04E-14	4.00E-10	2.35E-08
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	7.02E-03	1.99E-13	7.17E-09	4.22E-08	1.80E-06	0.016	3.63E-09	1.01E-08	5.95E-08	1.80E-06	9.59E-04	2.04E-14	4.00E-10	2.35E-09
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	7.02E-03	1.32E-12	4.78E-08	3.99E-05	1.20E-05	0.016	2.42E-08	6.75E-08	5.62E-05	1.20E-05	9.59E-04	1.36E-13	2.67E-09	2.22E-06
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	7.02E-03	1.21E-10	4.38E-06	2.74E-03	1.10E-03	0.016	2.22E-06	6.18E-06	3.87E-03	1.10E-03	9.59E-04	1.24E-11	2.44E-07	1.53E-04
218-01-9	Chrysene	1.7	1.80E-06	7.02E-03	1.99E-13	7.17E-09	4.22E-09	1.80E-06	0.016	3.63E-09	1.01E-08	5.95E-09	1.80E-06	9.59E-04	2.04E-14	4.00E-10	2.35E-10
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	7.02E-03	9.27E-12	3.35E-07	1.08E-03	8.40E-05	0.016	1.69E-07	4.72E-07	1.52E-03	8.40E-05	9.59E-04	9.50E-13	1.87E-08	6.02E-05
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	7.02E-03	1.32E-13	4.78E-09	2.81E-06	1.20E-06	0.016	2.42E-09	6.75E-09	3.97E-06	1.20E-06	9.59E-04	1.36E-14	2.67E-10	1.57E-07
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	7.02E-03	1.32E-10	4.78E-06	1.84E-05	1.20E-03	0.016	2.42E-06	6.75E-06	2.59E-05	1.20E-03	9.59E-04	1.36E-11	2.67E-07	1.03E-06
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	7.02E-03	1.76E-12	6.38E-08	4.55E-03	1.60E-05	0.016	3.23E-08	9.00E-08	6.43E-03	1.60E-05	9.59E-04	1.81E-13	3.55E-09	2.54E-04
50-00-0	Formaldehyde	0.14	0.075	7.02E-03	8.27E-09	2.99E-04	2.13E-03	0.075	0.016	1.51E-04	4.22E-04	3.01E-03	0.075	9.59E-04	8.48E-10	1.67E-05	1.19E-04
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	7.02E-03	1.99E-13	7.17E-09	4.22E-07	1.80E-06	0.016	3.63E-09	1.01E-08	5.95E-07	1.80E-06	9.59E-04	2.04E-14	4.00E-10	2.35E-08
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	7.02E-03	1.99E-13	7.17E-09	4.48E-05	1.80E-06	0.016	3.63E-09	1.01E-08	6.32E-05	1.80E-06	9.59E-04	2.04E-14	4.00E-10	2.50E-06
91-20-3	Naphthalene	0.083	6.10E-04	7.02E-03	6.73E-11	2.43E-06	2.93E-05	6.10E-04	0.016	1.23E-06	3.43E-06	4.13E-05	6.10E-04	9.59E-04	6.90E-12	1.35E-07	1.63E-06
7440-02-0	Nickel and compounds	0.011	2.10E-03	7.02E-03	2.32E-10	8.37E-06	7.61E-04	2.10E-03	0.016	4.23E-06	1.18E-05	1.07E-03	2.10E-03	9.59E-04	2.38E-11	4.66E-07	4.24E-05
		Source-wide or Site-wide Total Cancer Risk	1.27E-02					1.79E-02					7.05E-04				

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

		Model ID:	CDENDF					ADMNF				
		Title V Emission Unit ID#:	041a; 041b					041a; 041b				
		Emission Unit Description:	Cold End Building Building Heating Systems					Administration Building Building Heating Systems				
		Emission Point Description:	Heating System Vent					Heating System Vent				
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--				
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	4.26224					40.74678				
		Area Source Dimension (m^2):	25,301					1,088				
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	3.95E-05					9.19E-04				
CAS No.	**Pollutant**	**Cancer RSL** (µg/m³)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** (g/s/m^c)	**Calc. Amb. Conc.** (µg/m³)	**Cancer Risk** (--)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** (g/s/m^c)	**Calc. Amb. Conc.** (µg/m³)	**Cancer Risk** (--)
Natural Gas Combustion TAPs												
7440-38-2	Arsenic compounds	0.00065	2.00E-04	4.00E-04	3.98E-13	4.30E-08	6.61E-05	2.00E-04	6.20E-04	1.44E-11	6.37E-07	9.79E-04
71-43-2	Benzene	0.36	2.10E-03	4.00E-04	4.18E-12	4.51E-07	1.25E-06	2.10E-03	6.20E-04	1.51E-10	6.68E-06	1.86E-05
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	4.00E-04	3.59E-15	3.87E-10	2.27E-08	1.80E-06	6.20E-04	1.29E-13	5.73E-09	3.37E-07
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	4.00E-04	2.39E-15	2.58E-10	1.52E-07	1.20E-06	6.20E-04	8.61E-14	3.82E-09	2.25E-06
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	4.00E-04	3.59E-15	3.87E-10	2.27E-08	1.80E-06	6.20E-04	1.29E-13	5.73E-09	3.37E-07
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	4.00E-04	3.59E-15	3.87E-10	2.27E-09	1.80E-06	6.20E-04	1.29E-13	5.73E-09	3.37E-08
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	4.00E-04	2.39E-14	2.58E-09	2.15E-06	1.20E-05	6.20E-04	8.61E-13	3.82E-08	3.18E-05
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	4.00E-04	2.19E-12	2.36E-07	1.48E-04	1.10E-03	6.20E-04	7.90E-11	3.50E-06	2.19E-03
218-01-9	Chrysene	1.7	1.80E-06	4.00E-04	3.59E-15	3.87E-10	2.27E-10	1.80E-06	6.20E-04	1.29E-13	5.73E-09	3.37E-09
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	4.00E-04	1.67E-13	1.80E-08	5.82E-05	8.40E-05	6.20E-04	6.03E-12	2.67E-07	8.63E-04
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	4.00E-04	2.39E-15	2.58E-10	1.52E-07	1.20E-06	6.20E-04	8.61E-14	3.82E-09	2.25E-06
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	4.00E-04	2.39E-12	2.58E-07	9.91E-07	1.20E-03	6.20E-04	8.61E-11	3.82E-06	1.47E-05
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	4.00E-04	3.19E-14	3.44E-09	2.45E-04	1.60E-05	6.20E-04	1.15E-12	5.09E-08	3.64E-03
50-00-0	Formaldehyde	**0.14**	0.075	4.00E-04	1.49E-10	1.61E-05	1.15E-04	0.075	6.20E-04	5.38E-09	2.39E-04	1.71E-03
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	4.00E-04	3.59E-15	3.87E-10	2.27E-08	1.80E-06	6.20E-04	1.29E-13	5.73E-09	3.37E-07
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	4.00E-04	3.59E-15	3.87E-10	2.42E-06	1.80E-06	6.20E-04	1.29E-13	5.73E-09	3.58E-05
91-20-3	Naphthalene	0.083	6.10E-04	4.00E-04	1.22E-12	1.31E-07	1.58E-06	6.10E-04	6.20E-04	4.38E-11	1.94E-06	2.34E-05
7440-02-0	Nickel and compounds	0.011	2.10E-03	4.00E-04	4.18E-12	4.51E-07	4.10E-05	2.10E-03	6.20E-04	1.51E-10	6.68E-06	6.08E-04
	Source-wide or Site-wide Total Cancer Risk				**6.82E-04**					**1.01E-02**		

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

		Model ID:	HVSCPF					COOLF				
		Title V Emission Unit ID#:	041a; 041b					041a; 041b				
		Emission Unit Description:	Heavy Scrap Storage Building Building Heating Systems					Cooling Water Building Building Heating Systems				
		Emission Point Description:	Heating System Vent					Cooling Water Building Fugitives				
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--				
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	3.56516					40.90323				
		Area Source Dimension (m^2):	5,113					425				
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	1.96E-04					2.35E-03				
CAS No.	**Pollutant**	**Cancer RSL** (µg/m³)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** (g/s/m^c)	**Calc. Amb. Conc.** (µg/m³)	**Cancer Risk** (--)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** (g/s/m^c)	**Calc. Amb. Conc.** (µg/m³)	**Cancer Risk** (--)
Natural Gas Combustion TAPs												
7440-38-2	Arsenic compounds	0.00065	2.00E-04	6.00E-05	2.96E-13	5.39E-09	8.29E-06	2.00E-04	4.85E-04	2.87E-11	5.00E-07	7.69E-04
71-43-2	Benzene	0.36	2.10E-03	6.00E-05	3.10E-12	5.66E-08	1.57E-07	2.10E-03	4.85E-04	3.02E-10	5.25E-06	1.46E-05
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	6.00E-05	2.66E-15	4.85E-11	2.85E-09	1.80E-06	4.85E-04	2.59E-13	4.50E-09	2.65E-07
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	6.00E-05	1.77E-15	3.23E-11	1.90E-08	1.20E-06	4.85E-04	1.72E-13	3.00E-09	1.76E-06
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	6.00E-05	2.66E-15	4.85E-11	2.85E-09	1.80E-06	4.85E-04	2.59E-13	4.50E-09	2.65E-07
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	6.00E-05	2.66E-15	4.85E-11	2.85E-10	1.80E-06	4.85E-04	2.59E-13	4.50E-09	2.65E-08
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	6.00E-05	1.77E-14	3.23E-10	2.70E-07	1.20E-05	4.85E-04	1.72E-12	3.00E-08	2.50E-05
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	6.00E-05	1.63E-12	2.96E-08	1.85E-05	1.10E-03	4.85E-04	1.58E-10	2.75E-06	1.72E-03
218-01-9	Chrysene	1.7	1.80E-06	6.00E-05	2.66E-15	4.85E-11	2.85E-11	1.80E-06	4.85E-04	2.59E-13	4.50E-09	2.65E-09
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	6.00E-05	1.24E-13	2.26E-09	7.30E-06	8.40E-05	4.85E-04	1.21E-11	2.10E-07	6.77E-04
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	6.00E-05	1.77E-15	3.23E-11	1.90E-08	1.20E-06	4.85E-04	1.72E-13	3.00E-09	1.76E-06
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	6.00E-05	1.77E-12	3.23E-08	1.24E-07	1.20E-03	4.85E-04	1.72E-10	3.00E-06	1.15E-05
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	6.00E-05	2.37E-14	4.31E-10	3.08E-05	1.60E-05	4.85E-04	2.30E-12	4.00E-08	2.86E-03
50-00-0	Formaldehyde	**0.14**	0.075	6.00E-05	1.11E-10	2.02E-06	1.44E-05	0.075	4.85E-04	1.08E-08	1.87E-04	1.34E-03
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	6.00E-05	2.66E-15	4.85E-11	2.85E-09	1.80E-06	4.85E-04	2.59E-13	4.50E-09	2.65E-07
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	6.00E-05	2.66E-15	4.85E-11	3.03E-07	1.80E-06	4.85E-04	2.59E-13	4.50E-09	2.81E-05
91-20-3	Naphthalene	0.083	6.10E-04	6.00E-05	9.02E-13	1.64E-08	1.98E-07	6.10E-04	4.85E-04	8.77E-11	1.52E-06	1.84E-05
7440-02-0	Nickel and compounds	0.011	2.10E-03	6.00E-05	3.10E-12	5.66E-08	5.15E-06	2.10E-03	4.85E-04	3.02E-10	5.25E-06	4.77E-04
		Source-wide or Site-wide Total Cancer Risk			**8.56E-05**					**7.94E-03**		

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

		Model ID:	MOLDF					DROSSF					HEMAINTF				
		Title V Emission Unit ID#:	041a; 041b					041a; 041b					041a; 041b				
		Emission Unit Description:	Mold Room Buildings Building Heating Systems					Dross House Building Building Heating Systems					Hot End Maintenance Building Building Heating Systems				
		Emission Point Description:	Mold Room Buildings Fugitives					Dross House Fugitives					Hot End Maintenance Building Fugitives				
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--					--				
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	23.00952					3.94778					33.148				
		Area Source Dimension (m^2):	807					2,463					1,584				
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	1.24E-03					4.06E-04					6.31E-04				
CAS No.	Pollutant	Cancer RSL (µg/m³)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^2)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^2)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^2)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)
Natural Gas Combustion TAPs																	
7440-38-2	Arsenic compounds	0.00065	2.00E-04	1.87E-04	5.84E-12	1.08E-07	1.67E-04	2.00E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-04	1.10E-03	1.74E-11	9.15E-07	1.41E-03
71-43-2	Benzene	0.36	2.10E-03	1.87E-04	6.13E-11	1.14E-06	3.16E-06	2.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-03	1.10E-03	1.83E-10	9.60E-06	2.67E-05
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	1.87E-04	5.25E-14	9.76E-10	5.74E-08	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-06	1.10E-03	1.57E-13	8.23E-09	4.84E-07
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	1.87E-04	3.50E-14	6.51E-10	3.83E-07	1.20E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	1.10E-03	1.05E-13	5.49E-09	3.23E-06
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	1.87E-04	5.25E-14	9.76E-10	5.74E-08	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-06	1.10E-03	1.57E-13	8.23E-09	4.84E-07
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	1.87E-04	5.25E-14	9.76E-10	5.74E-09	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-06	1.10E-03	1.57E-13	8.23E-09	4.84E-08
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	1.87E-04	3.50E-13	6.51E-09	5.42E-06	1.20E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-05	1.10E-03	1.05E-12	5.49E-08	4.57E-05
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	1.87E-04	3.21E-11	5.96E-07	3.73E-04	1.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-03	1.10E-03	9.58E-11	5.03E-06	3.14E-03
218-01-9	Chrysene	1.7	1.80E-06	1.87E-04	5.25E-14	9.76E-10	5.74E-10	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-06	1.10E-03	1.57E-13	8.23E-09	4.84E-09
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	1.87E-04	2.45E-12	4.55E-08	1.47E-04	8.40E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.40E-05	1.10E-03	7.32E-12	3.84E-07	1.24E-03
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	1.87E-04	3.50E-14	6.51E-10	3.83E-07	1.20E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-06	1.10E-03	1.05E-13	5.49E-09	3.23E-06
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	1.87E-04	3.50E-11	6.51E-07	2.50E-06	1.20E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-03	1.10E-03	1.05E-10	5.49E-06	2.11E-05
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	1.87E-04	4.67E-13	8.67E-09	6.20E-04	1.60E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.60E-05	1.10E-03	1.39E-12	7.32E-08	5.23E-03
50-00-0	Formaldehyde	0.14	0.075	1.87E-04	2.19E-09	4.07E-05	2.90E-04	0.075	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.075	1.10E-03	6.53E-09	3.43E-04	2.45E-03
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	1.87E-04	5.25E-14	9.76E-10	5.74E-08	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-06	1.10E-03	1.57E-13	8.23E-09	4.84E-07
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	1.87E-04	5.25E-14	9.76E-10	6.10E-06	1.80E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.80E-06	1.10E-03	1.57E-13	8.23E-09	5.14E-05
91-20-3	Naphthalene	0.083	6.10E-04	1.87E-04	1.78E-11	3.31E-07	3.98E-06	6.10E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.10E-04	1.10E-03	5.31E-11	2.79E-06	3.36E-05
7440-02-0	Nickel and compounds	0.011	2.10E-03	1.87E-04	6.13E-11	1.14E-06	1.03E-04	2.10E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-03	1.10E-03	1.83E-10	9.60E-06	8.73E-04
		Source-wide or Site-wide Total Cancer Risk	**1.72E-03**					**0.00E+00**					**1.45E-02**				

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

CAS No.	Pollutant	Cancer RSL (µg/m³)	CASTRF Emission Factor (lb/MMscf)	CASTRF Process Rate (MMscf/hr)	CASTRF Emission Rate (g/s/m²)	CASTRF Calc. Amb. Conc. (µg/m³)	CASTRF Cancer Risk (--)	CEELECF Emission Factor (lb/MMscf)	CEELECF Process Rate (MMscf/hr)	CEELECF Emission Rate (g/s/m²)	CEELECF Calc. Amb. Conc. (µg/m³)	CEELECF Cancer Risk (--)	CEMAINTF Emission Factor (lb/MMscf)	CEMAINTF Process Rate (MMscf/hr)	CEMAINTF Emission Rate (g/s/m²)	CEMAINTF Calc. Amb. Conc. (µg/m³)	CEMAINTF Cancer Risk (--)
Model ID:			CASTRF					CEELECF					CEMAINTF				
Title V Emission Unit ID#:			041a; 041b; 046a; IA-15					041a; 041b					041a; 041b				
Emission Unit Description:			Caster Area Building Heating Systems, Casting Process Emission Sources - CFF Preheater & Caster Area Fugitives for Molten Metal Utility Heaters					Cold End Electrical Room Building Heating Systems					Cold End Maintenance Building Building Heating Systems				
Emission Point Description:			Caster Area Fugitives					Cold End Electrical Room Fugitives					Cold End Maintenance Fugitives				
Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):			--					--					--				
Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):			2.40387					27.07635					13.69247				
Area Source Dimension (m^2):			7,139					1,303					3,180				
Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:			1.40E-04					7.67E-04					3.14E-04				
Natural Gas Combustion TAPs																	
7440-38-2	Arsenic compounds	0.00065	2.00E-04	1.29E-02	4.55E-11	7.80E-07	1.20E-03	2.00E-04	1.29E-03	2.49E-11	8.80E-07	1.35E-03	2.00E-04	9.30E-04	7.37E-12	3.21E-07	4.94E-04
71-43-2	Benzene	0.36	2.10E-03	1.29E-02	4.77E-10	8.19E-06	2.28E-05	2.10E-03	1.29E-03	2.62E-10	9.24E-06	2.57E-05	2.10E-03	9.30E-04	7.74E-11	3.37E-06	9.36E-06
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	1.29E-02	4.09E-13	7.02E-09	4.13E-07	1.80E-06	1.29E-03	2.24E-13	7.92E-09	4.66E-07	1.80E-06	9.30E-04	6.63E-14	2.89E-09	1.70E-07
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	1.29E-02	2.73E-13	4.68E-09	2.75E-06	1.20E-06	1.29E-03	1.50E-13	5.28E-09	3.11E-06	1.20E-06	9.30E-04	4.42E-14	1.93E-09	1.13E-06
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	1.29E-02	4.09E-13	7.02E-09	4.13E-07	1.80E-06	1.29E-03	2.24E-13	7.92E-09	4.66E-07	1.80E-06	9.30E-04	6.63E-14	2.89E-09	1.70E-07
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	1.29E-02	4.09E-13	7.02E-09	4.13E-08	1.80E-06	1.29E-03	2.24E-13	7.92E-09	4.66E-08	1.80E-06	9.30E-04	6.63E-14	2.89E-09	1.70E-08
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	1.29E-02	2.73E-12	4.68E-08	3.90E-05	1.20E-05	1.29E-03	1.50E-12	5.28E-08	4.40E-05	1.20E-05	9.30E-04	4.42E-13	1.93E-08	1.60E-05
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	1.29E-02	2.50E-10	4.29E-06	2.68E-03	1.10E-03	1.29E-03	1.37E-10	4.84E-06	3.03E-03	1.10E-03	9.30E-04	4.05E-11	1.76E-06	1.10E-03
218-01-9	Chrysene	1.7	1.80E-06	1.29E-02	4.09E-13	7.02E-09	4.13E-09	1.80E-06	1.29E-03	2.24E-13	7.92E-09	4.66E-09	1.80E-06	9.30E-04	6.63E-14	2.89E-09	1.70E-09
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	1.29E-02	1.91E-11	3.28E-07	1.06E-03	8.40E-05	1.29E-03	1.05E-11	3.70E-07	1.19E-03	8.40E-05	9.30E-04	3.10E-12	1.35E-07	4.35E-04
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	1.29E-02	2.73E-13	4.68E-09	2.75E-06	1.20E-06	1.29E-03	1.50E-13	5.28E-09	3.11E-06	1.20E-06	9.30E-04	4.42E-14	1.93E-09	1.13E-06
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	1.29E-02	2.73E-10	4.68E-06	1.80E-05	1.20E-03	1.29E-03	1.50E-10	5.28E-06	2.03E-05	1.20E-03	9.30E-04	4.42E-11	1.93E-06	7.41E-06
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	1.29E-02	3.64E-12	6.24E-08	4.46E-03	1.60E-05	1.29E-03	2.00E-12	7.04E-08	5.03E-03	1.60E-05	9.30E-04	5.90E-13	2.57E-08	1.83E-03
50-00-0	Formaldehyde	0.14	0.075	1.29E-02	1.71E-08	2.93E-04	2.09E-03	0.075	1.29E-03	9.35E-09	3.30E-04	2.36E-03	0.075	9.30E-04	2.76E-09	1.20E-04	8.60E-04
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	1.29E-02	4.09E-13	7.02E-09	4.13E-07	1.80E-06	1.29E-03	2.24E-13	7.92E-09	4.66E-07	1.80E-06	9.30E-04	6.63E-14	2.89E-09	1.70E-07
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	1.29E-02	4.09E-13	7.02E-09	4.39E-05	1.80E-06	1.29E-03	2.24E-13	7.92E-09	4.95E-05	1.80E-06	9.30E-04	6.63E-14	2.89E-09	1.81E-05
91-20-3	Naphthalene	0.083	6.10E-04	1.29E-02	1.39E-10	2.38E-06	2.87E-05	6.10E-04	1.29E-03	7.61E-11	2.68E-06	3.23E-05	6.10E-04	9.30E-04	2.25E-11	9.79E-07	1.18E-05
7440-02-0	Nickel and compounds	0.011	2.10E-03	1.29E-02	4.77E-10	8.19E-06	7.45E-04	2.10E-03	1.29E-03	2.62E-10	9.24E-06	8.40E-04	2.10E-03	9.30E-04	7.74E-11	3.37E-06	3.06E-04
Source-wide or Site-wide Total Cancer Risk				**1.24E-02**					**1.40E-02**					**5.10E-03**			

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

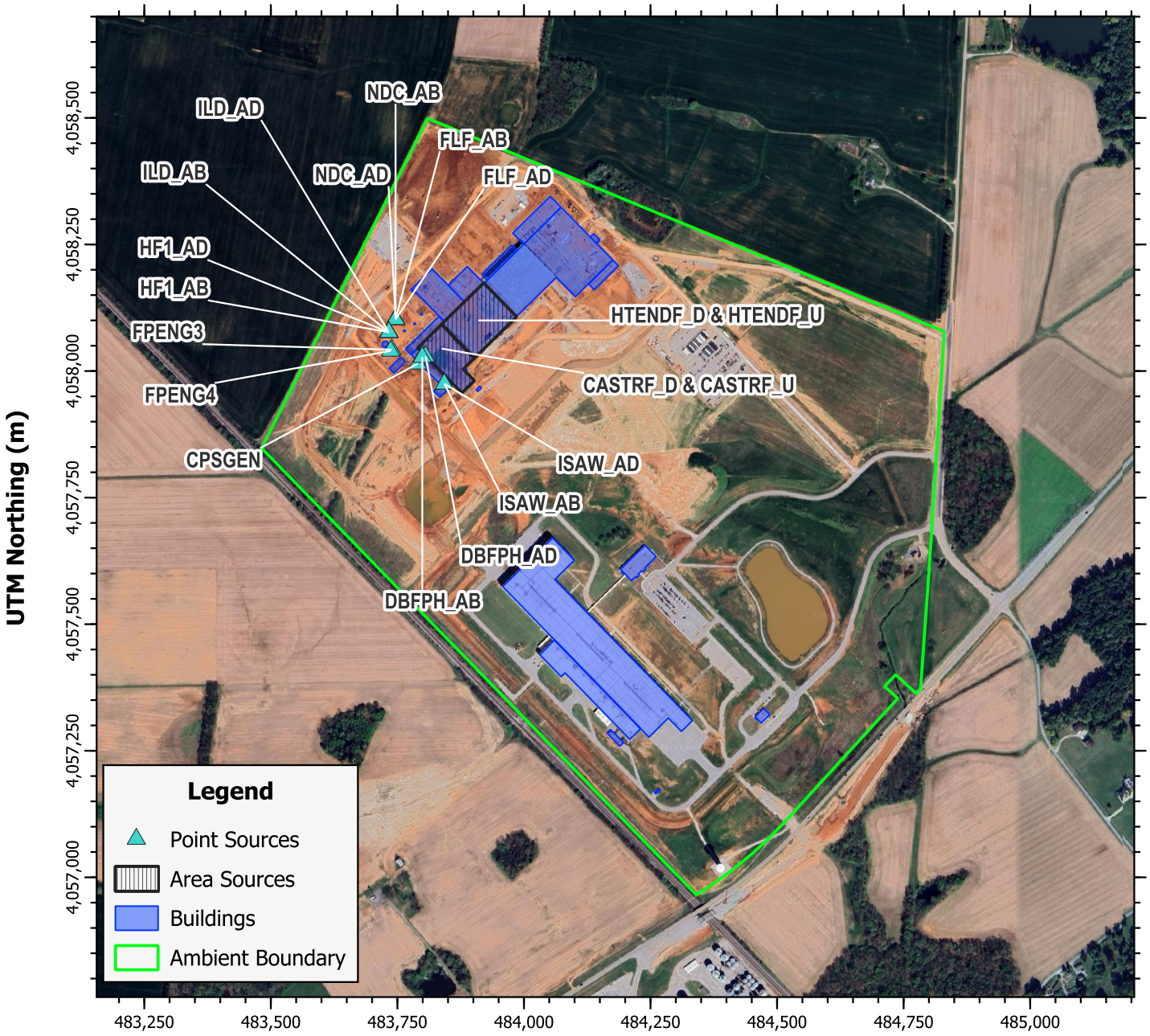
		Model ID:	CLARSTOF					HTERF					INGSAWF				
		Title V Emission Unit ID#:	041a; 041b					041a; 041b					041a; 041b				
		Emission Unit Description:	Chlorine & Argon Storage Building Heating Systems					Hot End Electrical Room Building Heating Systems					Ingot Saw Building Building Heating Systems				
		Emission Point Description:	Chlorine & Argon Storage Fugitives					Hot End Electrical Room Fugitives					Ingot Saw Building Fugitives				
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s (µg/m³):	--					--					--				
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. (µg/m³):	33.02659					21.9377					18.79897				
		Area Source Dimension (m^2):	47					604					656				
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	2.11E-02					1.66E-03					1.52E-03				
CAS No.	Pollutant	Cancer RSL (µg/m³)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^c)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^c)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)	Emission Factor (lb/MMscf)	Process Rate (MMscf/hr)	Emission Rate (g/s/m^c)	Calc. Amb. Conc. (µg/m³)	Cancer Risk (--)
Natural Gas Combustion TAPs																	
7440-38-2	Arsenic compounds	0.00065	2.00E-04	1.50E-04	7.99E-11	1.25E-07	1.92E-04	2.00E-04	6.80E-04	2.84E-11	3.76E-07	5.78E-04	2.00E-04	2.10E-03	8.07E-11	9.95E-07	1.53E-03
71-43-2	Benzene	0.36	2.10E-03	1.50E-04	8.39E-10	1.31E-06	3.65E-06	2.10E-03	6.80E-04	2.98E-10	3.95E-06	1.10E-05	2.10E-03	2.10E-03	8.47E-10	1.04E-05	2.90E-05
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	1.50E-04	7.19E-13	1.13E-09	6.62E-08	1.80E-06	6.80E-04	2.55E-13	3.38E-09	1.99E-07	1.80E-06	2.10E-03	7.26E-13	8.95E-09	5.27E-07
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	1.50E-04	4.80E-13	7.50E-10	4.41E-07	1.20E-06	6.80E-04	1.70E-13	2.26E-09	1.33E-06	1.20E-06	2.10E-03	4.84E-13	5.97E-09	3.51E-06
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	1.50E-04	7.19E-13	1.13E-09	6.62E-08	1.80E-06	6.80E-04	2.55E-13	3.38E-09	1.99E-07	1.80E-06	2.10E-03	7.26E-13	8.95E-09	5.27E-07
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	1.50E-04	7.19E-13	1.13E-09	6.62E-09	1.80E-06	6.80E-04	2.55E-13	3.38E-09	1.99E-08	1.80E-06	2.10E-03	7.26E-13	8.95E-09	5.27E-08
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	1.50E-04	4.80E-12	7.50E-09	6.25E-06	1.20E-05	6.80E-04	1.70E-12	2.26E-08	1.88E-05	1.20E-05	2.10E-03	4.84E-12	5.97E-08	4.97E-05
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	1.50E-04	4.40E-10	6.88E-07	4.30E-04	1.10E-03	6.80E-04	1.56E-10	2.07E-06	1.29E-03	1.10E-03	2.10E-03	4.44E-10	5.47E-06	3.42E-03
218-01-9	Chrysene	1.7	1.80E-06	1.50E-04	7.19E-13	1.13E-09	6.62E-10	1.80E-06	6.80E-04	2.55E-13	3.38E-09	1.99E-09	1.80E-06	2.10E-03	7.26E-13	8.95E-09	5.27E-09
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	1.50E-04	3.36E-11	5.25E-08	1.69E-04	8.40E-05	6.80E-04	1.19E-11	1.58E-07	5.09E-04	8.40E-05	2.10E-03	3.39E-11	4.18E-07	1.35E-03
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	1.50E-04	4.80E-13	7.50E-10	4.41E-07	1.20E-06	6.80E-04	1.70E-13	2.26E-09	1.33E-06	1.20E-06	2.10E-03	4.84E-13	5.97E-09	3.51E-06
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	1.50E-04	4.80E-10	7.50E-07	2.88E-06	1.20E-03	6.80E-04	1.70E-10	2.26E-06	8.67E-06	1.20E-03	2.10E-03	4.84E-10	5.97E-06	2.30E-05
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	1.50E-04	6.39E-12	1.00E-08	7.14E-04	1.60E-05	6.80E-04	2.27E-12	3.01E-08	2.15E-03	1.60E-05	2.10E-03	6.45E-12	7.96E-08	5.68E-03
50-00-0	Formaldehyde	0.14	0.075	1.50E-04	3.00E-08	4.69E-05	3.35E-04	0.075	6.80E-04	1.06E-08	1.41E-04	1.01E-03	0.075	2.10E-03	3.03E-08	3.73E-04	2.66E-03
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	1.50E-04	7.19E-13	1.13E-09	6.62E-08	1.80E-06	6.80E-04	2.55E-13	3.38E-09	1.99E-07	1.80E-06	2.10E-03	7.26E-13	8.95E-09	5.27E-07
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	1.50E-04	7.19E-13	1.13E-09	7.03E-06	1.80E-06	6.80E-04	2.55E-13	3.38E-09	2.11E-05	1.80E-06	2.10E-03	7.26E-13	8.95E-09	5.60E-05
91-20-3	Naphthalene	0.083	6.10E-04	1.50E-04	2.44E-10	3.81E-07	4.59E-06	6.10E-04	6.80E-04	8.66E-11	1.15E-06	1.38E-05	6.10E-04	2.10E-03	2.46E-10	3.03E-06	3.66E-05
7440-02-0	Nickel and compounds	0.011	2.10E-03	1.50E-04	8.39E-10	1.31E-06	1.19E-04	2.10E-03	6.80E-04	2.98E-10	3.95E-06	3.59E-04	2.10E-03	2.10E-03	8.47E-10	1.04E-05	9.50E-04
		Source-wide or Site-wide Total Cancer Risk			**1.99E-03**					**5.97E-03**					**1.58E-02**		

B-4. Air Toxics - Cumulative Cancer Risk Assessment Results

		Model ID:	RECOFFF					SHIPOFFF					**DBFPH_AB**					--
		Title V Emission Unit ID#:	041a; 041b					041a; 041b					046a; 046b					--
		Emission Unit Description:	Receiving Office Building Heating Systems					Shipping Office Building Heating Systems					Casting Process Emission Sources - DBF Preheater (As-Built)					--
		Emission Point Description:	Receiving Office Fugitives					Shipping Office Fugitives					Casting Process Emission Sources - DBF Preheater (As-Built)					--
		Point Source Maximum Off-Site Modeled Concentration @ 1 g/s ($\mu g/m^3$):	--					--					**9.93103**					--
		Area Source Maximum Off-Site Modeled Concentration @ 1 g/s / Area Src Dim. ($\mu g/m^3$):	89.49537					33.01696					--					--
		Area Source Dimension (m^2):	168					34					--					--
		Area Source Modeled Emission Rate [(1 g/s)/(Area Source Dim.; m^2)]:	5.95E-03					2.95E-02					--					--
CAS No.	**Pollutant**	**Cancer RSL** ($\mu g/m^3$)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** ($g/s/m^c$)	**Calc. Amb. Conc.** ($\mu g/m^3$)	**Cancer Risk** (--)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** ($g/s/m^c$)	**Calc. Amb. Conc.** ($\mu g/m^3$)	**Cancer Risk** (--)	**Emission Factor** (lb/MMscf)	**Process Rate** (MMscf/hr)	**Emission Rate** (g/s)	**Calc. Amb. Conc.** ($\mu g/m^3$)	**Cancer Risk** (--)	**Total Cancer Risk** (--)
Natural Gas Combustion TAPs																		
7440-38-2	Arsenic compounds	0.00065	2.00E-04	1.10E-04	1.65E-11	2.48E-07	3.82E-04	2.00E-04	6.00E-05	4.46E-11	4.99E-08	7.68E-05	2.00E-04	3.80E-03	9.58E-08	9.51E-07	1.46E-03	0.026
71-43-2	Benzene	0.36	2.10E-03	1.10E-04	1.73E-10	2.60E-06	7.24E-06	2.10E-03	6.00E-05	4.68E-10	5.24E-07	1.46E-06	2.10E-03	3.80E-03	1.01E-06	9.99E-06	2.77E-05	0.000
56-55-3	Benzo(a)anthracene	0.017	1.80E-06	1.10E-04	1.48E-13	2.23E-09	1.31E-07	1.80E-06	6.00E-05	4.01E-13	4.49E-10	2.64E-08	1.80E-06	3.80E-03	8.62E-10	8.56E-09	5.03E-07	0.000
50-32-8	Benzo(a)pyrene	0.0017	1.20E-06	1.10E-04	9.89E-14	1.49E-09	8.76E-07	1.20E-06	6.00E-05	2.67E-13	3.00E-10	1.76E-07	1.20E-06	3.80E-03	5.75E-10	5.71E-09	3.36E-06	0.000
205-99-2	Benzo(b)fluoranthene	0.017	1.80E-06	1.10E-04	1.48E-13	2.23E-09	1.31E-07	1.80E-06	6.00E-05	4.01E-13	4.49E-10	2.64E-08	1.80E-06	3.80E-03	8.62E-10	8.56E-09	5.03E-07	0.000
207-08-9	Benzo(k)fluoranthene	0.17	1.80E-06	1.10E-04	1.48E-13	2.23E-09	1.31E-08	1.80E-06	6.00E-05	4.01E-13	4.49E-10	2.64E-09	1.80E-06	3.80E-03	8.62E-10	8.56E-09	5.03E-08	0.000
7440-41-7	Beryllium and compounds	0.0012	1.20E-05	1.10E-04	9.89E-13	1.49E-08	1.24E-05	1.20E-05	6.00E-05	2.67E-12	3.00E-09	2.50E-06	1.20E-05	3.80E-03	5.75E-09	5.71E-08	4.75E-05	0.001
7440-43-9	Cadmium and compounds	0.0016	1.10E-03	1.10E-04	9.07E-11	1.36E-06	8.53E-04	1.10E-03	6.00E-05	2.45E-10	2.75E-07	1.72E-04	1.10E-03	3.80E-03	5.27E-07	5.23E-06	3.27E-03	0.057
218-01-9	Chrysene	1.7	1.80E-06	1.10E-04	1.48E-13	2.23E-09	1.31E-09	1.80E-06	6.00E-05	4.01E-13	4.49E-10	2.64E-10	1.80E-06	3.80E-03	8.62E-10	8.56E-09	5.03E-09	0.000
7440-48-4	Cobalt and compounds	0.00031	8.40E-05	1.10E-04	6.92E-12	1.04E-07	3.36E-04	8.40E-05	6.00E-05	1.87E-11	2.10E-08	6.76E-05	8.40E-05	3.80E-03	4.02E-08	3.99E-07	1.29E-03	0.022
53-70-3	Dibenz(a,h)anthracene	0.0017	1.20E-06	1.10E-04	9.89E-14	1.49E-09	8.76E-07	1.20E-06	6.00E-05	2.67E-13	3.00E-10	1.76E-07	1.20E-06	3.80E-03	5.75E-10	5.71E-09	3.36E-06	0.000
106-46-7	1,4-Dichlorobenzene(p-Dichlorobenzene)	0.26	1.20E-03	1.10E-04	9.89E-11	1.49E-06	5.72E-06	1.20E-03	6.00E-05	2.67E-10	3.00E-07	1.15E-06	1.20E-03	3.80E-03	5.75E-07	5.71E-06	2.19E-05	0.000
57-97-6	7,12-Dimethylbenz(a)anthracene	0.000014	1.60E-05	1.10E-04	1.32E-12	1.98E-08	1.42E-03	1.60E-05	6.00E-05	3.56E-12	3.99E-09	2.85E-04	1.60E-05	3.80E-03	7.66E-09	7.61E-08	5.43E-03	0.095
50-00-0	Formaldehyde	**0.14**	0.075	1.10E-04	6.18E-09	9.30E-05	6.64E-04	0.075	6.00E-05	1.67E-08	1.87E-05	1.34E-04	0.075	3.80E-03	3.59E-05	3.57E-04	2.55E-03	0.044
193-39-5	Indeno (1,2,3-cd)pyrene	0.017	1.80E-06	1.10E-04	1.48E-13	2.23E-09	1.31E-07	1.80E-06	6.00E-05	4.01E-13	4.49E-10	2.64E-08	1.80E-06	3.80E-03	8.62E-10	8.56E-09	5.03E-07	0.000
56-49-5	3-Methylcholanthrene	0.00016	1.80E-06	1.10E-04	1.48E-13	2.23E-09	1.40E-05	1.80E-06	6.00E-05	4.01E-13	4.49E-10	2.81E-06	1.80E-06	3.80E-03	8.62E-10	8.56E-09	5.35E-05	0.001
91-20-3	Naphthalene	0.083	6.10E-04	1.10E-04	5.03E-11	7.57E-07	9.12E-06	6.10E-04	6.00E-05	1.36E-10	1.52E-07	1.83E-06	6.10E-04	3.80E-03	2.92E-07	2.90E-06	3.49E-05	0.001
7440-02-0	Nickel and compounds	0.011	2.10E-03	1.10E-04	1.73E-10	2.60E-06	2.37E-04	2.10E-03	6.00E-05	4.68E-10	5.24E-07	4.77E-05	2.10E-03	3.80E-03	1.01E-06	9.99E-06	9.08E-04	0.016
		Source-wide or Site-wide Total Cancer Risk			**3.94E-03**					**7.93E-04**					**1.51E-02**			**0.26**

APPENDIX C. AERIAL MAP OF MODELED SOURCES

Figure C-1. Casting Expansion Project As-Built Reconsiliation Modeled Sources Aerial Map



All coordinates shown in UTM Coordinates,
UTM Zone 16, NAD 83 Datum

APPENDIX D. MODELING FILES SUBMITTED ELECTRONICALLY

The modeling file zipped directory was submitted concurrently with this modeling report to Mr. Kevin Davis (Division for Air Quality) via email. The zipped directory contains all input and output data files used to generate the results from the air quality analyses presented in this report. The following provides a description of the contents of each folder included in the zipped directory.

AERMAP

- Class II Receptors – Contains the AERMAP input (.inp), output (.out), and receptor (.rec) files for the SIL analysis modeling grids and developed for the SIL, NAAQS, and PSD Increment analyses.
- Class I Receptors – Contains the AERMAP input (.inp), output (.out), and receptor (.rec) files for the Class I modeling analysis grid.

AERMET

- Model-Ready Files
  - KWBG – Contains the surface (.sfc) and profile (.pfl) meteorological data files based on KWBG surface characteristics and KBNA upper air characteristics that were utilized in this modeling analysis. These files were downloaded from the Division's website (2018-2021) and provided by the Division (2022) via email.

BPIP

- Contains the input, output, and summary files from the building downwash analysis. This analysis includes only as-built modeled sources and buildings at the Guthrie facility.

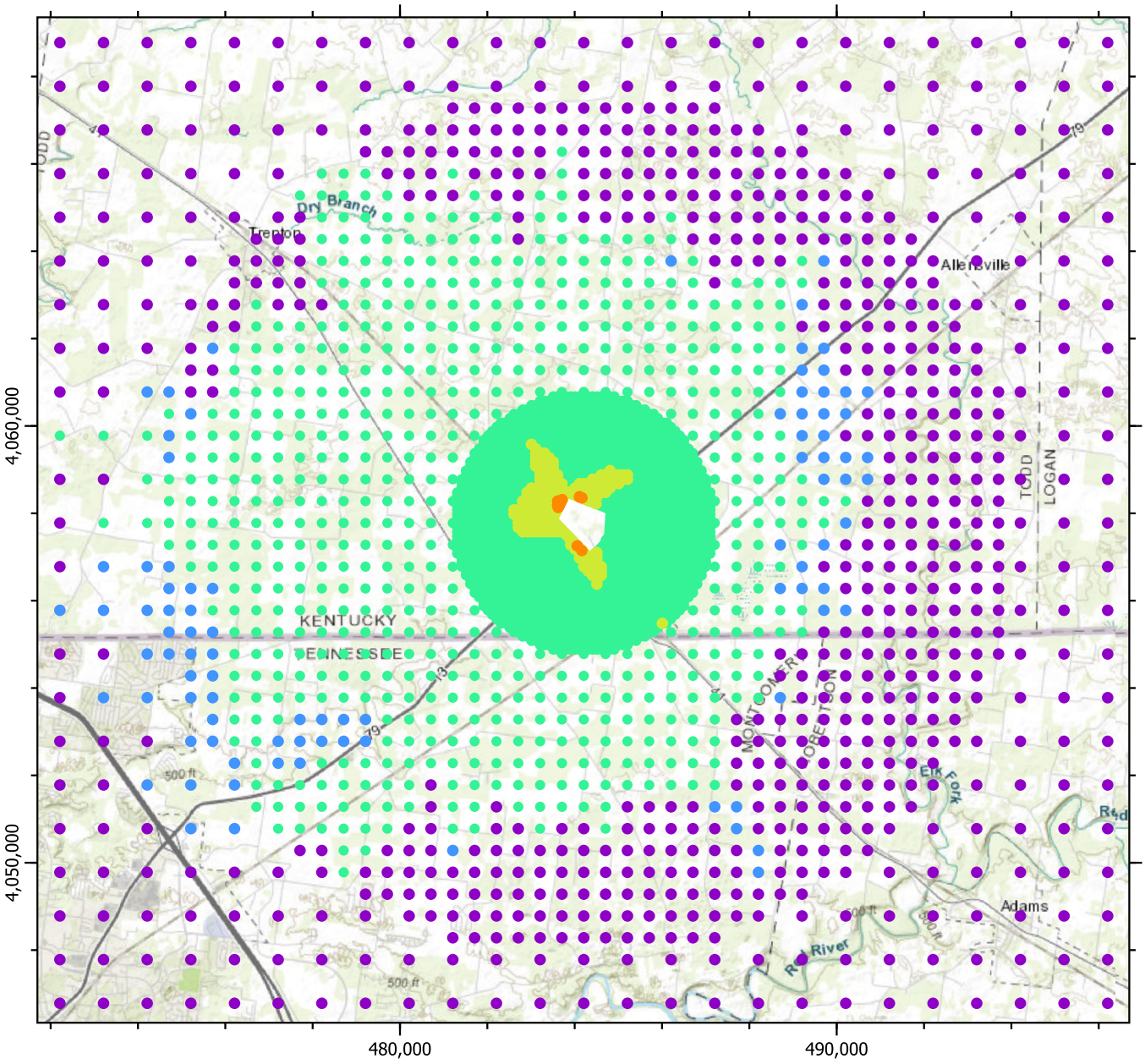
AERMOD

- CO
  - SIL
    - 1HR – includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the 1-hour CO SIL analysis.
    - 8HR – includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the 8-hour CO SIL analysis.
- NO2
  - SIL
    - 1HR – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the 1-hour NO_2 SIL analysis.
    - ANN – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the annual NO_2 SIL analysis.
  - CISIL
    - ANN – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the annual NO_2 Class I SIL analysis.
  - VEGSOIL
    - 1HR – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the annual NO_2 Soils and Vegetation Analysis.
- PM25
  - SIL
    - 24HR – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the 24-hour $PM_{2.5}$ SIL analysis.

        - ANN – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the annual $PM_{2.5}$ SIL analysis.
    - CISIL
        - 24HR – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the 24-hour $PM_{2.5}$ Class I SIL analysis.
        - ANN – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the annual $PM_{2.5}$ Class I SIL analysis.
- PM10
    - SIL
        - 24HR – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the 24-hour PM_{10} SIL analysis.
        - ANN – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the annual PM_{10} SIL analysis.
    - CISIL
        - 24HR – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the 24-hour PM_{10} Class I SIL analysis.
        - ANN – Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the annual PM_{10} Class I SIL analysis.
- TOXICS
    - Includes a .zip file containing the AERMOD input (.dat), output (.lst), and plot (.plt) files for the air toxics analysis with the "unit emission rate" approach described in **Section 8**.

APPENDIX E. CLASS II MODELING RESULTS FIGURES

Figure E-1. Maximum Five-Year Average 8th-High Daily Maximum 1-hr NO2 Impacts (µg/m³) for NAAQS Analysis Over Five Meteorological Years Modeled



Maximum 1-hr NO2 concentration (136.8 µg/m³) occurs 0.9 km north of Novelis.

UTM Easting (m)

All coordinates shown in UTM Coordinates, UTM Zone 16, NAD 83 Datum

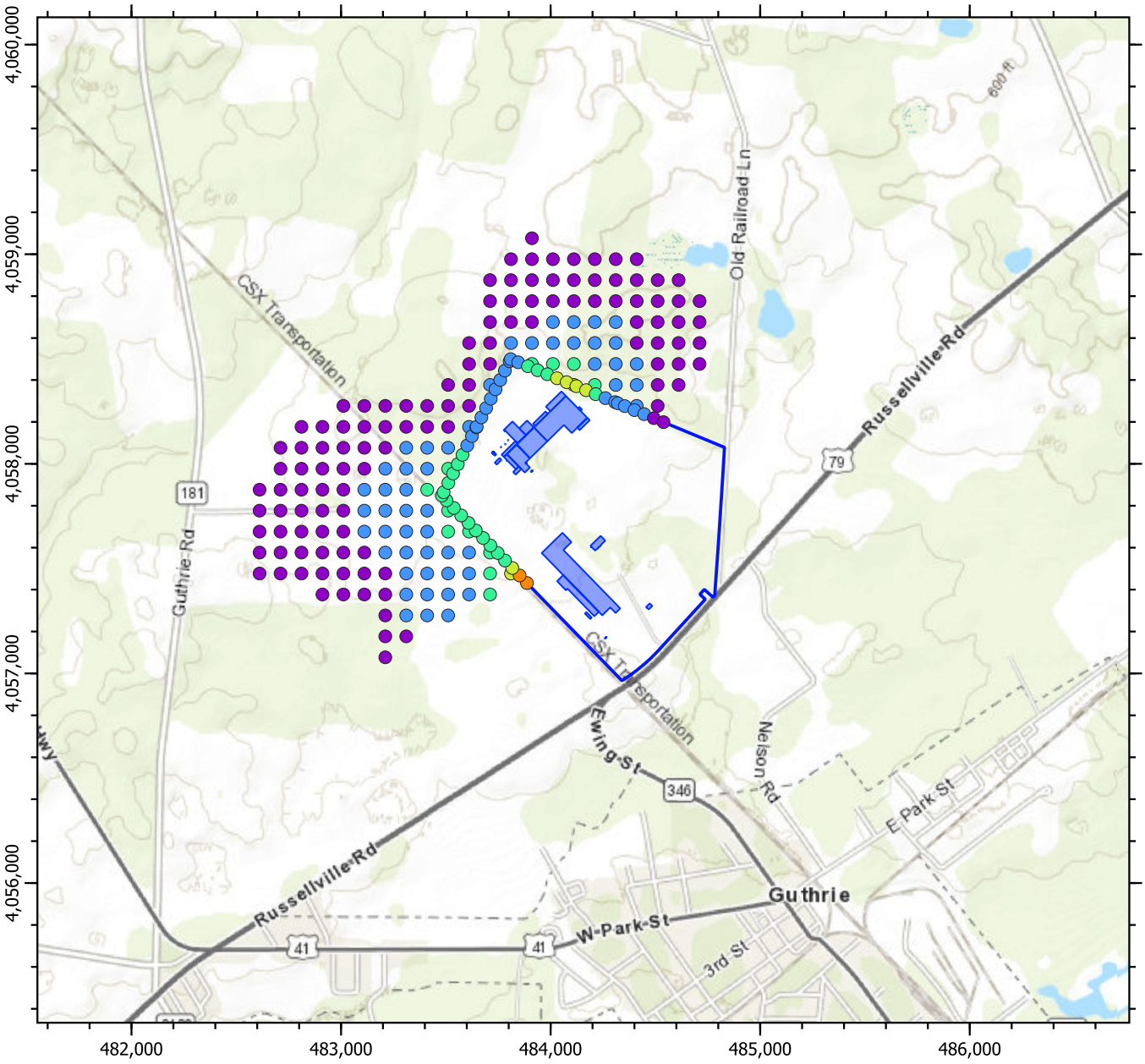
1-Hour NO2 NAAQS: 188 µg/m³

NO2 Concentrations* (µg/m³)

- 0 - 27
- 27 - 55
- 55 - 82
- 82 - 110
- 110 - 137

*All values shown include background concentration.

Figure E-2. Maximum Annual NO2 Impacts (µg/m³) for NAAQS Analysis From Among Five Meteorological Years Modeled



Annual NO2 NAAQS: 100 µg/m³

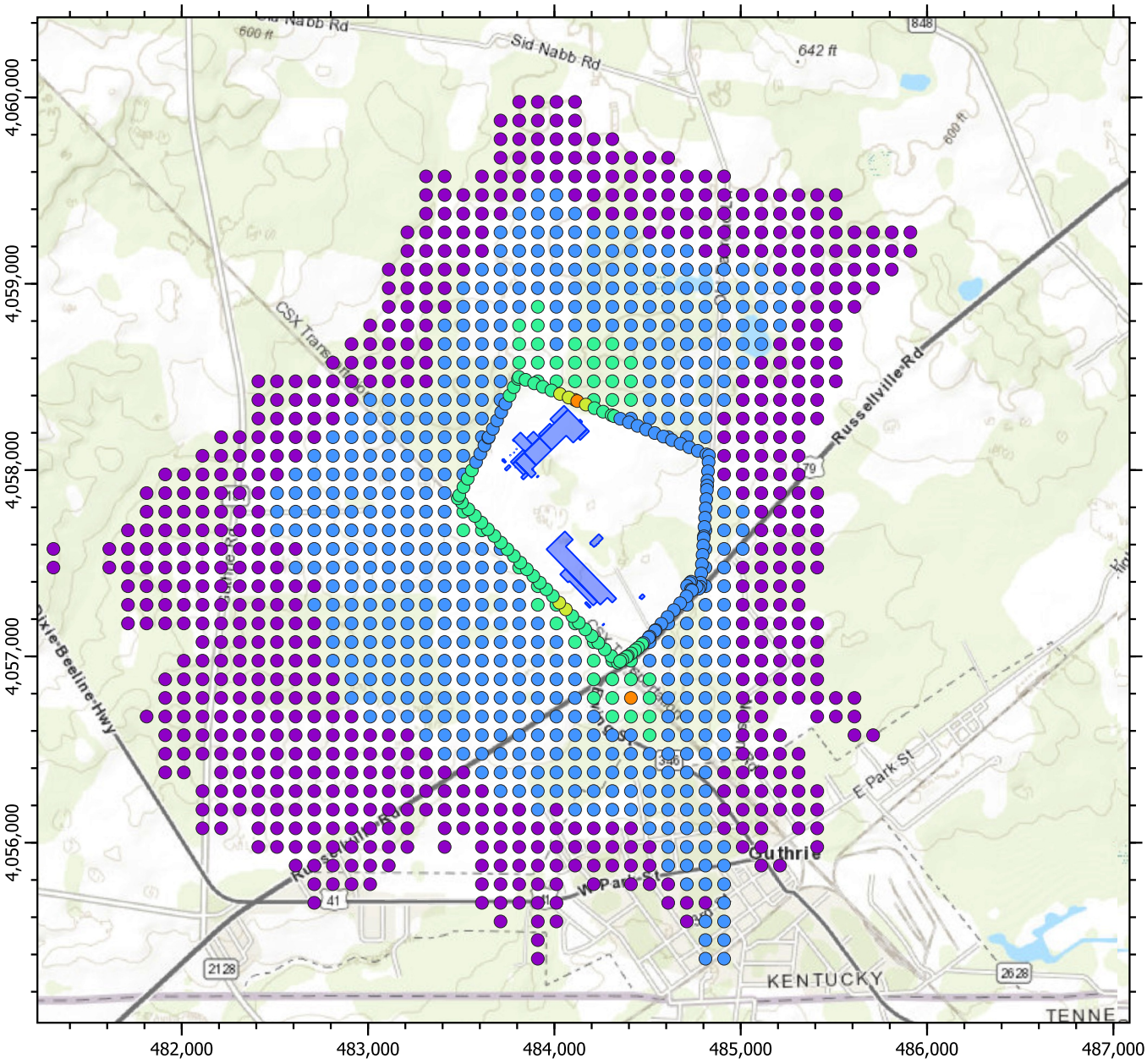
All coordinates shown in UTM Coordinates, UTM Zone 16, NAD 83 Datum

NO2 Concentrations* (µg/m³)

- 10.8 - 12
- 12 - 13
- 13 - 14
- 14 - 15
- 15 - 16.9

*All values shown include annual background concentration of 9.4 µg/m³.

Figure E-3. Maximum Five-Year Average 8th-High Daily Maximum 24-hr PM2.5 Impacts (µg/m³) for NAAQS Analysis Over Five Meteorological Years Modeled



UTM Northing (m)

UTM Easting (m)

All coordinates shown in UTM Coordinates, UTM Zone 16, NAD 83 Datum

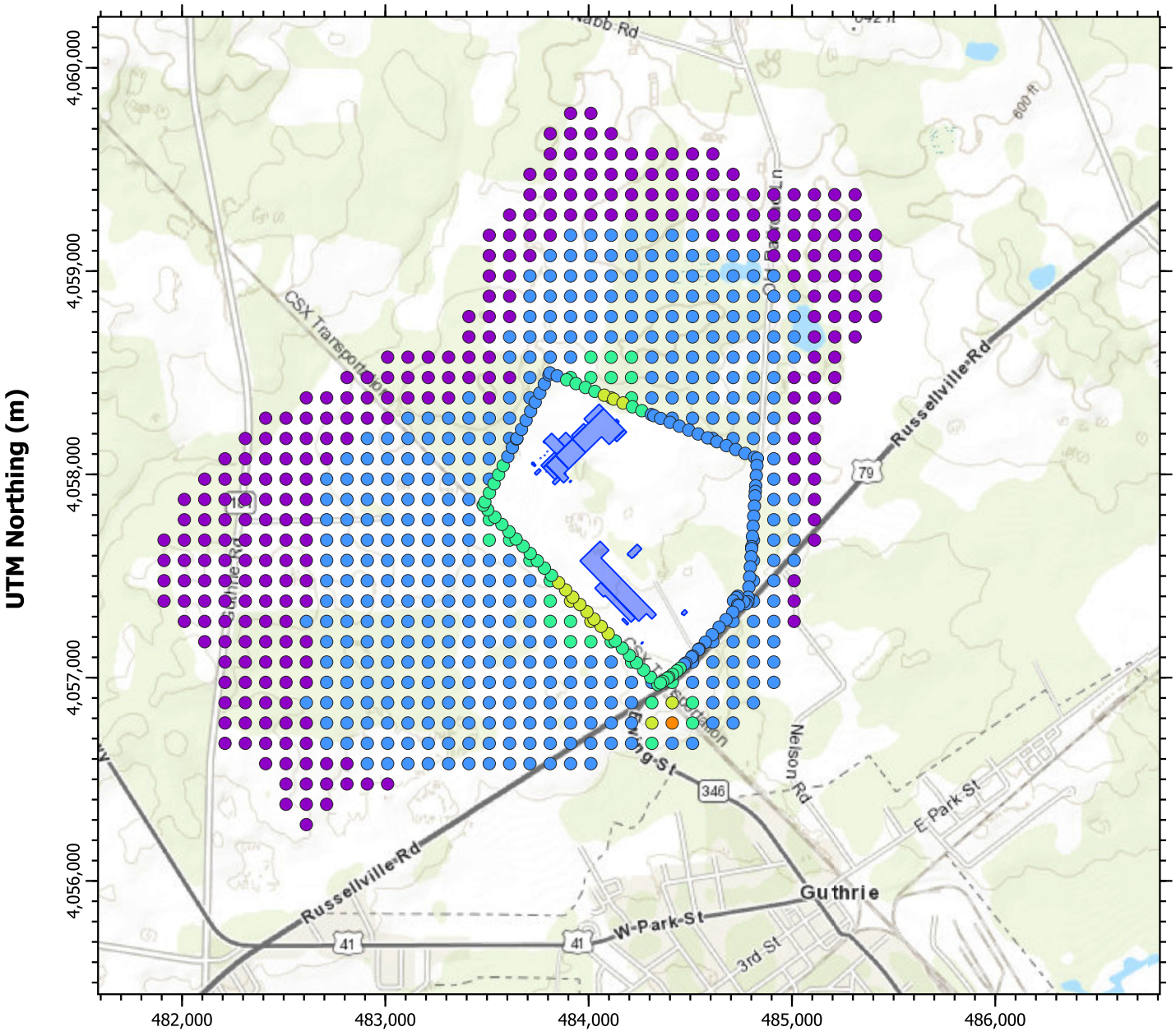
24-hr PM2.5 NAAQS: 35 µg/m³

PM2.5 Concentrations* (µg/m³)

- 23 - 23.4
- 23.4 - 24.8
- 24.8 - 26.3
- 26.3 - 27.5
- 27.5 - 28.9

*All values shown include 24-hour background concentration of 22.0 µg/m³.

Figure E-4. Average Annual PM2.5 Impacts (µg/m³) for NAAQS Analysis Over Five Meteorological Years Modeled



Annual PM2.5 NAAQS: 12 µg/m³

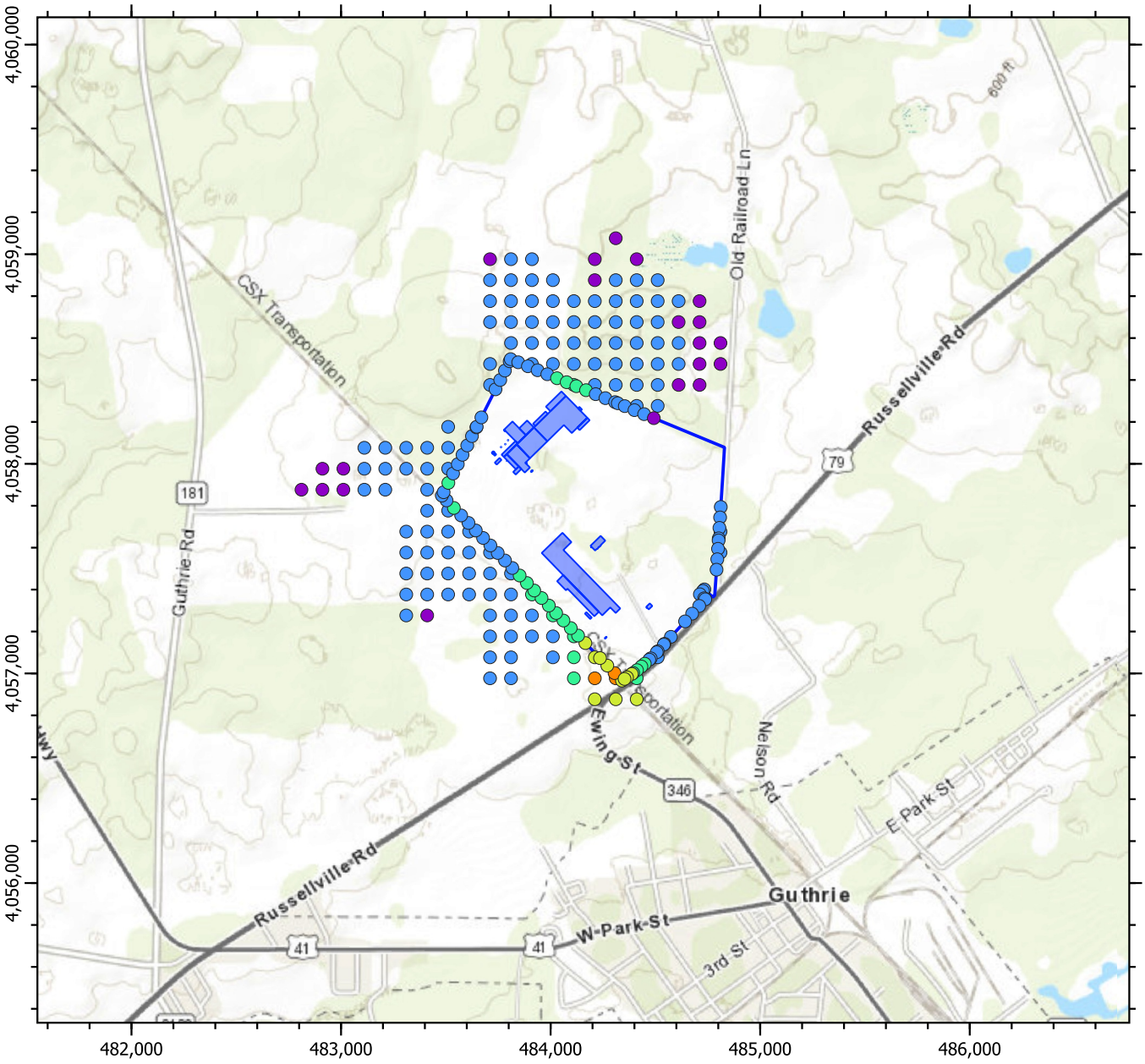
All coordinates shown in UTM Coordinates, UTM Zone 16, NAD 83 Datum

PM2.5 Concentrations* (µg/m³)

- 8.4 - 8.7
- 8.7 - 9.2
- 9.2 - 9.6
- 9.6 - 10.1
- 10.1 - 10.7

*All values shown include annual background concentration of 8.3 µg/m³.

Figure E-5. Maximum 6th-High 24-hr PM10 Impacts (µg/m³) for NAAQS Analysis From Among Five Meteorological Years Modeled



24-hr PM10 NAAQS: 150 µg/m³

All coordinates shown in UTM Coordinates, UTM Zone 16, NAD 83 Datum

PM10 Concentrations* (µg/m³)

- 55.5 - 56.5
- 56.5 - 60.9
- 60.9 - 65.4
- 65.4 - 69.9
- 69.9 - 74.3

*All values shown include 24-hour background concentration of 51.9 µg/m³.

October 10, 2024

Zachary Bittner
Metallurgy Section Supervisor
Kentucky Department of Environmental Protection
Division of Air Quality
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601-1403

RE: Section 502(b)(10) Change Notification – Two New Emergency Engines
Novelis Corporation – Guthrie, Kentucky Plant
(AI #136118; Source ID 21-219-00039)

Dear Zachary:

Novelis Corporation (Novelis) owns and operates an automotive coil finishing and secondary aluminum ingot casting facility located at 8155 Old Railroad Lane in Guthrie, Kentucky (Todd County). The Novelis Guthrie facility is classified as a major source under both the Title V operating permit program and the PSD construction permitting program and currently operates in accordance with the combined construction and operating permit V-22-011 R1, issued initially by the Kentucky Division for Air Quality (KDAQ) on July 25, 2022, and most recently revised on June 7, 2024.

Novelis is submitting this Section 502(b)(10) change notification to inform KDAQ of the need to install two (2) new small natural gas-fired emergency engines to be used for emergency power back-up. One of the proposed units is a Generac SG080 engine rated at 129 bhp, while the other unit is a Generac QT025A engine rated at 38 bhp. Novelis has reviewed the proposed equipment changes and has concluded that the emergency engine additions qualify for treatment as a Section 502(b)(10) change as defined by the criteria specified in 401 KAR 52:020, Section 18(1). This letter and all necessary DEP 7007 forms, included in Attachment A, constitute a complete Section 502(b)(10) change notification.

Process Description

Novelis recently began the commissioning process of a new aluminum ingot casting facility, operating independently from the existing coil finishing plant on the Guthrie site. The project includes the installation of a scrap shredding line, decoating kiln and melting furnaces, holding furnaces, an in-line degassing unit and various ancillary equipment.

Novelis is proposing to install two (2) new small natural gas-fired emergency back-up engines to support the new operations in the event of sudden power failure to the operations. One proposed unit is a 129-bhp Generac SG080 engine (proposed Title V ID EP 47) intended to provide auxiliary power to the casting pit sump pump. The other unit is a 38-bhp Generac QT025A engine (proposed Title V ID EP 48) intended to provide auxiliary back-up emergency power to the rotary decoating kiln (EU 029).

The two (2) new emergency engines to be installed are stationary spark ignition internal combustion engines (SI ICE) that commenced construction[1] after June 12, 2006 with a maximum engine power greater than 25 hp; therefore, pursuant to 40 CFR 60.4230(a)(4)(iv), these engines should be added to Group 4 in Novelis's Title V permitting infrastructure.

Air Emission Impacts of Proposed Changes

Regulated air pollutant emissions are generated by emergency engines of the size and type reflected by Novelis's proposed Generac emergency engines from normal, natural gas combustion byproducts. Potential emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and volatile organic compounds (VOC) from both emergency engines have been calculated using emission factors from the manufacturer's emissions data sheet, as provided in the detailed emission calculations included in Attachment B. Particulate matter ($PM/PM_{10}/PM_{2.5}$) and sulfur dioxide (SO_2) emissions for the Generac natural gas-fired units are calculated using lean-burn emission factors from AP-42 Chapter 3.2, Table 3.2-3. Potential greenhouse gas (GHG) emissions are calculated using emission factors from 40 CFR 98, Subpart C for natural gas combustion. Consistent with EPA guidance, the annual potential emission calculations for the new emergency engines are based on 500 hours of operation per year.[2]

A summary of the criteria pollutant emissions increases from the installation of the new emergency engines is included in Table 1 below. Emissions of GHGs and other natural gas combustion byproducts are detailed in Attachment B.

Table 1. Potential Criteria Pollutant Emissions Summary for Project

Pollutant	**Potential Emission Rate from EP 47[a,b]** (tpy)	**Potential Emission Rate from EP 48[a,b]** (tpy)	**Potential Emission Rate Project Total** (tpy)
PM / $PM_{2.5}$ / PM_{10}	2.71×10^{-3}	9.68×10^{-4}	3.67×10^{-3}
NO_x	0.24	0.037	0.28
CO	3.05	1.47	4.52
VOC	0.035	0.034	0.068
SO_2	1.59×10^{-4}	5.70×10^{-5}	2.16×10^{-4}
Lead	1.33×10^{-7}	4.75×10^{-8}	1.80×10^{-7}

[a] The basis for each emission factor is included in Attachment B.
[b] Emission rate (tpy) = EF (lb/MMscf) x fuel consumption rate (MMscf/hr) x 500 hours/yr x 1 ton/2000 lb

Regulatory and Air Permit Requirements

An analysis of potentially applicable federal regulations and a discussion of the associated permit revisions requested by Novelis are included in the subsections below.

[1] Per 40 CFR 60.4230(a), for the purposes of NSPS Subpart JJJJ, "the date that construction commences is the date the engine is ordered by the owner or operator."

[2] Memorandum from John S. Seitz, Director Office of Air Quality Planning and Standards to Regional Air Division Directors, *Calculating Potential to Emit (PTE) for Emergency Generators*, September 6, 1995.

40 CFR 60, Subpart JJJJ – Stationary Spark Ignition (SI) Internal Combustion engines (ICE)

Owners and operators of a stationary SI ICE that commenced construction after June 12, 2006, where the stationary SI ICE was manufactured as an emergency engine after January 1, 2009, are subject to 40 CFR 60, Subpart JJJJ pursuant to 40 CFR 60.4230(a)(4)(iv). Pursuant to 40 CFR 60.4233(d) and (e), the new 129-bhp SG080 natural gas-fired emergency engine and 38-bhp QT025A natural gas-fired emergency engine shall comply with the Table 1 emission standards of 10 g/hp-hr for HC + NO_x and 387 g/hp-hr for CO. According to the manufacturer's emissions data sheet, the new emergency engines are well within the required emissions standards.

40 CFR 63, Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines (RICE)

Pursuant to 40 CFR 63.6590(c)(6), a new emergency RICE that commenced construction after June 12, 2006, meets the requirements of 40 CFR 63, Subpart ZZZZ by meeting the requirements of 40 CFR 60, Subpart JJJJ. No further requirements apply for such engines under 40 CFR 63, Subpart ZZZZ.

Requested Changes to Title V Permit

Novelis requests that the new Generac SG080 and QT025A emergency engines described herein be added to Group 4 in the permit. The applicable regulations can be found on the DEP7007 V form in Attachment A.

Qualification for Treatment as a 502(b)(10) Change

401 KAR 52:001, Section 63 defines a Section 502(b)(10) change as:

> "*a change that contravenes an express permit term and does not include changes that would violate applicable requirements or contravene federally enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.*"

The specific criteria that qualify a particular project as a Section 502(b)(10) change and the corresponding procedures to follow are defined under 401 KAR 52:020, Section 18. An analysis of the proposed project's qualification for processing as a Section 502(b)(10) change is presented in the following bullets:

- The proposed addition of two (2) new emergency engines does not constitute a modification under Title I of the Act. The associated emissions increases are less than the corresponding Significant Emission Rates (SERs); thus, no PSD avoidance limits are required or necessary.
- The proposed emergency engine additions will not result in a violation of any applicable requirements nor any federally enforceable compliance assurance conditions. The only required updates to the current permit are to add the new engines to an EU Group identifying applicable requirements for SI ICE from 40 CFR 60, Subpart JJJJ.
- The project emissions are summarized and detailed in Attachment B. The proposed engines will not result in an exceedance of emissions allowed under the permit.

Based on consideration of the applicable regulations and the nature of the proposed permit changes, Novelis has concluded that the proposed revision meets these criteria for a Section 502(b)(10) change.

Required Information for a Section 502(b)(10) Change Notification

The following bulleted list demonstrates that the contents of this letter meet all of the 502(b)(10) change notification requirements in 401 KAR 52:020 Section 18(2):

- *A brief description of the change*

  Refer to the project description in this notification letter.

- *The date on which the change will occur*

  The proposed equipment installations will be commenced and completed at least seven (7) workdays after submitting this Section 502(b)(10) change notification.

- *Any change in emissions or pollutants that result from the change*

  Refer to the emission calculations provided in Attachment B.

- *Any new applicable requirements that will apply after the change*

  Refer to the DEP 7007V form in Attachment A.

Novelis has provided the required items for a Section 502(b)(10) change notification listed in 401 KAR 52:020, Section 18(2)(a) through (d) in this letter. Additionally, Attachment A contains DEP 7007AI, N, V, and EE forms to facilitate processing this permit action.

Certification Statement

Based on information and belief formed after reasonable inquiry, the statements and information contained in this notification are true, accurate, and complete and the planned operational change meets the criteria of a Section 502(b)(10) change. This declaration is affirmed by the Guthrie Plant's responsible official via the signature on the DEP 7007AI form in Attachment A. Through this letter and application, Novelis requests use of these procedures in accordance with 401 KAR 52:020, Section 18(1).

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

If you have any questions or comments about the information presented in this notification, please do not hesitate to contact Steve Royer at (404) 263-1948 or Elisabeth Martin with Trinity Consultants at (859) 341-8100.

Sincerely,

NOVELIS CORPORATION

Steve Royer
Senior EHS Manager, Novelis North America Capital Projects

Attachments

cc: Tom Lilienthal, Novelis Guthrie
Elisabeth Martin, P.E., Trinity Consultants
John Colebrook, Trinity Consultants
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ATTACHMENT A – DEP 7007 SERIES FORMS

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

None

___ Additional Documentation attached

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: 10/2024

Section AI.1: Source Information

Physical Location Address:	**Street:**	8155 Old Railroad Lane					
	City:	Guthrie	**County:**	Todd	**Zip Code:**	42234	
Mailing Address:	**Street or P.O. Box:**	Same as above					
	City:		**State:**	KY	**Zip Code:**		

Standard Coordinates for Source Physical Location

Longitude: -87.17463 (decimal degrees) **Latitude:** 36.66469 (decimal degrees)

Primary (NAICS) Category: Aluminum Sheet, Plate, and Foil Manufacturing/Secondary Smelting and Alloying of Aluminum **Primary NAICS #:** 331315/331314

Classification (SIC) Category: Aluminum Sheet, Plate, and Foil/Secondary Smelting and Refining of Nonferrous Metal **Primary SIC #:** 3353/3341

Briefly discuss the type of business conducted at this site: Aluminum processing for automotive parts in coil finishing plant. Aluminum ingot casting from primary and secondary aluminum inputs.

Description of Area Surrounding Source: ☑ Rural Area ☐ Industrial Park ☐ Residential Area ☐ Urban Area ☐ Industrial Area ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 250

Approximate distance to nearest residence or commercial property: *0.10 miles*

Property Area: 304 acres

Is this source portable? ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☑ Currently Hold	☐ Need	☐ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:

☐ Mixed Waste Generator ☐ Generator ☐ Recycler ☐ Other: _____

☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility ☑ N/A

Section AI.2: Applicant Information

Applicant Name: Novelis Corporation

Title: (if individual)

Mailing Address:
Street or P.O. Box: 8155 Old Railroad Lane
City: Guthrie **State:** KY **Zip Code:** 42234

Email: (if individual)

Phone:

Technical Contact

Name: Steve Royer

Title: Senior EHS Manager, Novelis North America Capital Projects

Mailing Address:
Street or P.O. Box: 3550 Peachtree Road, Suite 1100
City: Atlanta **State:** GA **Zip Code:** 30326

Email: steve.royer@novelis.com

Phone: 404-263-1948

Air Permit Contact for Source

Name: Same as technical contact

Title:

Mailing Address:
Street or P.O. Box:
City: **State:** **Zip Code:**

Email:

Phone:

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name: _____

Title: _____

Mailing Address: **Street or P.O. Box:** _____

City: _____ **State:** _____ **Zip Code:** _____

Email: _____

Phone: _____

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position

Section AI.4: Type of Application

Current Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment
☐ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide OperatingPermit
☑ 502(b)(10)Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: _____

Is the source requesting a limitation of potential emissions? ☐ Yes ☑ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☐ Volatile Organic Compounds (VOC)		☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* Oct. 2024

Proposed Operation Start-Up Date: *(MM/YYYY)* Oct. 2024

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* na

Proposed Operation Start-Up Date: *(MM/YYYY)* na

Applicant is seeking coverage under a permit shield. ☐ **Yes** ☑ **No**

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- ☐ DEP7007A Indirect Heat Exchangers and Turbines
- ☐ DEP7007B Manufacturing or Processing Operations
- ☐ DEP7007C Incinerators and Waste Burners
- ☐ DEP7007F Episode Standby Plan
- ☐ DEP7007J Volatile Liquid Storage
- ☐ DEP7007K Surface Coating or Printing Operations
- ☐ DEP7007L Mineral Processes
- ☐ DEP7007M Metal Cleaning Degreasers
- ☑ DEP7007N Source Emissions Profile
- ☐ DEP7007P Perchloroethylene Dry Cleaning Systems
- ☐ DEP7007R Emission Offset Credit
- ☐ DEP7007S Service Stations
- ☐ DEP7007T Metal Plating and Surface Treatment Operations
- ☑ DEP7007V Applicable Requirements and Compliance Activities
- ☐ DEP7007Y Good Engineering Practice and Stack Height Determination
- ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units
- ☐ DEP7007BB Certified Progress Report
- ☐ DEP7007CC Compliance Certification
- ☐ DEP7007DD Insignificant Activities
- ☑ DEP7007EE Internal Combustion Engines
- ☐ DEP7007FF Secondary Aluminum Processing
- ☐ DEP7007GG Control Equipment
- ☐ DEP7007HH Haul Roads
- ☐ Confidentiality Claim
- ☐ Ownership Change Form
- ☐ Secretary of State Certificate
- ☐ Flowcharts or diagrams depicting process
- ☐ Digital Line Graphs (DLG) files of buldings, roads, etc.
- ☐ Site Map
- ☐ Map or drawing depicting location of facility
- ☐ Safety Data Sheet (SDS)
- ☐ Emergency Response Plan
- ☐ Other: _____

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Authorized Signature	10/10/2024 **Date**
Thomas A. Lilienthal **Type or Printed Name of Signatory**	Plant Manager **Title of Signatory**

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007N

Source Emissions Profile

__ Section N.1: Emission Summary

__ Section N.2: Stack Information

__ Section N.3: Fugitive Information

__ Section N.4: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: 10/2024

N.1: Emission Summary

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 07/2000	na	na	0.011	na	2.71E-03	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	NOx	898.93	Manufacturer Emissions Data Sheet	na	na	0.96	na	0.24	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	SO2	0.60	AP-42 Table 3.2-2, 07/2000	na	na	6.38E-04	na	1.59E-04	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	VOC	131.09	Manufacturer Emissions Data Sheet (as THC)	na	na	0.14	na	0.035	na

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	CO	11,472	Manufacturer Emissions Data Sheet	na	na	12.19	na	3.05	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	CO2	119,317	40 CFR 98, Subpart C, Table C-1	na	na	126.83	na	31.71	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	N2O	0.22	40 CFR 98, Subpart C, Table C-2	na	na	2.39E-04	na	5.98E-05	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	CH4	2.25	40 CFR 98, Subpart C, Table C-2	na	na	2.39E-03	na	5.98E-04	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Formaldehyde	53.86	AP-42 Table 3.2-2, 07/2000	na	na	0.057	na	0.014	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Ammonia	18.00	SCAQMD Document, 12/2016	na	na	0.019	na	4.78E-03	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Lead	5.00E-04	AP-42 Table 1.4-2	na	na	5.32E-07	na	1.33E-07	na
047	Cast Pit Sump Emergency Generator	1	Natural Gas Combustion	na	na	S16	1.06E-03	Total HAP	73.64	Sum of individual HAP	na	na	0.078	na	0.020	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 07/2000	na	na	3.87E-03	na	9.68E-04	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	NOx	390.21	Manufacturer Emissions Data Sheet	na	na	0.15	na	0.037	na

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity *(SCC Units/hour)*	Pollutant	Uncontrolled Emission Factor *(lb/SCC Units)*	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency *(%)*	Control Efficiency *(%)*	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential *(lb/hr)*	Controlled Potential *(lb/hr)*	Uncontrolled Potential *(tons/yr)*	Controlled Potential *(tons/yr)*
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	SO2	0.60	AP-42 Table 3.2-2, 07/2000	na	na	2.28E-04	na	5.70E-05	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	VOC	352.74	Manufacturer Emissions Data Sheet (as THC)	na	na	0.13	na	0.034	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	CO	15,445	Manufacturer Emissions Data Sheet	na	na	5.87	na	1.47	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	CO2	119,317	40 CFR 98, Subpart C, Table C-1	na	na	45.34	na	11.34	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	N2O	0.22	40 CFR 98, Subpart C, Table C-2	na	na	8.55E-05	na	2.14E-05	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	CH4	2.25	40 CFR 98, Subpart C, Table C-2	na	na	8.55E-04	na	2.14E-04	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Formaldehyde	53.86	AP-42 Table 3.2-2, 07/2000	na	na	0.020	na	5.12E-03	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Ammonia	18.00	SCAQMD Document, 12/2016	na	na	6.84E-03	na	1.71E-03	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Lead	5.00E-04	AP-42 Table 1.4-2	na	na	1.90E-07	na	4.75E-08	na
048	Decoater Backup Emergency Generator	1	Natural Gas Combustion	na	na	S17	3.80E-04	Total HAP	73.64	Sum of individual HAP	na	na	0.028	na	7.00E-03	na

Section N.2: Stack Information

UTM Zone: 16

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter *(ft)*	Height *(ft)*	Base Elevation *(ft)*	Northing *(m)*	Easting *(m)*	Flowrate *(acfm)*	Temperature *(° F)*	Exit Velocity *(ft/sec)*
S16	047-1, Cast Pit Sump Emergency Generator	2.5	5.8	568.5	4,058,014	483,790	456	1425.0	1.5
S17	048-1, Decoater Backup Emergency Generator	2.5	3.6	568.5	4,058,138	483,928	220	975.0	0.7

Section N.3: Fugitive Information

UTM Zone:

Emission Unit #	Emission Unit Name	Process ID	Area Physical Data		Area UTM Coordinates		Area Release Data	
			Length of the X Side *(ft)*	Length of the Y Side *(ft)*	Northing *(m)*	Easting *(m)*	Release Temperature *(°F)*	Release Height *(ft)*
Not Applicable								

Section N.4: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007V

Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)

___ Section V.2: Monitoring Requirements

___ Section V.3: Recordkeeping Requirements

___ Section V.4: Reporting Requirements

___ Section V.5: Testing Requirements

___ Section V.6: Notes, Comments, and Explanations

Additional Documentation
__ Complete DEP7007AI

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: 10/2024

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NESHAP ZZZZ: 40 CFR 63.6590(c)(6)	na	na	na	Meet the requirements of NESHAP ZZZZ by complying with NSPS JJJJ.	Comply with NSPS JJJJ.

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJ: 40 CFR 60.4234	na	na	na	Owners and operators of stationary SI ICE must operate and maintain stationary SI ICE that achieve the emission standards as required in § 60.4233 over the entire life of the engine.	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4243(b)).
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4233(d)-(e)	HC + NOX	Per Table 1 to this subpart, HC + NOX shall not exceed 10 g/HP-hr.	na	na	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4243(b)).
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4233(d)-(e)	CO	Per Table 1 to this subpart, CO shall not exceed 387 g/HP-hr.	na	na	Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4243(b)).
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4243(b)	na	na	na	Operate and maintain the certified stationary SI internal combustion engine and control device according to the manufacturer's emission-related written instructions. Meet requirements as specified in 40 CFR part 1068, subpart A through D	Keep records of conducted maintenance to demonstrate compliance with the manufacturer's instruction (60.4245(a)).

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	NSPS JJJJ: 40 CFR 60.4243(d)	na	na	na	Operate according to the requirements in (d)(1) through (3) to be considered an emergency stationary ICE.	Monitor hours of operation in emergency and non-emergency service and the reason the engine was in operation during that time.

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	NSPS JJJJ: 40 CFR 60.4237(c)	Operating Hours	Install a non-resettable hour meter prior to startup of the engine.
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	401 KAR 52:020, Section 10	Operating Hours and Purpose	Monitor the hours of operation and the purpose of operation.

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	NSPS JJJJ: 40 CFR 60.4245(a)	Maintenance Records	Keep records of conducted maintenance to demonstrate compliance with the manufacturer's instruction
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	NSPS JJJJ: 40 CFR 60.4245(b)	Operating Hours	Maintain records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	401 KAR 52:020, Section 10	Operating Hours	Maintain the records of the monhtly hours of operation and purpose of operation

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
047	Cast Pit Sump Emergency Generator	na	NSPS JJJ: 40 CFR 60.4245(e)	na	If the permittee operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in 40 CFR 60.4243(d)(2)(ii) and (iii) or that operates for the purposes specified in 40 CFR 60.4243(d)(3)(i), the permittee must submit an annual report according to the requirements in 40 CFR 60.4245(e)(1) through (3).

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
047, 048	Cast Pit Sump Emergency Generator, Decoater Backup Emergency Generator	na	na	na	na

Section V.6: Notes, Comments, and Explanations

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007EE

Internal Combustion Engines

___ Section EE.1: General Information
___ Section EE.2: Operating Information
___ Section EE.3: Design Information
___ Section EE.4: Fuel Information
___ Section EE.5: Emission Factor Information
___ Section EE.6: Notes, Comments, and Explanations

Additional Documentation

__ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG

__ Attach EPA certification of the engine

Source Name: Novelis Corporation
KY EIS (AFS) #: 21- 219-00039
Permit #: V-22-011 R1
Agency Interest (AI) ID: 136118
Date: 10/2024

Section EE.1: General Information

Emission Unit #	Emission Unit Name	Control Device ID	Stack ID	Manufacturer	Model Number	Model Year	Date of Manufacture	Proposed/Actual Date of Construction Commencement *(MM/YYYY)*	Date Reconstructed / Modified	List Applicable Regulations
047	Cast Pit Sump Emergency Generator	na	S16	Generac	SG080	2024	2024	10/2024	na	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart JJJJ
048	Decoater Backup Emergency Generator	na	S17	Generac	QT025A	2023	2023	10/2024	na	40 CFR 63 Subpart ZZZZ, 40 CFR 60 Subpart JJJJ

Section EE.2: Operating Information

Emission Unit #	Engine Purpose (Identify if Non-Emergency, Emergency,Fire/Water Pump, Black-start engine for combustion turbine, Engine Testing)	Hours Operated	Is this engine a rental? *(Yes/No)*	Rental Time Period *(hrs)*	Alternate Operating Scenarios (Describe any operating scenarios in which the engine may be used in a different configuration)
047	Emergency	500	No	na	
048	Emergency	500	No	na	

Section EE.3: Design Information

Emission Unit #	Engine Type (Identify all that apply: Commercial, Institutional, Stationary, Non-Road)	Ignition Type (Identify if either Compression or Spark Ignition)	Engine Family (Identify all that apply: 2-stroke, 4-stroke, Rich Burn, Lean Burn)	Maximum Engine Power *(bhp)*	Maximum Engine Speed *(rpm)*	Total Displacement *(L)*	Number of Cylinders
047	Stationary	Spark Ignition	4-Stroke Lean Burn	129	1,800	4.5	4
048	Stationary	Spark Ignition	4-Stroke Lean Burn	38	1,800	2.4	4

Section EE.4: Fuel Information

Emission Unit #	Identify if Primary, Secondary, or Tertiary Fuel	Fuel Type (Identify if Diesel, Gasoline, Natural Gas, Liquefied Petroleum Gas (LPG), Landfill/Digester Gas, or Other)	Fuel Grade	Percent Time Used *(%)*	Maximum Fuel Consumption	Heat Content	Sulfur Content *(%)*	SCC Code	SCC Units
047	Primary	Natural Gas	na	100	1.06E-03 MMscf/hr	1020 Btu/scf	Neg.	20200202	MMscf
048	Primary	Natural Gas	na	100	3.80E-04 MMscf/hr	1020 Btu/scf	Neg.	20200202	MMscf

Section EE.5: Emission Factor Information

Emission factors expressed here are based on the potential to emit.

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
047	Primary	PM/PM10/PM2.5	10.19	lb/MMscf	AP-42 Table 3.2-2, 07/2000
047	Primary	NOx	898.93	lb/MMscf	Manufacturer Emissions Data Sheet
047	Primary	SO2	0.60	lb/MMscf	AP-42 Table 3.2-2, 07/2000
047	Primary	VOC	131.09	lb/MMscf	Manufacturer Emissions Data Sheet (as THC)
047	Primary	CO	11,472.0	lb/MMscf	Manufacturer Emissions Data Sheet
047	Primary	CO2	119,316.9	lb/MMscf	40 CFR 98, Subpart C, Table C-1
047	Primary	N2O	0.22	lb/MMscf	40 CFR 98, Subpart C, Table C-2
047	Primary	CH4	2.25	lb/MMscf	40 CFR 98, Subpart C, Table C-2
047	Primary	Formaldehyde	53.86	lb/MMscf	AP-42 Table 3.2-2, 07/2000
047	Primary	Ammonia	18.00	lb/MMscf	SCAQMD Document, 12/2016
047	Primary	Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-2
047	Primary	Total HAP	73.64	lb/MMscf	Sum of individual HAP
048	Primary	PM/PM10/PM2.5	10.19	lb/MMscf	AP-42 Table 3.2-2, 07/2000
048	Primary	NOx	390.21	lb/MMscf	Manufacturer Emissions Data Sheet

Emission Unit #	Fuel	Pollutant	Emission Factor	Emission Factor Units	Source of Emission Factor
048	Primary	SO2	0.60	lb/MMscf	AP-42 Table 3.2-2, 07/2000
048	Primary	VOC	352.74	lb/MMscf	Manufacturer Emissions Data Sheet (as THC)
048	Primary	CO	15,445.4	lb/MMscf	Manufacturer Emissions Data Sheet
048	Primary	CO2	119,316.9	lb/MMscf	40 CFR 98, Subpart C, Table C-1
048	Primary	N2O	0.22	lb/MMscf	40 CFR 98, Subpart C, Table C-2
048	Primary	CH4	2.25	lb/MMscf	40 CFR 98, Subpart C, Table C-2
048	Primary	Formaldehyde	53.86	lb/MMscf	AP-42 Table 3.2-2, 07/2000
048	Primary	Ammonia	18.00	lb/MMscf	SCAQMD Document, 12/2016
048	Primary	Lead	5.00E-04	lb/MMscf	AP-42 Table 1.4-2
048	Primary	Total HAP	73.64	lb/MMscf	Sum of individual HAP

Section EE.6: Notes, Comments, and Explanations

ATTACHMENT B – DETAILED EMISSIONS CALCULATIONS

1. Emissions Associated with Generac SG080 Generator Engine - Cast Pit Sump

1.1 Generator Power and Fuel Consumption Data

> Pertinent data on engine power and fuel usage taken from the technical data sheet and statement of exhaust for the Generac SG080 generator.

Engine Output in hp (100% load, standby):	129.0	bhp
Generator Output in kW (100% load, standby):	80.0	kW
Fuel Consumption Rate in scf/hr (100% load, standby):	1,063.0	scf/hr
Annual Operating Hours:	500	hrs
Heat Content of Natural Gas (HHV):	1,020	Btu/scf

1.2 Source Classification Code

> Emissions are tied to the SCC code for natural gas fueled engines listed below.

SCC:	20200202
SCC Description:	Internal Combustion Engines, Industrial (2-02), Natural Gas (2-02-002), Reciprocating (2-02-002-02)
SCC Units:	Million Cubic Feet Natural Gas Burned

1.3 Rich/Lean Burn Engine Determination

> Emissions for natural gas/propane-fired engines are directly linked to the air-to-fuel ratio and as such, emission factors in AP-42 are delineated into separate tables for rich and lean burn engines. The air-to-fuel ratio is calculated below to determine which of these emission factor sets are more

	Value	Units	Basis
Combustion Air in cfh:	10,680	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	1,063.0	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	18.17	--	= (10,680 cfh * 0.076 lb/cf) / (1063.0 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.50	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio:	1.25	--	= (18.17 / 14.50)

> According to 40 CFR 60.4248, rich-burn engines are defined as any four-stroke spark ignited engine where the operating air/fuel ratio divided by the stoichiometric air/fuel ratio at full load conditions is less than or equal to 1.1. Lean-burn engines are defined as any two-stroke or four-stroke spark ignited engine that does not meet the definition of a rich burn engine. Therefore, the engine integral to this generator set is classified as a lean-burn engine when combusting natural gas fuel and the emission factors for AP-42 Table 3.2-2 apply.

1.4 Emission Calculation Methodology and Emission Factors

> Emission factors are from the manufacturer emissions data sheet as well as AP-42 Section 3.2 (7/2000) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines. Conservatively over-estimating VOC emissions by assuming THC is equal to VOC and conservatively over-estimating PM by assuming PM is equal to PM10/PM2.5.

1.4.1 NOX

Emission factor for NOX:	3.36	g/bhp-hr	Manufacturer Emissions Data Sheet
NOX emission factor in terms of SCC units:	898.93	lb/MMscf	= 3.36 g/bhp-hr * 0.0022046 lb/g * 129.0 bhp / 1,063 scf/hr * 1E06

1.4.2 CO

Emission factor for CO:	42.88	g/bhp-hr	Manufacturer Emissions Data Sheet
CO emission factor in terms of SCC units:	11,472.05	lb/MMscf	= 42.88 g/bhp-hr * 0.0022046 lb/g * 129.0 bhp / 1,063 scf/hr * 1E06

1.4.3 VOC

Emission factor for VOC:	0.49	g/bhp-hr	Manufacturer Emissions Data Sheet (as THC)
VOC emission factor in terms of SCC units:	131.09	lb/MMscf	= 0.49 g/bhp-hr * 0.0022046 lb/g * 129.0 bhp / 1,063 scf/hr * 1E06

1.4.4 PM/PM10/PM2.5

Emission factor for PM:	9.99E-03	lb/MMBtu	AP-42 Table 3.2-2, 07/2000
PM emission factor in terms of SCC units:	10.19	lb/MMscf	= 9.99E-03 lb/MMBtu * 1,020 Btu/scf

1.4.5 SO2

Emission factor for SO2:	5.88E-04	lb/MMBtu	AP-42 Table 3.2-2, 07/2000
SO2 emission factor in terms of SCC units:	0.60	lb/MMscf	= 5.88E-04 lb/MMBtu * 1,020 Btu/scf

1.4.6 HAP Emission Estimates

> The ammonia emission factor is from South Coast Air Quality Management District (SCAQMD) *Reporting Procedures for AB2588 Facilities for Reporting Their Quadrennial Air Toxics Emissions Inventory* from 12/2016, the lead emission factor is from AP-42 Section 1.4 Table 1.4-2, and all other HAP emission factors are from AP-42 Section 3.2 (7/2000) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines.

	CAS #	HAP?	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMscf)	Emission Factor Basis
Formaldehyde	50-00-0	Y	0.053	53.86	AP-42 Table 3.2-2, 07/2000
Ammonia	7664-41-7	N	0.018	18	SCAQMD Document, 12/2016
Lead	7439-92-1	Y	4.90E-07	5.00E-04	AP-42 Table 1.4-2
1,1,2,2-Tetrachloroethane	79-34-5	Y	4.00E-05	0.041	AP-42 Table 3.2-2, 07/2000
1,1,2-Trichloroethane	79-00-5	Y	3.18E-05	0.032	AP-42 Table 3.2-2, 07/2000
1,3-Butadiene	106-99-0	Y	2.67E-04	0.27	AP-42 Table 3.2-2, 07/2000
1,3-Dichloropropene	542-75-6	Y	2.64E-05	0.027	AP-42 Table 3.2-2, 07/2000
2-Methylnaphthalene	91-57-6	Y	3.32E-05	0.034	AP-42 Table 3.2-2, 07/2000
2,2,4-Trimethylpentane	540-84-1	Y	2.50E-04	0.26	AP-42 Table 3.2-2, 07/2000
Acenaphthene	83-32-9	Y	1.25E-06	1.28E-03	AP-42 Table 3.2-2, 07/2000
Acenaphthylene	208-96-8	Y	5.53E-06	5.64E-03	AP-42 Table 3.2-2, 07/2000
Acetaldehyde	75-07-0	Y	8.36E-03	8.53	AP-42 Table 3.2-2, 07/2000
Acrolein	107-02-8	Y	5.14E-03	5.24	AP-42 Table 3.2-2, 07/2000
Benzene	71-43-2	Y	4.40E-04	0.45	AP-42 Table 3.2-2, 07/2000
Benzo(b)fluoranthene	205-99-2	Y	1.66E-07	1.69E-04	AP-42 Table 3.2-2, 07/2000
Benzo(e)pyrene	50-32-8	Y	4.15E-07	4.23E-04	AP-42 Table 3.2-2, 07/2000
Benzo(g,h,i)perylene	191-24-2	Y	4.14E-07	4.22E-04	AP-42 Table 3.2-2, 07/2000
Biphenyl	92-52-4	Y	2.12E-04	0.22	AP-42 Table 3.2-2, 07/2000
Carbon Tetrachloride	56-23-5	Y	3.67E-05	0.037	AP-42 Table 3.2-2, 07/2000
Chlorobenzene	108-90-7	Y	3.04E-05	0.031	AP-42 Table 3.2-2, 07/2000
Chloroform	67-66-3	Y	2.85E-05	0.029	AP-42 Table 3.2-2, 07/2000
Chrysene	218-01-9	Y	6.93E-07	7.07E-04	AP-42 Table 3.2-2, 07/2000
Ethylbenzene	100-41-4	Y	3.97E-05	0.040	AP-42 Table 3.2-2, 07/2000
Ethylene Dibromide	106-93-4	Y	4.43E-05	0.045	AP-42 Table 3.2-2, 07/2000
Fluoranthene	206-44-0	Y	1.11E-06	1.13E-03	AP-42 Table 3.2-2, 07/2000
Fluorene	86-73-7	Y	5.67E-06	5.78E-03	AP-42 Table 3.2-2, 07/2000
Methanol	67-56-1	Y	2.50E-03	2.55	AP-42 Table 3.2-2, 07/2000
Methylene Chloride	75-09-2	Y	2.00E-05	0.020	AP-42 Table 3.2-2, 07/2000
n-Hexane	110-54-3	Y	1.11E-03	1.13	AP-42 Table 3.2-2, 07/2000
Naphthalene	91-20-3	Y	7.44E-05	0.076	AP-42 Table 3.2-2, 07/2000
PAH	na	Y	2.69E-05	0.027	AP-42 Table 3.2-2, 07/2000
Phenanthrene	85-01-8	Y	1.04E-05	0.011	AP-42 Table 3.2-2, 07/2000
Phenol	108-95-2	Y	2.40E-05	0.024	AP-42 Table 3.2-2, 07/2000
Pyrene	129-00-0	Y	1.36E-06	1.39E-03	AP-42 Table 3.2-2, 07/2000
Styrene	100-42-5	Y	2.36E-05	0.024	AP-42 Table 3.2-2, 07/2000
Toluene	108-88-3	Y	4.08E-04	0.42	AP-42 Table 3.2-2, 07/2000
Vinyl Chloride	75-01-4	Y	1.49E-05	0.015	AP-42 Table 3.2-2, 07/2000
Xylene	1330-20-7	Y	1.84E-04	0.19	AP-42 Table 3.2-2, 07/2000
Total HAP				73.64	Sum of individual HAP

1.4.7 GHG Emission Factors

> CO2, CH4 and N2O emissions for natural gas combustion are estimated using the natural gas emission factors published in 40 CFR 98, Subpart C, Table C-1 and C-2.

Global Warming Potentials of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	28
N2O	265

CO2 Emission Factor	53.06	kg CO2/MMBtu	40 CFR 98, Subpart C, Table C-1; Natural Gas (weighted U.S. average)
CH4 Emission Factor	1.0E-03	kg CH4/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas
N2O Emission Factor	1.0E-04	kg N2O/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas

Pollutant	Emission Factor (kg/MMBtu)	Equivalent Factor (lb/MMscf)
CO2	53.06	119,317
CH4	1.00E-03	2.25
N2O	1.00E-04	0.22
CO2e	53.11	119,439

1.5 Summary of Engine Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Potential Emissions (lb/hr)	Potential Emissions (tpy)
NOX	898.93	Manufacturer Emissions Data Sheet	1.06E-03	0.96	0.24
CO	11,472.05	Manufacturer Emissions Data Sheet	1.06E-03	12.19	3.05
VOC	131.09	Manufacturer Emissions Data Sheet (as THC)	1.06E-03	0.14	0.035
PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 07/2000	1.06E-03	1.08E-02	2.71E-03
SO2	0.60	AP-42 Table 3.2-2, 07/2000	1.06E-03	6.38E-04	1.59E-04
Formaldehyde	53.86	AP-42 Table 3.2-2, 07/2000	1.06E-03	0.057	0.014
Ammonia	18.00	SCAQMD Document, 12/2016	1.06E-03	0.019	4.78E-03
Lead	5.00E-04	AP-42 Table 1.4-2	1.06E-03	5.32E-07	1.33E-07
Total HAP	73.64	Sum of individual HAP	1.06E-03	0.078	0.020
CO2	119,317	40 CFR 98, Subpart C, Table C-1	1.06E-03	126.83	31.71
CH4	2.25	40 CFR 98, Subpart C, Table C-2	1.06E-03	2.39E-03	5.98E-04
N2O	0.22	40 CFR 98, Subpart C, Table C-2	1.06E-03	2.39E-04	5.98E-05
CO2e	119,439	40 CFR 98, Subpart C	1.06E-03	126.96	31.74

2. Emissions Associated with Generac QT025A Generator Engine - Decoater

2.1 Generator Power and Fuel Consumption Data

> Pertinent data on engine power and fuel usage taken from the technical data sheet and statement of exhaust for the Generac QT025A generator.

Engine Output in hp (100% load, standby):	38.0	bhp
Generator Output in kW (100% load, standby):	25.0	kW
Fuel Consumption Rate in scf/hr (100% load, standby):	380.0	scf/hr
Annual Operating Hours:	500	hrs
Heat Content of Natural Gas (HHV):	1,020	Btu/scf

2.2 Source Classification Code

> Emissions are tied to the SCC code for natural gas fueled engines listed below.

SCC:	20200202
SCC Description:	Internal Combustion Engines, Industrial (2-02), Natural Gas (2-02-002), Reciprocating (2-02-002-02)
SCC Units:	Million Cubic Feet Natural Gas Burned

2.3 Rich/Lean Burn Engine Determination

> Emissions for natural gas/propane-fired engines are directly linked to the air-to-fuel ratio and as such, emission factors in AP-42 are delineated into separate tables for rich and lean burn engines. The air-to-fuel ratio is calculated below to determine which of these emission factor sets are more

	Value	Units	Basis
Combustion Air in cfh:	4,200	cfh	Manufacturer Specification Sheet
Density of Air in lb/cf:	0.076	lb/cf	At sea level at 15 C (60 F)
Fuel consumption rate in cfh (100% load):	380.0	cfh	Manufacturer Specification Sheet
Density of Natural Gas in lb/cf:	0.042	lb/cf	AP-42 Appendix A, Misc. Data and Conversion Factors
Operating Air-to-Fuel Ratio (AFR):	19.99	--	= (4,200 cfh * 0.076 lb/cf) / (380.0 cfh * 0.042 lb/cf)
Stoichiometric AFR:	14.50	--	John B. Heywood: "Internal Combustion Engine Fundamentals page 915", 1988
AFR Ratio:	1.38	--	= (19.99 / 14.50)

> According to 40 CFR 60.4248, rich-burn engines are defined as any four-stroke spark ignited engine where the operating air/fuel ratio divided by the stoichiometric air/fuel ratio at full load conditions is less than or equal to 1.1. Lean-burn engines are defined as any two-stroke or four-stroke spark ignited engine that does not meet the definition of a rich burn engine. Therefore, the engine integral to this generator set is classified as a lean-burn engine when combusting natural gas fuel and the emission factors for AP-42 Table 3.2-2 apply.

2.4 Emission Calculation Methodology and Emission Factors

> Emission factors are from the manufacturer emissions data sheet as well as AP-42 Section 3.2 (7/2000) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines. Conservatively over-estimating VOC emissions by assuming THC is equal to VOC and conservatively over-estimating PM by assuming PM is equal to PM10/PM2.5.

2.4.1 NOX

Emission factor for NOX:	1.77	g/bhp-hr	Manufacturer Emissions Data Sheet
NOX emission factor in terms of SCC units:	390.21	lb/MMscf	= 1.77 g/bhp-hr * 0.0022046 lb/g * 38.0 bhp / 380 scf/hr * 1E06

2.4.2 CO

Emission factor for CO:	70.06	g/bhp-hr	Manufacturer Emissions Data Sheet
CO emission factor in terms of SCC units:	15,445.43	lb/MMscf	= 70.06 g/bhp-hr * 0.0022046 lb/g * 38.0 bhp / 380 scf/hr * 1E06

2.4.3 VOC

Emission factor for VOC:	1.60	g/bhp-hr	Manufacturer Emissions Data Sheet (as THC)
VOC emission factor in terms of SCC units:	352.74	lb/MMscf	= 1.60 g/bhp-hr * 0.0022046 lb/g * 38.0 bhp / 380 scf/hr * 1E06

2.4.4 PM/PM10/PM2.5

Emission factor for PM:	9.99E-03	lb/MMBtu	AP-42 Table 3.2-2, 07/2000
PM emission factor in terms of SCC units:	10.19	lb/MMscf	= 9.99E-03 lb/MMBtu * 1,020 Btu/scf

2.4.5 SO2

Emission factor for SO2:	5.88E-04	lb/MMBtu	AP-42 Table 3.2-2, 07/2000
SO2 emission factor in terms of SCC units:	0.60	lb/MMscf	= 5.88E-04 lb/MMBtu * 1,020 Btu/scf

2.4.6 HAP Emission Estimates

> The ammonia emission factor is from South Coast Air Quality Management District (SCAQMD) *Reporting Procedures for AB2588 Facilities for Reporting Their Quadrennial Air Toxics Emissions Inventory* from 12/2016, the lead emission factor is from AP-42 Section 1.4 Table 1.4-2, and all other HAP emission factors are from AP-42 Section 3.2 (7/2000) Table 3.2-2 Uncontrolled Emission Factors for 4-Stroke Lean-Burn Engines.

	CAS #	HAP?	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMscf)	Emission Factor Basis
Formaldehyde	50-00-0	Y	0.053	53.86	AP-42 Table 3.2-2, 07/2000
Ammonia	7664-41-7	N	0.018	18.00	SCAQMD Document, 12/2016
Lead	7439-92-1	Y	4.90E-07	5.00E-04	AP-42 Table 1.4-2
1,1,2,2-Tetrachloroethane	79-34-5	Y	4.00E-05	0.041	AP-42 Table 3.2-2, 07/2000
1,1,2-Trichloroethane	79-00-5	Y	3.18E-05	0.032	AP-42 Table 3.2-2, 07/2000
1,3-Butadiene	106-99-0	Y	2.67E-04	0.27	AP-42 Table 3.2-2, 07/2000
1,3-Dichloropropene	542-75-6	Y	2.64E-05	0.027	AP-42 Table 3.2-2, 07/2000
2-Methylnaphthalene	91-57-6	Y	3.32E-05	0.034	AP-42 Table 3.2-2, 07/2000
2,2,4-Trimethylpentane	540-84-1	Y	2.50E-04	0.26	AP-42 Table 3.2-2, 07/2000
Acenaphthene	83-32-9	Y	1.25E-06	1.28E-03	AP-42 Table 3.2-2, 07/2000
Acenaphthylene	208-96-8	Y	5.53E-06	5.64E-03	AP-42 Table 3.2-2, 07/2000
Acetaldehyde	75-07-0	Y	8.36E-03	8.53	AP-42 Table 3.2-2, 07/2000
Acrolein	107-02-8	Y	5.14E-03	5.24	AP-42 Table 3.2-2, 07/2000
Benzene	71-43-2	Y	4.40E-04	0.45	AP-42 Table 3.2-2, 07/2000
Benzo(b)fluoranthene	205-99-2	Y	1.66E-07	1.69E-04	AP-42 Table 3.2-2, 07/2000
Benzo(e)pyrene	50-32-8	Y	4.15E-07	4.23E-04	AP-42 Table 3.2-2, 07/2000
Benzo(g,h,i)perylene	191-24-2	Y	4.14E-07	4.22E-04	AP-42 Table 3.2-2, 07/2000
Biphenyl	92-52-4	Y	2.12E-04	0.22	AP-42 Table 3.2-2, 07/2000
Carbon Tetrachloride	56-23-5	Y	3.67E-05	0.037	AP-42 Table 3.2-2, 07/2000
Chlorobenzene	108-90-7	Y	3.04E-05	0.031	AP-42 Table 3.2-2, 07/2000
Chloroform	67-66-3	Y	2.85E-05	0.029	AP-42 Table 3.2-2, 07/2000
Chrysene	218-01-9	Y	6.93E-07	7.07E-04	AP-42 Table 3.2-2, 07/2000
Ethylbenzene	100-41-4	Y	3.97E-05	0.040	AP-42 Table 3.2-2, 07/2000
Ethylene Dibromide	106-93-4	Y	4.43E-05	0.045	AP-42 Table 3.2-2, 07/2000
Fluoranthene	206-44-0	Y	1.11E-06	1.13E-03	AP-42 Table 3.2-2, 07/2000
Fluorene	86-73-7	Y	5.67E-06	5.78E-03	AP-42 Table 3.2-2, 07/2000
Methanol	67-56-1	Y	2.50E-03	2.55	AP-42 Table 3.2-2, 07/2000
Methylene Chloride	75-09-2	Y	2.00E-05	0.020	AP-42 Table 3.2-2, 07/2000
n-Hexane	110-54-3	Y	1.11E-03	1.13	AP-42 Table 3.2-2, 07/2000
Naphthalene	91-20-3	Y	7.44E-05	0.076	AP-42 Table 3.2-2, 07/2000
PAH	na	Y	2.69E-05	0.027	AP-42 Table 3.2-2, 07/2000
Phenanthrene	85-01-8	Y	1.04E-05	0.011	AP-42 Table 3.2-2, 07/2000
Phenol	108-95-2	Y	2.40E-05	0.024	AP-42 Table 3.2-2, 07/2000
Pyrene	129-00-0	Y	1.36E-06	1.39E-03	AP-42 Table 3.2-2, 07/2000
Styrene	100-42-5	Y	2.36E-05	0.024	AP-42 Table 3.2-2, 07/2000
Toluene	108-88-3	Y	4.08E-04	0.42	AP-42 Table 3.2-2, 07/2000
Vinyl Chloride	75-01-4	Y	1.49E-05	0.015	AP-42 Table 3.2-2, 07/2000
Xylene	1330-20-7	Y	1.84E-04	0.19	AP-42 Table 3.2-2, 07/2000
Total HAP				73.64	Sum of individual HAP

2.4.7 GHG Emission Factors

> CO2, CH4 and N2O emissions for natural gas combustion are estimated using the natural gas emission factors published in 40 CFR 98, Subpart C, Table C-1 and C-2.

Global Warming Potentials of GHGs per 40 CFR 98 Subpart A, Table A-1.

CO2	1
CH4	28
N2O	265

CO2 Emission Factor	53.06	kg CO2/MMBtu	40 CFR 98, Subpart C, Table C-1; Natural Gas (weighted U.S. average)
CH4 Emission Factor	1.0E-03	kg CH4/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas
N2O Emission Factor	1.0E-04	kg N2O/MMBtu	40 CFR 98, Subpart C, Table C-2; Natural Gas

Pollutant	Emission Factor (kg/MMBtu)	Equivalent Factor (lb/MMscf)
CO2	53.06	119,317
CH4	1.00E-03	2.25
N2O	1.00E-04	0.22
CO2e	53.11	119,439

2.5 Summary of Engine Potential Emissions

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Potential Emissions (lb/hr)	Potential Emissions (tpy)
NOX	390.21	Manufacturer Emissions Data Sheet	3.80E-04	0.15	0.037
CO	15,445.43	Manufacturer Emissions Data Sheet	3.80E-04	5.87	1.47
VOC	352.74	Manufacturer Emissions Data Sheet (as THC)	3.80E-04	0.13	0.034
PM/PM10/PM2.5	10.19	AP-42 Table 3.2-2, 07/2000	3.80E-04	3.87E-03	9.68E-04
SO2	0.60	AP-42 Table 3.2-2, 07/2000	3.80E-04	2.28E-04	5.70E-05
Formaldehyde	53.86	AP-42 Table 3.2-2, 07/2000	3.80E-04	0.020	5.12E-03
Ammonia	18.00	SCAQMD Document, 12/2016	3.80E-04	0.007	1.71E-03
Lead	5.00E-04	AP-42 Table 1.4-2	3.80E-04	1.90E-07	4.75E-08
Total HAP	73.64	Sum of individual HAP	3.80E-04	2.80E-02	7.00E-03
CO2	119,317	40 CFR 98, Subpart C, Table C-1	3.80E-04	45.34	11.34
CH4	2.25	40 CFR 98, Subpart C, Table C-2	3.80E-04	8.55E-04	2.14E-04
N2O	0.22	40 CFR 98, Subpart C, Table C-2	3.80E-04	8.55E-05	2.14E-05
CO2e	119,439	40 CFR 98, Subpart C	3.80E-04	45.39	11.35

ATTACHMENT C – ENGINE SPECIFICATIONS, EMISSIONS DATA SHEETS, AND CERTIFICATES OF CONFORMITY

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

Standby Power Rating

80 kW, 100 kVA, 60 Hz

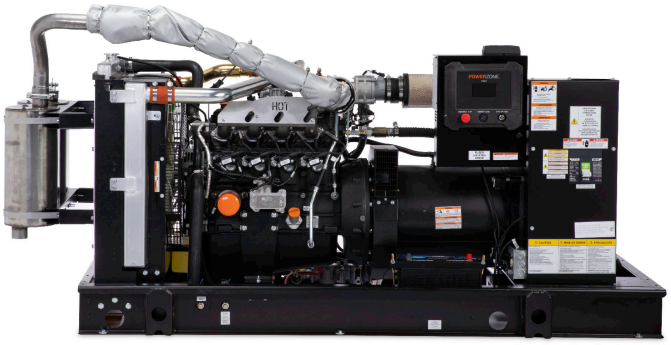


Image used for illustration purposes only

*Assembled in the USA using domestic and foreign parts

Codes and Standards

Generac products are designed to the following standards:

UL2200, UL6200, UL1236, UL489

CSA C22.2, ULC S601

BS5514 and DIN 6271

SAE J1349

NFPA 37, 70, 99, 110

NEC700, 701, 702, 708

NEMA ICS10, MG1, 250, ICS6, AB1

ANSI C62.41

IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering Ahead

Generac ensures superior quality by designing and manufacturing most of its generator components, such as alternators, enclosures, control systems and communications software. Generac also makes its own spark-ignited engines, and you'll find them on every Generac gaseous-fueled generator. We engineer and manufacture them from the block up — all at our facilities throughout Wisconsin. Applying natural gas and LP-fueled engines to generators requires advanced engineering expertise to ensure reliability, durability and necessary performance. By designing specifically for these dry, hotter-burning fuels, the engines last longer and require less maintenance. Building our own engines also means we control every step of the supply chain and delivery process, so you benefit from single-source responsibility.

Plus, Generac Industrial Power's distribution network provides all parts and service so you don't have to deal with third-party suppliers. It all leads to a positive owner experience and higher confidence level. Generac spark-ignited engines give you more options in commercial and industrial generator applications as well as extended run time from utility-supplied natural gas.

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

STANDARD FEATURES

ENGINE SYSTEM

- Oil Drain Extension
- Heavy Duty Air Cleaner
- Level 1 Fan and Belt Guards (Open Set Only)
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Critical Silencer
- Oil Temperature Sender with Alarm
- Air Filter Restriction Indicator

NOTE:: This is an example note.

NOTE::

FUEL SYSTEM

- NPT Fuel Connection on Frame
- Primary and Secondary Fuel Shutoff

COOLING SYSTEM

- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- Radiator Drain Extension

ELECTRICAL SYSTEM

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM

- UL2200 GENprotect™
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Brushless Excitation
- Sealed Bearing
- Full Load Capacity Alternator

GENERATOR SET

- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Separation of Circuits - Multiple Breakers
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Year Limited Warranty (Standby and Demand Response Rated Units)

ENCLOSURE (IF SELECTED)

- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuated Enclosures)
- Gasketed Doors
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

CONTROL SYSTEM

Power Zone® Pro Controller

- NFPA 110 Level 1 Compliant
- Engine Protective Functions
- Alternator Protective Functions
- Digital Engine Governor Control
- Digital Voltage Regulator
- Multiple Programmable Inputs and Outputs
- Remote Display Capability

Power Zone® Pro Controller Continued

- Remote Communication via Modbus® RTU, Modbus TCP/IP, and Ethernet 10/100, SNMP
- Alarm and Event Logging with Real Time Stamping
- Expandable Analog and Digital Inputs and Outputs
- Remote Wireless Software Update Capable
- Built-In Programmable Logic Eliminates the Need for External Controllers Under Most Conditions
- Programmable I/O Channel Properties
- Built-In Diagnostics

Alarms and Warnings

- High/Low Oil Pressure
- High/Low Coolant Level
- High/Low Coolant Temperature
- Sender/Sensor Failure
- High/Low Oil Temperature
- Over Total kW
- Over/Under Speed
- Over/Under Voltage
- Over/Under Frequency
- Over Current
- High/Low Battery Voltage

Alarms and Warnings Continued

- Battery Charger Current
- Phase to Phase and Phase to Neutral Short Circuits (I^2T Algorithm)

4.3 Inch Color Touch Screen Display

- Resistive Color Touch Screen
- Easily Identifiable Icons
- Multi-Lingual
- On Screen Editable Parameters

Key Function Monitoring

- Three Phase Voltage, Amperage, kW, kVA, and kVAr
- Selectable Line to Line or Line to Neutral Measurements
- Frequency
- Engine Speed
- Engine Coolant Temperature
- Engine Oil Temperature
- Battery Voltage
- Hourmeter
- Warning and Alarm Indication
- Diagnostics
- Maintenance Events/Information

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

CONFIGURABLE OPTIONS

ENGINE SYSTEM

- Heater with Shutoff Valves
- Engine Coolant Heater
- Oil Heater
- Level 1 Fan and Belt Guards (Enclosed Units Only)
- Radiator Duct Adapter (Open Set Only)
- Critical Grade Silencer
- Baseframe Cover/Rodent Guard

ELECTRICAL SYSTEM

- 10A UL Battery Charger
- Battery Warmer

ALTERNATOR SYSTEM

- Permanent Magnet Excitation
- Alternator Upsizing
- Anti-Condensation Heater
- Tropical Coating

CIRCUIT BREAKER OPTIONS

- Main Line Circuit Breaker
- 2nd Main Line Circuit Breaker
- 3rd Main Line Circuit Breaker
- Shunt Trip and Auxiliary Contact
- Electronic Trip Breakers

FUEL SYSTEM

- NPT Flexible Fuel Line

GENERATOR SET

- Extended Factory Testing (3-Phase Only)
- 8 Position Load Center
- IBC Seismic Certification (Contact Factory for Availability)
- OSHPD Seismic Certification (Contact Factory or Availability)
- Elevated Stand

ENCLOSURE

- Level 0 Sound Attenuated
- Level 1 Sound Attenuated
- Level 2 Sound Attenuated
- Level 2 Sound Attenuated with Motorized Dampers
- Steel Enclosure
- Aluminum Enclosure
- Up to 200 MPH Wind Load Rating (Contact Factory for Availability)
- AC/DC Enclosure Lighting Kit
- Enclosure Heaters (with Motorized Dampers Only)
- Door Alarm Switch
- Spring Vibration Isolators
- Pad Vibration Isolators

CONTROL SYSTEM

- NFPA 110 Compliant 21-Light Remote Annunciator
- Remote Relay Assembly (8 or 16)
- Remote E-Stop (Break Glass-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Flush Mount)
- 10A Engine Run Relay
- Ground Fault Annunciator
- 120 V GFCI and 240 V Outlets
- 100 dB Alarm Horn
- Damper Alarm Contacts (with Motorized Dampers Only)

WARRANTY (STANDBY GENSETS ONLY)

- 2 Year Extended Limited Warranty
- 5 Year Limited Warranty
- 5 Year Extended Limited Warranty
- 7 Year Extended Limited Warranty
- 10 Year Extended Limited Warranty

ENGINEERED OPTIONS

CONTROL SYSTEM

- Spare Inputs (x4) / Outputs (x4)
- Battery Disconnect Switch

GENERATOR SET

- Special Testing
- Battery Box

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
Cylinder #	4
Type	In-Line
Displacement - in3 (L)	275.0 (4.5)
Bore: in (mm)	4.5 (114.3)
Stroke: in (mm)	4.25 (107.95)
Compression Ratio	9.1:1
Intake Air Method	Turbocharged
Number of Main Bearings	5
Connecting Rods	Forged Steel, Fractured Split, Bushingless
Cylinder Head	Cast Iron
Cylinder Liners	Cast Iron
Ignition	Coil Near Plug Solid State Inductive
Piston Type	Cast Aluminum Flat Top
Crankshaft Type	Forged Steel
Lifter Type	Hydraulic Roller
Intake Valve Material	Stainless Steel
Exhaust Valve Material	Stainless Steel
Hardened Valve Seats	High Steel Iron Alloy

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	0.25

Lubrication System

Oil Pump	Gear Driven
Oil Filter Type	Full Flow Spin-On Cartridge
Engine Oil Capacity: qt (L)	21 (20)

Cooling System

Cooling System Type	Pressurized Closed
Fan Type	Pusher
Fan Speed (rpm)	2,100
Fan Diameter - in (mm)	22 (533)

Fuel System

Fuel Type	Natural Gas
Fuel Injection	Down Draft
Fuel Shutoff	Generac
G Operating Fuel Pressure - in H_2O (kPa)	5 - 14 (1.2 - 3.5)

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative (-)

ALTERNATOR SPECIFICATIONS

Standard Model	K0080124Y21
Poles	4
Field Type	Revolving
Insulation Class — Rotor	H
Insulation Class — Stator	H
Total Harmonic Distortion (THD)	<5%
Telephone Interference Factor (TIF)	<50
Standard Excitation	Synchronous Brushless
Bearings	Sealed Ball
Coupling	Direct via Flexible Disc
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

OPERATING DATA

POWER RATINGS NATURAL GAS/PROPANE VAPOR

	Standby	
Single-Phase 120/240 VAC @1.0pf	80 kW/80 kVA	Amps: 333
Three-Phase 120/208 VAC @0.8pf	80 kW/100 kVA	Amps: 278
Three-Phase 120/240 VAC @0.8pf	80 kW/100 kVA	Amps: 241
Three-Phase 277/480 VAC @0.8pf	80 kW/100 kVA	Amps: 120
Three-Phase 346/600 VAC @0.8pf	80 kW/100 kVA	Amps: 96

STARTING CAPABILITIES (SKVA)

	sKVA vs. Voltage Dip					
120/240 VAC 1Ø	30%	277/480 VAC 3Ø	30%	208/240 VAC 3Ø	30%
A0080044N21	58	K0080124Y21	172	K0045124Y21	132
A0130044N21	105	K0100124Y21	327	K0060124Y21	327

FUEL CONSUMPTION RATES*

Natural Gas – scfh (m3/hr)	
Percent Load	Standby
25%	290 (8.2)
50%	538 (15.2)
75%	795 (22.5)
100%	1,063 (30.1)

*Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

		Standby
Air Flow (Fan Air Flow Across Radiator) - Open Set	cfm (m3/min)	4,343 (123)
Coolant Flow	gpm (Lpm)	24 (90)
Coolant System Capacity	gal (L)	9 (34)
Maximum Operating Ambient Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)		See Bulletin No. 0199270SSD
Maximum Radiator Backpressure	in H2O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power scfm (m3/min)	178 (5.0

ENGINE

		Standby
Rated Engine Speed: RPM	rpm	1,800
Horsepower at Rated kW**	hp	128
Piston Speed	ft/min (m/min)	1,275 (389)
BMEP	psi (kPa)	214 (1,473)

** Refer to “Emissions Data Sheet” for maximum bHP for EPA and SCAQMD permitting purposes.

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m3/min)	456 (13.0)
Maximum Exhaust Back pressure	in Hg (Kpa)	0.75 (2.54)
Exhaust Temp (Rated Output - Post Silencer)	°F (°C)	1,425 (774)

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.

Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528, and DIN6271 standards.

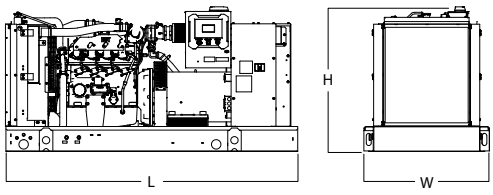
Standby - See Bulletin 0187500SSB Demand Response - See Bulletin 10000018250

SG080 | 4.5L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

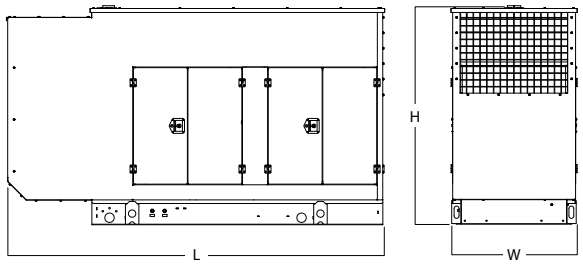
EPA Certified Stationary Emergency

DIMENSIONS AND WEIGHTS*



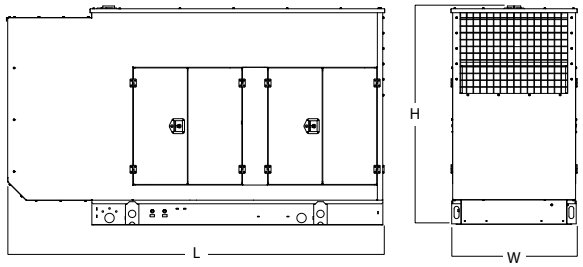
OPEN SET (Includes Exhaust Flex)

L x W x H - in (mm)	92.9 (2,360) x 39.9 (1,014) x 46.0 (1,170)
Weight lbs (kg)	2,192 - 2,250 (994 - 1,021)



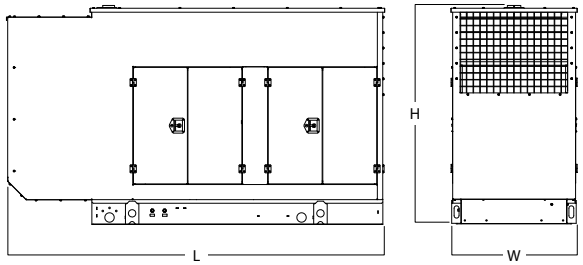
WEATHER PROTECTED ENCLOSURE

L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)
Weight lbs (kg)	Steel: 2,932 - 2,989 (1,330 - 1,356) Aluminum: 2,580 - 2,638 (1,170 - 1,196)



LEVEL 1 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)
Weight lbs (kg)	Steel: 3,022 - 3,080 (1,371 - 1,397) Aluminum: 2,671 - 2,729 (1,211 - 1,238)



LEVEL 2 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	120.8 (3,068) x 40.5 (1,028) x 69.0 (1,754)
Weight lbs (kg)	Steel: 3,100 - 3,158 (1,406 - 1,433) Aluminum: 2,727 - 2,785 (1,237 - 1,263)

* All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings

Generac Power Systems, Inc. | S45 W29290 HWY. 59 | Waukesha, WI 53189 | generac.com
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Part No. A0000317173
Rev. C 10/17/2023

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2024 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Generac Power Systems, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: RGNXB04.5MDI-040

Effective Date: 11/16/2023

Expiration Date: 12/31/2024

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 11/16/2023

Revision Date: N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: RGNXB04.5MDI
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
LPG/Propane
Emission Standards :
Part 90 Phase 1
HC + NOx (g/kW-hr) : 13.4
NMHC + NOx (g/kW-hr) : 13.4
CO (g/kW-hr) : 519.0
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

STATEMENT OF EXHAUST EMISSIONS
2024 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

	Model	Engine (L)	Engine Emissions Designation	EPA Engine Family	Fuel	Catalyst Required	Combination Catalyst or Separate Catalyst	EPA Certification #	Grams/bhp-hr.				Rated RPM	BHP	Fuel Flow (lb/hr)
									THC	NMHC	NOx	CO			
SSIE (SORE)	QTA25	2.4	A02.4GCN029A0	RGNXB02.4MDI	NG	No	Not Required	RGNXB02.4MDI-046	1.60	1.56	1.77	70.06	1,800	38	16.52
	QTA25	2.4	A02.4GCV032A0	RGNXB02.4MDI	LPG			RGNXB02.4MDI-046	1.43	N/A	4.38	86.18	1,800	43	17.59
	SG035, 40, 45, 50NA	4.5	A04.5SPN057A0	RGNXB04.5MDI	NG			RGNXB04.5MDI-040	0.64	0.10	4.48	35.10	1,800	75	25.89
	SG035, 40, 45, 50NA	4.5	A04.5SPV057A0	RGNXB04.5MDI	LPG			RGNXB04.5MDI-040	0.84	N/A	5.27	64.25	1,800	76	29.51
	SG050T, 60, 70, 80	4.5	A04.5SPN096A0	RGNXB04.5MDI	NG			RGNXB04.5MDI-040	0.49	0.12	3.36	42.88	1,800	129	45.22
	SG050T, 60, 70, 80	4.5	A04.5SSV096A0	RGNXB04.5MDI	LPG			RGNXB04.5MDI-040	0.47	N/A	3.27	59.64	1,800	129	48.96
	SG080	9.0	A08.9GSN093A0	RGNXB08.9MDA	NG			RGNXB08.9MDA-041	0.60	0.06	1.07	93.19	1,800	125	62.37
	SG080	9.0	A08.9GSV095A0	RGNXB08.9MDA	LP-LPV			RGNXB08.9MDA-041	0.71	N/A	1.54	124.79	1,800	128	61.52
	SG080	9.0	A08.9MSL095A0	RGNXB08.9MDA	LP-LPL			RGNXB08.9MDA-041	0.75	N/A	1.33	127.68	1,800	128	60.23
LSIE	SG080/100	9.0	E08.9GSN111A1	RGNXB08.92O1	NG	Yes	Catalyst Muffler	RGNXB08.92O1-047	0.18	0.00	0.01	0.25	1,800	153	53.1
	SG080/100 (LPF)	9.0	E08.9MSN116A1	RGNXB08.92O1	NG			RGNXB08.92O1-047	0.11	0.00	0.12	0.03	1,800	153	53.24
	SG080/100	9.0	F08.9GSV106A0	RGNXB08.92O2	LPV			RGNXB08.92O2-028	0.01	N/A	0.21	0.22	1,800	142	54.36
	SG080/100	9.0	F08.9MSL106A0	RGNXB08.92O2	LPL			RGNXB08.92O2-028	0.03	N/A	0.00	0.36	1,800	142	55.27
	SG/MG130, 150	9.0	E08.9MSN170A0	PGNXB08.92O3	NG			RGNXB08.92O3-029	0.14	0.00	0.10	0.74	1,800	229	86.37
	SG/MG130, 150	9.0	F08.9MSV169A1	PGNXB08.92O4	LPV			RGNXB08.92O4-030	0.02	N/A	0.03	0.09	1,800	230	86.37
	SG175	14.2	E14.2MSN227A3	RGNXB14.22C1	NG			RGNXB14.22C1-031	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG/MG150, 200	14.2	E14.2MSN227A3	RGNXB14.22C1	NG			RGNXB14.22C1-031	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG230	14.2	E14.2MSN279A3	RGNXB14.22C1	NG			RGNXB14.22C1-031	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG/MG250	14.2	E14.2MSN279A3	RGNXB14.22C1	NG			RGNXB14.22C1-031	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG275, 300	14.2	E14.2MSN343A3	RGNXB14.22C1	NG			RGNXB14.22C1-031	0.03	0.00	0.04	0.32	1,800	460	140.33
	MG300	14.2	E14.2MSN343A3	RGNXB14.22C1	NG			RGNXB14.22C1-031	0.03	0.00	0.04	0.32	1,800	460	140.33
	SG350	21.9	E21.9MSN474A4	RGNXB21.92C1	NG			RGNXB21.92C1-032	0.07	0.00	0.26	0.21	1,800	636	176
	SG350 (LPF)	21.9	E21.9MSN474A5	RGNXB21.92C1	NG			RGNXB21.92C1-032	0.30	0.00	0.06	0.12	1,800	636	214
	SG/MG350	21.9	E21.9MSN474A4	RGNXB21.92C1	NG			RGNXB21.92C1-032	0.15	0.00	0.60	0.12	1,800	636	214
	SG400	21.9	E21.9MSN474A5	RGNXB21.92C1	NG			RGNXB21.92C1-032	0.15	0.00	0.60	0.12	1,800	636	214
	SG/MG400	21.9	E21.9MSN502A2	RGNXB21.92C3	NG			RGNXB21.92C3-033	0.15	0.00	0.01	0.33	1,800	673	228
	SG/MG450	21.9	E21.9MSN502A2	RGNXB21.92C3	NG			RGNXB21.92C3-033	0.15	0.00	0.01	0.33	1,800	673	228
	SG/MG450 (LPF)	21.9	E21.9MSN0502A5	RGNXB21.92C3	NG			RGNXB21.92C3-033	0.19	0.00	0.05	0.17	1,800	673	224
	SG/MG500	25.8	E25.8MSN580A4	RGNXB25.82C1	NG			RGNXB25.82C1-034	0.16	0.00	0.03	0.60	1,800	778	280
	SG/MG500 (LPF)	25.8	E25.8MSN580A5	RGNXB25.82C1	NG			RGNXB25.82C1-034	0.19	0.00	0.06	0.57	1,800	778	280
	SG/MG625	33.9	E33.9MSN677A0	RGNXB33.92C1	NG			RGNXB33.92C1-035	0.13	0.00	0.15	0.92	1,800	909	325
	SG/MG750	33.9	E33.9MSN803A0	RGNXB33.92C1	NG			RGNXB33.92C1-035	0.18	0.00	0.15	0.92	1,800	1,077	417
	SG/MG1000	49.0	E49.0ASN1100A0	RGNXB49.02C1	NG			RGNXB49.02C1-036	0.11	0.00	0.03	0.65	1,800	1,475	427

NG: Natural Gas
LPV: Liquid Propane Vapor
LPL: Liquid Propane Liquid

Engine BHP is taken from Engine Emissions Certificate Results
LPG: Liquid Propane Vapor or Liquid Propane Liquid
LPF: Units with Option Low Pressure Fuel System

N/A: Not Applicable
Refer to Page 2 for Definitions and Advisory Notes.

Part No. A0005031814
Rev. C 3/5/24

STATEMENT OF EXHAUST EMISSIONS
2024 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

2024 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Generac spark-ignited gensets, including SG, MG, QTA, QT and RG series gensets that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve covers.

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family

The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required

Indicates whether a three-way catalyst (TWC) and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a TWC to meet EPA certification requirements. Please note that some units that do not require a TWC to meet EPA requirements do need one if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst

SG and MG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many QT and RG series generator sets use the same engines as SG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number

Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr

Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number

A separate low-emissions option is available on many Generac gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers

The information provided here is proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc.

Advisory Notes on Emissions Actuals

- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems, Inc. cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.

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QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

Standby Power Rating

25 kW, 31 kVA, 60 Hz

*Assembled in the USA using domestic and foreign parts

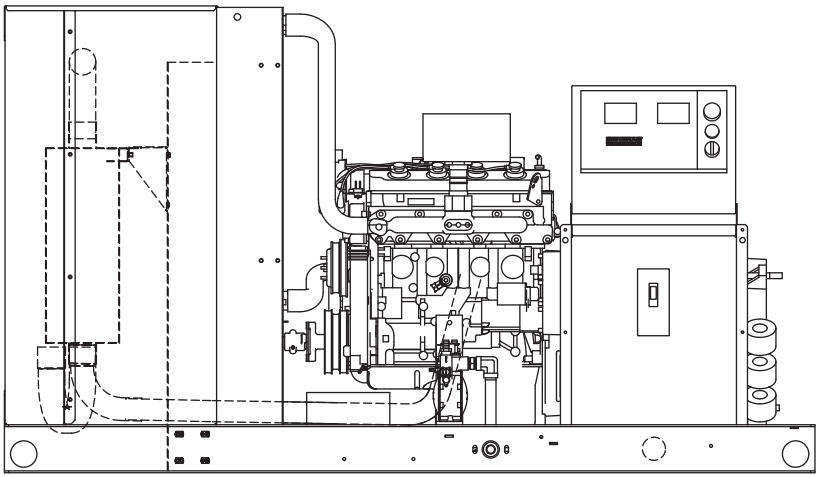


Image used for illustration purposes only

Codes and Standards

Generac products are designed to the following standards:

UL2200, UL508, UL489

CSA 22.2

BS5514 and DIN 6271

SAE J1349

NFPA 37, 70, 99, 110

NEC700, 701, 702, 708

ISO 3046, 7637, 8528, 9001

NEMA ICS10, MG1, 250, ICS6, AB1

ANSI C62.41

IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering Ahead

Generac ensures superior quality by designing and manufacturing most of its generator components, such as alternators, enclosures, control systems and communications software. Generac also makes its own spark-ignited engines, and you'll find them on every Generac gaseous-fueled generator. We engineer and manufacture them from the block up — all at our facilities throughout Wisconsin. Applying natural gas and LP-fueled engines to generators requires advanced engineering expertise to ensure reliability, durability and necessary performance. By designing specifically for these dry, hotter-burning fuels, the engines last longer and require less maintenance. Building our own engines also means we control every step of the supply chain and delivery process, so you benefit from single-source responsibility.

Plus, Generac Industrial Power's distribution network provides all parts and service so you don't have to deal with third-party suppliers. It all leads to a positive owner experience and higher confidence level. Generac spark-ignited engines give you more options in commercial and industrial generator applications as well as extended run time from utility-supplied natural gas.

QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

STANDARD FEATURES

ENGINE SYSTEM

- Oil Drain Extension
- Heavy Duty Air Cleaner
- Fan Guard
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Radiator Duct Adapter (Open Set Only)
- Critical Exhaust Silencer (Enclosed Only)

Fuel System

- Fuel Lockoff Solenoid
- Secondary Fuel Regulator
- Flexible Fuel Lines
- Fuel Line - NPT Connection
- Primary and Secondary Fuel Shutoff

Cooling System

- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- 120VAC Coolant Heater

Electrical System

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM

- GENprotect™
- Fault Protection
- 10A UL Float/Equalize Battery Charger
- Main Line Circuit Breaker
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Brushless Excitation
- Sealed Bearing
- Amortisseur Winding
- Full Load Capacity Alternator

GENERATOR SET

- Internal Genset Vibration Isolation
- Separation of Circuits-High/Low Voltage
- Separation of Circuits-Multiple Breakers
- Wrapped Exhaust Piping (Enclosed Only)
- Standard Factory Testing
- 2 Year Limited Warranty
- Silencer Mounted in the Discharge Hood (Enclosed Only)

ENCLOSURE (If Selected)

- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuation Enclosures)
- Gasketed Doors
- Stamped Air-Intake Louvers
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

CONFIGURABLE OPTIONS

ENCLOSURE

- ○ Level 1 Sound Attenuation
- ○ Steel Enclosure
- ○ Aluminum Enclosure
- ○ Up to 200 MPH Wind Load Rating (Contact Factory for Availability)

CONTROL SYSTEM

- ○ Compliant 21-Light Remote Annunciator
- ○ Remote Relay Assembly (8 or 16)

CONTROL SYSTEM

Digital H Control Panel—Dual 4x20 Display

Program Functions

- Programmable Crank Limiter
- 7-Day Programmable Exerciser
- Special Applications Programmable Logic Controller
- RS-232/485 Communications
- 3-Phase Sensing Digital Voltage Regulator
- 2-Wire Start Capability
- Date/Time Fault History (Event Log)
- Isochronous Governor Control
- Waterproof/Sealed Connectors
- Audible Alarms and Shutdowns
- Not in Auto (Flashing Light)
- Auto/Off/Manual Switch
- E-Stop (Red Mushroom-Type)
- NFPA110 Level I and II (Programmable)
- Customizable Alarms, Warnings, and Events
- Modbus® Protocol
- Predictive Maintenance Algorithm
- Sealed Boards
- Password Parameter Adjustment Protection
- Single Point Ground
- 16 Channel Remote Trending
- 0.2 msec High Speed Remote Trending
- Alarm Information Automatically Annunciated on the Display

Full System Status Display

- Power Output (kW)
- Power Factor
- kW Hours, Total, and Last Run
- Real/Reactive/Apparent Power
- All Phase AC Voltage
- All Phase Currents
- Oil Pressure
- Coolant Temperature
- Coolant Level
- Engine Speed
- Battery Voltage
- Frequency

Alarms and Warnings

- Oil Pressure
- Coolant Temperature
- Coolant Level
- Low Fuel Pressure Alarm
- Engine Overspeed
- Battery Voltage
- Alarms and Warnings Time and Date Stamped
- Snap Shots of Key Operation Parameters During Alarms and Warnings
- Alarms and Warnings Spelled Out (No Alarm Codes)

QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
EPA Emissions Compliance	Stationary Emergency
EPA Emissions Engine Reference	See Emissions Data Sheet
Cylinder #	4
Type	In-Line
Displacement - in^3 (L)	146.4 (2.4)
Bore - in (mm)	3.41 (86.61)
Stroke - in (mm)	3.94 (100.08)
Compression Ratio	9.5:1
Intake Air Method	Naturally Aspirated
Number of Main Bearings	5
Connecting Rods	Forged Steel
Cylinder Head	Aluminum
Cylinder Liners	No
Ignition	High Energy
Piston Type	Aluminum Alloy
Crankshaft Type	Cast Steel
Lifter Type	Overhead Cam
Intake Valve Material	Steel Alloy
Exhaust Valve Material	Hardened Steel
Hardened Valve Seats	Yes

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	±0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full-Flow Spin-On Cartridge
Crankcase Capacity - qt (L)	4 (3.8)

Cooling System

Cooling System Type	Pressurized Closed Recovery
Fan Type	Pusher
Fan Speed - rpm	1,980
Fan Diameter - in (mm)	18 (457)

Fuel System

Fuel Type	Natural Gas, Propane Vapor
Carburetor	Down Draft
Secondary Fuel Regulator	Standard
Fuel Shut Off Solenoid	Standard
Operating Fuel Pressure - in H_2O (kPa)	5 - 14 (1.2 - 3.5)

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	Generac 390 mm
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<5% (3-Phase)
Telephone Interference Factor (TIF)	<50
Standard Excitation	Synchronous Brushless

Bearings	Sealed Ball
Coupling	Flexible Disc
Load Capacity - Standby	100%
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

GENERAC® | INDUSTRIAL POWER

OPERATING DATA

POWER RATINGS—Natural Gas/Propane Vapor

		Standby
Single-Phase 120/240 VAC @1.0pf	25 kW	Amps: 104
Three-Phase 120/208 VAC @0.8pf	25 kW	Amps: 87
Three-Phase 120/240 VAC @0.8pf	25 kW	Amps: 75
Three-Phase 277/480 VAC @0.8pf	25 kW	Amps: 38

STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip

277/480 VAC							
Alternator	kW	10%	15%	20%	25%	30%	35%
Standard	25	16	25	33	41	49	57

208/240 VAC							
Alternator	kW	10%	15%	20%	25%	30%	35%
Standard	25	12	19	25	31	37	43

FUEL CONSUMPTION RATES*

Natural Gas – ft³/hr (m³/hr)

Percent Load	Standby
25%	140 (3.9)
50%	220 (6.2)
75%	300 (8.5)
100%	380 (10.8)

Propane Vapor - ft³/hr (m³/hr)

Percent Load	Standby
25%	56 (1.6)
50%	87 (2.5)
75%	119 (3.4)
100%	151 (4.3)

* Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

		Standby
Air Flow (Inlet Air Combustion and Radiator)	ft³/min (m³/min)	1,500 (42.48)
Coolant Flow	gal/min (l/min)	42 (160)
Coolant System Capacity	gal (l)	2.5 (9.5)
Heat Rejection to Coolant	BTU/hr (kPa)	95,000 (27.8)
Maximum Operating Ambient Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)	See Bulletin No. 0199270SSD	
Maximum Radiator Backpressure	in H_2O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power cfm (m³/min)	70 (2.0)

ENGINE

		Standby
Rated Engine Speed	rpm	1,800
Horsepower at Rated kW**	hp	40
Piston Speed	ft/min (m/min)	1,182 (360.3)
BMEP	psi (kPa)	120 (827)

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m³/min)	220 (6.2)
Maximum Exhaust Backpressure	inHg (kPa)	1.5 (5.1)
Exhaust Temp (Rated Output - Post Silencer)	°F (°C)	975 (524)

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

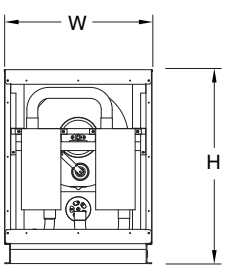
Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.
Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528, and DIN6271 standards.
Standby - See Bulletin 0187500SSB

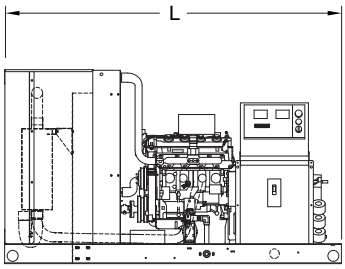
QT025A | 2.4L | 25 kW

INDUSTRIAL GASEOUS GENERATOR SET

EPA Certified Stationary Emergency

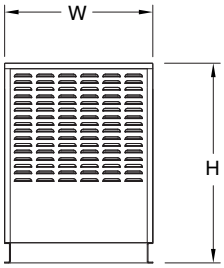
DIMENSIONS AND WEIGHTS*

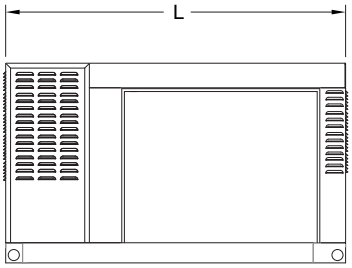




OPEN SET (Includes Exhaust Flex)

L x W x H - in (mm)	77 (1,956) x 34 (864) x 43 (1,092)
Weight - lbs (kg)	1,163 (528)





LEVEL 1 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	77 (1,956) x 34 (864) x 46 (1,168)
Weight - lbs (kg)	1,414 (641)

* All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

SPEC SHEET

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53189
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Part No. 0173110SBY
Rev. E 11/15/17

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2023 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Generac Power Systems, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: PGNXB02.42NN-019

Effective Date: 09/01/2022

Expiration Date: 12/31/2023

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 09/01/2022

Revision Date: N/A

Manufacturer: Generac Power Systems, Inc.
Engine Family: PGNXB02.42NN
Mobile/Stationary Certification Type: Stationary
Fuel : Natural Gas (CNG/LNG)
Emission Standards :
Part 90 Phase 1
NMHC + NOx (g/kW-hr) : 13.4
CO (g/kW-hr) : 519.0
HC + NOx (g/kW-hr) : 13.4
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

STATEMENT OF EXHAUST EMISSIONS
2023 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

	Model	Engine (L)	EPA Engine Family	Fuel	Catalyst Required	Combination Catalyst or Separate Catalyst	EPA Certification #	Grams/bhp-hr.				Rated RPM	BHP	Fuel Flow (lb/hr)
								THC	NMHC	NOx	CO			
Small Spark Ignited Engine (SSIE) Small Off-Road Engines (SORE)	QTA25	2.4	PGNXB02.42NN	NG	No	Not Required	PGNXB02.42NN-019	1.60	1.56	1.77	70.06	1,800	38	16.52
	QTA25	2.4	PGNXB02.42NL	LPG			PGNXB02.42NL-020	1.43	N/A	4.38	86.18	1,800	43	17.59
	SG035, 40, 45, 50NA	4.5	PGNXB04.52NN	NG			PGNXB04.52NN-015	0.64	0.10	4.48	35.10	1,800	75	25.89
	SG035, 40, 45, 50NA	4.5	PGNXB04.52NL	LPG			PGNXB04.52NL-016	0.84	N/A	5.27	64.25	1,800	76	29.51
	SG050T, 60, 70, 80	4.5	PGNXB04.52NN	NG			PGNXB04.52NN-015	0.49	0.12	3.36	42.88	1,800	129	45.22
	SG050T, 60, 70, 80	4.5	PGNXB04.52NL	LPG			PGNXB04.52NL-016	0.47	N/A	3.27	59.64	1,800	129	48.96
	SG080	9.0	PGNXB08.92U1	NG			PGNXB08.92U1-017	0.60	0.06	1.07	93.19	1,800	125	62.37
	SG080 (DF)	9.0	PGNXB08.92U1	NG/LPV			PGNXB08.92U1-017	0.42	0.05	1.89	52.04	1,800	125	57.18
	SG080 (DF)	9.0	PGNXB08.92U1	NG/LPL			PGNXB08.92U1-017	0.68	0.11	1.61	82.22	1,800	128	55.82
	SG080	9.0	PGNXB08.92U2	LPV			PGNXB08.92U2-018	0.71	N/A	1.54	124.79	1,800	128	61.52
	SG080	9.0	PGNXB08.92U2	LPL			PGNXB08.92U2-018	0.75	N/A	1.33	127.68	1,800	128	60.23
Large Spark Ignited Engines (LSIE)	SG080, 100	9.0	PGNXB08.92O1	NG	Yes	Catalyst Muffler	PGNXB08.92O1-021	0.18	0.00	0.01	0.25	1,800	153	53.10
	SG080, 100 (LPF)	9.0	PGNXB08.92O1	NG			PGNXB08.92O1-021	0.11	0.00	0.12	0.03	1,800	153	53.24
	SG080, 100	9.0	PGNXB08.92O2	LPV			PGNXB08.92O4-024	0.01	N/A	0.21	0.22	1,800	142	54.36
	SG080, 100	9.0	PGNXB08.92O2	LPL			PGNXB08.92O2-022	0.03	N/A	0.00	0.36	1,800	142	55.27
	SG080, 100 (DF)	9.0	PGNXB08.92O1	NG/LPV			PGNXB08.92O1-021	0.14	0.00	0.00	0.17	1,800	148	53.20
	SG080, 100 (DF)	9.0	PGNXB08.92O1	NG/LPL			PGNXB08.92O1-021	0.17	0.00	0.01	1.03	1,800	151	51.86
	SG080, 100 (DF, LPF)	9.0	PGNXB08.92O1	NG/LPV			PGNXB08.92O1-021	0.11	0.00	0.00	0.18	1,800	152	46.90
	SG080, 100 (DF, LPF)	9.0	PGNXB08.92O1	NG/LPL			PGNXB08.92O1-021	0.08	0.00	0.00	0.09	1,800	151	51.58
	SG/MG130, 150	9.0	PGNXB08.92O3	NG			PGNXB08.92O3-023	0.14	0.00	0.10	0.74	1,800	228	86.37
	SG/MG130, 150 (DF)	9.0	PGNXB08.92O3	NG/LPV			PGNXB08.92O3-023	0.18	0.00	0.08	0.56	1,800	229	88.01
	SG/MG130, 150 (DF)	9.0	PGNXB08.92O3	NG/LPL			PGNXB08.92O3-023	0.06	0.00	0.09	0.19	1,800	228	84.82
	SG/MG130, 150	9.0	PGNXB08.92O4	LPV			PGNXB08.92O4-024	0.02	N/A	0.03	0.09	1,800	230	85.37
	SG/MG130, 150	9.0	PGNXB08.92O4	LPL			PGNXB08.92O4-024	0.01	N/A	0.28	0.20	1,800	230	86.38
	SG175	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG/MG150, 200	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.24	0.00	0.12	0.21	1,800	304	101.16
	SG230	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG/MG250	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.15	0.00	0.35	0.41	1,800	374	141.71
	SG275, 300	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.03	0.00	0.04	0.32	1,800	460	140.33
	MG300	14.2	PGNXB14.22C1	NG			PGNXB14.22C1-025	0.03	0.00	0.04	0.32	1,800	460	140.33
	SG/MG350, 400	21.9	PGNXB21.92C1	NG			PGNXB21.92C1-026	0.07	0.00	0.26	0.21	1,800	636	175.68
	SG/MG350, 400 (LPF)	21.9	PGNXB21.92C1	NG			PGNXB21.92C1-026	0.30	0.00	0.06	0.12	1,800	636	213.96
	SGMG350, 400, 450	21.9	PGNXB21.92C3	NG			PGNXB21.92C3-027	0.15	0.00	0.008	0.33	1,800	673	280.37
	SG/MG350, 400, 450 (LPF)	21.9	PGNXB21.92C3	NG			PGNXB25.82C1-028	0.19	0.00	0.05	0.17	1,800	673	224.29
	SG/MG500	25.8	PGNXB25.82C1	NG			PGNXB25.82C1-028	0.16	0.00	0.03	0.60	1,800	777	280.37
	SG/MG500 (LPF)	25.8	PGNXB25.82C1	NG			PGNXB25.82C1-028	0.19	0.00	0.06	0.57	1,800	777	279.64
	SG/MG625	33.9	PGNXB33.92C1	NG			PGNXB33.92C1-029	0.13	0.00	0.01	0.22	1,800	908	324.88
	SG/MG750	33.9	PGNXB33.92C1	NG			PGNXB33.92C1-029	0.18	0.00	0.15	0.92	1,800	1,077	416.90
	SG/MG1000	49.0	PGNXB49.02C1	NG			PGNXB49.02C1-030	0.12	0	0.03	0.65	1,800	1,475	426.67

NG: Natural Gas
LPV: Liquid Propane Vapor
LPL: Liquid Propane Liquid

DF: Dual Fuel
LPG: Liquid Propane Vapor or Liquid Propane Liquid
LPF: Units with Option Low Pressure Fuel System

N/A: Not Applicable
Refer to Page 2 for Definitions and Advisory Notes.

Part No. A0003951583
Rev. B 2/2/23

STATEMENT OF EXHAUST EMISSIONS
2023 Spark-Ignited Generators
Industrial Series - NON-SCAQMD Certified, Stationary Emergency

2023 EPA SPARK-IGNITED EXHAUST EMISSIONS DATA

Effective since 2009, the EPA has implemented exhaust emissions regulations on stationary spark-ignited (gaseous) engine generators for emergency applications. All Generac spark-ignited gensets, including SG, MG, QTA, QT and RG series gensets that are built with engines manufactured in 2009 and later meet the requirements of 40CFR part 60 subpart JJJJ and are EPA certified. These generator sets are labeled as EPA Certified with decals affixed to the engines' valve covers.

The attached documents summarize the general information relevant to EPA certification on these generator sets. This information can be used for submittal data and for permitting purposes, if required. These documents include the following information:

EPA Engine Family

The EPA Engine Family is assigned by the Manufacturer under EPA guidelines for certification purposes and appears on the EPA certificate.

Catalyst Required

Indicates whether a three-way catalyst (TWC) and Air/Fuel Ratio control system are required on the generator set to meet EPA certification requirements. Generally, units rated 80kW and smaller do not require a TWC to meet EPA certification requirements. Please note that some units that do not require a TWC to meet EPA requirements do need one if the California SCAQMD option is selected. Please see "California SCAQMD" below for additional information on this option.

Combination Catalyst or Separate Catalyst

SG and MG series generator sets typically utilize a single combination catalyst/silencer as part of meeting EPA certification requirements. Many QT and RG series generator sets use the same engines as SG series units, but have different exhaust configurations that require the use of conventional silencers with additional separate catalysts installed.

EPA Certificate Number

Upon certification by the EPA, a Certificate Number is assigned by the EPA.

Emissions Actuals - Grams/bhp-hr

Actual exhaust emission data for Total Hydrocarbons (THC), Nitrogen Oxides (NOx) and Carbon Monoxide (CO) that were submitted to EPA and are official data of record for certification. This data can be used for permitting if necessary. Values are expressed in grams per brake horsepower-hour; to convert to grams/kW-hr, multiply by 1.341. Please see advisory notes below for further information.

California Units, SCAQMD CEP Number

A separate low-emissions option is available on many Generac gaseous-fueled generator sets to comply with the more stringent South Coast Air Quality Management District requirements that are recognized in certain areas in California. Gensets that include this option are also EPA Certified.

General Advisory Note to Dealers

The information provided here is proprietary to Generac and its' authorized dealers. This information may only be disseminated upon request, to regulatory governmental bodies for emissions permitting purposes or to specifying organizations as submittal data when expressly required by project specifications, and shall remain confidential and not open to public viewing. This information is not intended for compilation or sales purposes and may not be used as such, nor may it be reproduced without the expressed written permission of Generac Power Systems, Inc.

Advisory Notes on Emissions Actuals

- The stated values are actual exhaust emission test measurements obtained from units representative of the generator types and engines described.
- Values are official data of record as submitted to the EPA and SCAQMD for certification purposes. Testing was conducted in accordance with prevailing EPA protocols, which are typically accepted by SCAQMD and other regional authorities.
- No emission values provided are to be construed as guarantees of emissions levels for any given Generac generator unit.
- Generac Power Systems, Inc. reserves the right to revise this information without prior notice.
- Consult state and local regulatory agencies for specific permitting requirements.
- The emissions performance data supplied by the equipment manufacturer is only one element required toward completion of the permitting and installation process. State and local regulations may vary on a case-by-case basis and must be consulted by the permit applicant/equipment owner prior to equipment purchase or installation. The data supplied herein by Generac Power Systems, Inc. cannot be construed as a guarantee of installability of the generator set.
- The emission values provided are the result of multi-mode, weighted scale testing in accordance with EPA testing regulations, and may not be representative of any specific load point.
- The emission values provided are not to be construed as emission limits.

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December 2, 2024

Zachary Bittner
Kentucky Department of Environmental Protection
Division of Air Quality
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601-1403

RE: Section 502(b)(10) Change Notification – Twelve Molten Metal Utility Heaters
Novelis Corporation – Guthrie, Kentucky Plant
(AI #136118; Source ID 21-219-00039)

Dear Zach:

Novelis Corporation (Novelis) owns and operates an automotive coil finishing and secondary aluminum ingot casting facility located at 8155 Old Railroad Lane in Guthrie, Kentucky (Todd County). The Novelis Guthrie facility is classified as a major source under both the Title V operating permit program and the PSD construction permitting program and currently operates in accordance with the combined construction and operating permit V-22-011 R1, issued initially by the Kentucky Division for Air Quality (KDAQ) on July 25, 2022, and most recently revised on June 7, 2024.

Novelis is submitting this Section 502(b)(10) change notification to inform KDAQ of its planned installation of up to twelve (12) torch-style molten metal utility heaters to be used to pre-heat tools and areas of the molten metal trough system from the furnaces to the ingot casting pit. However, two of the planned twelve molten metal utility heaters were installed and placed into service to address significant safety concerns on November 4, 2024 prior to obtaining the appropriate permit authorization via a pre-construction Section 502(b)(10) change notification submittal. Novelis intends to identify this event in the required semi-annual and annual compliance certification reports for 2024. The remaining ten planned molten metal utility heaters will be installed and used by receiving authorization through this notification plus the requisite waiting period after submittal of the notification letter. Novelis has reviewed the proposed changes and has concluded that the molten metal utility heater addition qualifies for treatment as a Section 502(b)(10) change as defined by the criteria specified in 401 KAR 52:020, Section 18(1). This letter and all necessary DEP7007 forms, included in Attachment A, constitute a complete Section 502(b)(10) change notification.

Process Description

Novelis has installed and used two of six planned stationary molten metal utility heaters. This type of utility heaters preheats hand tools that the operators use in direct contact with the molten metal. The need for these pre-heaters was identified through a safety risk assessment process to identify how to reduce the likelihood of molten metal explosions after three minor events that have occurred since initial casting operations of the plant commenced in early June 2024. Molten metal that comes into contact with

water can cause a violent explosion that would cause the hot molten metal to spray out and contact operators potentially causing significant injury and/or fatality. The root cause for the three minor events were instances where operators were using hand tools to help push and direct the flowing molten metal around blockage locations or bends that prevented it from flowing evenly to downstream units or the casting pit. These tools were at ambient temperature and likely contained trace amounts of moisture. The risk assessment concluded that pre-heating the tools would significantly reduce the potential of this serious safety concern.

Electric heaters were trialed initially, but did not work as had been desired. The natural-gas fired torch style heaters were trialed at the two highest risk locations in the trough system. The needs for up to four additional, fixed tool pre-heat stations were identified, and will be installed upon obtaining authorization via this notification process.

In addition to the six fixed tool pre-heat stations described above, Novelis also plans to have the ability to use up to six additional molten metal utility heaters that would be used at natural gas line connection points located near each melting furnace producing molten metal that flows through the trough systems connecting the melting furnaces to the holding furnace and then to the casting pit. These flexible utility heater connection locations will be used on an intermittent as needed and focused basis to help dislodge or address frozen metal or blockage points that may occur at various points throughout the trough system.

Both types of the molten metal utility heaters are driven by safety considerations and do not offer any increase in productions capability for the melting or casting operations. The natural gas torch associated with each utility heater has a maximum hourly heat input of 100,000 Btu/hr giving a combined total potential natural gas heat input of 1.2 MMBtu/hr. Figure 1 below provides an image of an installed stationary molten metal utility heater for tool pre-heating to support the process description narrative. This figure also illustrates the small-scale nature of the equipment and associated low level of natural gas combustion byproduct emissions generated by the low heat input for all types of torch-style utility heaters.

Figure 1. Representative Image of the Installed Molten Metal Utility Heater for Tool Heating

The twelve molten metal utility heaters (proposed Title V EU ID 051) operate via a direct-fired process and would produce normal natural gas combustion byproduct emissions into the main production building associated with the melting and casting operations. The calculated annual potential emissions (see Table 1 below) for each unit is below the threshold for treatment as an insignificant activity; therefore, pursuant 401 KAR 52:020, Section 6 (0.5 tpy HAP and 5 tpy non-hazardous regulated air pollutant), these utility heaters should be added to Section C in Novelis's Title V permitting infrastructure, as documented by DEP 7007DD form in Attachment A.

Air Emission Impacts of Proposed Changes

Besides normal natural gas combustion byproduct emissions, the molten metal utility heaters do not generate any other regulated air pollutant emissions. Particulate matter ($PM/PM_{10}/PM_{2.5}$) emissions for the molten metal utility heaters are calculated using the emission factors presented in Section 9.2.3 of Appendix B to Volume 1 of the November 2021 initial PSD application for the casting expansion project derived from a combination of the filterable PM emission factor from AP-42 Table 1.4-2 and EPA's SPECIATE database profile for natural gas sources. Based on representative emission factors from reference EPA publications, the annual potential emissions for each molten metal utility heater is below the threshold for treatment as an insignificant activity under 401 KAR 52:020, as presented in Table 1 and further documented in the supporting emission calculations provided in Attachment B.

A summary of the criteria pollutant emissions increases from the installation of the new molten metal utility heaters is included in Table 1 below. Emissions of GHGs and other natural gas combustion byproducts are detailed in Attachment B.

Table 1. Potential Criteria Pollutant Emissions Summary for Project

Pollutant	**Potential Emission Rate** (tpy)
PM	0.010
PM_{10}	0.018
$PM_{2.5}$	0.018
NO_x	0.53
CO	0.44
VOC	0.029
SO_2	3.15×10^{-3}
Lead	2.63×10^{-6}
Total HAP	0.01

Regulatory and Air Permit Requirements

Pursuant to 401 KAR 52:020 Section 6(1)(c), an insignificant activity cannot be subject to a federally-enforceable requirement other than generally applicable requirements. As demonstrated by the following state and federal air regulatory applicability analysis, the molten metal utility heaters are not subject to any air regulations, and thus, the utility heaters can be considered to meet the applicable requirements restriction of the insignificant activity criteria (i.e., only generally applicable state air regulations may apply).

The natural gas combustion systems associated with the molten metal utility heaters operate via a direct-fired process, so any state and federal regulations addressing indirect heat exchangers (i.e., 401 KAR 59:015) and indirect process heaters (i.e., 40 CFR 63 Subpart DDDDD) are not applicable and are not addressed in this regulatory analysis.

401 KAR 59:010 – New Process Operations

Kentucky regulates the emissions of particulate emissions through 401 KAR 59:010 for sources which are not subject to another emission standard for particulates. For Section 3(2), the allowable emission rate for particulate matter (PM) is based on the process weight which, as defined by 401 KAR 59:010 Section 2(2), means the total weight of all materials introduced into any affected facility which may cause any emission of particulate matter, but does not include liquid or gaseous fuels charged, combustion air, or uncombined water. 401 KAR 59:010 Section 3(1) provides an opacity limitation of emissions from a stack of 20 percent in addition to the allowable PM emission standard. Both the allowable PM emission rate and opacity standard in 401 KAR 59:010 only apply to “a control device or stack”. Because the molten metal utility heaters are not equipped with a stack or vent, they are not subject to 401 KAR 59:010.

Requested Changes to Title V Permit

Novelis requests that the molten metal utility heaters described herein be added to Section C in the permit upon issuance of the final renewal permit as shown in DEP 7007DD form in Attachment A.

Qualification for Treatment as a 502(b)(10) Change

401 KAR 52:001, Section 63 defines a Section 502(b)(10) change as:

> “*a change that contravenes an express permit term and does not include changes that would violate applicable requirements or contravene federally enforceable permit terms and conditions that are monitoring (including test methods), recordkeeping, reporting, or compliance certification requirements.*”

The specific criteria that qualify a particular project as a Section 502(b)(10) change and the corresponding procedures to follow are defined under 401 KAR 52:020, Section 18. Although the installation of an insignificant activity at a Title V source would commonly fully qualify for coverage as an off-permit change, KDAQ has directed Novelis to submit this permit action as a Section 502(b)(10) change notification even in light of the two utility heaters already installed comprising an activity which contravenes the general provisions in Section A of the Title V permit.

An analysis of the proposed project's qualification for processing as a Section 502(b)(10) change based on the remaining criteria in the Title V regulations is presented in the following bullets:

- The proposed addition of twelve (12) molten metal utility heaters does not constitute a modification under Title I of the Act. The associated emissions increases are less than the corresponding Significant Emission Rates (SERs); thus, no PSD avoidance limits are required or necessary.
- The molten metal utility heaters will not result in a violation of any applicable requirements nor any federally enforceable compliance assurance conditions. The only required updates to the current permit are to add the utility heaters to Section C as shown in DEP7007DD in Attachment A.
- The project emissions are summarized and detailed in Attachment B. The molten metal utility heaters will not result in an exceedance of emissions allowed under the permit.

Based on consideration of the applicable regulations and the nature of the proposed permit changes, Novelis has concluded that the proposed revision meets the criteria for a Section 502(b)(10) change.

Required Information for a Section 502(b)(10) Change Notification

The following bulleted list demonstrates that the contents of this letter meet all of the 502(b)(10) change notification requirements in 401 KAR 52:020 Section 18(2):

- *A brief description of the change*

  Refer to the project description in this notification letter.

- *The date on which the change will occur*

  The first two molten metal utility heaters began combusting natural gas on November 4, 2024. The remaining ten molten metal utility heaters will not be installed until at least seven workdays after the submittal of this Section 502(b)(10) change notification.

- *Any change in emissions or pollutants that result from the change*

  Refer to the emission calculations provided in Attachment B.

- *Any new applicable requirements that will apply after the change*

  No new applicable requirements will apply after the change as referenced in the DEP7007DD form in Attachment A.

Novelis has provided the required items for a Section 502(b)(10) change notification listed in 401 KAR 52:020, Section 18(2)(a) through (d) in this letter. Additionally, Attachment A contains DEP 7007AI and DD forms to facilitate processing this permit action.

Certification Statement

Based on information and belief formed after reasonable inquiry, the statements and information contained in this notification are true, accurate, and complete and the planned operational change meets the criteria of a Section 502(b)(10) change. This declaration is affirmed by the Guthrie Plant's responsible official via the signature on the DEP 7007AI form in Attachment A. Through this letter and application, Novelis requests use of these procedures in accordance with 401 KAR 52:020, Section 18(1).

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

If you have any questions or comments about the information presented in this notification, please do not hesitate to contact Steve Royer at (404) 263-1948 or John Colebrook with Trinity Consultants at (859) 341-8100.

Sincerely,

NOVELIS CORPORATION

Steve Royer
Senior EHS Manager, Novelis North America Capital Projects

Attachments

cc: Aranxta Espinoza DelAngel, Novelis
Tom Lilienthal, Novelis Guthrie
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Attachment A – DEP7007 Series Forms

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007AI

Administrative Information

___ Section AI.1: Source Information

___ Section AI.2: Applicant Information

___ Section AI.3: Owner Information

___ Section AI.4: Type of Application

___ Section AI.5: Other Required Information

___ Section AI.6: Signature Block

___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

None

___ Additional Documentation attached

Source Name: Novelis Corporation

KY EIS (AFS) #: 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: 12/2/2024

Section AI.1: Source Information

Physical Location Address:
Street: 8155 Old Railroad Lane
City: Guthrie **County:** Todd **Zip Code:** 42234

Mailing Address:
Street or P.O. Box: Same as above
City: **State:** KY **Zip Code:**

Standard Coordinates for Source Physical Location

Longitude: -87.17463 (decimal degrees) **Latitude:** 36.66469 (decimal degrees)

Primary (NAICS) Category: Aluminum Sheet, Plate, and Foil Manufacturing/Secondary Smelting and Alloying of Aluminum **Primary NAICS #:** 331315/331314

Classification (SIC) Category: Aluminum Sheet, Plate, and Foil/Secondary Smelting and Refining of Nonferrous Metal **Primary SIC #:** 3353/3341

Briefly discuss the type of business conducted at this site: Aluminum processing for automotive parts in coil finishing plant. Aluminum ingot casting from primary and secondary aluminum inputs.

Description of Area Surrounding Source: ☑ Rural Area ☐ Industrial Park ☐ Residential Area ☐ Urban Area ☐ Industrial Area ☐ Commercial Area

Is any part of the source located on federal land? ☐ Yes ☑ No

Number of Employees: 250

Approximate distance to nearest residence or commercial property: *0.10 miles*

Property Area: 304 acres

Is this source portable? ☐ Yes ☑ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:	☑ Currently Hold	☐ Need	☐ N/A
Solid Waste:	☐ Currently Hold	☐ Need	☑ N/A
RCRA:	☐ Currently Hold	☐ Need	☑ N/A
UST:	☐ Currently Hold	☐ Need	☑ N/A

Type of Regulated Waste Activity:

☐ Mixed Waste Generator ☐ Generator ☐ Recycler ☐ Other: _____

☐ U.S. Importer of Hazardous Waste ☐ Transporter ☐ Treatment/Storage/Disposal Facility ☑ N/A

Section AI.2: Applicant Information

Applicant Name: Novelis Corporation

Title: (if individual)

Mailing Address:
Street or P.O. Box: 8155 Old Railroad Lane
City: Guthrie **State:** KY **Zip Code:** 42234

Email: (if individual)

Phone:

Technical Contact

Name: Steve Royer

Title: Senior EHS Manager, Novelis North America Capital Projects

Mailing Address:
Street or P.O. Box: 3550 Peachtree Road, Suite 1100
City: Atlanta **State:** GA **Zip Code:** 30326

Email: Steve.Royer@novelis.adityabirla.com

Phone: 404-263-1948

Air Permit Contact for Source

Name: Same as technical contact

Title:

Mailing Address:
Street or P.O. Box:
City: **State:** **Zip Code:**

Email:

Phone:

Section AI.3: Owner Information

☑ **Owner same as applicant**

Name: _____

Title: _____

Mailing Address: **Street or P.O. Box:** _____

City: _____ **State:** _____ **Zip Code:** _____

Email: _____

Phone: _____

List names of owners and officers of the company who have an interest in the company of 5% or more.

Name	Position

Section AI.4: Type of Application

Current Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ General Permit ☐ Registration ☐ None

Requested Action: *(check all that apply)*

☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment
☐ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide OperatingPermit
☑ 502(b)(10)Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice
☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities
☐ Ownership Change	☐ Closure		

Requested Status: ☑ Title V ☐ Conditional Major ☐ State-Origin ☐ PSD ☐ NSR ☐ Other: _____

Is the source requesting a limitation of potential emissions? ☐ Yes ☑ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter		☐ Single HAP	
☐ Volatile Organic Compounds (VOC)		☐ Combined HAPs	
☐ Carbon Monoxide		☐ Air Toxics (40 CFR 68, Subpart F)	
☐ Nitrogen Oxides		☐ Carbon Dioxide	
☐ Sulfur Dioxide		☐ Greenhouse Gases (GHG)	
☐ Lead		☐ Other	

For New Construction:

Proposed Start Date of Construction: *(MM/YYYY)* December 2024

Proposed Operation Start-Up Date: *(MM/YYYY)* December 2024

For Modifications:

Proposed Start Date of Modification: *(MM/YYYY)* na

Proposed Operation Start-Up Date: *(MM/YYYY)* na

Applicant is seeking coverage under a permit shield. ☐ **Yes** ☑ **No**

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- ☐ DEP7007A Indirect Heat Exchangers and Turbines
- ☐ DEP7007B Manufacturing or Processing Operations
- ☐ DEP7007C Incinerators and Waste Burners
- ☐ DEP7007F Episode Standby Plan
- ☐ DEP7007J Volatile Liquid Storage
- ☐ DEP7007K Surface Coating or Printing Operations
- ☐ DEP7007L Mineral Processes
- ☐ DEP7007M Metal Cleaning Degreasers
- ☐ DEP7007N Source Emissions Profile
- ☐ DEP7007P Perchloroethylene Dry Cleaning Systems
- ☐ DEP7007R Emission Offset Credit
- ☐ DEP7007S Service Stations
- ☐ DEP7007T Metal Plating and Surface Treatment Operations
- ☐ DEP7007V Applicable Requirements and Compliance Activities
- ☐ DEP7007Y Good Engineering Practice and Stack Height Determination
- ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units
- ☐ DEP7007BB Certified Progress Report
- ☐ DEP7007CC Compliance Certification
- ☑ DEP7007DD Insignificant Activities
- ☐ DEP7007EE Internal Combustion Engines
- ☐ DEP7007FF Secondary Aluminum Processing
- ☐ DEP7007GG Control Equipment
- ☐ DEP7007HH Haul Roads
- ☐ Confidentiality Claim
- ☐ Ownership Change Form
- ☐ Secretary of State Certificate
- ☐ Flowcharts or diagrams depicting process
- ☐ Digital Line Graphs (DLG) files of buldings, roads, etc.
- ☐ Site Map
- ☐ Map or drawing depicting location of facility
- ☐ Safety Data Sheet (SDS)
- ☐ Emergency Response Plan
- ☐ Other: _____

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.

Authorized Signature

12/02/24

Date

Thomas A. Lilienthal

Type or Printed Name of Signatory

Plant Manager

Title of Signatory

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

Division for Air Quality
300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007DD

Insignificant Activities

___ Section DD.1: Table of Insignificant Activities
___ Section DD.2: Signature Block
___ Section DD.3: Notes, Comments, and Explanations

Source Name: Novelis Corporation

KY EIS (AFS) # 21- 219-00039

Permit #: V-22-011 R1

Agency Interest (AI) ID: 136118

Date: 45630

Section DD.1: Table of Insignificant Activities

*Identify each activity with a unique Insignificant Activity number (IA #); for example: 1, 2, 3… etc.

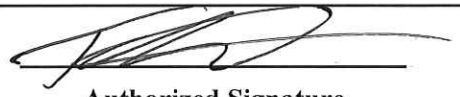
Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
IA-01	EU 001 - HTL - Pre-Cleaner (control - wet scrubber)		401 KAR 59:010	
IA-02	EU 004A - PTL- Alkaline Etch and Rinse (control - wet scrubber)		401 KAR 59:010	
IA-03	EU 004B – PTL - Acid Etch and Rinse (control - wet scrubber)		401 KAR 59:010 401 KAR 63:020	
IA-04	EU 004C - PTL - Pretreatment and Rinse (control - wet scrubber)		401 KAR 59:010	
IA-05	EU 010 - Lime Storage Silo (control – passive sock filter)		401 KAR 59:010	

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
IA-06	EU 013 - HTL Tension Leveler		None	
IA-07	EU 015 - Reluber		None	
IA-08	EU 016 - PTL-Stenciler 1		401 KAR 63:020	
IA-09	EU 017 - PTL-Stenciler 2		401 KAR 63:020	
IA-10	EU 018 - HTL-Stenciler 1		401 KAR 63:020	
IA-11	Tank Farm (TK-1 – TK-10)		None	
IA-12	EU 023 – Cooling Tower		401 KAR 59:010	
IA-13	. EU 024 – 44 Indirect Heat Exchangers, each less than 1 MMBtu/hr & 2 Direct Fired Space Heaters, each less than 1 MMBtu/hr		401 KAR 59:010 401 KAR 63:020	
IA-14	10 Make-Up Air Units, each direct fired at 3.5 MMBtu/hr		401 KAR 59:010 401 KAR 63:020	

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
IA-15	Molten Metal Utility Heaters		None	Max. Non-HAP (NO_X) = 0.53 tpy & Total HAP = 0.01 tpy

Section DD.2: Signature Block

I, THE UNDERSIGNED, HEREBY CERTIFY UNDER PENALTY OF LAW, THAT I AM A RESPONSIBLE OFFICIAL, AND THAT I HAVE PERSONALLY EXAMINED, AND AM FAMILIAR WITH, THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ITS ATTACHMENTS. BASED ON MY INQUIRY OF THOSE INDIVIDUALS WITH PRIMARY RESPONSIBILITY FOR OBTAINING THE INFORMATION, I CERTIFY THAT THE INFORMATION IS ON KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE OR INCOMPLETE INFORMATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.



Authorized Signature

12/02/24

Date

By:

Thomas A. Lilienthal

Type/Print Name of Siguatory

Plant Manager

Title of Siguatory

Section DD.3: Notes, Comments, and Explanations

Attachment B – Detailed Emissions Calculations

1. Molten Metal Utility Heaters

> The proposed project includes a total of 12 molten metal utility heater units spread across various casting, holder, and melting areas to remove moisture present on hand tools that the operators use in close direct contact with molten metal and to support removal of molten metal blockages in the trough system. The units are identified as a preventative safety measure for molten metal proctection.

> Each molten metal utility heater unit has a maximum heat input rate of 0.10 MMBtu/hr with an overall average firing rate across all units of 1.2 MMBtu/hr. The small direct-fired molten metal utility heaters will discharge into the building with no stack/vent other than building openings or HVAC system discharge points.

1.1 Molten Metal Utility Heater Natural Gas Usage Rate

> The maximum hourly emissions from the molten metal utility heaters are a function of the maximum gas usage, which is based on the heat input capacity of its burner and the heating value of the gas consumed at the plant.

Heat Input Capacity (Each Unit):	0.10	MMBtu/hr	Design specification per unit
Total Units:	12	Units	
Heating Value of Natural Gas at Plant:	1,000	Btu/scf	
Maximum Hourly Gas Usage Rate (Each Unit):	1.00E-04	MMscf/hr	= 0.1 MMBtu/hr / 1,000 Btu/scf
Maximum Annual Gas Usage Rate (Each Unit):	0.876	MMscf/yr	= 1.0E-4 MMscf/hr x 8,760 hr/yr
Total Combined Heat Input Rate:	1.20E-03	MMscf/hr	= 1.0E-4 MMscf/hr * 12 Units

1.2 Potential Emission Calculations for Molten Metal Utility Heaters

> Refer to Section 9.2.3 of Appendix B to Volume 1 of the November 2021 initial PSD application for the casting expansion project for the PM10 and PM2.5 emission factor derivation. All other emission factors are based on reference literature (e.g., EPA's AP-42 and 40 CFR 98).

Pollutant	Emission Factor (lb/MMscf)	Emission Factor Basis	Maximum Hourly Process Rate (MMscf/hr)	Potential Emissions (lb/hr)	(tpy)
NOX	100.0	AP-42 Table 1.4-1	1.20E-03	0.12	0.53
CO	84.0	AP-42 Table 1.4-1	1.20E-03	0.10	0.44
PM	1.9	AP-42 Table 1.4-2	1.20E-03	2.28E-03	0.010
PM10	3.5	AP-42 Table 1.4-2 + EPA Speciate DB	1.20E-03	4.17E-03	0.018
PM2.5	3.5	AP-42 Table 1.4-2 + EPA Speciate DB	1.20E-03	4.17E-03	0.018
VOC	5.5	AP-42 Table 1.4-2	1.20E-03	0.01	0.029
SO2	0.6	AP-42 Table 1.4-2	1.20E-03	7.20E-04	3.15E-03
CO2	116,977	40 CFR 98 Subpart C, Table C-1	1.20E-03	140	615
CH4	2.20	40 CFR 98 Subpart C, Table C-2	1.20E-03	0.003	0.01
N2O	0.22	40 CFR 98 Subpart C, Table C-2	1.20E-03	2.65E-04	1.16E-03
CO2e	117,098	40 CFR 98 Subpart C	1.20E-03	141	615
Lead	5.00E-04	AP-42 Tables 1.4-4.	1.20E-03	6.00E-07	2.63E-06
Total HAPs	1.89	AP-42 Tables 1.4-3 & 1.4-4.	1.20E-03	0.002	0.01