# PERMIT APPLICATION
## Greenfield Battery Plants

## BlueOval SK, LLC / Glendale, KY Plants

**Source ID: 21-093-00176**
**Agency Interest: 170550**

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# TABLE OF CONTENTS

# LIST OF TABLES

# 1. EXECUTIVE SUMMARY

BlueOval SK, LLC (BOSK) is proposing to construct two lithium-ion electric vehicle (EV) battery manufacturing plants in Glendale, Kentucky. Although the initial permit application for this site identified Ford Motor Company (Ford) as the permittee, the project represents a joint venture between Ford and SK Battery America, which is referred to as BOSK. These plants are referred to as KY1 and KY2 throughout this revised application. KY1 will focus on making EV batteries for cars and sport utility vehicles (SUV), while KY2 will focus on battery production for trucks and commercial vehicles.

## 1.1 Permitting History and Revision Strategy

Ford originally submitted a Prevention of Significant Deterioration (PSD) construction and operating permit application for two co-located lithium-ion EV battery manufacturing plants to the Kentucky Division for Air Quality (KDAQ) in October 2021. This application was deemed complete by KDAQ in February 2022. Ford then submitted application revisions in the first quarter of 2022, and KDAQ issued the initial Title V/PSD permit (V-21-041) on June 20, 2022. Ford subsequently requested an administrative permit amendment in June 2024 to update the permittee and source name to BOSK. A revised Title V/PSD permit (V-21-041 R1) was issued on August 12, 2024.

Since the issuance of the air permit, BOSK has identified various changes to the on-site equipment, construction schedule, and other administrative information that were not foreseen in the previous permit applications. Additionally, while KY1 and KY2 represent a single source from a PSD and Title V permitting perspective, BOSK is proposing to separate the emission sources and associated limits for KY1 and KY2 equipment given the staged construction schedule. Therefore, BOSK is submitting this application to revise the permit to incorporate the proposed changes. Specific changes to the proposed equipment are detailed in the following section.

BOSK has been working with equipment suppliers to prepare final "as-built" site design information. The site plan and building layouts are essentially unchanged from the current permit's basis. Potential emissions from the proposed operations were revised using this as-built design information to determine applicability of the PSD permitting program. Based on this revised assessment, PSD permitting is required for carbon monoxide (CO), nitrogen oxides ($NO_X$), volatile organic compounds (VOC), and greenhouse gases (GHG), which is consistent with the scope of PSD permitting presented in the original application; however, the design updates resulted in emissions decreases for all PSD pollutants other than VOC. Additionally, based on refinements to the estimates of site-wide hazardous air pollutant (HAP) emissions, the site will be designated as an area HAP source.[1]

BOSK is proposing to revise the current permit's source numbering convention by preceding each emission unit identification with either "KY1" or "KY2" to differentiate between the plants. The project description and emission calculations presented in Sections 2 and 3 of this narrative application, respectively, are limited to design changes relative to the original permitting basis.[2] Likewise, the regulatory review presented in Section 4 of this application is limited to changes to the applicability of the regulations outlined in the Code of Federal Regulations (CFR) and Kentucky Administrative Regulations (KAR) relative to the current permit.

[1] The original permit application and current air permit characterize the site as a major source of HAP emissions.

[2] An updated source number is not considered a design change.

While the original application presented top-down Best Available Control Technology (BACT) analyses for all sources of the PSD-regulated pollutants exceeding the major source threshold or PSD significant emission rates (SER), Section 5 of this revised application is limited to updated BACT reviews when material changes to the design basis made the previously determined BACT incompatible with the revised equipment design.

Furthermore, as discussed with KDAQ during a meeting on October 10, 2023, Section 6 of this revised application presents dispersion modeling analyses for pollutants with increased emissions relative to the original permitting basis. As only site-wide VOC emissions have increased relative to the original permitting basis, this application is limited to a revised quantitative assessment of potential ozone impacts from the proposed project using the approach outlined in EPA's *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool*. However, as discussed with KDAQ during a meeting on October 31, 2024, Section 6 also verifies that minor increases to $NO_2$ emissions from natural gas-fired air handling units (AHUs) will not adversely affect the conclusions reached by the full modeling evaluation currently on file with KDAQ.

The Kentucky permit application forms presented in Appendix A are generally limited to design changes relative to the current permitting basis; however, a comprehensive DEP7007N.1 form is included to document site-wide emissions associated with the revised design. A site plan representing the current site design is included in Appendix B; however, process flow diagrams (PFDs) are not included as they have not materially changed since the previous application submittal. Comprehensive emission calculations for the revised site design, with changes denoted by formatting, are presented in Appendix C, while supplemental supporting documentation for those calculations is included as Appendix D.

## 1.2 Summary of Equipment Changes

This application characterizes the following design changes relative to the current permitting basis for equipment associated with KY1, which is referred to as "Building 1" in the current permit. The emission unit (EU) numbering convention applies to the current permit. The revised EU numbering convention is reflected in Appendix C.

- ► EU 01: Electrode Manufacturing Processes
  - Revised equipment counts;
  - Revised air pollution control device counts and exhaust configurations;
  - Revised air flow rates and reduced outlet grain loading concentrations for dust collectors (DCs) used to control solids processing sources based on vendor data;
  - Removed internal venting control efficiency for sources controlled by DCs;
  - Revised air flow rates and ***increased*** outlet VOC concentrations for activated carbon systems (ACs) used to control electrode processing sources based on vendor data;
  - Revised air flow rates for scrubbers used to control cathode drying sources based on vendor data; and
  - Combined "Cathode Processing" and "Anode Processing" sources into "Cathode/Anode Processing", as they vent to the same control equipment.
- ► EU 02: Battery Assembly
  - Revised equipment counts for currently permitted sources;
  - Revised air pollution control device counts and exhaust configurations for currently permitted sources;
  - Revised air flow rates and reduced outlet grain loading concentrations for DCs used to control currently permitted sources based on vendor data;

- Revised air flow rates and ***increased*** outlet VOC concentrations for ACs used to control currently permitted sources based on vendor data;
- Adjusted VOC calculations to account for the use of electrolyte rather than NMP in currently permitted sources;
- Accounted for presence of 1,3-propane sultone (HAP) in electrolyte filling and sealing process;
- Added cathode and anode slitting processes controlled by DCs (***additional sources of PM relative to previous application***[3]);
- Added cathode and anode press processes controlled by DCs and ACs (***additional sources of PM and VOC relative to previous application***[4]); and
- Added tab welding processes for both battery assembly and module assembly controlled by DCs (***additional sources of PM relative to previous application***[5]).

▶ EU 03: Battery Formation
- Revised equipment counts;
- Revised air pollution control device counts and exhaust configurations;
- Revised air flow rates for ACs and scrubbers;
- ***Increased*** outlet VOC concentration for ACs based on vendor data; and
- Adjusted VOC calculations to account for the use of electrolyte rather than NMP.

▶ EU 04: Cell Discharge
- Same changes as EU 03.

▶ EU 05: Laboratories
- Same changes as EU 03.

▶ EU 06: Natural Gas-Fired Boilers
- Increased number of units and capacity per unit;
- Reduced $NO_X$ emission factor; and
- Reduced hexane emission factor.

▶ EU 07: Natural Gas-Fired Hot Oil Heaters
- Reduced capacity per unit (different capacities for anode and cathode area heaters); and
- Reduced hexane emission factor.

▶ EU 08A: Diesel-Fired Emergency Fire Pump Engines
- Reduced number of engines but increased engine rating; and
- Revised PM and CO emission factors based on Tier 3 standards.

▶ EU 08B: Diesel-Fired Emergency Engines (generators)
- Revised number of engines and engine rating (four types of emergency generator engines included in KY1); and
- Revised emission factors based on Tier 2 standards.

▶ EU 09: Cooling Towers
- Reduced number of units; and
- Increased capacity per unit (two types of cooling towers included in KY1).

▶ EU 10: Storage Tanks
- Reduced number of NMP tanks; and
- Added electrolyte tanks (***additional sources of VOC relative to previous application***).

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[3] Rather than representing new sources resulting from the updated BOSK site design, the inclusion of the cathode and anode slitting processes, cathode and anode presses, and tab welding processes associated with EU 02 (KY1-02 and KY2-02) are the result of a better defined breakdown of PM and VOC sources within the battery assembly process equipment proposed by the previous application.

[4] Ibid.

[5] Ibid.

- EU 11: Date Code Printers
  - No changes to Building 1 (KY1) design or emission calculations.
- EU 12: Paved Haul Roads
  - All haul roads for site accounted for under KY1 (no contribution from KY2).
- EU 13A: Direct-Fired Natural Gas-Fired Dehumidification Units
  - Revised unit count;
  - Reduced CO and hexane emission factors; and
  - ***Increased*** $NO_X$ emission factor.
- EU 13B: Indirect-Fired Natural Gas-Fired Dehumidification Units
  - Removed indirect-fired dehumidification units from KY1.
- EU 14: Indirect-Fired Natural Gas-Fired Building Air Handling Units
  - Reduced number of units;
  - Reduced hexane emission factor; and
  - ***Increased*** $NO_X$ emission factor.
- EU 15: Indirect-Fired Natural Gas-Fired Office Air Handling Units
  - Revised unit count;
  - Reduced hexane emission factor; and
  - ***Increased*** $NO_X$ emission factor.
- EU 16A: Direct-Fired Natural Gas-Fired Coater Oven Air Handling Units
  - Reduced number of units;
  - Increased capacity per unit (two types of units);
  - Reduced hexane emission factor; and
  - Reduced $NO_X$ emission factor.
- EU 16B: Indirect-Fired Natural Gas-Fired Coater Oven AHUs
  - Removed indirect-fired coater oven AHUs from KY1.

Design changes for KY2, which is referred to as "Building 2" in the current permit, largely overlap in scope relative to the changes listed above for KY1, with the following exceptions:

- EU 02: Battery Assembly
  - No cathode and anode slitting processes in KY2; and
  - Added tab welding processes for battery assembly only (no tab welding for module assembly in KY2).
- EU 08A: Diesel-Fired Emergency Fire Pump Engines
  - No fire pump engines associated with KY2.
- EU 08B: Diesel-Fired Emergency Engines (generators)
  - Three types of emergency generator engines included in KY2.
- EU 12: Paved Haul Roads
  - No dedicated haul roads for KY2.

The following sections of the permit application detail these design changes with a focus on new sources of regulated pollutants and increased emission factors/exhaust concentrations.

Furthermore, BOSK requests that the emission limits established by permit V-21-041 R1 be separated for KY1 and KY2 sources. Given the anticipated delay in the construction timeline for KY2, it is appropriate to separate these limits such that each plant compares operations to the emission limits specified for that plant. The site-wide VOC emission limits established by Section D.3 of the current permit are already separated for Building 1 (KY1) and Building 2 (KY2); however, these limits should be updated to reflect the new VOC emissions totals presented in this application: 249.6 tons per year (tpy) for KY1 and 269.5 tpy for KY2. BOSK requests that a similar strategy be applied to the Section B limits representing the combined operations of KY1 and KY2. Specifically, BOSK requests that the annual emission limits for the combined natural gas-fired boilers (EU 06) be separated for the KY1-06 and KY2-06 boilers. Likewise, BOSK requests that the annual limits for emissions from the combined natural gas-fired hot oil heaters (EU 07) be separated for KY1-07 and KY2-07.

# 2. PROJECT DESCRIPTION

This section details changes to the EV battery manufacturing processes proposed for the KY1 and KY2 Glendale plants relative to the previous permit application. Revised equipment counts, air pollution control device counts, and exhaust configurations are detailed in Appendix C.

## 2.1 Electrode Manufacturing

The Electrode Manufacturing process, which is characterized as EU 01 in the current permit and as EUKY1-01 and EUKY2-01 in this application, remains largely unchanged. The redesigned dust collectors will vent outdoors. Accordingly, BOSK is no longer taking credit for the PM control efficiency provided by internal venting of the dust collectors. Additionally, this application groups Cathode/Anode Processing as a single process ID because these systems vent to the same AC.

## 2.2 Battery Assembly

The design of the Battery Assembly process, which is characterized as EU 02 in the current permit and as EUKY1-02 and EUKY2-02 in this application, reflects the following changes to the anode and cathode processing equipment:

- Added cathode and anode slitting processes controlled by DCs added to KY1 (no slitting processes associated with KY2);
- Added cathode and anode press processes controlled by DCs and ACs to both KY1 and KY2;
- Added tab welding processes for both battery assembly and module assembly controlled by DCs to KY1; and
- Added tab welding processes for battery assembly only controlled by DCs to KY2.

## 2.3 Battery Formation

The design of the Battery Formation process, which is characterized as EU 03 in the current permit and as EUKY1-03 and EUKY2-03 in this application, remains unchanged.

## 2.4 Cell Discharge

The design of the Cell Discharge process, which is characterized as EU 04 in the current permit and as EUKY1-04 and EUKY2-04 in this application, remains unchanged.

## 2.5 Laboratories

The design of the Laboratories, which are characterized as EU 05 in the current permit and as EUKY1-05 and EUKY2-05 in this application, remains largely unchanged. One of the quality evaluation laboratories will be dedicated for emergency use, and therefore is excluded from the scope of this air permit application.

## 2.6 Support Operations

The following sections summarize proposed changes to the various categories of support operations and ancillary equipment.

### 2.6.1 Natural Gas-Fired Boilers

The natural gas-fired boiler system is characterized as EU 06 in the current permit and as EUKY1-06 and EUKY2-06 in this application. The current permit identifies eight boilers rated at 10.0 million British thermal units per hour (MMBtu/hr) each for the entire site, which corresponds to a total boiler heat input capacity rating of 80 MMBtu/hr. The revised application proposes 11 boilers rated at 12.0 MMBtu/hr each for KY1 and 11 boilers rated at 12.0 MMBtu/hr for KY2, for a site-wide total of 22 boilers with a combined heat input capacity of 264 MMBtu/hr. One boiler will operate as a back-up unit, but its emissions are included in the potential emissions calculations based on full capacity continuous operation for conservatism.

### 2.6.2 Natural Gas-Fired Hot Oil Heaters

The natural gas-fired hot oil heater system is characterized as EU 07 in the current permit and as EUKY1-07 and EUKY2-07 in this application. The current permit identifies 20 hot oil heaters rated at 31.9 MMBtu/hr each for the entire site, which corresponds to a total heat input capacity rating of 638 MMBtu/hr. The revised application proposes five hot oil heaters rated at 27.8 MMBtu/hr each for the cathode area of KY1 and five heaters rated at 23.8 MMBtu/hr each for the anode area of KY1. The KY2 hot oil heater system will be identical to the proposed KY1 system, for a site-wide total of 20 hot oil heaters with a combined heat input capacity of 516 MMBtu/hr.

### 2.6.3 Diesel-Fired Emergency Fire Pump Engines

The diesel-fired emergency fire pump engines are characterized as EU 08A in the current permit and as EUKY1-08 (process ID 1) in this application. The current permit identifies four engines rated at 117 horsepower (hp) each for the entire site, which corresponds to a total rating of 468 hp. The revised application proposes three engines rated at 399 hp each for KY1 and no additional pump engines for KY2, for a site-wide total pump capacity of 1,197 hp.

### 2.6.4 Diesel-Fired Emergency Engines

The diesel-fired emergency generator engines are characterized as EU 08B in the current permit and as EUKY1-08 (process ID 2) and EUKY2-08 (process ID 2) in this application. The current permit identifies eight engines rated at 1,220 hp each for the entire site, which corresponds to a total rating of 9,760 hp. The revised application proposes two engines rated at 1,676 hp each, one engine rated at 1,341 hp, one engine rated at 805 hp, and one engine rated at 1,140 hp for KY1. For KY2, the revised application proposes two engines rated at 1,073 hp each, one engine rated at 1,676 hp, and one engine rated at 2,146 hp. The total of these emergency generator engine capacities for KY1 and KY2 is 12,606 hp.

### 2.6.5 Cooling Towers

The cooling tower system is characterized as EU 09 in the current permit and as EUKY1-09 and EUKY2-09 in this application. The current permit identifies 48 cooling towers, each with a recirculating water flowrate of 3,203 gallons per minute (gpm) for a total cooling system recirculating water flowrate of 153,744 gpm. The revised application proposes four cooling towers with a recirculating water flowrate of 7,507 gpm and three cooling towers with a recirculating water flowrate of 3,804 gpm for for KY1. The KY2 cooling tower system will be identical to the proposed KY1 system, for a site-wide total of 14 cooling towers with a combined recirculating water flowrate of 82,880 gpm.

### 2.6.6 Storage Tanks

The storage tanks are identified as EU 10 in the current permit and as EUKY1-10 and EUKY2-10 in this application. The current permit identifies 12 raw material tanks containing NMP and 24 waste tanks containing recovered NMP. The revised application proposes four raw material (NMP) tanks, eight waste (recovered NMP) tanks, eight electrolyte tanks, two electrolyte separator tanks, and one electrolyte waste tanks associated with KY1.[6] The KY2 tank system will be identical to the proposed KY1 system. Detailed design information, including tank parameters and throughputs, is presented in Appendix C.

### 2.6.7 Date Code Printers

The date code printers are identified as EU 11 in the current permit and as EUKY1-11 and EUKY2-11 in this application. The current permit does not specify the number of printers or the maximum throughput rate for each VOC-containing material; however, the associated application identified maximum material usage rates for ink and make-up chemicals, with a total material usage of 200 gallons per year per material. The revised application proposes the same site-wide rate of ink and make-up chemical usage but allocates 100 gallons per year of each material to KY1 and the remaining 100 gallons per year of each material to KY2.

### 2.6.8 Paved Haul Roads

The site's paved haul roads are characterized as EU 12 in the current permit and as EUKY1-12 in this application. The current permit's emission calculations are based on a short-term operating rate of 8.2 vehicle miles travelled (VMT) per hour and 70,420 VMT per year. These same operating rates are applied for the paved haul roads associated with KY1, which covers haul road operations for the entire site such that an additional contribution for KY2 is not needed.

### 2.6.9 Natural Gas-Fired Dehumidification Units

The natural gas-fired dehumidification system is identified as EU 13 in the current permit and as EUKY1-13 and EUKY2-13 in this application. The current permit basis consists of direct-fired equipment characterized as EU 13A and indirect-fired equipment characterized as EU 13B; however, the revised design basis is limited to direct-fired equipment only. Accordingly, the "A" and "B" qualifiers are no longer necessary.

The current permit identifies 60 direct-fired units and 32 indirect-fired units each rated at each rate at 2.0 MMBtu/hr, which corresponds to a total heat input capacity rating of 184 MMBtu/hr. The revised application proposes 46 direct-fired units rated at 2.0 MMBtu/hr each for KY1. The KY2 dehumidification system will be identical to the proposed KY1 system, for a site-wide total of 92 direct-fired units with a combined heat input capacity of 184 MMBtu/hr.

### 2.6.10 Natural Gas-Fired Building Air Handling Units

The building AHU system is characterized as EU 14 in the current permit and as EUKY1-14 and EUKY2-14 in this application. The current permit identifies 68 indirect-fired building AHUs rated at 3.0 MMBtu/hr each for the entire site, which corresponds to a total heat input capacity rating of 204 MMBtu/hr. The revised application proposes ten units rated at 3.0 MMBtu/hr each for KY1. The KY2 building AHU system will be identical to the proposed KY1 system, for a site-wide total of 20 indirect-fired units with a combined heat input capacity of 60 MMBtu/hr.

### 2.6.11 Natural Gas-Fired Office Air Handling Units

The natural gas-fired office AHU system is characterized as EU 15 in the current permit and as EUKY1-15 and EUKY2-15 in this application. The current permit identifies 14 indirect-fired office AHUs rated at 3.0

[6] The previous permit application identified the electrolyte as being delivered to the site in totes, but that approach was deemed to be inefficient. Accordingly, this revised design basis accounts for storage tanks for the electrolyte.

MMBtu/hr each for the entire site, which corresponds to a total heat input capacity rating of 42 MMBtu/hr. The revised application proposes ten units rated at 3.0 MMBtu/hr each for KY1. The KY2 office AHU system will be identical to the proposed KY1 system, for a site-wide total of 20 indirect-fired units with a combined heat input capacity of 60 MMBtu/hr.

### 2.6.12 Natural Gas-Fired Coater Oven Air Handling Units

The natural gas-fired coater oven AHU system is identified as EU 16 in the current permit and as EUKY1-16 and EUKY2-16 in this application. The current permit basis consists of direct-fired equipment characterized as EU 16A and indirect-fired equipment characterized as EU 16B; however, the revised design basis is limited to direct-fired equipment only. Accordingly, the "A" and "B" qualifiers are no longer necessary.

The current permit identifies 64 direct-fired units each rated at 3.5 MMBtu/hr and 70 indirect-fired units each rated at 3.0 MMBtu/hr, which corresponds to a total heat input capacity rating of 434 MMBtu/hr. The revised application proposes 12 direct-fired units rated at 5.0 MMBtu/hr each and four additional direct-fired units rated at 5.6 MMBtu/hr each for KY1. The KY2 coater oven AHU system will be identical to the proposed KY1 system, for a site-wide total of 32 direct-fired units with a combined heat input capacity of 164.8 MMBtu/hr.

# 3. PSD PERMITTING EVALUATION METHODOLOGY

This section addresses updates to the methodology used to quantify the emissions increases from the project and assesses federal PSD permitting applicability. Emissions from the project include CO, $NO_X$, VOC, PM, $PM_{10}$, $PM_{2.5}$, sulfur dioxide ($SO_2$), GHG, and lead. Detailed emission increase calculations for the proposed project are presented in Appendix C. The design changes described in Section 2 and the calculation methodology updates presented in this section resulted in an overall emissions reduction for all PSD pollutants other than VOC.

The PSD permitting evaluation methodology and conclusions are largely the same as those presented in the original application. Although this application distinguishes between the two plants, KY1 and KY2, emissions from these plants are combined for PSD evaluation purposes. Hardin County remains an "attainment" or "unclassifiable" area for all criteria pollutants at the time of this application submittal.

## 3.1 Major Source Status

Pursuant to 401 KAR 51:017, Section 1(2), the PSD permitting program applies to the construction of a new major stationary source. "Major stationary source" is generally defined in 401 KAR 51:001, Section 1(118)(a)2.a. and b. as:

- Belonging to one of the 28 named source categories and has a potential to emit (PTE) of 100 tpy of any pollutant subject to the regulation; or
- Has a PTE of 250 tpy of any pollutant subject to the regulation, regardless of its source category.

Lithium-ion battery manufacturing plants are not a named source category. However, the proposed project includes fossil fuel boilers with more than 250 million British thermal units per hour (MMBtu/hr) heat input, which is a listed source category. Guidance from the EPA has indicated that PSD applicability should be handled separately for the sub-source nested within the larger non-listed source.[7] Therefore, the nested sources (i.e., all fossil fuel boilers) are considered major if the PTE of a regulated pollutant from these sources exceeds 100 tpy. Independently, the non-listed source (i.e., the entire site, including the fossil fuel boilers) is considered major if the PTE of a regulated NSR pollutant exceeds 250 tpy.

As documented by the detailed emission calculations in Appendix C and summarized in Table 3-1, the PTE of CO and $NO_X$ each exceed 100 tpy from the nested fossil fuel boilers. Additionally, the site-wide PTE of VOC exceeds 250 tpy. Therefore, both the nested sub-source and the site as a whole are considered major stationary sources with respect to the PSD permitting program. If PSD is triggered by any regulated NSR pollutant, then all of the other project emissions are compared to the applicable significant emission rates (SERs) defined under 401 KAR 51:001, Section 1(218)(a) for regulated NSR pollutants (refer to Table 3-1). Since the Glendale plants will represent a new major stationary source, and potential emissions associated with the project itself exceed major source thresholds for VOC, PSD permitting is also required for CO and $NO_X$ and because project emissions of those pollutants exceed their respective SERs. On the other hand, potential emissions from the project for PM, $PM_{10}$, $PM_{2.5}$, $SO_2$, and lead are less than the respective SER, so PSD permitting requirements do not apply to these pollutants.

[7] Letter from Steve Rothblatt, Director of US EPA Region 5 Air and Radiation Branch, to J. Michael Valentine Director of Minnesota Pollution Control Agency, Air Quality Division. 12 Jun 1990. https://www.epa.gov/sites/default/files/2015-07/documents/chemolite.pdf.

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 GHG, those emissions must first become "subject to regulation" to be treated as a regulated NSR pollutant that can fall under the PSD requirements.[8] Specifically, if PSD review is triggered for a non-GHG NSR pollutant, and GHG emissions increases exceed 75,000 tpy of carbon dioxide equivalents ($CO_2e$) for the project, then GHG emissions increases from the project are subject to regulation and require PSD review.[9] As shown in Table 3-1, the annual potential emissions of GHG for the proposed project exceed the applicable PSD triggering threshold.

## 3.2 Potential Emissions

Since this project only includes new emissions sources, all emissions increases are due to the proposed project, and emissions increases are equivalent to the site's potential emissions. "Potential to emit" is defined by 401 KAR 51:001, Section 1(190)(b):

> *(190) "Potential to emit" or "PTE" means:*
> *(b) For the PSD and NSR programs, the maximum capacity of a stationary source to emit a pollutant under its physical and operational design, in which:*
> *1. A physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, is treated as part of its design if the limitation or the effect it would have on emissions:*
> *a. Is federally enforceable...*

Emissions from new equipment must be calculated using potential throughput and equipment capacity. Generally, potential emissions associated with this project were determined using maximum air flow rates, burner heat input capacities, equipment design specifications to be guaranteed by the selected manufacturers, and continuous annual operation (8,760 hours of operation per year). The following subsections describe these calculation methodologies in detail. Detailed emissions calculations are provided in Appendix C.

### 3.2.1 Solid Material Handling Sources

Although equipment counts, control device configurations, air flow rates, and grain-loading concentrations have been revised, the calculation methodology for solid material handling sources has not changed from the previous application. This same methodology has been applied to the new solid material handling sources described by this application, including the cathode and anode slitting processes, the cathode and anode presses, and the tab welding processes. Furthermore, as the redesigned DCs in this area are now venting outdoors, the internal venting control efficiency has been removed from these calculations.

### 3.2.2 Volatile Material Handling Sources

Although equipment counts, control device configurations, air flow rates, and exhaust concentrations have been revised, the calculation methodology for volatile material handling sources has not changed from the previous application. This same methodology has been applied to the new volatile material handling sources

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[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).

[9] The component of the "subject to regulation" definition relating to the 100,00 tpy CO2e major source threshold was recently revoked by the U.S. Supreme Court in Utility Air Regulatory Group (UARG) v. Environmental Protection Agency (EPA) (No. 12-1146) ruling.

described by this application, including the cathode and anode presses. For processes where the electrolyte is emitted as VOC, the calculations apply the molecular weight of the electrolyte rather than NMP.

### 3.2.3 External Combustion Sources

Although equipment counts and rated capacities have been adjusted and revised vendor-supplied emission factors are used where available, the emission calculation methodology for external combustion sources has not changed. The emission calculations presented in Appendix C apply updated vendor-supplied emissions information $NO_X$ and CO where available. Furthermore, calculations for hexane/n-hexane emissions from natural gas-fired external combustion sources were revised using the more current emission factors from the Ventura County Air Pollution Control District (APCD).[10]

### 3.2.4 Internal Combustion Sources

Although equipment counts and rated capacities have been adjusted and EPA's tiered emission factors are used where available for each proposed engine, the emission calculation methodology for internal combustion sources has not changed.

### 3.2.5 Cooling Towers

Although equipment counts and recirculating water flowrates have been adjusted, the emission calculation methodology for cooling towers has not changed.

### 3.2.6 Storage Tanks

Potential emissions from all storage tanks were quantified using the methods presented in AP-42 Section 7.1 "Organic Liquid Storage Tanks". Emissions from the electrolyte tanks were added to this evaluation using material specifications from the corresponding Safety Data Sheet (SDS), as presented in Appendix C.

### 3.2.7 Haul Roads

The emission calculation methodology for haul roads has not changed.

### 3.2.8 Printing Material Usage

The emission calculation methodology for printing operations has not changed.

## 3.3 PSD Emissions Increase Summary

To evaluate whether the project must undergo PSD permitting, potential emissions were compared to first the applicable major stationary source threshold and then the SER. The results, shown in Table 3-1, demonstrate that both the nested sub-source of boilers is major for $NO_X$ and CO, and the site as a whole is major for VOC. Potential emissions of remaining pollutants were then compared to the SERs. As a greenfield site, there are no contemporaneous increases or decreases to consider, the project emissions increases are equivalent to the project net emissions increases. Apart from CO and $NO_X$, potential emissions of all other

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[10] https://www.aqmd.gov/docs/default-source/permitting/toxics-emission-factors-from-combustion-process-.pdf

Chapter 1.4 of EPA's AP-42 was published in July 1998, while AB 2588 was published in May 2001. The hexane emission factors for natural gas-fired external combustion equipment documented in AB 2588 were derived from *AIRx Testing, Emissions Testing OLS Energy Natural Gas Fired Turbine, and Two Auxiliary Boilers, Job Number 22030, April 21, 1994*.

regulated NSR pollutants fall below their respective SER, but GHG emissions each exceed the 75,000 tpy $CO_2e$ PSD applicability threshold. Therefore, PSD permitting is required for CO, $NO_X$, VOC, and GHG.

**Table 3-1. Proposed Project Potential Emissions Compared with Applicable Major Source Thresholds and PSD Significant Emission Rates**

| Pollutant | Nested Source Potential Emissions (tpy) | Project Potential Emissions[11] (tpy) | Project Emissions Increases Relative to Current Permit Basis[12] (tpy) | Nested Source PSD Major Source Threshold (tpy) | Site-Wide PSD Major Source Threshold (tpy) | PSD Significant Emission Rate[13] (tpy) | Project Triggers PSD Review? [14] (Yes/No) |
|---|---|---|---|---|---|---|---|
| PM | 2.0 | 17.2 | -4.2 | 100 | 250 | 25 | No |
| $PM_{10}$ | 2.0 | 8.9 | -4.1 | | | 15 | No |
| $PM_{2.5}$ | 1.7 | 6.0 | -3.7 | | | 10 | No |
| $NO_X$ | 102.6 | 246.7 | -31.8 | | | 40 | Yes |
| CO | 145.7 | 207.1 | -56.5 | | | 100 | Yes |
| VOC | 21.2 | 519.0 | 225.9 | | | 40 | Yes |
| $SO_2$ | 2.3 | 3.4 | -1.5 | | | 40 | No |
| Lead | 1.9E-03 | 2.7E-03 | -8.0E-04 | | | 0.6 | No |
| GHG (as $CO_2e$)[15] | 461,034 | 643,785 | -185,120 | -- | -- | 75,000 | Yes |

[11] The project's potential emission rates presented in Table 3-1 account for the site-wide totals, including contributions from the nested fossil fuel boilers and fugitive sources.

[12] As demonstrated by the entries in this column, project emissions of all pollutants other than VOC decreased as a result of the design changes characterized by this permit application.

[13] 401 KAR 51:001, Section 1(218)(a) and (231).

[14] The entire site, including the nested fossil fuel boilers, becomes major with respect to PSD if the site-wide emissions exceed 250 tpy. Since the site as a whole is not a listed source, fugitive emissions are initially excluded from the PSD applicability evaluation pursuant to 401 KAR 51:001, Section 1(118)(c). However, because the non-fugitive site-wide VOC emissions total (507.9 tpy) exceeds this threshold, remaining pollutants are compared to the significant emission rates to determine if a major modification is occurring. If only the nested source is major (i.e., the site-wide PTE does not exceed 250 tpy for any pollutant), only the nested source emissions are compared to the significant emission rates. Otherwise, the site-wide source emissions are compared to the significant emission rates.

[15] 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, GHG become subject to regulation and are treated as a regulated NSR pollutant with a PSD Significant Emission Rate of 0 tpy.

# 4. REGULATORY ANALYSIS

The regulatory review presented in this section is limited to changes in the applicability of federal and Kentucky regulations relative to the current air permit (V-21-041 R1). If the current permit accurately represents applicable requirements for the revised design basis, a detailed regulatory analysis is not included in this application.

## 4.1 Federal Regulations

The following is a discussion of the revised applicability of regulations contained in Title 40 of the CFR (40 CFR) with regards to the two proposed BOSK Glendale plants (KY1 and KY2).

### 4.1.1 40 CFR 60 – Standards of Performance for New Stationary Sources

New Source Performance Standards (NSPS) require new, modified, or reconstructed units in specific source categories to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. The NSPS also specify monitoring, compliance, testing, recordkeeping, and reporting requirements. Moreover, any source subject to an NSPS is also subject to the general provisions of NSPS Subpart A, except as noted. The Kentucky Department for Environmental Protection (KDEP) has been delegated by the EPA to regulate facilities subject to NSPS. The federal NSPS rules have been incorporated into the Kentucky SIP through 401 KAR 60:005.

The following list summarizes the impacts of proposed design changes to the applicability of NSPS subparts.

- *Subpart Dc – Small Industrial-Commercial-Institutional Steam Generating Units*
  - Although the updated design basis associated with this application includes revised equipment counts and capacities for the natural gas-fired boilers and hot oil heaters, the proposed design changes do not impact the overall applicability of NSPS Subpart Dc or the specifically applicable requirements. Therefore, the current air permit sufficiently documents these requirements.
- *Subpart Kb – Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984*
  - While the updated design basis includes additional tanks used to store volatile organic liquids (VOL), no tank with a storage capacity of 75 $m^3$ (19,813 gallons) or more is being proposed with this application. Therefore, Subpart Kb does not apply to the revised site design.
- *Subpart Kc - Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After October 4, 2023*
  - Given the date of this regulation, the previous application did not assess the applicability of Subpart Kc. According to 40 CFR 60.110c, the affected facility to which this subpart applies is each storage vessel with a capacity greater than or equal to 20,000 gallons (75.7 $m^3$) that is used to store VOL for which construction, reconstruction, or modification is commenced after October 4, 2023. The largest tank proposed for KY1 and KY2 has a capacity of 13,800 gallons. Accordingly, Subpart Kc does not apply.
- *Subpart TT – Metal Coil Surface Coating*
  - Although the updated design basis reflects changes to the electrode manufacturing process, the anode/cathode material will be applied to a metallic foil with a thickness of less than 0.15 mm. Therefore, BOSK's proposed operations are not considered affected facilities and Subpart TT does not apply.
- *Subpart VVV – Polymeric Coating of Supporting Substrates Facilities*

- In spite of the design changes represented by this application, the anode/cathode coating is applied to a metallic foil that is specifically excluded from the definition of the affected facility. Therefore, Subpart VVV does not apply.

► *Subpart IIII – Stationary Compression Ignition Internal Combustion Engines*

- The revised design of KY1 and KY2 involves changes to the number and capacity of diesel-fired emergency fire pump engines and diesel-fired emergency generator engines; however, apart from the numerical emission standards, the current permit accurately represents the applicability of Subpart IIII requirements. The DEP7007V forms presented in Appendix A identify the updated emission standards for each type of engine.

### 4.1.2 40 CFR 63 – National Emission Standards for Hazardous Air Pollutants for Source Categories

NESHAP under 40 CFR 63 are emission standards for HAP that apply to major sources of HAP (facilities that exceed the major source thresholds of 10 tpy of a single HAP and 25 tpy of any combination of HAP) or area sources (facilities emitting HAP in amounts less than the major source thresholds). Moreover, any source subject to a Part 63 NESHAP is also subject to the general provisions of Subpart A, except as noted. The federal regulations have been incorporated into the Kentucky SIP through 401 KAR 63:002.

Although the previous permit application characterized the site as a major source of HAP, emissions associated with the revised design basis for the combined Glendale plants are less than the major source thresholds as demonstrated in Appendix C. Therefore, the two Glendale plants are not subject to any Part 63 NESHAP regulations applicable to major sources, and only area source standards are evaluated in this section.

► *Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines*

- The revised design of KY1 and KY2 involves changes to the number and capacity of diesel-fired emergency fire pump engines and diesel-fired emergency generator engines. Based on the site's transition from major to area HAP source status, slightly different requirements apply under this subpart relative to the current air permit requirements; however, compliance with Subpart ZZZZ is still largely satisfied by complying with NSPS Subpart IIII. Revised Subpart ZZZZ requirements are detailed in the DEP7007V forms presented in Appendix A. An initial notification under Subpart ZZZZ is no longer required for these engines based on the site's area source status.

► *Subpart JJJJJJ – Industrial, Commercial, and Institutional Boilers Area Sources*

- While the previous application characterized the applicability of Subpart DDDDD requirements for natural gas-fired equipment at major sources of HAP, by redesignating BOSK as an area source, Subpart DDDDD no longer applies. Instead, area sources of HAP are potentially subject to the requirements of Subpart JJJJJJ; however, per 40 CFR 63.11237 and 40 CFR 63.11195, respectively, process heaters are not regulated under this subpart and boilers combusting only natural gas are not subject to this subpart. Therefore, the requirements of Subpart JJJJJJ do not apply to BOSK.

► *Subpart CCCCCCC – Area Sources: Paints and Allied Products Manufacturing*

- While the previous application characterized the applicability of Subpart HHHHH requirements for miscellaneous coating manufacturing at major sources of HAP, by redesignating BOSK as an area source, Subpart HHHHH no longer applies. Instead, electrode manufacturing operations at area sources of HAP are potentially subject to the requirements of Subpart CCCCCCC. This subpart applies to *paints and allied products manufacturing* processes, "the intended use of which is to leave a dried film of solid material on a substrate."
- Per 40 CFR 63.11599, the affected source under Subpart CCCCCCC consists of all paints and allied products manufacturing operations that process, use, or generate materials containing HAP at the

facility. Because the electrode manufacturing processes at BOSK will use nickel, cobalt, and manganese in the cathode coating, which are regulated HAPs, EU KY1-01 and KY2-01 will be subject to requirements under this subpart. This applicability determination for BOSK is consistent with EPA's findings for the LG Chem Michigan (LGCMI) facility in Holland, Michigan, as documented by the April 8, 2020 guidance letter authored by Sara J. Breneman, Chief of EPA's Air Enforcement and Compliance Assurance Branch.[16] This facility produces a variety of lithium-ion batteries for the electric car industry. According to EPA's letter, LGCMI's cathode mixing line is subject to NESHAP Subpart CCCCCCC because the cathode slurry mixture produced by LGCMI, which contains a HAP (i.e., nickel) and is intended to leave a dried film of solid material on a substrate, meets the definition of "paint and allied products".

- Given its construction dates, the electrode manufacturing equipment at KY1 and KY2 will be classified as new affected sources.
- According to 40 CFR 63.11601(a), the following standards apply to these processes at BOSK[17]:
  - Add the dry pigments and solids that contain compounds of nickel and operate a capture system that minimizes fugitive particulate emissions during the addition of dry pigments and solids that contain compounds of cadmium, chromium, lead, or nickel to a process vessel or to the grinding and milling process.
  - Capture particulate emissions and route them to a particulate control device meeting the requirements of this section during the addition of dry pigments and solids that contain compounds of nickel to a process vessel. This requirement does not apply to pigments and other solids that are in paste, slurry, or liquid form.
  - Either capture particulate emissions associated with the grinding and milling of materials containing nickel, fully enclose the associated grinding and milling equipment, or ensure the pigments and solids are in solution during the grinding and milling process.
  - Ensure that visible emissions from the particulate control device exhaust that vent to the atmosphere do not exceed 10% opacity.
- To demonstrate compliance with the applicable standards of 40 CFR 63.11601(a), BOSK will conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602.
- BOSK will comply with the initial notification, notification of compliance status, and annual compliance certification reporting requirements for new affected sources established by 40 CFR 63.11603.

### 4.1.3 40 CFR 64 – Compliance Assurance Monitoring

Under 40 CFR Part 64, the Compliance Assurance Monitoring (CAM) regulations, facilities are required to prepare and submit monitoring plans for certain emission unit classes covered under a Title V application. The CAM plans are intended to document methods that will provide on-going and reasonable assurance of compliance with various emission limits. Pursuant to 40 CFR 64.2(a), the CAM regulations apply to a pollutant-specific emission unit (PSEU), as defined under 40 CFR 64.1, located at a major Title V source if the following criteria are met:

1. The PSEU is subject to an emission limitation or standard for the regulated pollutant, other than an emission limitation or standard that is exempt under 40 CFR 64.2(b);
2. The PSEU uses a control device as defined in 40 CFR 64.1 to achieve compliance with the emission limitation; and

[16] EPA document control number M200005.

[17] While additional storage and mixing requirements are established by 40 CFR 63.11601(b), these requirements apply to materials containing benzene or methylene chloride. As BOSK does not use benzene or methylene chloride in its electrode formulations, these requirements do not apply to the electrode manufacturing operations at KY1 and KY2.

3. The PSEU has potential pre-controlled emissions of the applicable regulated air pollutant that are equal to or greater than the applicable Title V major source thresholds.

The CAM regulations specifically exempt certain emission limitations from being considered for CAM applicability. Specifically, limitations or standards proposed by the EPA after November 15, 1990, pursuant to Section 111 or Section 112 of the Clean Air Act are considered exempt.[18] Emission limitations for which "a part 70 or 71 permit specifies a continuous compliance determination, as defined in 40 CFR 64.1" are also considered exempt from CAM requirements. Pursuant to 40 CFR 64.1, the definition of a continuous compliance determination method is:

> *…a method, specified by the applicable standard or an applicable permit condition, which: (1) Is used to determine compliance with an emission limitation or standard on a continuous basis, consistent with the averaging period established for the emission limitation or standard; and (2) Provides data either in units of the standard or correlated directly with the compliance limit.*

For Large PSEUs (i.e., those units with potential controlled emissions equal to or greater than 100% of the Title V major source threshold), a CAM Plan must be submitted as part of the initial Title V permit application or a significant revision. For Other PSEUs (i.e., those units with potential controlled emissions less than 100% of the Title V major source threshold), the CAM Plan must be submitted as part of the first significant permit revision that involves a Large PSEU or as part of the first renewal application covering all PSEUs. As demonstrated by the emissions calculations provided in Appendix C, no proposed emissions sources will be classified as Large PSEUs. Accordingly, this initial Title V permit application is not required to include CAM Plans.

### 4.1.4 Risk Management Plan Regulations

Subpart B of 40 CFR 68 outlines requirements for risk management prevention plans pursuant to Section 112(r) of the Clean Air Act. Applicability to this subpart is determined based on type and quantity of the chemicals stored at the Glendale plants. Consistent with the previous application, BOSK will not store chemicals in quantities above the specified threshold quantity during or after the expansion project. Therefore, the KY1 and KY2 plants are not subject to the Risk Management Plan regulations in 40 CFR 68 Subpart B.

### 4.1.5 40 CFR 70 – State Operating Permit Programs

40 CFR 70 establishes the federal Title V Operating Permit Program. Kentucky has incorporated the provisions of this federal program in its Title V program through 401 KAR 52:020.

The major source thresholds with respect to the Kentucky Title V Operating Permit Program regulations are 10 tpy of a single HAP, 25 tpy of any combination of HAP, and 100 tpy of other regulated pollutants. As shown in Appendix C, the PTE of several regulated pollutants exceed 100 tpy. Therefore, the Glendale plants are both classified as a major source with regards to the Title V Operating Permit Program.

## 4.2 State Implementation Plan Regulations

The following is a discussion of the revised applicability of regulations contained in Title 401 of the KAR (401 KAR) with regards to the two proposed BOSK Glendale plants (KY1 and KY2).

[18] 40 CFR 64.2(b)(1)(i)

### 4.2.1 401 KAR 51:017 and 52:020 – PSD and Title V Permitting Programs

Consistent with the previous application, both Glendale plants will be located in Hardin County, which has been designated by EPA as an unclassified/attainment area for all criteria pollutants.[19] Therefore, with respect to the federal NSR permitting program, only PSD requirements could potentially apply to the source. As discussed in Section 3.1, the PTE of CO and $NO_X$ each exceed 100 tpy from the nested fossil fuel boilers. Additionally, the site-wide PTE of VOC exceeds 250 tpy. Therefore, both the nested sub-source and the site as a whole are each considered a major stationary source with respect to the PSD permitting program. PSD permitting requirements for these pollutants and GHG were addressed in the previous application, while this application representing the revised design basis for the site includes additional detail regarding the BACT analysis and Air Quality Analysis to address concerns expressed by KDAQ during a conference call on October 31, 2024.[20]

The Glendale plants will represent a new 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, and 502(b)(10) changes. The previous application package provided information required under 401 KAR 52:020, Section 4 and 5 for the purposes of a new major Title V and PSD source, while this application provides supplemental and revised information to accommodate site design changes. DEP7007 series application forms representing design changes for the proposed project are provided in Appendix A of the application package.

### 4.2.2 401 KAR 59:010 – New Process Operations

The revised design of KY1 and KY2 involves changes to the number, exhaust configuration, and operating rate/air flowrate of various equipment subject to 401 KAR 59:010; however, the applicable requirements under this section will continue to be the 20% opacity limit and process weight-based allowable emission rate algorithm, which depends on if the process weight for the affected operation is above or below 60,000 lb/hr (i.e., 30 ton/hr). For each of the affected emission units proposed by this revised application, potential emissions will fall below 2.34 lb/hr, which represents the most stringent PM emission limit established by 401 KAR 59:010.

### 4.2.3 401 KAR 59:015 – New Indirect Heat Exchangers

The revised design of KY1 and KY2 involves changes to the number and capacity of various indirect heat exchangers including boilers, hot oil heaters, and the indirect-fired portions of the AHUs subject to 401 KAR 59:015; however, the applicable requirements under this section will continue to be represented by the opacity, PM, and $SO_2$ requirements for sources with an aggregate affected facility heat input capacity total of greater than 250 MMBtu/hr.

Specifically, per Section 4(2) of 401 KAR 59:015, opacity is limited to 20%, except a maximum of 27% opacity is allowed for one 6-minute period in any 60 consecutive minutes. PM emissions are limited to 0.10 lb/MMBtu, while $SO_2$ emissions are limited to 0.8 lb/MMBtu under Sections 4(1)(b) and 5(1)(b), respectively. For each of the affected emission units proposed by this revised application, emissions will fall below these limits by combusting natural gas.

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[19] 401 KAR 51:010, Section 2.

[20] 401 KAR 51:017, Section 1(2) and (3)

Lastly, Section 7 of the rule requires the operator to follow certain procedures during startup and shutdown periods. While the previous application deferred to the startup and shutdown requirements of 40 CFR 63 Subpart DDDDD (Boiler MACT) for the boilers and hot oil heaters, these emission units are no longer subject to MACT startup and shutdown requirements based on the HAP area source status represented by this application. Therefore, all combustion equipment subject to 401 KAR 59:015 will be subject to the startup and shutdown requirements of Section 7(1).

### 4.2.4 401 KAR 59:225 – New Miscellaneous Metal Parts and Products Surface Coating Operations

The design updates characterized by this revised permit application do not impact the regulatory applicability analysis for this section.

### 4.2.5 401 KAR 59:050 – New Storage Vessels for Petroleum Liquids

In addition to the diesel and NMP tanks identified in the previous application, the revised design basis includes electrolyte tanks. As the electrolyte does not represent a "petroleum liquid", the proposed storage vessels remain exempt from this regulation.

### 4.2.6 401 KAR 63:010 – Fugitive Emissions

The design updates characterized by this revised permit application do not impact the regulatory applicability analysis for this section. BOSK will take reasonable precautions as described in the regulation to prevent fugitive emissions from the paved haul roads as required by the air permit.

### 4.2.7 401 KAR 63:020 – Potentially Hazardous Matter or Toxic Substances

Kentucky regulates toxic air pollutant emissions through 401 KAR 63:020. KDAQ can require that dispersion modeling or other analyses be completed by facilities if a project causes an increase in toxic pollutant emissions, as defined under 401 KAR 63:020, Section 2(2), that are deemed to be "significant." This is done so that there is a documented basis for affirming that a facility does not cause an adverse impact. However, pursuant to 401 KAR 63:020, Section 1, the requirements of this rule are applicable only to the extent that such emissions are not elsewhere subject to the provisions of the KAR.

Combustion emissions from the proposed emergency fire pump engines and emergency generator engines will be subject to RICE MACT. Nickel emissions from the electrode manufacturing process are subject to NESHAP Subpart CCCCCCC.[21] Since the toxic air pollutant emissions from these sources are already regulated under Kentucky and federal standards, no additional requirements under 401 KAR 63:020 will apply.

NMP used in BOSK's processes does not contain regulated HAPs or toxic air pollutants; however, the electrolyte contains up to 0.49% by weight 1,3-propane sultone, which is a listed HAP. As provided in the emissions calculations in Appendix C, acetonitrile and 1,3-propane sultone emissions from the battery assembly process, hydrogen chloride (HCl) emissions from the cell discharge process, HCl emissions from on-site laboratories, 1,3-propane sultone emissions from electrolyte storage tanks, and combustion emissions from the boilers, heaters, and AHUs represent sources of air toxic emissions not elsewhere

[21] While the applicability of NESHAP Subpart CCCCCCC is specific to cadmium, chromium, lead, and nickel (where only nickel is used in BOSK's electrodes), these requirements restrict emissions of all metallic dusts from the affected source. Therefore, the NESHAP requirements for nickel compounds will also serve to restrict emissions of cobalt and manganese from electrode manufacturing operations at KY1 and KY2.

subject to the provisions of the KAR. Thus, these emissions sources are subject to 401 KAR 63:020. The toxics modeling evaluation presented in this application builds on the results presented in Volume 2 of the previous application to characterize the impacts of proposed design changes.

# 5. BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

The previous application described the BACT methodology and presented top-down BACT analyses for all sources of the PSD-regulated pollutants exceeding the major source threshold or PSD SER (CO, $NO_X$, VOC, and GHG). As the same pollutants and emission units trigger PSD review and BACT evaluations in this revised application representing the updated design basis for KY1 and KY2, the control technology determinations made by the previous application remain valid; however, based on updated vendor information better representing available equipment for the site, BOSK is proposing various revisions to the numerical BACT limits identified by Step 5 of the respective evaluations.

Additionally, this section presents the BACT analyses for sources of pollutants triggering PSD review that were not included in the previous application. Specifically, this section presents the BACT evaluation for VOC emissions from the cathode and anode presses associated with battery assembly and included with KY1-02 and KY2-02, as well as the electrolyte storage tanks included with KY1-10 and KY2-10.[22]

## 5.1 Modified BACT Limits

### 5.1.1 VOC from Carbon Adsorbers

Section 5.6.3 of the previous application presents the top-down BACT analysis for VOC emissions from the battery manufacturing process. Step 5 of this evaluation concludes that BACT for these sources is adsorption (i.e., activated carbon towers) and proposes a limit of 3 ppmv for the exhaust of the ACs used to control these VOC emissions, on a 3-hour block average basis.[23] However, based on operating experience from the SKBA facility in Commerce, Georgia, the emission concentrations associated with AC exhausts have been revised. Operating data indicates that the carbon units operate within a window up to 6 ppm (as NMP) at the SKBA facility before carbon breakthrough and replacement occur. Given the larger scope of AC towers and associated exhaust flow, BOSK is proposing a limit of 4.5 ppmv (as NMP) for NMP-associated AC towers and 6 ppmv (as electrolyte) for electrolyte-associated AC units.

Additionally, carbon vendors indicated that accepting an emission limit at the 3 ppmv levels would result in unnecessary carbon replacement of functional carbon and increase carbon waste generation. For the AC units associated with the battery formation process equipment, these emissions include any ethylene emissions generated from the formation process that typically pass through carbon without being adsorbed. Based on lab testing performed at SK, the ethylene emissions are a small percentage of overall VOC emissions and do not change control strategies or BACT determinations.

- Electrode manufacturing (KY1-01 and KY2-01) – Adjusted from 3 ppmv to 4.5 ppmv (as NMP)
- Battery assembly (KY1-02 and KY2-02) – Adjusted from 3 ppmv to 6 ppmv (as electrolyte)

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[22] The revised design basis also includes cathode and anode slitting and tab welding processes associated with battery assembly and included with KY1-02 and KY2-02; however, these represent sources of PM emissions only and as such are not subject to BACT review.

[23] This BACT determination does not apply to the NMP recovery process, which will use absorption systems (i.e., wet scrubbers) that are considered inherent process equipment to recover NMP from the exhaust stream to a level of 2 ppmv in the exhaust gas (3-hour block average basis). Section E-4 of Appendix E of the previous application presents annualized control costs associated with installing a carbon adsorption system downstream of the inherent scrubber. As the outlet concentration of the scrubber has not changed with the updated design basis represented by this application, a revised cost evaluation is not presented.

- Battery formation (KY1-03 and KY2-03) – Adjusted from 3 ppmv to 6 ppmv (as electrolyte)
- Cell discharge (KY1-04 and KY2-04) – Adjusted from 3 ppmv to 6 ppmv (as electrolyte)
- Laboratories (KY1-05 and KY2-05) – Adjusted from 3 ppmv to 6 ppmv (as electrolyte)

BOSK will demonstrate compliance with these emission limits through periodic stack testing of a representative unit controlled by carbon adsorbers.

### 5.1.2 $NO_X$ from Natural Gas-fired Combustion Equipment

Section 5.5 of the previous application presents the top-down BACT analysis for $NO_X$ emissions from the external combustion sources (i.e., boilers, hot oil heaters, dehumidification units, and AHUs). Step 5 of this evaluation concludes that BACT is the use of ultra-low $NO_X$ burners and proposes a limit of 20 ppmv at 3% $O_2$ for the boilers and hot oil heaters, and a limit of 35 ppmv at 3% $O_2$ for the dehumidification units and AHUs. However, based on information provided by available burner suppliers (Munters and Zeeco), it was determined that small combustion burners as used in the building and office AHUs are not available at the previously specified $NO_X$ emission level. BOSK committed to purchasing the lowest $NO_X$ emission guarantee available for those units from the suppliers at 55 ppmv at 3% $O_2$.

For the dehumidification units, the burner supplier (Munters) indicated that the combination of tight temperature and humidity requirements specified for the clean rooms prevents the use of low-$NO_X$ burner technology. Low-$NO_X$ burners typically have a larger operating envelope that does not meet the temperature and humidity capacity control required for the clean room conditions. As such, Munters specified that a traditional burner design would be required to meet those specifications. Munters $NO_X$ emission data (89 ppmv at 3% $O_2$) was used in determining the appropriate BACT limit and PTE for these units.

- Boilers (KY1-06 and KY2-06) – Adjusted from 20 ppmv to 9 ppmv
- Hot oil heaters (KY1-07 and KY2-07) – No change
- Direct-fired dehumidification units (KY1-13 and KY2-13) – Adjusted from 35 ppmv to 89 ppmv
- Indirect-fired building AHUs (KY1-14 and KY2-14) – Adjusted from 35 ppmv to 55 ppmv
- Indirect-fired office AHUs (KY1-15 and KY2-15) – Adjusted from 35 ppmv to 55 ppmv
- Direct-fired coater oven AHUs (KY1-16 and KY2-16) – Adjusted from 35 ppmv to 25 ppmv

The current permit requires initial performance testing for $NO_X$ emissions from a representative boiler and hot oil heater to demonstrate compliance with the BACT limits. On the other hand, direct pollutant sampling following EPA's reference test methods for $NO_X$ emissions is not feasible for the dehumidification units and AHUs because direct-fired systems cannot be "stack tested" and these small indirect-fired units are not equipped with ducts/stacks for exhaust stream pollutant sampling; however, the burner systems will be designed to achieve the specified $NO_X$ emissions performance levels and BOSK will maintain associated vendor documentation.

### 5.1.3 VOC, CO, and $NO_X$ from Diesel-fired Emergency Engines

While the previous application proposed four identical emergency fire pump engines and eight identical emergency generator engines, the current application proposes the following engines:

- KY1 - Fire pump engines (KY1-08, Process ID 1)
  - Three units rated at 399 hp each; compliant with EPA Tier 3
- KY1 - Generator engines (KY1-08, Process ID 2)
  - Two units rated at 1,676 hp each; compliant with EPA Tier 2
  - One unit rated at 1,341 hp; compliant with EPA Tier 2

- One unit rated at 805 hp; compliant with EPA Tier 2
- One unit rated at 1,140 hp; compliant with EPA Tier 2

► KY2 - Generator engines (KY2-08, Process ID 2)
- Two units rated at 1,073 hp each; compliant with EPA Tier 2
- One unit rated at 1,676 hp; compliant with EPA Tier 2
- One unit rated at 2,146 hp; compliant with EPA Tier 2

Potential emissions of each criteria pollutant from each engine are well below 5 tpy. In addition, the operation of this equipment will be limited to emergency events and for routine testing and maintenance purposes. Therefore, the total hours of operation are limited to 500 hours per year. Due to the small quantity of emissions associated with the emergency units and the emergency nature of operation of the units, rather than conducting a top-down BACT analysis, BOSK proposes to meet BACT by complying with the applicable requirements of NSPS Subpart IIII and NESHAP Subpart ZZZZ. Specifically, BOSK is proposing BACT limits equivalent to the emissions limitations under NSPS Subpart IIII for CO, $NO_X$, and VOC, as presented in the following table and reflected in the emission calculations in Appendix C of this revised application.

**Table 5-1. Emergency Engine BACT Limit Summary**

| Engine Type | CO (lb/hp-hr) | $NO_X$ (lb/hp-hr) | VOC (lb/hp-hr) |
|---|---|---|---|
| Fire Pumps | 0.0058 | 0.0066 | 0.0066 |
| Generators | 0.0058 | 0.011 | 0.011 |

BOSK will demonstrate compliance with these BACT limits by purchasing engines certified to meet the requisite EPA tier standards and by installing, operating, and maintaining those units in accordance with manufacturer's recommendations. This revised application does not propose a modification of the GHG limit for diesel-fired emergency engines identified by the previous application.

## 5.2 BACT Analyses for New Sources

### 5.2.1 Cathode and Anode Presses

Section 5.6.3 of the previous application presents the top-down BACT analysis for VOC emissions from the battery manufacturing process. Step 5 of this evaluation concludes that BACT for VOC emissions from these sources is adsorption (i.e., activated carbon towers). As discussed in Section 5.1.1 of this revised application, BOSK proposes a limit of 6 ppmv for VOC emissions (as electrolyte) in the exhaust of ACs from battery manufacturing sources. Therefore, this same BACT limit is proposed for the cathode and anode presses, which are part of KY1-02 and KY2-02, in accordance with the rationale described in Section 5.1.1. Compliance will be demonstrated through periodic stack testing of a representative unit controlled by carbon adsorbers.

### 5.2.2 Electrolyte Storage Tanks

As documented by Section 5.3.1 of the previous application, the BACT determination for the project's NMP storage tanks consists of using submerged fill lines and spill and overfill protection to minimize VOC emissions from atmospheric storage tanks. As documented by the emission calculations in Appendix C, the proposed electrolyte storage tanks have the same capacity or less, lower throughputs, and similar levels of VOC emissions (less than 0.01 tpy per tank) relative to the NMP tanks. Accordingly, BOSK proposes to use the same design and work practice standards to minimize emissions as BACT for all atmospheric storage tanks included in KY1-10 and KY2-10.

# 6. DISPERSION MODELING EVALUATION

This revised application addresses the modeling impacts for pollutants with increased emissions relative to the basis for the dispersion modeling evaluation submitted to KDAQ in March 2022. As documented by Table 3-1, only site-wide VOC emissions have increased relative to the original permitting basis. Accordingly, Section 6.1 presents a revised quantitative assessment of potential ozone impacts from the proposed project using the approach outlined in EPA's *Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier 1 Demonstration Tool*.

Although site-wide emissions of $NO_2$ decreased relative to the basis for the March 2022 modeling evaluation, as discussed in Section 5.1.2, this revised application proposes increased $NO_2$ exhaust concentrations for select categories of combustion equipment. To determine the ambient impacts of these concentration increases, Section 6.2 presents a revised $NO_2$ modeling assessment. This analysis uses the results of culpability modeling to adjust the ambient impacts of the combustion equipment with increased $NO_2$ exhaust concentrations. Apart from specific changes discussed in Section 6.2, the relative stack locations, parameters, and building parameters remain essentially unchanged relative to the basis for the March 2022 modeling evaluation.

Furthermore, Section 6.3 uses the results of the Air Toxics Analysis presented in Section 8 of the March 2022 modeling report to estimate the impacts of toxic air contaminant emissions increases proposed by this revised application. As the Additional Impacts Analysis presented in Section 5 of the March 2022 modeling report is not impacted by the site-wide VOC increases, an updated version of this analysis is not included in this application.

## 6.1 Ozone Ambient Impact Analysis

This section describes the revised analysis for ozone ambient impacts from BOSK. This evaluation applies the same methodology and background concentration selection as the March 2022 modeling report submitted to KDAQ, but updates the Significant Impact Level (SIL) and NAAQS results based on the revised site-wide $NO_X$ and VOC emission rates for the BOSK site as presented in Table 3-1.

The latest revision to EPA's *Guideline on Air Quality Models (Guideline)* recommends the use of Model Emissions Rate for Precursors (MERPs) to evaluate a proposed project's impact on ozone levels in the surrounding airshed.[24] The *Guideline* establishes a two-tiered demonstration approach for addressing single-source impacts on ozone. Tier 1 demonstrations involve the use of technically credible relationships between emissions and ambient impacts based on existing modeling studies deemed sufficient for evaluating a project source's impacts. Tier 2 demonstrations involve the case-specific application of chemical transport modeling (e.g., with a Eulerian grid or Lagrangian model). MERPs are a type of Tier 1 demonstration that represents a level of increased precursor emissions that is not expected to contribute to significant levels of ozone. In other words, project emissions are compared against MERP values to determine whether the project emissions would have a significant impact on ozone levels.

To derive a MERP value, a model predicted relationship between precursor emissions from hypothetical sources and their downwind maximum impacts is combined with a critical air quality threshold using a predefined equation. For the Glendale plants' MERPs analysis, BOSK is relying on pre-established MERP

[24] 40 CFR 51, Appendix W, Guideline on Air Quality Models, published January 17, 2017. Referenced by Section 10 of 401 KAR 51:017.

values based on prior photochemical grid modeling as the primary indicator that the project does not cause or contribute to a violation of the ozone NAAQS.

A Tier 1 demonstration approach in the *Guideline* relies on the use of MERPs. The U.S. EPA discusses this approach in detail 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* (hereafter referred to as *MERPs Guidance*).[25] The guidance is relevant for the PSD program and focuses on assessing the ambient impacts of precursors of ozone (and $PM_{2.5}$) for purposes of that program. MERPs can be viewed as a Tier 1 demonstration tool under the PSD permitting program that provides a straightforward and representative way to relate maximum source impacts with a critical air quality threshold (e.g., a significant impact level or SIL).[26] Specifically, the MERP framework may be used to describe an emission rate of an individual precursor (such as $NO_x$ or VOC for ozone) that is expected to result in a change in the level of ambient ozone that would be less than a specific air quality threshold for ozone that a permitting authority adopts and chooses to use in determining whether a projected impact causes or contributes to a violation of the ozone NAAQS, such as the ozone SIL recommended by the U.S. EPA.[27] In short, MERPs are intended to be used with SILs as analytical tools for PSD air quality analyses, and if necessary, a cumulative impacts analysis including background air quality. [28]

The nearest hypothetical source modeled by EPA to the BOSK site was found in EPA's MERPs View Qlik website and was located in Barren County, Kentucky and is less than 50 km from the site location. This hypothetical source location has similar terrain and surrounding land use to the BOSK site. The Barren County (Bowling Green) location is also generally within the same air shed and as such is expected to be subject to similar atmospheric chemistry and secondary pollutant formation processes as the area surrounding the BOSK site. Therefore, the Barren County source was determined as the most representative hypothetical source in EPA's compiled photochemical modeling dataset and used in this Tier-1 modeling analysis.

Table 6-1 shows the selected MERPs values for the Barren County hypothetical source (10 m stack height source selected), the calculated ozone MERPs, project emission increases of $NO_X$ and VOC, and the estimated ozone impact associated with the expansion project.

An example calculation for the $NO_X$ and VOC estimated ozone impacts, is provided here.

$$\left(\left(\frac{246.7\ tpy\ NOx\ from\ facility}{172\ tpy\ NOx\ 8-hr\ daily\ O_3\ MERP}\right)+\left(\frac{519.0\ tpy\ VOC\ from\ facility}{8{,}306\ tpy\ VOC\ 8-hr\ daily\ O_3\ MERP}\right)\right)=1.50\ ppb$$

[25] 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.

[26] *MERPs Guidance*, pg. 5.

[27] *MERPs Guidance*, pg. 10.

[28] As discussed in the Class II modeling protocol, the February 2020 $PM_{2.5}$ modeling guidance is being followed for the consideration of secondary ozone and $PM_{2.5}$ impacts for this project, and not the recently proposed draft $PM_{2.5}$ modeling guidance in September 2021.

**Table 6-1. Ozone SIL Analysis**

| Averaging Period | Precursor | Modeled Emission Rate from Hypo. Source (tpy) | Modeled Impact from Hypo. Source (ppb) | Ozone MERP (tpy/ppb) | Project Emissions (tpy) | Ozone Project Impact (ppb) | SIL (ppb) |
|---|---|---|---|---|---|---|---|
| 8-hour | $NO_X$ | 500 | 2.908 | 172 | 246.7 | 1.43 | |
| | VOC | 500 | 0.060 | 8,306 | 519.0 | 0.06 | |
| | | | | | Total | **1.50** | **1.0** |

In Table 6-2, the calculated MERPs concentrations are added to the background ozone concentration (2021-2023 design value) taken from the Elizabethtown, KY monitor (21-093-0006) to calculate overall ozone impacts as follows:

65 ppb (background) + 1.497 ppb (estimated ozone impact) = 66.497 ppb

**Table 6-2. Ozone NAAQS Analysis**

| Averaging Period | Pollutant | Ozone Project Impact (ppb) | Ozone Background Conc. (ppb) | Cumulative Ozone Impact (ppb) | NAAQS (ppb) |
|---|---|---|---|---|---|
| 8-hour | Ozone | 1.50 | 65 | **66.50** | **70** |

Even with the conservative assumption that all potential ozone formation from the project would occur at the monitor location, the analysis demonstrates compliance with the Ozone 8-hour NAAQS.

## 6.2 $NO_2$ Ambient Impact Analysis

Although site-wide emissions of $NO_2$ decreased relative to the basis for the March 2022 modeling evaluation, as discussed in Section 5.1.2, this revised application proposes increased $NO_2$ exhaust concentrations for select categories of combustion equipment. To determine the ambient impacts of these concentration increases, this section presents a revised $NO_2$ modeling assessment. Specifically, this analysis uses the results of culpability modeling to adjust the ambient impacts of the combustion equipment by an appropriate scaling factor.

The only $NO_2$ exhaust concentration increases proposed by the updated design are associated with the following equipment: direct-fired dehumidification units (KY1-13 and KY2-13), indirect-fired building AHUs (KY1-14 and KY2-14), indirect-fired office AHUs (KY1-15 and KY2-15), and direct-fired coater oven AHUs (KY1-16 and KY2-16). However, due to changes in the capacity and number of each unit type, total $NO_2$ emissions from the vents associated with the indirect-fired building AHUs (KY1-14 and KY2-14) and direct-fired coater oven AHUs (KY1-16 and KY2-16) have decreased relative to the emission rates represented by the March 2022 modeling report.

The vents associated with these units effectively act as capped stacks. As such, the March 2022 modeling evaluation assigned a nominal exit velocity (1 m/s) and stack diameter (1 m) to these vents, which is consistent with EPA's approach for simulating dispersion from capped stacks. The exhaust discharge temperature of the heating units was conservatively set to a nominal temperature for the building environment (70 deg. F) as opposed to the more elevated temperatures that may occur from residual heat from natural gas combustion remaining in the exhaust stream. Therefore, the updated rated capacities of these sources do not impact the modeled exit velocities or temperatures for these vents. As the actual exhaust flowrate and temperature of the combustion equipment is not incorporated into the dispersion model and the associated building parameters have not changed, only the modeled emission rates would change for these sources. Accordingly, the adjustments made to this revised $NO_2$ ambient impact analysis accounted for the following scaling factors based on the $NO_X$ emission rates proposed by this application relative to the basis for the March 2022 modeling report.

**Table 6-3. $NO_2$ Emission Rate Scaling Factors**

| **Permit Source ID** | **Proposed Source ID** | **Previously Permitted $NO_X$ Emission Rate** (tpy) | **Revised $NO_X$ Emission Rate** (tpy) | **Model Scaling Factor** |
|---|---|---|---|---|
| EU 13A/B | KY1-13 & KY2-13 | 40.21 | 87.10 | 2.17 |
| EU 14 | KY1-13 & KY2-13 | 37.98 | 17.55 | 0.46 |
| EU 15 | KY1-13 & KY2-13 | 7.82 | 17.55 | 2.24 |
| EU 16A/B | KY1-13 & KY2-13 | 80.27 | 21.91 | 0.27 |

The 1-hour $NO_2$ modeling analysis, submitted in the March 2022 modeling report, included a culpability (source contribution) analysis because there were modeled exceedances above the NAAQS. However, BOSK's contributions to the modeled exceedances were less than the 1-hour $NO_2$ SIL (7.5 $\mu g/m^3$). BOSK has reprocessed the same 1-hour $NO_2$ modeling file with additional source groups to discern the modeled contribution from each of the sources with revised $NO_2$ exhaust concentrations. The results of this updated source contribution analysis are shown in Table 6-4. The "All Sources", "BOSK Facility" (representing KY1 and KY2 sources), and "Nearby Sources" groups were included in the March 2022 modeling file, while the emission unit specific source groupings were added to the revised evaluation.

Table 6-4 shows the modeled impacts to which the BOSK operations most significantly contributed on a magnitude (not percentage) basis. The emission rate scaling factors identified by Table 6-3 were applied to each of the emission unit groupings based on the revised $NO_2$ emission rates for each emission unit. For any source groupings which included multiple emission units (e.g., the modeled sources ELE1/ELE2 contained both EU13A and EU16A emissions), the "worst-case" scaling factor was applied. After applying the scaling factors, the updated source contributions from each emission unit were calculated in Table 6-5 and the revised contributions from the BOSK site overall were tallied. As indicated in Table 6-5, after applying the scaling factors to the emission unit contributions, BOSK remains an insignificant (<7.5 $\mu g/m^3$) contributor to modeled NAAQS exceedances.

**Table 6-4. March 2022 Source Contribution with Additional EU Source Groups**

| All Sources (μg/m³) | Source Contributions (μg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | BOSK Facility | Nearby Sources | EU13A | EU13B | EU14 | EU15 | EU16A | EU16B |
| 627.75 | 5.42 | 622.33 | 0.22 | 0.40 | 0.92 | 0.17 | 1.49 | 0.90 |
| 179.60 | 4.89 | 174.71 | 0.18 | 0.35 | 0.78 | 0.15 | 1.32 | 0.77 |
| 883.84 | 4.33 | 879.51 | 0.18 | 0.30 | 0.86 | 0.14 | 1.13 | 0.66 |
| 175.59 | 4.25 | 171.34 | 0.18 | 0.29 | 0.59 | 0.12 | 1.36 | 0.66 |
| 291.76 | 4.16 | 287.60 | 0.18 | 0.29 | 0.65 | 0.14 | 1.33 | 0.64 |

**Table 6-5. Scaled Source Contribution Based on Revised $NO_2$ Exhaust Concentrations**

| All Sources (μg/m³) | Scaled Contributions (μg/m³) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | BOSK Facility | Nearby Sources | EU13A | EU13B | EU14 | EU15 | EU16A | EU16B |
| 629.28 | 6.94 | 622.33 | 0.47 | 0.87 | 0.43 | 0.38 | 3.24 | 0.24 |
| 180.96 | 6.25 | 174.71 | 0.40 | 0.75 | 0.36 | 0.34 | 2.86 | 0.21 |
| 884.94 | 5.43 | 879.51 | 0.40 | 0.65 | 0.40 | 0.31 | 2.44 | 0.18 |
| 177.08 | 5.75 | 171.34 | 0.38 | 0.64 | 0.27 | 0.28 | 2.94 | 0.18 |
| 293.23 | 5.62 | 287.60 | 0.40 | 0.63 | 0.30 | 0.30 | 2.89 | 0.17 |

The following list summarizes design changes for each category of $NO_2$-emitting equipment that is not addressed by the revised modeling results presented in Table 6-5.

- Natural gas-fired boilers – While the number of boilers, heat input capacity per boiler, and total heat input capacity increased (from eight boilers rated at 10 MMBtu/hr each with a total capacity of 80 MMBtu/hr to 22 boilers rated at 12 MMBtu/hr each with a total capacity of 264 MMBtu/hr for the BOSK site), the use of lower emitting equipment reduced the boilers' $NO_X$ exhaust concentration from 20 ppmv to 10 ppmv at 3% $O_2$. These changes correspond to a 46% reduction in potential $NO_X$ emissions from each boiler relative to the basis for the March 2022 modeling report. As each boiler has a dedicated stack, the $NO_X$ emissions from each unit are unlikely to have significant impacts on the same receptors. Therefore, the reduced per boiler emission rate and distribution of these reduced emissions among 22 different stacks are expected to decrease ambient $NO_2$ impacts from the boiler systems at KY1 and KY2 relative to the previous design.
- Natural gas-fired hot oil heaters – While the number and $NO_X$ exhaust concentration of the proposed hot oil heaters remains unchanged, the heat input capacity of each unit decreased relative to the basis for the March 2022 modeling report. These changes correspond to a total heat input capacity reduction from 638 MMBtu/hr to 516 MMBtu/hr for the hot oil heater systems at the BOSK site. Therefore, ambient $NO_2$ impacts from the hot oil heater systems at KY1 and KY2 will decrease relative to the previous design basis.

In comparison to the results presented in the March 2022 modeling report, $NO_2$ impacts from the natural gas-fired boilers are expected to decrease, impacts from the hot oil heaters will decrease, and impacts from the dehumidification units and AHUs will change as presented in Table 6-5. Therefore, the results of the March 2022 modeling report remain valid for the updated design basis presented in this application and no further demonstration of $NO_2$ impacts is required.

## 6.3 Air Toxics Analysis

This section assesses the impacts of toxic air contaminant emissions increases relative to the previous permit application by scaling the results of the Air Toxics Analysis presented in Section 8 of the March 2022 modeling report. Kentucky regulates potentially hazardous matter or toxic substances (commonly referred to as toxic air pollutants or TAP) through 401 KAR 63:020. KDAQ can require that dispersion modeling or other analyses be completed by facilities if a project causes an increase in TAP emissions, as defined under 401 KAR 63:020, Section 2(2), that are deemed to be "significant." This is done so that there is a documented basis for affirming that a facility does not cause an adverse impact. However, pursuant to 401 KAR 63:020, Section 1, the requirements of this rule are applicable only to the extent that such emissions are not subject to other provisions of the KAR.

Combustion emissions from the proposed emergency fire pump engines and emergency generator engines will be subject to NSPS Subpart IIII and NESHAP Subpart ZZZZ. NSPS Subpart IIII establishes limits for PM and VOC, which serve as surrogates for metallic and organic TAP, respectively. Nickel emissions from the electrode manufacturing process are subject to NESHAP Subpart CCCCCCC. These control requirements also serve to restrict emissions of other metallic dusts (i.e., cobalt and manganese) from the cathode mixing process. Since these TAP emissions are already regulated under Kentucky standards or federal requirements adopted by reference into the KAR, no additional requirements under 401 KAR 63:020 will apply.

The NMP used in BOSK's electrode manufacturing process does not contain regulated HAP or TAP; however, the subsequent battery assembly process uses both acetonitrile, which is regulated as a HAP, and an electrolyte containing up to 0.49% by weight 1,3-propane sultone, which is regulated as a HAP. Additionally, BOSK will emit HCl from the cell discharge process and on-site laboratories. As these TAP sources are not elsewhere subject to the provisions of the KAR, these emissions are subject to 401 KAR 63:020. Furthermore, the TAP emissions from natural gas combustion equipment are also subject to 401 KAR 63:020.

The Air Toxics Analysis presented in Section 8 of the March 2022 modeling report described the modeling methodology and associated results for HCl and acetonitrile emissions. The result for HCl was approximately 1.5% of the EPA Regional Screening Level (RSL) for Resident Air, while the result for acetonitrile was 0.8% of the RSL. As presented in Appendix C, potential HCl emissions proposed by this revised application have decreased by approximately 4.0 tpy relative to the previous application, while emissions of acetonitrile are unchanged. Furthermore, stack heights for the exhaust of the HCl scrubbers increased relative to the March 2022 modeling report due to the use of vertical scrubber systems and increased building heights. Therefore, the March 2022 modeling report findings are conservatively representative of the updated site design for these pollutants.

Although 1,3-propane sultone emissions from the battery assembly process and electrolyte storage are regulated as HAP, EPA has not established an RSL for Resident Air for this pollutant. Therefore, no further demonstration of compliance with 401 KAR 63:020 is presented in this application for 1,3-propane sultone.

The only remaining category of pollutants potentially subject to 401 KAR 63:020 are the TAPs resulting from natural gas combustion. The previous application characterized BOSK as a major source of HAP emissions, such that the tune-up requirements of NESHAP Subpart DDDDD applied to the natural gas-fired indirect heat exchangers and TAP emissions from these sources were not subject to 401 KAR 63:020. Accordingly, Section 8.1.1.1 of the March 2022 modeling report includes a "Determination of No Adverse Impacts for Natural Gas Combustion Units" that is limited to the units not subject to NESHAP Subpart DDDDD. On the other hand, under this revised application, the BOSK site represents an area source of HAP. As indirect heat exchangers firing only natural gas are exempt from the area source requirements of NESHAP Subpart JJJJJJ, TAP emissions from this combustion equipment are no longer subject to regulation elsewhere in the KAR and should therefore be evaluated under 401 KAR 63:020.

Despite this change in regulatory applicability, the conclusions of Section 8.1.1.1 of the March 2022 remain valid for the TAP emitted by natural gas combustion sources. EPA's lack of specific HAP emissions standards in NESHAP Subpart DDDDD for the "units designed to burn gas 1 fuel" category (which includes natural gas as a gas 1 fuel) demonstrates that adverse impacts to human health are not commonly associated with HAP/air toxics found in the exhaust of natural gas combustion systems. Furthermore, although not applicable to the BOSK site, the Louisville Metro Air Pollution Control District (District) implements the Strategic Toxic Air Reduction (STAR) Program for sources in Jefferson County, Kentucky. According to Section 2.7 of District Regulation 5.21, emissions from the combustion of natural gas are considered "de minimis" and may be excluded from the dispersion modeling assessment to demonstrate that the site meets the environmental acceptability goals of the STAR program, as these emissions are not expected to have adverse toxicological impacts.

Using the modeling evaluation presented in the March 2022 modeling report, the ratio of potential HCl emissions (tpy) to the associated RSL ($\mu g/m^3$) is 25.4%. The modeled impacts for HCl resulting from this emission rate were less than 2% of the RSL. The updated site design resulted in emissions increases of the following TAP from natural gas combustion sources, which have established RSLs: 1,3-butadiene, benzene, and xylene. The ratio of potential emissions (tpy) to the associated RSL ($\mu g/m^3$) is 0.1% for 1,3-butadiene, 7.9% for benzene, and 0.004% for xylenes. Based on the low impacts of HCl emissions from BOSK (less than 2% of the RSL), and the relative ratios of annual emissions to RSLs for these TAPs, ambient impacts of 1,3-butadiene, benzene, and xylene from the updated design basis will be well under their respective RSLs.

As a narrative only State-Origin regulation with no prescriptive methods for demonstrating compliance on an individual source basis, KDAQ has the full authority to implement the air toxics regulation on as "case-by-case" basis as appropriate for the site-specific circumstances of each proposed project source or modification. Given the analysis presented in this section, Ford is seeking concurrence from KDAQ on the acceptability of this qualitative assessment approach for demonstrating that TAP from natural gas combustion sources at KY1 and KY2 do not pose an adverse risk to the "health and welfare of humans, animals and plants" (refer to 401 KAR 63:020 Section 3).

# APPENDIX A. PERMIT APPLICATION 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**

___ Additional Documentation attached

**Source Name:** BlueOval SK, LLC

**KY EIS (AFS) #:** 21- 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/6/2024

## Section AI.1: Source Information

| | | | | | | |
|---|---|---|---|---|---|---|
| **Physical Location Address:** | **Street:** | 2022 Battery Park Drive | | | | |
| | **City:** | Glendale | **County:** | Hardin | **Zip Code:** | 42740 |
| **Mailing Address:** | **Street or P.O. Box:** | 2022 Battery Park Drive | | | | |
| | **City:** | Glendale | **State:** | Hardin | **Zip Code:** | 42740 |

### Standard Coordinates for Source Physical Location

**Longitude:** -85.89023257 (decimal degrees) **Latitude:** 37.58726258 (decimal degrees)

**Primary (NAICS) Category:** Primary Battery Manufacturing **Primary NAICS #:** 335912

**Classification (SIC) Category:** Primary Batteries, Dry and Wet **Primary SIC #:** 3692

**Briefly discuss the type of business conducted at this site:** The proposed plants will manufacture lithium-ion electric vehicle (EV) batteries.

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

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

**Number of Employees:** ~2,410

**Approximate distance to nearest residence or commercial property:** Adjacent

**Property Area:** 1,536 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:** BlueOval SK, LLC

**Title:** (if individual)

**Mailing Address:**
**Street or P.O. Box:** 2022 Battery Park Drive
**City:** Glendale **State:** KY **Zip Code:** 42740

**Email:** (if individual)

**Phone:**

**Technical Contact**

**Name:** Rob Streight

**Title:** Air Policy Manager

**Mailing Address:**
**Street or P.O. Box:** 1500 Enterprise Drive
**City:** Allen Park **State:** MI **Zip Code:** 48101

**Email:** rstreigh@ford.com

**Phone:** 810-986-5524

**Air Permit Contact for Source**

**Name:** Chad Borders

**Title:** Senior Environmental Engineer

**Mailing Address:**
**Street or P.O. Box:** 2022 Battery Park Drive
**City:** Glendale **State:** KY **Zip Code:** 42740

**Email:** CBORDER5@ford.com

**Phone:** 502-827-5796

## 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 |
|---|---|
| BlueOval SK, LLC | |
| | |
| | |

## 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) | KY1 - 249.6 tpy; KY2 - 269.5 tpy | ☐ 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)* N/A

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

**For Modifications:**

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

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

**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.**

| | |
|---|---|
| [signature] | 12-9-2024 |
| **Authorized Signature** | **Date** |
| Mark Haley | Plant Manager of BOSK KY 1 |
| **Type or Printed Name of Signatory** | **Title of Signatory** |

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

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

This application represents the final "as-built" facility design information based on information provided by BOSK's equipment vendors and accounts for changes to emission calculations and regulatory applicability relative to the Q1 2022 permit application. The narrative application and DEP7007-series forms detail these changes.

Division for Air Quality

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

# DEP7007A

## Indirect Heat Exchangers and Turbines

___ Section A.1: General Information
___ Section A.2: Operating and Fuel Information
___ Section A.3: Notes, Comments, and Explanations

**Additional Documentation**

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

____ Manufacturer's specifications

**Source Name:** BlueOval SK, LLC
**KY EIS (AFS) #:** 21-093-00176
**Permit #:** V-21-041 R1
**Agency Interest (AI) ID:** 170550
**Date:** 12/3/2024

## Section A.1: General Information

| Emission Unit # | Emission Unit Name | Process ID | Process Name | Identify General Type: Indirect Heat Exchanger, Gas Turbine, or Combustion Turbine | Indirect Heat Exchanger Configuration | Manufacturer | Model No./ Serial No. | Proposed/Actual Date of Construction Commencement *(MM/YYYY)* | SCC Code | SCC Units | Control Device ID | Stack ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY1-06 | Natural Gas-fired Boilers | 1 | Boiler Natural Gas Combustion (KY1-B01 - KY1-B11) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY1-B01_S - KY1-B11_S |
| KY1-07 | Natural Gas-fired Hot Oil Heaters | 1 | Hot Oil Heater Natural Gas Combustion (KY1-H01 - KY1-H10) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY1-H01_S - KY1-H10_S |
| KY1-14 | Natural Gas-fired Building AHUs | 1 | Building AHU Natural Gas Combustion (KY1-BA01 - KY1-BA10) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY1-BA01_S - KY1-BA10_S |
| KY1-15 | Natural Gas-fired Office AHUs | 1 | Office AHU Natural Gas Combustion (KY1-OA01 - KY1-OA10) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY1-OA01_S - KY1-OA10_S |

Division for Air Quality

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# DEP7007A

## Indirect Heat Exchangers and Turbines

___ Section A.1: General Information
___ Section A.2: Operating and Fuel Information
___ Section A.3: Notes, Comments, and Explanations

**Additional Documentation**

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

____ Manufacturer's specifications

**Source Name:** BlueOval SK, LLC
**KY EIS (AFS) #:** 21-093-00176
**Permit #:** V-21-041 R1
**Agency Interest (AI) ID:** 170550
**Date:** 12/3/2024

## Section A.1: General Information

| Emission Unit # | Emission Unit Name | Process ID | Process Name | Identify General Type: Indirect Heat Exchanger, Gas Turbine, or Combustion Turbine | Indirect Heat Exchanger Configuration | Manufacturer | Model No./ Serial No. | Proposed/Actual Date of Construction Commencement *(MM/YYYY)* | SCC Code | SCC Units | Control Device ID | Stack ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY2-06 | Natural Gas-fired Boilers | 1 | Boiler Natural Gas Combustion (KY2-B01 - KY2-B11) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY2-B01_S - KY2-B11_S |
| KY2-07 | Natural Gas-fired Hot Oil Heaters | 1 | Hot Oil Heater Natural Gas Combustion (KY2-H01 - KY2-H10) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY2-H01_S - KY2-H10_S |
| KY2-14 | Natural Gas-fired Building AHUs | 1 | Building AHU Natural Gas Combustion (KY2-BA01 - KY2-BA10) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY2-BA01_S - KY2-BA10_S |
| KY2-15 | Natural Gas-fired Office AHUs | 1 | Office AHU Natural Gas Combustion (KY2-OA01 - KY2-OA10) | Indirect Heat Exchanger | TBD | TBD | TBD | N/A | 10200602 | Million Cubic Feet Natural Gas Burned | N/A | KY2-OA01_S - KY2-OA10_S |

## Section A.2: Operating and Fuel Information

| Emission Unit # | If multipurpose unit, identify the percentage of use by purpose | | | | Rated Capacity Heat Input *(MMBTU/hr)* | Rated Capacity Power Output | | Describe Operating Scenario (only if this unit will be used in different configurations) | Classify Fuel as Primary or Secondary | Identify Fuel Type: Coal, Natural Gas, Wood, Biomass, Landfill/Digester Gas, Fuel Oil # (specify 1-6), or Other | Heat Content (HHV) | | Maximum Operating Hours | Ash Content *(%)* | Sulfur Content *(%)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Space Heat | Process Heat | Power | Emergency | | | *(Specify units: hp, MW, or lb steam/hr)* | | | | | *(Specify units: Btu/lb, Btu/gal, or Btu/scf)* | | | |
| KY1-06 | | | | | 12 MMBtu/hr each (11 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY1-07 | | | | | 27.8 MMBtu/hr each (5 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY1-07 | | | | | 23.8 MMBtu/hr each (5 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY1-14 | | | | | 3 MMBtu/hr each (10 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY1-15 | | | | | 3 MMBtu/hr each (10 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |

## Section A.2: Operating and Fuel Information

| Emission Unit # | If multipurpose unit, identify the percentage of use by purpose | | | | Rated Capacity Heat Input *(MMBTU/hr)* | Rated Capacity Power Output | | Describe Operating Scenario (only if this unit will be used in different configurations) | Classify Fuel as Primary or Secondary | Identify Fuel Type: Coal, Natural Gas, Wood, Biomass, Landfill/Digester Gas, Fuel Oil # (specify 1-6), or Other | Heat Content (HHV) | | Maximum Operating Hours | Ash Content *(%)* | Sulfur Content *(%)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Space Heat | Process Heat | Power | Emergency | | | *(Specify units: hp, MW, or lb steam/hr)* | | | | | *(Specify units: Btu/lb, Btu/gal, or Btu/scf)* | | | |
| KY2-06 | | | | | 12 MMBtu/hr each (11 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY2-07 | | | | | 27.8 MMBtu/hr each (5 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY2-07 | | | | | 23.8 MMBtu/hr each (5 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY2-14 | | | | | 3 MMBtu/hr each (10 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |
| KY2-15 | | | | | 3 MMBtu/hr each (10 units) | TBD | | | Primary | Natural Gas | 1,020 | Btu/scf | 8,760 | Neg. | Neg. |

| Section A.3: Notes, Comments, and Explanations |
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Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

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# DEP7007B

## Manufacturing or Processing Operations

___ Section B.1: Process Information

___ Section B.2: Materials and Fuel Informati

___ Section B.3: Notes, Comments, and Explanatic

**Additional Documentation**

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

___ Attach a flow diagram

___ Attach SDS

**Source Name:** BlueOval SK, LLC

**KY EIS (AFS) #:** 21- 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/3/2024

## Section B.1: Process Information

| Emission Unit # | Emission Unit Name | Describe Emission Unit | Process ID | Process Name | Manufacturer | Model No. | Proposed/Actual Date of Construction Commencement *(MM/YYYY)* | Is the Process Continuous or Batch? | Number of Batches per 24 Hours *(if applicable)* | Hours per Batch *(if applicable)* |
|---|---|---|---|---|---|---|---|---|---|---|
| KY1-01 | Electrode Manufacturing | Anode and Cathode Preparation | 1 | Powder Room: Anode Measure | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Powder Room: Cathode Measure | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 3 | Powder Room: Anode Feed | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 4 | Powder Room: Cathode Feed | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 5 | Cathode Powder Vacuum Pump | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 6 | Cathode Powder | TBD | TBD | N/A | Continuous | N/A | N/A |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | 7 | Anode Mixer Vacuum Pump | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 8 | Anode Powder Vacuum Pump | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 9 | Anode Powder | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 10 | Cathode/Anode Processing | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 11 | Electrode Cleaning | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 12 | Cathode Drying | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY1-02 | Battery Assembly | Assembly of Anode, Cathode, and Electrolyte | 1 | Cathode Notching | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Anode Notching | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 3 | Cathode Slitting | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 4 | Anode Slitting | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 5 | Vacuum Dryer (Cathode), Electrolyte Filling, Sealing | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 6 | Cathode Press | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 7 | Anode Press | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 8 | Tab Welding (BME) | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 9 | Tab Welding (SK) | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY1-03 | Battery Formation | Battery Formation | 1 | Cell Degassing | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY1-04 | Cell Discharge | Cell Discharge | 1 | Cell Discharge - VOC | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Cell Discharge - HCl | TBD | TBD | N/A | Continuous | N/A | N/A |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| KY1-05 | Laboratories | Laboratories | 1 | Quality Evaluation 1 | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Quality Evaluation 2 | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 3 | ICP Lab | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 4 | Raw Materials Inspection Lab | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY1-09 | Cooling Towers | Cooling Towers | 1 | Cooling Towers | TBD | TBD | N/A | Continuous | N/A | N/A |

## Section B.1: Process Information

| Emission Unit # | Emission Unit Name | Describe Emission Unit | Process ID | Process Name | Manufacturer | Model No. | Proposed/Actual Date of Construction Commencement *(MM/YYYY)* | Is the Process **Continuous** or **Batch**? | Number of Batches per 24 Hours *(if applicable)* | Hours per Batch *(if applicable)* |
|---|---|---|---|---|---|---|---|---|---|---|
| KY2-01 | Electrode Manufacturing | Anode and Cathode Preparation | 1 | Powder Room: Anode Measure | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Powder Room: Cathode Measure | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 3 | Powder Room: Anode Feed | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 4 | Powder Room: Cathode Feed | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 5 | Cathode Powder Vacuum Pump | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 6 | Cathode Powder | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 7 | Anode Mixer Vacuum Pump | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 8 | Anode Powder Vacuum Pump | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 9 | Anode Powder | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 10 | Cathode/Anode Processing | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 11 | Electrode Cleaning | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 12 | Cathode Drying | TBD | TBD | N/A | Continuous | N/A | N/A |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| KY2-02 | Battery Assembly | Assembly of Anode, Cathode, and Electrolyte | 1 | Cathode Notching | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Anode Notching | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 3 | Vacuum Dryer (Cathode), Electrolyte Filling, Sealing | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 4 | Cathode Press | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 5 | Anode Press | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 6 | Tab Welding (BME) | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 7 | Tab Welding (SK) | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY2-03 | Battery Formation | Battery Formation | 1 | Cell Degassing | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY2-04 | Cell Discharge | Cell Discharge | 1 | Cell Discharge - VOC | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Cell Discharge - HCl | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY2-05 | Laboratories | Laboratories | 1 | Quality Evaluation 1 | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 2 | Quality Evaluation 2 | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 3 | ICP Lab | TBD | TBD | N/A | Continuous | N/A | N/A |
| | | | 4 | Raw Materials Inspection Lab | TBD | TBD | N/A | Continuous | N/A | N/A |
| KY2-09 | Cooling Towers | Cooling Towers | 1 | Cooling Towers | TBD | TBD | N/A | Continuous | N/A | N/A |

## Section B.2: Materials and Fuel Information

**Maximum yearly fuel usage rate only applies if applicant request operating restrictions through federally enforceable limitations.*

| Emission Unit # | Emission Unit Name | Name of Raw Materials Input | Maximum Quantity of Each Raw Material Input | | Total Process Weight Rate for Emission Unit *(tons/hr)* | Name of Finished Materials | Maximum Quantity of Each Finished Material Output | | Fuel Type | Maximum Hourly Fuel Usage Rate | | Maximum Yearly Fuel Usage Rate | | Sulfur Content *(%)* | Ash Content *(%)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *(Specify Units/hr)* | | | | *(Specify Units/hr)* | | | *(Specify Units)* | | *(Specify Units)* | | |
| KY1-01 | Electrode Manufacturing | Anode Powder, Cathode Powder, NMP, Foil | TBD | *TBD* | TBD | Electrodes | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY1-02 | Battery Assembly | Electrodes, Electrolyte | TBD | *TBD* | TBD | Arrays | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY1-03 | Battery Formation | Arrays | TBD | *TBD* | TBD | Arrays | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY1-04 | Cell Discharge | Arrays | TBD | *TBD* | TBD | Arrays | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY1-05 | Laboratories | Raw Materials for Electrodes, Electrodes, Arrays | TBD | *TBD* | TBD | Primarily sent to recycling | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY1-09 | Cooling Towers | TDS (per tower) | 8.29 | *ton/hr* | 8.29 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

## Section B.2: Materials and Fuel Information

**Maximum yearly fuel usage rate only applies if applicant request operating restrictions through federally enforceable limitations.*

| Emission Unit # | Emission Unit Name | Name of Raw Materials Input | Maximum Quantity of Each Raw Material Input | | Total Process Weight Rate for Emission Unit *(tons/hr)* | Name of Finished Materials | Maximum Quantity of Each Finished Material Output | | Fuel Type | Maximum Hourly Fuel Usage Rate | | Maximum Yearly Fuel Usage Rate | | Sulfur Content *(%)* | Ash Content *(%)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | *(Specify Units/hr)* | | | | *(Specify Units/hr)* | | | *(Specify Units)* | | *(Specify Units)* | | |
| KY2-01 | Electrode Manufacturing | Anode Powder, Cathode Powder, NMP, Foil | TBD | *TBD* | TBD | Electrodes | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY2-02 | Battery Assembly | Electrodes, Electrolyte | TBD | *TBD* | TBD | Arrays | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY2-03 | Battery Formation | Arrays | TBD | *TBD* | TBD | Arrays | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY2-04 | Cell Discharge | Arrays | TBD | *TBD* | TBD | Arrays | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY2-05 | Laboratories | Raw Materials for Electrodes, Electrodes, Arrays | TBD | *TBD* | TBD | Primarily sent to recycling | 86 | *GWh/yr* | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KY2-09 | Cooling Towers | TDS (per tower) | 8.29 | *ton/hr* | 8.29 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| **Section B.3: Notes, Comments, and Explanations** |
|---|
| The process weight for each emission unit is still to be determined; however, each emission unit will comply with the most stringent PM standard potentially applicable under 401 KAR 59:010 (2.34 lb/hr). |
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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:** BlueOval SK, LLC

**KY EIS (AFS) #:** 21- 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/3/2024

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| KY1-08-1 | Fire Pump Engine Diesel Combustion (KY1-FPE01 - KY1-FPE03) | N/A | KY1-FPE01_S - KY1-FPE03_S | TBD | TBD | TBD | TBD | N/A | N/A | NSPS IIII, NESHAP ZZZZ |
| KY1-08-2 | Generator Engine Diesel Combustion (KY1-GE01 - KY1-GE05) | N/A | KY1-GE01_S - KY1-GE05_S | Cummins | Engine: QSK23-G7 NR2 Genset: 800DQCC | TBD | TBD | N/A | N/A | NSPS IIII, NESHAP ZZZZ |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| KY2-08-2 | Generator Engine Diesel Combustion (KY2-GE01 - KY2-GE04) | N/A | KY2-GE01_S - KY2-GE04_S | Cummins | Engine: QSK23-G7 NR2 Genset: 800DQCC | TBD | TBD | N/A | N/A | NSPS IIII, NESHAP ZZZZ |

## 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** *(per year per unit)* | **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) |
|---|---|---|---|---|---|
| KY1-08-1 | Emergency | 500 | No | N/A | N/A |
| KY1-08-2 | Emergency | 500 | No | N/A | N/A |

## 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** *(per year per unit)* | **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) |
|---|---|---|---|---|---|
| KY2-08-2 | Emergency | 500 | No | N/A | N/A |

## 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 per unit)* | Maximum Engine Speed *(rpm)* | Total Displacement *(L)* | Number of Cylinders |
|---|---|---|---|---|---|---|---|
| KY1-08-1 | Stationary | Compression | TBD | 399 | TBD | TBD | TBD |
| KY1-08-2 | Stationary | Compression | 4 Cycle, In-line | 1,676 | 1800 | 23.2 | 6 |
| KY1-08-2 | Stationary | Compression | 4 Cycle, In-line | 1,341 | 1800 | 23.2 | 6 |
| KY1-08-2 | Stationary | Compression | 4 Cycle, In-line | 805 | 1800 | 23.2 | 6 |
| KY1-08-2 | Stationary | Compression | 4 Cycle, In-line | 1,140 | 1800 | 23.2 | 6 |

## 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 per unit)* | Maximum Engine Speed *(rpm)* | Total Displacement *(L)* | Number of Cylinders |
|---|---|---|---|---|---|---|---|
| KY2-08-2 | Stationary | Compression | 4 Cycle, In-line | 1,073 | 1800 | 23.2 | 6 |
| KY2-08-2 | Stationary | Compression | 4 Cycle, In-line | 1,676 | 1800 | 23.2 | 6 |
| KY2-08-2 | Stationary | Compression | 4 Cycle, In-line | 2,146 | 1800 | 23.2 | 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 *(gal/hr per unit)* | Heat Content *(Btu/gal)* | Sulfur Content *(%)* | SCC Code | SCC Units |
|---|---|---|---|---|---|---|---|---|---|
| KY1-08-1 | Primary | Diesel | ULSD | 100% | 20.39 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |
| KY1-08-2 | Primary | Diesel | ULSD | 100% | 85.6 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |
| KY1-08-2 | Primary | Diesel | ULSD | 100% | 68.5 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |
| KY1-08-2 | Primary | Diesel | ULSD | 100% | 41.1 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |
| KY1-08-2 | Primary | Diesel | ULSD | 100% | 58.2 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |

## 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 *(gal/hr per unit)* | Heat Content *(Btu/gal)* | Sulfur Content *(%)* | SCC Code | SCC Units |
|---|---|---|---|---|---|---|---|---|---|
| KY2-08-2 | Primary | Diesel | ULSD | 100% | 54.82 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |
| KY2-08-2 | Primary | Diesel | ULSD | 100% | 85.65 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |
| KY2-08-2 | Primary | Diesel | ULSD | 100% | 109.63 | 137,000 | 0.0015% | 20200102 | 1000 Gallons Distillate Oil (Diesel) Burned |

## 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 |
|---|---|---|---|---|---|
| KY1-08-1 | Diesel | PM/PM10/PM2.5 | 3.29E-04 | lb/hp-hr | Tier 3 Standards 40 CFR 1039 Appendix I |
| | | CO | 5.75E-03 | lb/hp-hr | Tier 3 Standards 40 CFR 1039 Appendix I |
| | | NOX | 6.58E-03 | lb/hp-hr | Tier 3 Standards 40 CFR 1039 Appendix I |
| | | SO2 | 2.05E-03 | lb/hp-hr | AP-42 Section 3.3 |
| | | VOC | 6.58E-03 | lb/hp-hr | Tier 3 Standards 40 CFR 1039 Appendix I |
| | | CO2 | 163.05 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | CH4 | 6.61E-03 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | N2O | 1.32E-03 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | Benzene | 9.33E-04 | lb/MMBtu | AP-42 Section 3.3 |
| | | Toluene | 4.09E-04 | lb/MMBtu | AP-42 Section 3.3 |
| | | Xylenes | 2.85E-04 | lb/MMBtu | AP-42 Section 3.3 |
| KY1-08-2 | Diesel | PM/PM10/PM2.5 | 3.29E-04 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | CO | 5.75E-03 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | NOX | 1.05E-02 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | SO2 | 1.21E-05 | lb/hp-hr | AP-42 Section 3.4 |
| | | VOC | 1.05E-02 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | CO2 | 163.05 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | CH4 | 6.61E-03 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | N2O | 1.32E-03 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | Benzene | 7.76E-04 | lb/MMBtu | AP-42 Section 3.4 |
| | | Toluene | 2.81E-04 | lb/MMBtu | AP-42 Section 3.4 |
| | | Xylenes | 1.93E-04 | lb/MMBtu | AP-42 Section 3.4 |

## 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 |
|---|---|---|---|---|---|
| KY2-08-2 | Diesel | PM/PM10/PM2.5 | 3.29E-04 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | CO | 5.75E-03 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | NOX | 1.05E-02 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | SO2 | 1.21E-05 | lb/hp-hr | AP-42 Section 3.4 |
| | | VOC | 1.05E-02 | lb/hp-hr | Tier 2 Standards 40 CFR 1039 Appendix I |
| | | CO2 | 163 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | CH4 | 6.61E-03 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | N2O | 1.32E-03 | lb/MMBtu | 40 CFR 98 Subpart C |
| | | Benzene | 7.76E-04 | lb/MMBtu | AP-42 Section 3.4 |
| | | Toluene | 2.81E-04 | lb/MMBtu | AP-42 Section 3.4 |
| | | Xylenes | 1.93E-04 | lb/MMBtu | AP-42 Section 3.4 |

| Section EE.6: Notes, Comments, and Explanations |
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Division for Air Quality

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# DEP7007GG

## Control Equipment

**Additional Documentation**

___ Complete Sections GG.1 through GG.12, as applic

___ Attach manufacturer's specifications for each control device

___ Complete DEP7007AI

**Source Name:** BlueOval SK, LLC

**KY EIS (AFS) #:** 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/3/2024

### Section GG.1: General Information - Control Equipment

| | | | | | | Inlet Gas Stream Data For All Control Devices | | | | | Inlet Gas Stream Data For Condensers, Adsorbers, Afterburners, Incinerators, Oxidizers Only | | | Equipment Operational Data For All Control Devices | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control Device ID # | Control Device Name | Cost | Manufacturer | Model Name/ Serial # | Date Installed | Temperature (°F) | Flowrate per Device (scfm @ 68°F) | Average Particle Diameter (μm) | Particle Density ($lb/ft^3$) or Specific Gravity | Gas Density ($lb/ft^3$) | Gas Moisture Content (%) | Gas Composition | Fan Type | Pressure Drop Range (in. $H_2O$) | Pollutants Collected/ Controlled | Pollutant Removal (%) |
| KY1-AC01 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 13,014 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC02 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 15,270 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC03 | Carbon Adsorber | TBD | TBD | TBD | N/A | 190 | 12,840 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC04 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 4,511 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC05 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 3,818 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY1-AC06 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 3,818 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC07 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 6,966 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC08 - KY1-AC15 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 13,014 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC16 - KY1-AC17 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 18,497 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC18 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 9,107 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC19 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 8,053 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC20 | Carbon Adsorber | TBD | TBD | TBD | N/A | 165 | 7,038 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-AC21 | Carbon Adsorber | TBD | TBD | TBD | N/A | 363.2 | 7,353 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC01 - KY1-DC06 | Dust Collector | TBD | TBD | TBD | N/A | TBD | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC07 | Dust Collector | TBD | TBD | TBD | N/A | 861 | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC08 - KY1-DC09 | Dust Collector | TBD | TBD | TBD | N/A | TBD | 361 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC10 - KY1-DC18 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC19 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC20 - KY1-DC24 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 361 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC24 - KY1-DC27 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 361 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| Vents indoors. | Dust Collector | TBD | TBD | TBD | N/A | 0 | 16,150 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| Vents indoors. | Dust Collector | TBD | TBD | TBD | N/A | 0 | 16,150 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC42 - KY1-DC43 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 7,754 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC44 - KY1-DC45 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 7,754 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY1-DC46 - KY1-DC47 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 7,044 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC48 - KY1-DC49 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 13,102 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| Vents indoors. | Dust Collector | TBD | TBD | TBD | N/A | 0 | 12,308 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC54 - KY1-DC69 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 960 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-DC70 - KY1-DC101 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 922 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-SC01 - KY1-SC08 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 111,732 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-SC09 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 69,461 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-SC10 - KY1-SC12 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 3,531 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-SC13 - KY1-SC14 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 3,531 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

**Section GG.1: General Information - Control Equipment**

| Control Device ID # | Control Device Name | Cost | Manufacturer | Model Name/ Serial # | Date Installed | Inlet Gas Stream Data For All Control Devices: Temperature (°F) | Flowrate per Device (scfm @ 68°F) | Average Particle Diameter (μm) | Particle Density (lb/ft³) or Specific Gravity | Gas Density (lb/ft³) | Inlet Gas Stream Data For Condensers, Adsorbers, Afterburners, Incinerators, Oxidizers Only: Gas Moisture Content (%) | Gas Composition | Fan Type | Equipment Operational Data For All Control Devices: Pressure Drop Range (in. $H_2O$) | Pollutants Collected/ Controlled | Pollutant Removal (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY2-AC01 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 13,014 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC02 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 15,270 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC03 | Carbon Adsorber | TBD | TBD | TBD | N/A | 190 | 9,023 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC04 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 4,511 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC05 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 3,818 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC06 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 3,818 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC07 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 6,966 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC08 - KY2-AC15 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 13,014 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC16 - KY2-AC17 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 8,407 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC18 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 12,961 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC19 | Carbon Adsorber | TBD | TBD | TBD | N/A | 104 | 8,053 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC20 | Carbon Adsorber | TBD | TBD | TBD | N/A | 165 | 7,038 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-AC21 | Carbon Adsorber | TBD | TBD | TBD | N/A | 363.2 | 7,353 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC01 - KY2-DC07 | Dust Collector | TBD | TBD | TBD | N/A | TBD | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY2-DC08 | Dust Collector | TBD | TBD | TBD | N/A | 861 | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC09 - KY2-DC10 | Dust Collector | TBD | TBD | TBD | N/A | TBD | 361 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC11 - KY2-DC20 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC21 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 2,580 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC22 - KY2-DC26 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 361 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC27 - KY2-DC29 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 361 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC30 - KY2-DC34 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 16,113 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC35 - KY2-DC39 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 16,113 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC40 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 6,954 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC41 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 8,384 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC42 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 9,078 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC43 - KY2-DC44 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 12,362 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC45 - KY2-DC48 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 12,308 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-DC49 - KY2-DC64 | Dust Collector | TBD | TBD | TBD | N/A | 0 | 960 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-SC01 - KY2-SC08 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 141,264 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-SC09 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 31,257 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-SC10 - KY2-SC12 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 3,531 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-SC13 - KY2-SC14 | Wet Scrubber | TBD | TBD | TBD | N/A | 0 | 3,531 | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

## Section GG.5: Scrubber

| Control Device ID # | Identify all Emission Units and Control Devices that Feed to Scrubber | Identify Type of Scrubber: Venturi, Packed Bed, Spray Tower, or Other (specify) | For Venturi Scrubbers: Identify Throat Type: Fixed or Adjustable | For Packed Bed Scrubbers: Identify Packing Type | For Packed Bed Scrubbers: Packing Height (in) | For Spray Towers: Number of Nozzles | For Spray Towers: Nozzle Pressure (psig) | Identify Type of Flow: Concurrent, Countercurrent, or Crossflow | Length in Direction of Gas Flow (ft) | Cross-Sectional Area ($ft^2$) | Venturi Throat Velocity (ft/s) | Mist Eliminator: Identify Type: Mesh or Vane | Mist Eliminator: Cross-Sectional Area ($ft^2$) | Mist Eliminator: Pressure Drop (in. $H_2O$) | Scrubbing Liquid: Chemical Composition | Scrubbing Liquid: Flowrate (gal/min) | Scrubbing Liquid: Fresh Liquid Makeup Rate (gal/min) | Scrubbing Liquid: Describe Disposal Method of Scrubber Effluent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY1-SC01 - KY1-SC08 | KY1-01, Process ID 12, Cathode Drying (KY1-DR01 - KY1-DR08) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-SC09 | KY1-04, Process ID 2, Cell Discharge - HCl (KY1-CD01 - KY1-CD08) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-SC10 - KY1-SC12 | KY1-05, Process ID 3, ICP Lab (KY1-LB01 - KY1-LB03) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY1-SC13 - KY1-SC14 | KY1-05, Process ID 4, Raw Materials Inspection Lab (KY1-LB04 - KY1-LB05) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

## Section GG.5: Scrubber

| Control Device ID # | Identify all Emission Units and Control Devices that Feed to Scrubber | Identify Type of Scrubber: Venturi, Packed Bed, Spray Tower, or Other (specify) | For Venturi Scrubbers: | For Packed Bed Scrubbers: | | For Spray Towers: | | Identify Type of Flow: Concurrent, Countercurrent, or Crossflow | Length in Direction of Gas Flow *(ft)* | Cross-Sectional Area *($ft^2$)* | Venturi Throat Velocity *(ft/s)* | Mist Eliminator | | | Scrubbing Liquid | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Identify Throat Type: Fixed or Adjustable | Identify Packing Type | Packing Height *(in)* | Number of Nozzles | Nozzle Pressure *(psig)* | | | | | Identify Type: Mesh or Vane | Cross-Sectional Area *($ft^2$)* | Pressure Drop *(in. $H_2O$)* | Chemical Compositio n | Flowrate *(gal/min)* | Fresh Liquid Makeup Rate *(gal/min)* | Describe Disposal Method of Scrubber Effluent |
| KY2-SC01 - KY2-SC08 | KY2-01, Process ID 12, Cathode Drying (KY2-DR01 - KY2-DR08) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-SC09 | KY2-05, Process ID 3, ICP Lab (KY2-LB01 - KY2-LB03) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-SC10 - KY2-SC12 | KY2-05, Process ID 3, ICP Lab (KY2-LB01 - KY2-LB03) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |
| KY2-SC13 - KY2-SC14 | KY2-05, Process ID 4, Raw Materials Inspection Lab (KY2-LB04 - KY2-LB05) | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD | TBD |

## Section GG.8: Adsorber

| Control Device ID # | Identify all Emission Units and Control Devices that Feed to Adsorber | Identify Adsorbate | Identify Adsorbent: Activated carbon, Activated alumina, Silica Gel, Synthetic Polymers, Zeolite, or Other (specify) | Dimensions of Each Bed | | | | Type of Regeneration: Replacement, Steam, or Other (specify) | Regeneration Time *(minutes)* | Method of Regeneration: Alternate Use of Beds, Source Shutdown, or Other (specify) | Time On-line Before Regeneration *(minutes)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Thickness in Direction of Gas Flow *(in)* | Cross-Sectional Area *($in^2$)* | Weight of Adsorbent per Bed *(lb)* | Number of Beds | | | | |
| KY1-AC01 | KY1-01, Process ID 10, Cathode/Anode Processing (KY1-CP01 - KY1-CP60) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC02 | KY1-01, Process ID 11, Electrode Cleaning (KY1-CR01 - KY1-CR21) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC03 | KY1-01, Process ID 11, Electrode Cleaning (KY1-CR01 - KY1-CR21) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC04 | KY1-02, Process ID , Vacuum Dryer (Cathode) (KY1-VD01 - KY1-VD224) and Electrolyte Filling, Sealing (KY1-EL01 - KY1-EL56) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC05 | KY1-02, Process ID , Vacuum Dryer (Cathode) (KY1-VD01 - KY1-VD224) and Electrolyte Filling, Sealing (KY1-EL01 - KY1-EL56) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC06 | KY1-02, Process ID 6, Cathode Press (KY1-CS01 - KY1-CS13) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KY1-AC07 | KY1-02, Process ID 7, Anode Press (KY1-AS01 - KY1-AS17) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC08 - KY1-AC15 | KY1-03, Process ID 1, Cell Degassing (KY1-DG01 - KY1-DG56) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC16 - KY1-AC17 | KY1-04, Process ID 1, Cell Discharge - VOC (KY1-CD01 - KY1-CD04) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC18 | KY1-05, Process ID 1, Quality Evaluation 1 (KY1-QE01 - KY1-QE12) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC19 | KY1-05, Process ID 1, Quality Evaluation 1 (KY1-QE01 - KY1-QE12) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC20 | KY1-05, Process ID 2, Quality Evaluation 2 (N/A) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY1-AC21 | KY1-05, Process ID 2, Quality Evaluation 2 (N/A) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |

## Section GG.8: Adsorber

| Control Device ID # | Identify all Emission Units and Control Devices that Feed to Adsorber | Identify Adsorbate | Identify Adsorbent: Activated carbon, Activated alumina, Silica Gel, Synthetic Polymers, Zeolite, or Other (specify) | Dimensions of Each Bed: Thickness in Direction of Gas Flow | Dimensions of Each Bed: Cross-Sectional Area | Dimensions of Each Bed: Weight of Adsorbent per Bed | Dimensions of Each Bed: Number of Beds | Type of Regeneration: Replacement, Steam, or Other (specify) | Regeneration Time *(minutes)* | Method of Regeneration: Alternate Use of Beds, Source Shutdown, or Other (specify) | Time On-line Before Regeneration *(minutes)* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KY2-AC01 | KY2-01, Process ID 9, Cathode/Anode Processing (KY2-CP01 - KY2-CP57) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC02 | KY2-01, Process ID 11, Electrode Cleaning (KY2-CR01 - KY2-CR34) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC03 | KY2-01, Process ID 11, Electrode Cleaning (KY2-CR01 - KY2-CR34) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC04 | KY2-02, Process ID 3, Vacuum Dryer (Cathode) (KY2-VD01 - KY2-VD214) and Electrolyte Filling, Sealing (KY2-EL01 - KY2-EL56) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC05 | KY2-02, Process ID 3, Vacuum Dryer (Cathode) (KY2-VD01 - KY2-VD214) and Electrolyte Filling, Sealing (KY2-EL01 - KY2-EL56) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC06 | KY2-02, Process ID 4, Cathode Press (KY2-CS01 - KY2-CS11) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KY2-AC07 | KY2-02, Process ID 5, Anode Press (KY2-AS01 - KY2-AS11) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC08 - KY2-AC15 | KY2-03, Process ID 1, Cell Degassing (KY2-DG01 - KY2-DG56) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC16 - KY2-AC17 | KY2-04, Process ID 1, Cell Discharge - VOC (KY2-CD01 - KY2-CD04) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC18 | KY2-05, Process ID 1, Quality Evaluation 1 (KY2-QE01 - KY2-QE13) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC19 | KY2-05, Process ID 1, Quality Evaluation 1 (KY2-QE01 - KY2-QE13) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC20 | KY2-05, Process ID 2, Quality Evaluation 2 (N/A) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |
| KY2-AC21 | KY2-05, Process ID 2, Quality Evaluation 2 (N/A) | VOC | Activated carbon | TBD | TBD | TBD | TBD | Replacement | N/A | N/A | N/A |

| Section GG.12: Notes, Comments, and Explanations |
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Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

# DEP7007HH

Haul Roads

_____ Section HH.1: Haul Roads

_____ Section HH.2: Yard Area

_____ Section HH.3: Notes, Comments, and Explanations

**Additional Documentation**

___ Complete DEP7007AI, DEP7007N and DEP7007V

___ SDS for dust suppressant

**Source Name:** BlueOval SK, LLC

**KY EIS (AFS) #** 21- 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/3/2024

## Section HH.1: Haul Roads

**HH.1B Paved Haul Roads:**

Average Number of Days in a Year with 0.01 inches of Precipitation (P): 120 Days

Mean Vehicle Weight (W): Max. 40 Tons (depending on road segment)

Road Surface Silt Loading (sL): 0.6 ($G/M^2$)

Haul Road Length: Varies Miles

Maximum Vehicle Miles Traveled in a Year: 70,420 Miles

**Describe the dust control method for paved haul road(s):**
(If dust control suppressants will be utilized, attach the approved Safety Data Sheet(s), as applicable.)

TBD

| Section HH.3: Notes, Comments, and Explanations |
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Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

# DEP7007J

Volatile Liquid Storage

___ Section J.1: General Information

___ Section J.2: Tank Description

___ Section J.3: Gasoline Plants and Tern

___ Section J.4: Loading Rack(s)

___ Section J.5: Equipment Leaks

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

**Additional Documentation**

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

___ SDS attached

**Source Name:** BlueOval SK, LLC

**KY EIS (AFS) #:** 21- 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/3/2024

## Section J.1: General Information

| Emission Unit # | Emission Unit Name | Emission Unit Description | Proposed/Actual Date of Construction Commencement *(MM/YYYY)* | Date of modification/ reconstruction | Control Device ID | Stack ID |
|---|---|---|---|---|---|---|
| KY1-10 | Storage Tanks | Raw Material Tanks (KY1-RT01 - KY1-RT04) | N/A | N/A | N/A | KY1-RT01_V - KY1-RT04_V |
| | | Waste Tanks (KY1-WT01 - KY1-WT08) | N/A | N/A | N/A | KY1-WT01_V - KY1-WT08_V |
| | | Electrolyte Storage Tanks (KY1-ET01 - KY1-ET08) | N/A | N/A | N/A | KY1-ET01_V - KY1-ET08_V |
| | | Electrolyte Separator Tanks (KY1-EST101) | N/A | N/A | N/A | KY1-EST101_V |
| | | Electrolyte Separator Tanks (KY1-EST201) | N/A | N/A | N/A | KY1-EST201_V |
| | | Electrolyte Waste Tanks (KY1-EWT01) | N/A | N/A | N/A | KY1-EWT01_V - KY1-EWT01_V |

## Section J.1: General Information

| Emission Unit # | Emission Unit Name | Emission Unit Description | Proposed/Actual Date of Construction Commencement *(MM/YYYY)* | Date of modification/ reconstruction | Control Device ID | Stack ID |
|---|---|---|---|---|---|---|
| KY2-10 | Storage Tanks | Raw Material Tanks (KY2-RT01 - KY2-RT04) | N/A | N/A | N/A | KY2-RT01_V - KY2-RT04_V |
| | | Waste Tanks (KY2-WT01 - KY2-WT08) | N/A | N/A | N/A | KY2-WT01_V - KY2-WT08_V |
| | | Electrolyte Storage Tanks (KY2-ET01 - KY2-ET08) | N/A | N/A | N/A | KY2-ET01_V - KY2-ET08_V |
| | | Electrolyte Separator Tanks (KY2-EST101) | N/A | N/A | N/A | KY2-EST101_V |
| | | Electrolyte Separator Tanks (KY2-EST201) | N/A | N/A | N/A | KY2-EST201_V |
| | | Electrolyte Waste Tanks (KY2-EWT01) | N/A | N/A | N/A | KY2-EWT01_V - KY2-EWT01_V |

## Section J.2: Tank Description

**Emission Point #:** KY1-RT01_V - KY1-RT04_V

**Emission Point Name:** NMP Raw Material 4 Identical Tanks

**Tank ID#:** RT01 - RT04

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

## J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| N-Methyl-2-Pyrrolidone (NMP) | 1,112,661 | 8.59 | 99.1 | 98-100% | 57.90 | 88.54 | 0.0029 | 0.0047 |

## J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 13,800

**Shell Height/ Length:** *(ft)* 22.67

**Shell Diameter:** *(ft)* 10.17

**Tank Turnovers per Year:** 80.6

**Tank Orientation:** ☐ Horizontal ☑ Vertical

If Vertical, provide Maximum Liquid Height: *(ft)* 18

Average Liquid Height: *(ft)* 13.5

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** 1 ft | **Average Vapor Space Height:** TBD ft |
| **Is Tank Underground?** ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** -0.03 psig |
| **Is Tank Heated?:** ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** 0.03 psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 1 | NMP | Raw Material Tanks - Working Losses | 4.76E-03 | Continuous | AP-42 Section 7.1 |
| 2 | NMP | Raw Material Tanks - Standing Losses | 7.05E-02 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY2-RT01_V - KY2-RT04_V

**Emission Point Name:** NMP Raw Material 4 IdenticalTanks

**Tank ID#:** RT01 - RT04

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| N-Methyl-2-Pyrrolidone (NMP) | 1,112,661 | 8.59 | 99.1 | 98-100% | 57.90 | 88.54 | 0.0029 | 0.0047 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 13,800

**Shell Height/ Length:** *(ft)* 22.67

**Shell Diameter:** *(ft)* 10.17

**Tank Turnovers per Year:** 80.6

**Tank Orientation:** ☐ Horizontal ☑ Vertical

If Vertical, provide Maximum Liquid Height: *(ft)* 18

Average Liquid Height: *(ft)* 13.5

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** | ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** 1 ft | **Average Vapor Space Height:** TBD ft |
| **Is Tank Underground?** | ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** -0.03 psig |
| **Is Tank Heated?:** | ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** 0.03 psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 1 | NMP | Raw Material Tanks - Working Losses | 4.76E-03 | Continuous | AP-42 Section 7.1 |
| 2 | NMP | Raw Material Tanks - Standing Losses | 7.05E-02 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY1-WT01_V - KY1-WT08_V

**Emission Point Name:** Waste Tanks, 8 Identical Tanks

**Tank ID#:** WT01 - WT08

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| N-Methyl-2-Pyrrolidone (NMP) | 695,413 | 8.59 | 99.1 | 98-100% | 57.90 | 88.54 | 0.0029 | 0.0047 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 13,800 **Shell Height/ Length:** *(ft)* 22.67 **Shell Diameter:** *(ft)* 10.17 **Tank Turnovers per Year:** 50.4

**Tank Orientation:** ☐ Horizontal ☑ Vertical If Vertical, provide Maximum Liquid Height: *(ft)* 18 Average Liquid Height: *(ft)* 13.5

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** 1 ft | **Average Vapor Space Height:** TBD ft |
| **Is Tank Underground?** ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** -0.03 psig |
| **Is Tank Heated?:** ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** 0.03 psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 3 | NMP | Waste Tanks - Working Losses | 6.67E-03 | Continuous | AP-42 Section 7.1 |
| 4 | NMP | Waste Tanks - Standing Losses | 7.05E-02 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY2-WT01 - KY2-WT08

**Emission Point Name:** Waste Tanks, 8 Identical Tanks

**Tank ID#:** WT01 - WT08

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

## J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| N-Methyl-2-Pyrrolidone (NMP) | 653,213 | 8.59 | 99.1 | 98-100% | 57.90 | 88.54 | 0.0029 | 0.0047 |

## J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 13,800 — **Shell Height/ Length:** *(ft)* 22.67 — **Shell Diameter:** *(ft)* 10.17 — **Tank Turnovers per Year:** 47.3

**Tank Orientation:** [ ] Horizontal [x] Vertical — If Vertical, provide Maximum Liquid Height: *(ft)* 18 — Average Liquid Height: *(ft)* 13.5

**Shell Color/Shade:** [ ] Red [x] White [ ] Light Gray [ ] Medium Gray [ ] Aluminum Specular [ ] Aluminum Diffuse [ ] Other: ______

**Roof Color:** [ ] Slack [x] White [ ] Light Gray [ ] Medium Gray [ ] Aluminum Specular [ ] Aluminum Diffuse [ ] Other: ______

**Tank Type:** [x] Fixed Roof [ ] Internal Floating Roof [ ] External Floating Roof [ ] Pressure Tank

## J.2C: For Fixed Roof Tanks:

**Roof Type:** [ ] Dome [ ] Flat [x] Cone — **Dome/Cone Height:** 1 ft — **Average Vapor Space Height:** TBD ft

**Is Tank Underground?** [ ] Yes [x] No — **Roof Condition:** [x] Good [ ] Poor — **Vacuum Setting:** -0.03 psig

**Is Tank Heated?:** [ ] Yes [x] No — **Shell Condition:** [x] Good [ ] Poor — **Pressure Setting:** 0.03 psig

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 3 | NMP | Waste Tanks - Working Losses | 6.67E-03 | Continuous | AP-42 Section 7.1 |
| 4 | NMP | Waste Tanks - Standing Losses | 7.05E-02 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY1-ET01_V - KY1-ET08_V

**Emission Point Name:** Electrolyte Storage, 8 Identical Tanks

**Tank ID#:** ET01 - ET08

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 653,213 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 13,800

**Shell Height/ Length:** *(ft)* 19.03

**Shell Diameter:** *(ft)* 9.84

**Tank Turnovers per Year:** 47.3

**Tank Orientation:** ☐ Horizontal ☑ Vertical

If Vertical, provide Maximum Liquid Height: *(ft)* ______

Average Liquid Height: *(ft)* ______

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | | | |
|---|---|---|---|---|---|
| **Roof Type:** | ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** | _______ ft | **Average Vapor Space Height:** | TBD ft |
| **Is Tank Underground?** | ☐ Yes ☑ No | **Roof Condition:** | ☑ Good ☐ Poor | **Vacuum Setting:** | _______ psig |
| **Is Tank Heated?:** | ☐ Yes ☑ No | **Shell Condition:** | ☑ Good ☐ Poor | **Pressure Setting:** | _______ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 5 | E-Lyte | Electrolyte Storage Tanks - Working Losses | 0.025 | Continuous | AP-42 Section 7.1 |
| 6 | E-Lyte | Electrolyte Storage Tanks - Standing Losses | 0.200 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY2-ET01_V - KY2-ET08_V

**Emission Point Name:** Electrolyte Storage, 8 Identical Tanks

**Tank ID#:** ET01 - ET08

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 653,213 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 13,800 **Shell Height/ Length:** *(ft)* 19.03 **Shell Diameter:** *(ft)* 9.84 **Tank Turnovers per Year:** 47.3

**Tank Orientation:** ☐ Horizontal ☑ Vertical If Vertical, provide Maximum Liquid Height: *(ft)* ______ Average Liquid Height: *(ft)* ______

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | | | |
|---|---|---|---|---|---|
| **Roof Type:** | ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** | ____ ft | **Average Vapor Space Height:** | TBD ft |
| **Is Tank Underground?** | ☐ Yes ☑ No | **Roof Condition:** | ☑ Good ☐ Poor | **Vacuum Setting:** | ____ psig |
| **Is Tank Heated?:** | ☐ Yes ☑ No | **Shell Condition:** | ☑ Good ☐ Poor | **Pressure Setting:** | ____ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| **Process ID** | **Component Name** | **Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es))** | **Lost Emissions** *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | **Frequency of Occurrence** | **Determination Methodology for Each Type of Loss*** |
|---|---|---|---|---|---|
| 5 | E-Lyte | ET01 - ET08 | 0.025 | Continuous | AP-42 Section 7.1 |
| 6 | E-Lyte | ET01 - ET08 | 0.200 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY1-EST101_V

**Emission Point Name:** Electrolyte Separator (1), 1 Identical Tanks

**Tank ID#:** EST0101

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 52,257 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 790 **Shell Height/ Length:** *(ft)* 2.62 **Shell Diameter:** *(ft)* 6.23 **Tank Turnovers per Year:** 66.1

**Tank Orientation:** ☐ Horizontal ☑ Vertical If Vertical, provide Maximum Liquid Height: *(ft)* ______ Average Liquid Height: *(ft)* ______

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** ______ ft | **Average Vapor Space Height:** | TBD ft |
| **Is Tank Underground?** ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** | ______ psig |
| **Is Tank Heated?:** ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** | ______ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 7 | E-Lyte | Electrolyte Separator Tanks - Working Losses | 0.010 | Continuous | AP-42 Section 7.1 |
| 8 | E-Lyte | Electrolyte Separator Tanks - Standing Losses | 0.241 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY2-EST101_V

**Emission Point Name:** Electrolyte Separator (1), 1 Identical Tanks

**Tank ID#:** EST0101

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 52,257 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 790

**Shell Height/ Length:** *(ft)* 2.62

**Shell Diameter:** *(ft)* 6.23

**Tank Turnovers per Year:** 66.1

**Tank Orientation:** ☐ Horizontal ☑ Vertical

If Vertical, provide Maximum Liquid Height: *(ft)* ______ Average Liquid Height: *(ft)* ______

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** ______ ft | **Average Vapor Space Height:** | TBD ft |
| **Is Tank Underground?** ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** | ______ psig |
| **Is Tank Heated?:** ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** | ______ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 7 | E-Lyte | EST0101 | 0.010 | Continuous | AP-42 Section 7.1 |
| 8 | E-Lyte | EST0101 | 0.241 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY1-EST201_V

**Emission Point Name:** Electrolyte Seperator (2), 1 Identical Tanks

**Tank ID#:** EST0201

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 52,257 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 1,850 **Shell Height/ Length:** *(ft)* 6.23 **Shell Diameter:** *(ft)* 6.23 **Tank Turnovers per Year:** 28.2

**Tank Orientation:** ☐ Horizontal ☑ Vertical If Vertical, provide Maximum Liquid Height: *(ft)* ______ Average Liquid Height: *(ft)* ______

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** _______ ft | **Average Vapor Space Height:** | TBD ft |
| **Is Tank Underground?** ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** | _______ psig |
| **Is Tank Heated?:** ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** | _______ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 9 | E-Lyte | Electrolyte Separator Tanks - Working Losses | 0.029 | Continuous | AP-42 Section 7.1 |
| 10 | E-Lyte | Electrolyte Separator Tanks - Standing Losses | 0.209 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY2-EST201_V

**Emission Point Name:** Electrolyte Seperator (2), 1 Identical Tanks

**Tank ID#:** EST0201

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 52,257 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 1,850  **Shell Height/ Length:** *(ft)* 6.23  **Shell Diameter:** *(ft)* 6.23  **Tank Turnovers per Year:** 28.2

**Tank Orientation:** ☐ Horizontal ☑ Vertical  If Vertical, provide Maximum Liquid Height: *(ft)* ______  Average Liquid Height: *(ft)* ______

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** | ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** ______ ft | **Average Vapor Space Height:** TBD ft |
| **Is Tank Underground?** | ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** ______ psig |
| **Is Tank Heated?:** | ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** ______ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 9 | E-Lyte | Electrolyte Separator Tanks - Working Losses | 0.029 | Continuous | AP-42 Section 7.1 |
| 10 | E-Lyte | Electrolyte Separator Tanks - Standing Losses | 0.209 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY1-EWT01_V - KY1-EWT01_V

**Emission Point Name:** Electrolyte Waste, 1 Identical Tanks

**Tank ID#:** EWT01

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| **Single or Multi-Component Liquid Name(s)** | **Maximum Annual Throughput** *(gal/yr per tank)* | **Liquid Density** *(lb/gal)* | **Molecular Weight of Single or Multi-Component Liquid** | **Percent Composition of Multi-Component Liquid(s)** | **Temperature** *(°F, see J.6 note)* | | **Vapor Pressure** *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 52,257 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 1,320 **Shell Height/ Length:** *(ft)* 6.56 **Shell Diameter:** *(ft)* 6.20 **Tank Turnovers per Year:** 39.6

**Tank Orientation:** ☐ Horizontal ☑ Vertical If Vertical, provide Maximum Liquid Height: *(ft)* ______ Average Liquid Height: *(ft)* ______

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ______

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** _______ ft | **Average Vapor Space Height:** | TBD ft |
| **Is Tank Underground?** ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** | _______ psig |
| **Is Tank Heated?:** ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** | _______ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 11 | E-Lyte | Electrolyte Waste Tanks - Working Losses | 0.030 | Continuous | AP-42 Section 7.1 |
| 12 | E-Lyte | Electrolyte Waste Tanks - Standing Losses | 0.303 | Continuous | AP-42 Section 7.1 |

## Section J.2: Tank Description

**Emission Point #:** KY2-EWT01_V - KY2-EWT01_V

**Emission Point Name:** Electrolyte Waste, 1 Identical Tanks

**Tank ID#:** EWT01

**Date Installed:** Proposed

**List Applicable Regulations:** 401 KAR 51:017

### J.2A: Stored Liquid Data:

| Single or Multi-Component Liquid Name(s) | Maximum Annual Throughput *(gal/yr per tank)* | Liquid Density *(lb/gal)* | Molecular Weight of Single or Multi-Component Liquid | Percent Composition of Multi-Component Liquid(s) | Temperature *(°F, see J.6 note)* | | Vapor Pressure *(psia, see J.6 note)* | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Minimum | Maximum | Minimum | Maximum |
| E-Lyte: CEL748 | 52,257 | 10.84 | | 98-100% | 57.90 | 88.54 | | 1.6389 |

### J.2B: Tank Data:

**Tank Capacity:** *(gallons)* 1,320 **Shell Height/ Length:** *(ft)* 6.56 **Shell Diameter:** *(ft)* 6.20 **Tank Turnovers per Year:** 39.6

**Tank Orientation:** ☐ Horizontal ☑ Vertical If Vertical, provide Maximum Liquid Height: *(ft)* ____ Average Liquid Height: *(ft)* ____

**Shell Color/Shade:** ☐ Red ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ____

**Roof Color:** ☐ Slack ☑ White ☐ Light Gray ☐ Medium Gray ☐ Aluminum Specular ☐ Aluminum Diffuse ☐ Other: ____

**Tank Type:** ☑ Fixed Roof ☐ Internal Floating Roof ☐ External Floating Roof ☐ Pressure Tank

## J.2C: For Fixed Roof Tanks:

| | | | |
|---|---|---|---|
| **Roof Type:** ☐ Dome ☐ Flat ☑ Cone | **Dome/Cone Height:** ______ ft | **Average Vapor Space Height:** | TBD ft |
| **Is Tank Underground?** ☐ Yes ☑ No | **Roof Condition:** ☑ Good ☐ Poor | **Vacuum Setting:** | ______ psig |
| **Is Tank Heated?:** ☐ Yes ☑ No | **Shell Condition:** ☑ Good ☐ Poor | **Pressure Setting:** | ______ psig |

## J.2H: Emissions Data:

**Attach SDS/Composition Analysis for Each Component Listed**

| Process ID | Component Name | Process Name (e.g. Breathing, Working, Cleaning, Flashing Loss(es)) | Lost Emissions *(working: lb/1000 gal standing: lb/1000 gal capacity-yr)* | Frequency of Occurrence | Determination Methodology for Each Type of Loss* |
|---|---|---|---|---|---|
| 11 | E-Lyte | Electrolyte Waste Tanks - Working Losses | 0.030 | Continuous | AP-42 Section 7.1 |
| 12 | E-Lyte | Electrolyte Waste Tanks - Standing Losses | 0.303 | Continuous | AP-42 Section 7.1 |

| Section J.6: Notes, Comments, and Explanations |
|---|
| Temperature and vapor pressure entries represent conservative values based on assumed outdoor storage using Atlanta, GA meteorological data from the Commerce, GA SK site. |
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| |

# DEP7007K

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

## Surface Coating or Printing Operations

__ Section K.1: Process Information

__ Section K.2: Coating Operations

__ Section K.3: Other Operations

__ Section K.4: Coatings/Printing Materials as Applied

__ Section K.5: HAP-containing Coatings/Printing Materials

__ Section K.6: Notes, Comments, and Explanations

**Additional Documentation**

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

___ Attach SDS or Technical Sheets for all Coating/Printing Materials

___ Attach a flow diagram

**Source Name:** BlueOval SK, LLC

**KY EIS (AFS) #:** 21- 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/3/2024

## Section K.1: Process Information

**Emission Unit #:** KY1-11

**Emission Unit Name:** Printing

**Coating/Printing Line Name:** Various

**Proposed/Actual Date of Construction:** *(MM/YYYY)* N/A

**List Applicable Regulations:** 401 KAR 51:017

**Describe Overall Process:** Printing materials including ink and make-up fluid are used to date and code finished products

**Describe Coatings/Printing Materials:** Inks and make-up fluids (SDS included with Appendix D)

**Identify the Material that is Coated/Printed:** ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

**Provide detailed description of material coated/printed:** Finished Product of EV Battery Production

**Provide approximate dimensions and range of sizes of parts being coated or printed:** TBD

**Identify the Type of Operation:** ☑ Continuous ☐ Batch ☐ Other:

**Describe Surface Preparation/Pretreatment Steps:** TBD

**For Coating Operations:** ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☐ Brush ☐ Powder ☐ Roller Coat ☐ Other:

**For Printing Operations:** *(Select all that apply)* ☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☑ Other: TBD

**Describe Final Product:** Dated and coded finished products

**Check the category that most closely describes this unit:**

| | | | |
|---|---|---|---|
| ☐ Large Appliance Coating | ☐ Auto or Light-Duty Truck Coating | ☐ Metal Furniture Coating | ☐ Metal Coil Coating |
| ☐ Beverage Can Coating | ☐ Miscellaneious Metal Parts Coating | ☐ Magnet Wire Insulation Coating | ☐ Flat Wood Panel Coating |
| ☐ Fabric, Vinyl, or Paper Coating | ☐ Boat Manufacturing/ Ship Repair | ☐ Pressure Sensitive Tape and Label Coating | ☐ Magnet Tape Coating |
| ☐ Publication Rotogravure Printing | ☐ Coating of Plastic Parts for Business Machines | ☐ Flexible Vinyl and Urethane Coating and Printing | |
| ☐ Graphic Arts using Rotogravure and Flexographic Printing | | | ☑ Other: Date/code printing |

# DEP7007K

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

## Surface Coating or Printing Operations

__ Section K.1: Process Information

__ Section K.2: Coating Operations

__ Section K.3: Other Operations

__ Section K.4: Coatings/Printing Materials as Applied

__ Section K.5: HAP-containing Coatings/Printing Materials

__ Section K.6: Notes, Comments, and Explanations

**Additional Documentation**

___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG.

___ Attach SDS or Technical Sheets for all Coating/Printing Materials

___ Attach a flow diagram

**Source Name:** BlueOval SK, LLC

**KY EIS (AFS) #:** 21- 093-00176

**Permit #:** V-21-041 R1

**Agency Interest (AI) ID:** 170550

**Date:** 12/3/2024

## Section K.1: Process Information

**Emission Unit #:** KY2-11

**Emission Unit Name:** Printing

**Coating/Printing Line Name:** Various

**Proposed/Actual Date of Construction:** *(MM/YYYY)* N/A

**List Applicable Regulations:** 401 KAR 51:017

**Describe Overall Process:** Printing materials including ink and make-up fluid are used to date and code finished products

**Describe Coatings/Printing Materials:** Inks and make-up fluids (SDS included with Appendix D)

**Identify the Material that is Coated/Printed:** ☐ Metal ☐ Vinyl ☐ Plastics ☐ Wood ☐ Foil ☐ Paper ☑ Other Substrate

**Provide detailed description of material coated/printed:** Finished Product of EV Battery Production

**Provide approximate dimensions and range of sizes of parts being coated or printed:** TBD

**Identify the Type of Operation:** ☑ Continuous ☐ Batch ☐ Other:

**Describe Surface Preparation/Pretreatment Steps:** TBD

**For Coating Operations:** ☐ Spray ☐ Flow ☐ Dip tank ☐ Electrodeposition ☐ Brush ☐ Powder ☐ Roller Coat ☐ Other:

**For Printing Operations:**
*(Select all that apply)*
☐ Web ☐ Rotogravure ☐ Heatset ☐ Lithographic ☐ Sheetfed ☐ Letterpress ☐ Non-heatset ☐ Flexographic ☑ Other: TBD

**Describe Final Product:** Dated and coded finished products

**Check the category that most closely describes this unit:**

☐ Large Appliance Coating
☐ Auto or Light-Duty Truck Coating
☐ Metal Furniture Coating
☐ Metal Coil Coating
☐ Beverage Can Coating
☐ Miscellaneious Metal Parts Coating
☐ Magnet Wire Insulation Coating
☐ Flat Wood Panel Coating
☐ Fabric, Vinyl, or Paper Coating
☐ Boat Manufacturing/ Ship Repair
☐ Pressure Sensitive Tape and Label Coating
☐ Magnet Tape Coating
☐ Publication Rotogravure Printing
☐ Coating of Plastic Parts for Business Machines
☐ Flexible Vinyl and Urethane Coating and Printing
☐ Graphic Arts using Rotogravure and Flexographic Printing
☑ Other: Date/code printing

## Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

| Trade Name of Material | Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)* | Emission Unit/Coating ID where material is used | SCC Code | SCC Code Units | Density *(lb/gal)* | Solid Content *(lb/gal)* | VOC Content *(lb/gal)* | Emission Factor for PM* *(lb/SCC)* | Transfer Efficiency *(%)* | Emission Factor for VOC *(lb/SCC)* | Capture Efficiency *(%)* | Control Device/ Stack ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Domino IC-2BK124 PRINTING INK | Ink | KY1-11 | 40500597 | Pounds Ink Consumed | 7.21 | 1.62 | 5.58 | Negligible | 100 | 0.775 | N/A | Fugitive |
| Domino MC-2BK124-4 MAKE-UP | make-up material for printing (treated as ink for SCC purposes) | KY1-11 | 40500597 | Pounds Ink Consumed | 6.65 | 0.00 | 6.65 | Negligible | 100 | 1 | N/A | Fugitive |
| Domino MC-803BK MAKE-UP | make-up material for printing (treated as ink for SCC purposes) | KY1-11 | 40500597 | Pounds Ink Consumed | 6.76 | 0.00 | 6.76 | Negligible | 100 | 1 | N/A | Fugitive |

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

## Section K.4: Coatings/Printing Materials As Applied

Include SDS or Technical Sheets for all coating/printing materials used.

| Trade Name of Material | Description *(Identify as coating, ink, fountain solution, blanket wash, cleaning solvent, thinning solvent, auto wash, manual wash, etc.)* | Emission Unit/Coating ID where material is used | SCC Code | SCC Code Units | Density *(lb/gal)* | Solid Content *(lb/gal)* | VOC Content *(lb/gal)* | Emission Factor for PM* *(lb/SCC)* | Transfer Efficiency *(%)* | Emission Factor for VOC *(lb/SCC)* | Capture Efficiency *(%)* | Control Device/ Stack ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Domino IC-2BK124 PRINTING INK | Ink | KY2-11 | 40500597 | Pounds Ink Consumed | 7.21 | 1.62 | 5.58 | Negligible | 100 | 0.775 | N/A | Fugitive |
| Domino MC-2BK124-4 MAKE-UP | make-up material for printing (treated as ink for SCC purposes) | KY2-11 | 40500597 | Pounds Ink Consumed | 6.65 | 0.00 | 6.65 | Negligible | 100 | 1 | N/A | Fugitive |
| Domino MC-803BK MAKE-UP | make-up material for printing (treated as ink for SCC purposes) | KY2-11 | 40500597 | Pounds Ink Consumed | 6.76 | 0.00 | 6.76 | Negligible | 100 | 1 | N/A | Fugitive |

**Emission factor for particulate matter (PM) should not include transfer efficiency.*

## Section K.5: Hazardous Air Pollutant-containing Coatings/Printing Materials

List each individual hazardous air pollutant (HAP) contained in each material.

| Trade Name of Material | HAP Name | HAP CAS # | Identify Solid (*S*) or Volatile (*V*) | HAP % by weight | HAP Emission Factor *(lb/SCC)* | Control Device/ Stack ID |
|---|---|---|---|---|---|---|
| No HAPs in ink and make-up materials | | | | | | |

| Section K.6: Notes, Comments, and Explanations |
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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:** BlueOval SK, LLC
**KY EIS (AFS) #:** 21- 093-00176
**Permit #:** V-21-041 R1
**Agency Interest (AI) ID:** 170550
**Date:** 12/3/2024

## 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: Uncontrolled Potential (lb/hr) | Hourly Emissions: Controlled Potential (lb/hr) | Annual Emissions: Uncontrolled Potential (tons/yr) | Annual Emissions: Controlled Potential (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY1-01 | Electrode Manufacturing | 1 | Powder Room: Anode Measure (KY1-PR01 - KY1-PR08) | NA | NA | KY1-DC01 - KY1-DC27 | 1 | PM/PM10/PM2.5 | These emissions are routed through the control equipment for Process IDs 6 and 9 | | NA | NA | NA | NA | NA | NA |
| | | 2 | Powder Room: Cathode Measure (KY1-PR09 - KY1-PR16) | NA | NA | KY1-DC01 - KY1-DC27 | 1 | PM/PM10/PM2.5 | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Nickel Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Cobalt Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Manganese Compounds | | | NA | NA | NA | NA | NA | NA |
| | | 3 | Powder Room: Anode Feed (KY1-PR17 - KY1-PR24) | NA | NA | KY1-DC01 - KY1-DC27 | 1 | PM/PM10/PM2.5 | | | NA | NA | NA | NA | NA | NA |
| | | 4 | Powder Room: Cathode Feed (KY1-PR25 - KY1-PR32) | NA | NA | KY1-DC01 - KY1-DC27 | 1 | PM/PM10/PM2.5 | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Nickel Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Cobalt Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Manganese Compounds | | | NA | NA | NA | NA | NA | 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) |
| | | 5 | Cathode Powder Vacuum Pump (KY1-PR33 - KY1-PR40) | NA | NA | Building Vents | 1 | PM/PM10/PM2.5 | 0.048 | Design Basis | NA | NA | 0.048 | NA | 0.21 | NA |
| | | | | | | | 1 | Nickel Compounds | 3.03E-04 | Design Basis | NA | NA | 3.03E-04 | NA | 1.33E-03 | NA |
| | | | | | | | 1 | Cobalt Compounds | 2.48E-04 | Design Basis | NA | NA | 2.48E-04 | NA | 1.09E-03 | NA |
| | | | | | | | 1 | Manganese Compounds | 1.94E-04 | Design Basis | NA | NA | 1.94E-04 | NA | 8.48E-04 | NA |
| | | 6 | Cathode Powder (KY1-PR41 - KY1-PR75) | NA | NA | KY1-DC01 - KY1-DC09 | 1 | PM/PM10/PM2.5 | 0.017 | Design Basis | NA | NA | 0.017 | NA | 0.074 | NA |
| | | | | | | | 1 | Nickel Compounds | 1.06E-04 | Design Basis | NA | NA | 1.06E-04 | NA | 4.63E-04 | NA |
| | | | | | | | 1 | Cobalt Compounds | 8.67E-05 | Design Basis | NA | NA | 8.67E-05 | NA | 3.80E-04 | NA |
| | | | | | | | 1 | Manganese Compounds | 6.77E-05 | Design Basis | NA | NA | 6.77E-05 | NA | 2.96E-04 | NA |
| | | 9 | Anode Powder (KY1-PR92 - KY1-PR172) | NA | NA | KY1-DC10 - KY1-DC27 | 1 | PM/PM10/PM2.5 | 0.034 | Design Basis | NA | NA | 0.03 | NA | 0.15 | NA |
| | | | | | | | 1 | Nickel Compounds | 2.10E-04 | Design Basis | NA | NA | 2.10E-04 | NA | 9.22E-04 | NA |
| | | | | | | | 1 | Cobalt Compounds | 1.73E-04 | Design Basis | NA | NA | 1.73E-04 | NA | 7.56E-04 | NA |
| | | | | | | | 1 | Manganese Compounds | 1.35E-04 | Design Basis | NA | NA | 1.35E-04 | NA | 5.90E-04 | NA |
| | | 10 | Cathode/Anode Processing (KY1-CP01 - KY1-CP60) | NA | NA | KY1-AC01 | 1 | VOC | 0.90 | Design Basis | NA | NA | 0.90 | NA | 3.96 | NA |
| | | 11 | Electrode Cleaning (KY1-CR01 - KY1-CR21) | NA | NA | KY1-AC02 - KY1-AC03 | 1 | VOC | 1.95 | Design Basis | NA | NA | 1.95 | NA | 8.55 | NA |
| | | 12 | Cathode Drying (KY1-DR01 - KY1-DR08) | NA | NA | KY1-SC01 - KY1-SC08 | 1 | VOC | 27.6 | Design Basis | NA | NA | 27.60 | NA | 120.87 | 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)* |
| KY1-02 | Battery Assembly | 1 | Cathode Notching (KY1-CN01 - KY1-CN56) | NA | NA | Vents indoors. | 1 | PM/PM10/PM2.5 | 5.09E-05 | Design Basis | NA | NA | 5.09E-05 | NA | 2.23E-04 | NA |
| | | 2 | Anode Notching (KY1-AN01 - KY1-AN56) | NA | NA | Vents indoors. | 1 | PM/PM10/PM2.5 | 5.09E-05 | Design Basis | NA | NA | 5.09E-05 | NA | 2.23E-04 | NA |
| | | 3 | Cathode Slitting (KY1-CL01 - KY1-CL10) | NA | NA | KY1-DC42 - KY1-DC43 | 1 | PM/PM10/PM2.5 | 1.43E-04 | Design Basis | NA | NA | 1.43E-04 | NA | 6.25E-04 | NA |
| | | 4 | Anode Slitting (KY1-AL01 - KY1-AL10) | NA | NA | KY1-DC44 - KY1-DC45 | 1 | PM/PM10/PM2.5 | 1.43E-04 | Design Basis | NA | NA | 1.43E-04 | NA | 6.25E-04 | NA |
| | | 5 | Vacuum Dryer (Cathode) (KY1-VD01 - KY1-VD224) and Electrolyte Filling, Sealing (KY1-EL01 - KY1-EL56) | NA | NA | KY1-AC04, KY1-AC05 | 1 | VOC | 0.83 | Design Basis | NA | NA | 0.83 | NA | 3.65 | NA |
| | | | | | | | 1 | Acetonitrile | 0.60 | Design Basis | NA | NA | 0.60 | NA | 2.64 | NA |
| | | | | | | | 1 | 1,3-Propane Sultone | 0.16 | Design Basis | NA | NA | 0.16 | NA | 0.69 | NA |
| | | 6 | Cathode Press (KY1-CS01 - KY1-CS13) | NA | NA | KY1-DC46 - KY1-DC47 | 1 | PM/PM10/PM2.5 | 1.45E-04 | Design Basis | NA | NA | 1.45E-04 | NA | 6.35E-04 | NA |
| | | | | | | KY1-AC06 | 1 | VOC | 0.38 | Design Basis | NA | NA | 0.38 | NA | 1.67 | NA |
| | | 7 | Anode Press (KY1-AS01 - KY1-AS17) | NA | NA | KY1-DC48 - KY1-DC49 | 1 | PM/PM10/PM2.5 | 1.45E-04 | Design Basis | NA | NA | 1.45E-04 | NA | 6.35E-04 | NA |
| | | | | | | KY1-AC07 | 1 | VOC | 0.70 | Design Basis | NA | NA | 0.70 | NA | 3.05 | NA |
| | | 8 | Tab Welding (BME) (KY1-WB01 - KY1-WB16) | NA | NA | Vents indoors. | 1 | PM/PM10/PM2.5 | 2.88E-05 | Design Basis | NA | NA | 2.88E-05 | NA | 1.26E-04 | NA |
| | | 9 | Tab Welding (SK) (KY1-WS01 - KY1-WS16) | NA | NA | KY1-DC54 - KY1-DC69 | 1 | PM/PM10/PM2.5 | 1.92E-04 | Design Basis | NA | NA | 1.92E-04 | NA | 8.40E-04 | NA |
| | | 10 | Tab Welding (SK) (KY1-MA01 - KY1-MA32) | NA | NA | KY1-DC70 - KY1-DC101 | 1 | PM/PM10/PM2.5 | 0.06 | Design Basis | NA | NA | 0.06 | NA | 0.26 | NA |
| KY1-03 | Battery Formation | 1 | Cell Degassing (KY1-DG01 - KY1-DG56) | NA | NA | KY1-AC08 - KY1-AC15 | 1 | VOC | 10.41 | Design Basis | NA | NA | 10.41 | NA | 45.61 | NA |
| KY1-04 | Cell Discharge | 1 | Cell Discharge - VOC (KY1-CD01 - KY1-CD04) | NA | NA | KY1-AC16 - KY1-AC17 | 1 | VOC | 3.70 | Design Basis | NA | NA | 3.70 | NA | 16.21 | NA |
| | | 2 | Cell Discharge - HCl (KY1-CD01 - KY1-CD08) | NA | NA | KY1-SC09 | 1 | HCl | 0.49 | Design Basis | NA | NA | 0.49 | NA | 2.16 | 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)* |
| KY1-05 | Laboratories | 1 | Quality Evaluation 1 (KY1-QE01 - KY1-QE12) | NA | NA | KY1-AC18 - KY1-AC19 | 1 | VOC | 1.72 | Design Basis | NA | NA | 1.72 | NA | 7.52 | NA |
| | | 2 | Quality Evaluation 2 (N/A) | NA | NA | KY1-AC20 - KY1-AC21 | 1 | VOC | 0.74 | Design Basis | NA | NA | 0.74 | NA | 3.22 | NA |
| | | 3 | ICP Lab (KY1-LB01 - KY1-LB03) | NA | NA | KY1-SC10 - KY1-SC12 | 1 | HCl | 0.15 | Design Basis | NA | NA | 0.15 | NA | 0.66 | NA |
| | | 4 | Raw Materials Inspection Lab (KY1-LB04 - KY1-LB05) | NA | NA | KY1-SC13 - KY1-SC14 | 1 | HCl | 0.10 | Design Basis | NA | NA | 0.10 | NA | 0.44 | NA |
| KY1-06 | Natural Gas-fired Boilers | 1 | Boiler Natural Gas Combustion (KY1-B01 - KY1-B11) | NA | NA | KY1-B01_S - KY1-B11_S | 0.13 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.07 | NA | 0.29 | NA |
| | | | | | | | 0.13 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.06 | NA | 0.24 | NA |
| | | | | | | | 0.13 | CO | 37.7 | Burner Specification | NA | NA | 4.88 | NA | 21.37 | NA |
| | | | | | | | 0.13 | NOX | 11.1 | Burner Specification | NA | NA | 1.44 | NA | 6.32 | NA |
| | | | | | | | 0.13 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.08 | NA | 0.34 | NA |
| | | | | | | | 0.13 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.71 | NA | 3.12 | NA |
| | | | | | | | 0.13 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0001 | NA | 0.000 | NA |
| | | | | | | | 0.13 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 15,441 | NA | 67,632 | NA |
| | | | | | | | 0.13 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.29 | NA | 1.27 | NA |
| | | | | | | | 0.13 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.03 | NA | 0.13 | NA |
| | | | | | | | 0.13 | Hexane, n-5 | 0.00 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | NA |
| KY1-07 | Natural Gas-fired Hot Oil Heaters | 1 | Hot Oil Heater Natural Gas Combustion (KY1-H01 - KY1-H10) | NA | NA | KY1-H01_S - KY1-H10_S | 0.25 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.13 | NA | 0.58 | NA |
| | | | | | | | 0.25 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.11 | NA | 0.48 | NA |
| | | | | | | | 0.25 | CO | 37.7 | Burner Specification | NA | NA | 9.53 | NA | 41.75 | NA |
| | | | | | | | 0.25 | NOX | 24.8 | Burner Specification | NA | NA | 6.26 | NA | 27.43 | NA |
| | | | | | | | 0.25 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.15 | NA | 0.66 | NA |
| | | | | | | | 0.25 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 1.39 | NA | 6.09 | NA |
| | | | | | | | 0.25 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0001 | NA | 0.001 | NA |
| | | | | | | | 0.25 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 30,163 | NA | 132,112 | NA |
| | | | | | | | 0.25 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.57 | NA | 2.49 | NA |
| | | | | | | | 0.25 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.06 | NA | 0.25 | NA |
| | | | | | | | 0.25 | Hexane, n-5 | 0.00 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.01 | 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: Uncontrolled Potential (lb/hr) | Hourly Emissions: Controlled Potential (lb/hr) | Annual Emissions: Uncontrolled Potential (tons/yr) | Annual Emissions: Controlled Potential (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KY1-08 | Emergency Engines | 1 | Fire Pump Engine Diesel Combustion (KY1-FPE01 - KY1-FPE03) | NA | NA | KY1-FPE01_S - KY1-FPE03_S | 399.00 | PM/PM10/PM2.5 | 3.29E-04 | 40 CFR 60 Subpart IIII Standard | NA | NA | 0.13 | NA | 0.03 | NA |
| | | | | | | | 399.00 | CO | 5.75E-03 | 40 CFR 60 Subpart IIII Standard | NA | NA | 2.30 | NA | 0.57 | NA |
| | | | | | | | 399.00 | NOX | 6.58E-03 | 40 CFR 60 Subpart IIII Standard | NA | NA | 2.62 | NA | 0.66 | NA |
| | | | | | | | 399.00 | SO2 | 2.05E-03 | AP-42 Section 3.3 | NA | NA | 0.82 | NA | 0.20 | NA |
| | | | | | | | 399.00 | VOC | 6.58E-03 | 40 CFR 60 Subpart IIII Standard | NA | NA | 2.62 | NA | 0.66 | NA |
| | | | | | | | 2.79 | CO2 | 163.05 | 40 CFR 98 Subpart C | NA | NA | 455 | NA | 113.85 | NA |
| | | | | | | | 2.79 | CH4 | 6.61E-03 | 40 CFR 98 Subpart C | NA | NA | 0.018 | NA | 4.62E-03 | NA |
| | | | | | | | 2.79 | N2O | 1.32E-03 | 40 CFR 98 Subpart C | NA | NA | 3.69E-03 | NA | 9.24E-04 | NA |
| | | | | | | | 2.79 | Benzene | 9.33E-04 | AP-42 Section 3.3 | NA | NA | 2.61E-03 | NA | 6.51E-04 | NA |
| | | | | | | | 2.79 | Toluene | 4.09E-04 | AP-42 Section 3.3 | NA | NA | 1.14E-03 | NA | 2.86E-04 | NA |
| | | | | | | | 2.79 | Xylenes | 2.85E-04 | AP-42 Section 3.3 | NA | NA | 7.96E-04 | NA | 1.99E-04 | NA |
| KY1-08 | Emergency Engines | 2 | Generator Engine Diesel Combustion (KY1-GE01 - KY1-GE05) | NA | NA | KY1-GE01_S - KY1-GE05_S | 1676.28 | PM/PM10/PM2.5 | 3.29E-04 | 40 CFR 60 Subpart IIII Standard | NA | NA | 0.55 | NA | 0.14 | NA |
| | | | | | | | 399.00 | CO | 5.75E-03 | 40 CFR 60 Subpart IIII Standard | NA | NA | 2.30 | NA | 0.57 | NA |
| | | | | | | | 399.00 | NOX | 1.05E-02 | 40 CFR 60 Subpart IIII Standard | NA | NA | 4.20 | NA | 1.05 | NA |
| | | | | | | | 399.00 | SO2 | 1.21E-05 | 41 CFR 60 Subpart IIII Standard | NA | NA | 0.00 | NA | 0.00 | NA |
| | | | | | | | 399.00 | VOC | 1.05E-02 | 42 CFR 60 Subpart IIII Standard | NA | NA | 4.20 | NA | 1.05 | NA |
| | | | | | | | 11.73 | CO2 | 163.05 | 40 CFR 98 Subpart C | NA | NA | 1,913 | NA | 478.32 | NA |
| | | | | | | | 11.73 | CH4 | 6.61E-03 | 40 CFR 98 Subpart C | NA | NA | 0.08 | NA | 1.94E-02 | NA |
| | | | | | | | 11.73 | N2O | 1.32E-03 | 40 CFR 98 Subpart C | NA | NA | 0.02 | NA | 3.88E-03 | NA |
| | | | | | | | 11.73 | Benzene | 7.76E-04 | AP-42 Section 3.4 | NA | NA | 9.11E-03 | NA | 2.28E-03 | NA |
| | | | | | | | 11.73 | Toluene | 2.81E-04 | AP-42 Section 3.4 | NA | NA | 3.30E-03 | NA | 8.24E-04 | NA |
| | | | | | | | 11.73 | Xylenes | 1.93E-04 | AP-42 Section 3.4 | NA | NA | 2.26E-03 | NA | 5.66E-04 | NA |
| KY1-09 | Cooling Towers | 1 | Cooling Towers (KY1-CT01 - KY1-CT04) | NA | NA | KY1-CT01_S KY1-CT04_S | 6.91E-04 | PM | 0.033 | Drift Estimate | NA | NA | 2.30E-05 | NA | 1.01E-04 | NA |
| | | | | | | | 6.91E-04 | PM10 | 0.028 | Particle Size Distribution | NA | NA | 1.96E-05 | NA | 8.58E-05 | NA |
| | | | | | | | 6.91E-04 | PM2.5 | 0.00012 | Particle Size Distribution | NA | NA | 8.54E-08 | NA | 3.74E-07 | 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)* |
| KY1-10 | Storage Tanks | 1 | Raw Material Tanks - Working Losses (KY1-RT01 - KY1-RT04) | NA | NA | KY1-RT01_V - KY1-RT04_V | 0.51 | VOC | 0.005 | AP-42 Section 7.1 | NA | NA | 0.002 | NA | 0.011 | NA |
| | | 2 | Raw Material Tanks - Standing Losses (KY1-RT01 - KY1-RT04) | NA | NA | KY1-RT01_V - KY1-RT04_V | 0.006 | VOC | 0.070 | AP-42 Section 7.1 | NA | NA | 0.000 | NA | 1.95E-03 | NA |
| | | 3 | Waste Tanks - Working Losses (KY1-WT01 - KY1-WT08) | NA | NA | KY1-WT01_V - KY1-WT08_V | 0.64 | VOC | 0.007 | AP-42 Section 7.1 | NA | NA | 0.004 | NA | 0.019 | NA |
| | | 4 | Waste Tanks - Standing Losses (KY1-WT01 - KY1-WT08) | NA | NA | KY1-WT01_V - KY1-WT08_V | 0.013 | VOC | 0.070 | AP-42 Section 7.1 | NA | NA | 0.001 | NA | 3.89E-03 | NA |
| | | 5 | Electrolyte Storage Tanks - Working Losses (KY1-ET01 - KY1-ET08) | NA | NA | KY1-ET01_V - KY1-ET08_V | 0.60 | VOC | 0.025 | AP-42 Section 7.1 | NA | NA | 0.015 | NA | 0.064 | NA |
| | | 6 | Electrolyte Storage Tanks - Standing Losses (KY1-ET01 - KY1-ET08) | NA | NA | KY1-ET01_V - KY1-ET08_V | 0.013 | VOC | 0.200 | AP-42 Section 7.1 | NA | NA | 0.003 | NA | 0.011 | NA |
| | | 7 | Electrolyte Separator Tanks - Working Losses (KY1-EST101) | NA | NA | KY1-EST101_V | 0.01 | VOC | 0.010 | AP-42 Section 7.1 | NA | NA | 6.23E-05 | NA | 2.73E-04 | NA |
| | | 8 | Electrolyte Separator Tanks - Standing Losses (KY1-EST101) | NA | NA | KY1-EST101_V | 9.02E-05 | VOC | 0.241 | AP-42 Section 7.1 | NA | NA | 2.17E-05 | NA | 9.51E-05 | NA |
| | | 9 | Electrolyte Separator Tanks - Working Losses (KY1-EST201) | NA | NA | KY1-EST201_V | 0.01 | VOC | 0.029 | AP-42 Section 7.1 | NA | NA | 1.72E-04 | NA | 7.54E-04 | NA |
| | | 10 | Electrolyte Separator Tanks - Standing Losses (KY1-EST201) | NA | NA | KY1-EST201_V | 2.11E-04 | VOC | 0.209 | AP-42 Section 7.1 | NA | NA | 4.42E-05 | NA | 1.94E-04 | NA |
| | | 11 | Electrolyte Waste Tanks - Working Losses (KY1-EWT01) | NA | NA | KY1-EWT01_V - KY1-EWT01_V | 0.01 | VOC | 0.030 | AP-42 Section 7.1 | NA | NA | 1.81E-04 | NA | 7.91E-04 | NA |
| | | 12 | Electrolyte Waste Tanks - Standing Losses (KY1-EWT01) | NA | NA | KY1-EWT01_V - KY1-EWT01_V | 1.51E-04 | VOC | 0.303 | AP-42 Section 7.1 | NA | NA | 4.57E-05 | NA | 2.00E-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) |
| KY1-13 | Natural Gas-fired Dehumidification Units | 1 | Dehumidification Unit Natural Gas Combustion - Direct (KY1-DH01 - KY1-DH46) | NA | NA | KY1-DH01_S - KY1-DH46_S | 0.09 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.05 | NA | 0.21 | NA |
| | | | | | | | 0.09 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.04 | NA | 0.17 | NA |
| | | | | | | | 0.09 | CO | 18.85 | Burner Specification | NA | NA | 1.70 | NA | 7.45 | NA |
| | | | | | | | 0.09 | NOX | 110.24 | Burner Specification | NA | NA | 9.94 | NA | 43.55 | NA |
| | | | | | | | 0.09 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.05 | NA | 0.24 | NA |
| | | | | | | | 0.09 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.50 | NA | 2.17 | NA |
| | | | | | | | 0.09 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 4.51E-05 | NA | 1.98E-04 | NA |
| | | | | | | | 0.09 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 10,762 | NA | 47,137 | NA |
| | | | | | | | 0.09 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.20 | NA | 0.89 | NA |
| | | | | | | | 0.09 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.02 | NA | 0.09 | NA |
| | | | | | | | 0.09 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | NA |
| KY1-14 | Natural Gas-fired Building AHUs | 1 | Building AHU Natural Gas Combustion (KY1-BA01 - KY1-BA10) | NA | NA | KY1-BA01_S - KY1-BA10_S | 0.03 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.02 | NA | 0.07 | NA |
| | | | | | | | 0.03 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.01 | NA | 0.06 | NA |
| | | | | | | | 0.03 | CO | 37.70 | Burner Specification | NA | NA | 1.11 | NA | 4.86 | NA |
| | | | | | | | 0.03 | NOX | 68.13 | Burner Specification | NA | NA | 2.00 | NA | 8.78 | NA |
| | | | | | | | 0.03 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.02 | NA | 0.08 | NA |
| | | | | | | | 0.03 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.16 | NA | 0.71 | NA |
| | | | | | | | 0.03 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0000 | NA | 0.00 | NA |
| | | | | | | | 0.03 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 3,509 | NA | 15,371 | NA |
| | | | | | | | 0.03 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.07 | NA | 0.29 | NA |
| | | | | | | | 0.03 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.01 | NA | 0.03 | NA |
| | | | | | | | 0.03 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | 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) |
| KY1-15 | Natural Gas-fired Office AHUs | 1 | Office AHU Natural Gas Combustion (KY1-OA01 - KY1-OA10) | NA | NA | KY1-OA01_S - KY1-OA10_S | 0.03 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.02 | NA | 0.07 | NA |
| | | | | | | | 0.03 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.01 | NA | 0.06 | NA |
| | | | | | | | 0.03 | CO | 37.70 | Burner Specification | NA | NA | 1.11 | NA | 4.86 | NA |
| | | | | | | | 0.03 | NOX | 68.13 | Burner Specification | NA | NA | 2.00 | NA | 8.78 | NA |
| | | | | | | | 0.03 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.02 | NA | 0.08 | NA |
| | | | | | | | 0.03 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.16 | NA | 0.71 | NA |
| | | | | | | | 0.03 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0000 | NA | 0.00 | NA |
| | | | | | | | 0.03 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 3,509 | NA | 15,371 | NA |
| | | | | | | | 0.03 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.07 | NA | 0.29 | NA |
| | | | | | | | 0.03 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.01 | NA | 0.03 | NA |
| | | | | | | | 0.03 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | NA |
| KY1-16 | Natural Gas-fired Coater Oven AHUs | 1 | Coater Oven AHU Natural Gas Combustion - Direct (KY1-CO01 - KY1-CO16) | NA | NA | KY1-CO01_S - KY1-CO16_S | 0.08 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.04 | NA | 0.18 | NA |
| | | | | | | | 0.08 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.03 | NA | 0.15 | NA |
| | | | | | | | 0.08 | CO | 37.70 | Burner Specification | NA | NA | 3.05 | NA | 13.34 | NA |
| | | | | | | | 0.08 | NOX | 30.97 | Burner Specification | NA | NA | 2.50 | NA | 10.96 | NA |
| | | | | | | | 0.08 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.05 | NA | 0.21 | NA |
| | | | | | | | 0.08 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.44 | NA | 1.95 | NA |
| | | | | | | | 0.08 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0000 | NA | 0.00 | NA |
| | | | | | | | 0.08 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 9,639 | NA | 42,219 | NA |
| | | | | | | | 0.08 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.18 | NA | 0.80 | NA |
| | | | | | | | 0.08 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.02 | NA | 0.08 | NA |
| | | | | | | | 0.08 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | 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: Uncontrolled Potential (lb/hr) | Hourly Emissions: Controlled Potential (lb/hr) | Annual Emissions: Uncontrolled Potential (tons/yr) | Annual Emissions: Controlled Potential (tons/yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **N.1: Emission Summary** | | | | | | | | | | | | | | | | |
| KY2-01 | Electrode Manufacturing | 1 | Powder Room: Anode Measure (KY2-PR01 - KY2-PR08) | NA | NA | KY2-DC01 - KY2-DC29 | 1 | PM/PM10/PM2.5 | These emissions are routed through the control equipment for Process IDs 6 and 9 | | NA | NA | NA | NA | NA | NA |
| | | 2 | Powder Room: Cathode Measure (KY2-PR09 - KY2-PR16) | NA | NA | KY2-DC01 - KY2-DC29 | 1 | PM/PM10/PM2.5 | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Nickel Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Cobalt Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Manganese Compounds | | | NA | NA | NA | NA | NA | NA |
| | | 3 | Powder Room: Anode Feed (KY2-PR17 - KY2-PR24) | NA | NA | KY2-DC01 - KY2-DC29 | 1 | PM/PM10/PM2.5 | | | NA | NA | NA | NA | NA | NA |
| | | 4 | Powder Room: Cathode Feed (KY2-PR25 - KY2-PR32) | NA | NA | KY2-DC01 - KY2-DC29 | 1 | PM/PM10/PM2.5 | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Nickel Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Cobalt Compounds | | | NA | NA | NA | NA | NA | NA |
| | | | | | | | 1 | Manganese Compounds | | | NA | NA | NA | NA | NA | NA |
| | | 5 | Cathode Powder Vacuum Pump (KY2-PR33 - KY2-PR40) | NA | NA | Building Vents | 1 | PM/PM10/PM2.5 | 0.048 | Design Basis | NA | NA | 0.05 | NA | 0.21 | NA |
| | | | | | | | 1 | Nickel Compounds | 3.03E-04 | Design Basis | NA | NA | 3.03E-04 | NA | 1.33E-03 | NA |
| | | | | | | | 1 | Cobalt Compounds | 2.48E-04 | Design Basis | NA | NA | 2.48E-04 | NA | 1.09E-03 | NA |
| | | | | | | | 1 | Manganese Compounds | 1.94E-04 | Design Basis | NA | NA | 1.94E-04 | NA | 8.48E-04 | NA |
| | | 6 | Cathode Powder (KY2-PR41 - KY2-PR81) | NA | NA | KY2-DC01 - KY2-DC10 | 1 | PM/PM10/PM2.5 | 0.019 | Design Basis | NA | NA | 0.02 | NA | 0.08 | NA |
| | | | | | | | 1 | Nickel Compounds | 1.06E-04 | Design Basis | NA | NA | 1.06E-04 | NA | 4.63E-04 | NA |
| | | | | | | | 1 | Cobalt Compounds | 8.67E-05 | Design Basis | NA | NA | 8.67E-05 | NA | 3.80E-04 | NA |
| | | | | | | | 1 | Manganese Compounds | 6.77E-05 | Design Basis | NA | NA | 6.77E-05 | NA | 2.96E-04 | NA |
| | | 7 | Anode Mixer Vacuum Pump (KY2-PR82 - KY2-PR89) | NA | NA | Building Vents | 1 | PM/PM10/PM2.5 | 0.024 | Design Basis | NA | NA | 0.02 | NA | 0.11 | NA |
| | | 8 | Anode Powder Vacuum Pump (KY2-PR90 - KY2-PR97) | NA | NA | Building Vents | 1 | PM/PM10/PM2.5 | 0.048 | Design Basis | NA | NA | 0.05 | NA | 0.21 | NA |
| | | 9 | Anode Powder (KY2-PR98 - KY2-PR190) | NA | NA | KY2-DC11 - KY2-DC29 | 1 | PM/PM10/PM2.5 | 0.036 | Design Basis | NA | NA | 0.04 | NA | 0.16 | NA |
| | | | | | | | 1 | Nickel Compounds | 2.22E-04 | Design Basis | NA | NA | 2.22E-04 | NA | 9.74E-04 | NA |
| | | | | | | | 1 | Cobalt Compounds | 1.82E-04 | Design Basis | NA | NA | 1.82E-04 | NA | 7.98E-04 | NA |
| | | | | | | | 1 | Manganese Compounds | 1.42E-04 | Design Basis | NA | NA | 1.42E-04 | NA | 6.23E-04 | NA |
| | | 10 | Cathode/Anode Processing (KY2-CP01 - KY2-CP57) | NA | NA | KY2-AC01 | 1 | VOC | 0.90 | Design Basis | NA | NA | 0.90 | NA | 3.96 | NA |
| | | 11 | Electrode Cleaning (KY2-CR01 - KY2-CR34) | NA | NA | KY2-AC02 - KY2-AC03 | 1 | VOC | 1.69 | Design Basis | NA | NA | 1.69 | NA | 7.39 | NA |
| | | 12 | Cathode Drying (KY2-DR01 - KY2-DR08) | NA | NA | KY2-SC01 - KY2-SC08 | 1 | VOC | 34.9 | Design Basis | NA | NA | 34.89 | NA | 152.82 | 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) |
| KY2-02 | Battery Assembly | 1 | Cathode Notching (KY2-CN01 - KY2-CN35) | NA | NA | Vents indoors. | 1 | PM/PM10/PM2.5 | 3.62E-05 | Design Basis | NA | NA | 3.62E-05 | NA | 1.59E-04 | NA |
| | | 2 | Anode Notching (KY2-AN01 - KY2-AN35) | NA | NA | Vents indoors. | 1 | PM/PM10/PM2.5 | 3.62E-05 | Design Basis | NA | NA | 3.62E-05 | NA | 1.59E-04 | NA |
| | | 3 | Vacuum Dryer (Cathode) (KY2-VD01 - KY2-VD214) and Electrolyte Filling, Sealing (KY2-EL01 - KY2-EL56) | NA | NA | KY2-AC04, KY2-AC05 | 1 | VOC | 0.83 | Design Basis | NA | NA | 0.83 | NA | 3.65 | NA |
| | | | | | | | 1 | Acetonitrile | 0.60 | Design Basis | NA | NA | 0.60 | NA | 2.64 | NA |
| | | | | | | | 1 | 1,3-Propane Sultone | 0.16 | Design Basis | NA | NA | 0.16 | NA | 0.69 | NA |
| | | 4 | Cathode Press (KY2-CS01 - KY2-CS11) | NA | NA | KY2-DC40 - KY2-DC41 | 1 | PM/PM10/PM2.5 | 1.41E-04 | Design Basis | NA | NA | 1.41E-04 | NA | 6.17E-04 | NA |
| | | | | | | KY2-AC06 | 2 | VOC | 3.82E-01 | Design Basis | NA | NA | 7.64E-01 | NA | 3.34E+00 | NA |
| | | 5 | Anode Press (KY2-AS01 - KY2-AS11) | NA | NA | KY2-DC42 - KY2-DC44 | 1 | PM/PM10/PM2.5 | 2.42E-04 | Design Basis | NA | NA | 2.42E-04 | NA | 1.06E-03 | NA |
| | | | | | | KY2-AC07 | 1 | VOC | 0.70 | Design Basis | NA | NA | 0.70 | NA | 3.05 | NA |
| | | 6 | Tab Welding (BME) (KY2-WB01 - KY2-WB16) | NA | NA | Vents indoors. | 1 | PM/PM10/PM2.5 | 2.88E-05 | Design Basis | NA | NA | 2.88E-05 | NA | 1.26E-04 | NA |
| | | 7 | Tab Welding (SK) (KY2-WS01 - KY2-WS16) | NA | NA | KY2-DC49 - KY2-DC64 | 1 | PM/PM10/PM2.5 | 1.92E-04 | Design Basis | NA | NA | 1.92E-04 | NA | 8.40E-04 | NA |
| KY2-03 | Battery Formation | 1 | Cell Degassing (KY2-DG01 - KY2-DG56) | NA | NA | KY2-AC08 - KY2-AC15 | 1 | VOC | 10.41 | Design Basis | NA | NA | 10.41 | NA | 45.61 | NA |
| KY2-04 | Cell Discharge | 1 | Cell Discharge - VOC (KY2-CD01 - KY2-CD04) | NA | NA | KY2-AC16 - KY2-AC17 | 1 | VOC | 1.68 | Design Basis | NA | NA | 1.68 | NA | 7.37 | NA |
| | | 2 | Cell Discharge - HCl (KY2-CD01 - KY2-CD08) | NA | NA | KY2-SC09 | 1 | HCl | 0.22 | Design Basis | NA | NA | 0.22 | NA | 0.97 | NA |
| KY2-05 | Laboratories | 1 | Quality Evaluation 1 (KY2-QE01 - KY2-QE13) | NA | NA | KY2-AC18 - KY2-AC19 | 1 | VOC | 2.10 | Design Basis | NA | NA | 2.10 | NA | 9.21 | NA |
| | | 2 | Quality Evaluation 2 (N/A) | NA | NA | KY2-AC20 - KY2-AC21 | 1 | VOC | 0.74 | Design Basis | NA | NA | 0.74 | NA | 3.22 | NA |
| | | 3 | ICP Lab (KY2-LB01 - KY2-LB03) | NA | NA | KY2-SC10 - KY2-SC12 | 1 | HCl | 0.15 | Design Basis | NA | NA | 0.15 | NA | 0.66 | NA |
| | | 4 | Raw Materials Inspection Lab (KY2-LB04 - KY2-LB05) | NA | NA | KY2-SC13 - KY2-SC14 | 1 | HCl | 0.10 | Design Basis | NA | NA | 0.10 | NA | 0.44 | 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) |
| KY2-06 | Natural Gas-fired Boilers | 1 | Boiler Natural Gas Combustion (KY2-B01 - KY2-B11) | NA | NA | KY2-B01_S - KY2-B11_S | 0.13 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.07 | NA | 0.29 | NA |
| | | | | | | | 0.13 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.06 | NA | 0.24 | NA |
| | | | | | | | 0.13 | CO | 37.70 | Burner Specification | NA | NA | 4.88 | NA | 21.37 | NA |
| | | | | | | | 0.13 | NOX | 11.15 | Burner Specification | NA | NA | 1.44 | NA | 6.32 | NA |
| | | | | | | | 0.13 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.08 | NA | 0.34 | NA |
| | | | | | | | 0.13 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.71 | NA | 3.12 | NA |
| | | | | | | | 0.13 | Lead | 0.00 | AP-42 Section 1.4 | NA | NA | 0.0001 | NA | 0.000 | NA |
| | | | | | | | 0.13 | CO2 | 119,316.82 | 40 CFR 98 Subpart C | NA | NA | 15,441 | NA | 67,632 | NA |
| | | | | | | | 0.13 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.29 | NA | 1.27 | NA |
| | | | | | | | 0.13 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.03 | NA | 0.13 | NA |
| | | | | | | | 0.13 | n-Hexane | 0.00 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | NA |
| KY2-07 | Natural Gas-fired Hot Oil Heaters | 1 | Hot Oil Heater Natural Gas Combustion (KY2-H01 - KY2-H10) | NA | NA | KY2-H01_S - KY2-H10_S | 0.25 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.13 | NA | 0.58 | NA |
| | | | | | | | 0.25 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.11 | NA | 0.48 | NA |
| | | | | | | | 0.25 | CO | 37.70 | Burner Specification | NA | NA | 9.53 | NA | 41.75 | NA |
| | | | | | | | 0.25 | NOX | 24.77 | Burner Specification | NA | NA | 6.26 | NA | 27.43 | NA |
| | | | | | | | 0.25 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.15 | NA | 0.66 | NA |
| | | | | | | | 0.25 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 1.39 | NA | 6.09 | NA |
| | | | | | | | 0.25 | Lead | 0.00 | AP-42 Section 1.4 | NA | NA | 0.0001 | NA | 0.001 | NA |
| | | | | | | | 0.25 | CO2 | 119,316.82 | 40 CFR 98 Subpart C | NA | NA | 30,163 | NA | 132,112 | NA |
| | | | | | | | 0.25 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.57 | NA | 2.49 | NA |
| | | | | | | | 0.25 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.06 | NA | 0.25 | NA |
| | | | | | | | 0.25 | n-Hexane | 0.00 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.01 | NA |
| KY2-08 | Emergency Engines | 2 | Generator Engine Diesel Combustion (KY2-GE01 - KY2-GE04) | NA | NA | KY2-GE01_S - KY2-GE04_S | 1072.82 | PM/PM10/PM2.5 | 3.29E-04 | 40 CFR 60 Subpart IIII Standard | NA | NA | 0.35 | NA | 0.09 | NA |
| | | | | | | | 1072.82 | CO | 5.75E-03 | 40 CFR 60 Subpart IIII Standard | NA | NA | 6.17 | NA | 1.54 | NA |
| | | | | | | | 1072.82 | NOX | 1.05E-02 | 40 CFR 60 Subpart IIII Standard | NA | NA | 11.29 | NA | 2.82 | NA |
| | | | | | | | 1072.82 | SO2 | 1.21E-05 | 41 CFR 60 Subpart IIII Standard | NA | NA | 0.01 | NA | 0.00 | NA |
| | | | | | | | 1072.82 | VOC | 1.05E-02 | 42 CFR 60 Subpart IIII Standard | NA | NA | 11.29 | NA | 2.82 | NA |
| | | | | | | | 7.51 | CO2 | 163.05 | 40 CFR 98 Subpart C | NA | NA | 1,224 | NA | 306.12 | NA |
| | | | | | | | 7.51 | CH4 | 6.61E-03 | 40 CFR 98 Subpart C | NA | NA | 0.05 | NA | 0.01 | NA |
| | | | | | | | 7.51 | N2O | 1.32E-03 | 40 CFR 98 Subpart C | NA | NA | 0.01 | NA | 2.48E-03 | NA |
| | | | | | | | 7.51 | Benzene | 7.76E-04 | AP-42 Section 3.4 | NA | NA | 5.83E-03 | NA | 1.46E-03 | NA |
| | | | | | | | 7.51 | Toluene | 2.81E-04 | AP-42 Section 3.4 | NA | NA | 2.11E-03 | NA | 5.28E-04 | NA |
| | | | | | | | 7.51 | Xylenes | 1.93E-04 | AP-42 Section 3.4 | NA | NA | 1.45E-03 | NA | 3.62E-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) |
| KY2-09 | Cooling Towers | 1 | Cooling Towers (KY2-CT01 - KY2-CT04) | NA | NA | KY2-CT01_S - KY2-CT04_S | 6.91E-04 | PM | 0.033 | Drift Estimate | NA | NA | 2.30E-05 | NA | 1.01E-04 | NA |
| | | | | | | | 6.91E-04 | PM10 | 0.028 | Particle Size Distribution | NA | NA | 1.96E-05 | NA | 8.58E-05 | NA |
| | | | | | | | 6.91E-04 | PM2.5 | 0.00012 | Particle Size Distribution | NA | NA | 8.54E-08 | NA | 3.74E-07 | NA |
| KY2-10 | Storage Tanks | 1 | Raw Material Tanks - Working Losses (KY2-RT01 - KY2-RT04) | NA | NA | KY2-RT01_V - KY2-RT04_V | 0.51 | VOC | 0.005 | AP-42 Section 7.1 | NA | NA | 0.002 | NA | 0.011 | NA |
| | | 2 | Raw Material Tanks - Standing Losses (KY2-RT01 - KY2-RT04) | NA | NA | KY2-RT01_V - KY2-RT04_V | 0.006 | VOC | 0.070 | AP-42 Section 7.1 | NA | NA | 0.000 | NA | 1.95E-03 | NA |
| | | 3 | Waste Tanks - Working Losses (KY2-WT01 - KY2-WT08) | NA | NA | KY2-WT01_V - KY2-WT08_V | 0.64 | VOC | 0.007 | AP-42 Section 7.1 | NA | NA | 0.004 | NA | 0.019 | NA |
| | | 4 | Waste Tanks - Standing Losses (KY2-WT01 - KY2-WT08) | NA | NA | KY2-WT01_V - KY2-WT08_V | 0.013 | VOC | 0.070 | AP-42 Section 7.1 | NA | NA | 0.001 | NA | 3.89E-03 | NA |
| | | 5 | Electrolyte Storage Tanks - Working Losses (KY2-ET01 - KY2-ET08) | NA | NA | KY2-ET01_V - KY2-ET08_V | 0.60 | VOC | 0.025 | AP-42 Section 7.1 | NA | NA | 0.015 | NA | 0.064 | NA |
| | | 6 | Electrolyte Storage Tanks - Standing Losses (KY2-ET01 - KY2-ET08) | NA | NA | KY2-ET01_V - KY2-ET08_V | 0.013 | VOC | 0.200 | AP-42 Section 7.1 | NA | NA | 0.003 | NA | 0.011 | NA |
| | | 7 | Electrolyte Separator Tanks - Working Losses (KY2-EST101) | NA | NA | KY2-EST101_V | 0.01 | VOC | 0.010 | AP-42 Section 7.1 | NA | NA | 6.23E-05 | NA | 2.73E-04 | NA |
| | | 8 | Electrolyte Separator Tanks - Standing Losses (KY2-EST101) | NA | NA | KY2-EST101_V | 9.02E-05 | VOC | 0.241 | AP-42 Section 7.1 | NA | NA | 2.17E-05 | NA | 9.51E-05 | NA |
| | | 9 | Electrolyte Separator Tanks - Working Losses (KY2-EST201) | NA | NA | KY2-EST201_V | 0.01 | VOC | 0.029 | AP-42 Section 7.1 | NA | NA | 1.72E-04 | NA | 7.54E-04 | NA |
| | | 10 | Electrolyte Separator Tanks - Standing Losses (KY2-EST201) | NA | NA | KY2-EST201_V | 2.11E-04 | VOC | 0.209 | AP-42 Section 7.1 | NA | NA | 4.42E-05 | NA | 1.94E-04 | NA |
| | | 11 | Electrolyte Waste Tanks - Working Losses (KY2-EWT01) | NA | NA | KY2-EWT01_V - KY2-EWT01_V | 0.01 | VOC | 0.030 | AP-42 Section 7.1 | NA | NA | 1.81E-04 | NA | 7.91E-04 | NA |
| | | 12 | Electrolyte Waste Tanks - Standing Losses (KY2-EWT01) | NA | NA | KY2-EWT01_V - KY2-EWT01_V | 1.51E-04 | VOC | 0.303 | AP-42 Section 7.1 | NA | NA | 4.57E-05 | NA | 2.00E-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)* |
| KY2-13 | Natural Gas-fired Dehumidification Units | 1 | Dehumidification Unit Natural Gas Combustion - Direct (KY2-DH01 - KY2-DH46) | NA | NA | KY2-DH01_S - KY2-DH46_S | 0.09 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.05 | NA | 0.21 | NA |
| | | | | | | | 0.09 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.04 | NA | 0.17 | NA |
| | | | | | | | 0.09 | CO | 18.85 | Burner Specification | NA | NA | 1.70 | NA | 7.45 | NA |
| | | | | | | | 0.09 | NOX | 110.24 | Burner Specification | NA | NA | 9.94 | NA | 43.55 | NA |
| | | | | | | | 0.09 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.05 | NA | 0.24 | NA |
| | | | | | | | 0.09 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.50 | NA | 2.17 | NA |
| | | | | | | | 0.09 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 4.51E-05 | NA | 1.98E-04 | NA |
| | | | | | | | 0.09 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 10,762 | NA | 47,137 | NA |
| | | | | | | | 0.09 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.20 | NA | 0.89 | NA |
| | | | | | | | 0.09 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.02 | NA | 0.09 | NA |
| | | | | | | | 0.09 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | NA |
| KY2-14 | Natural Gas-fired Building AHUs | 1 | Building AHU Natural Gas Combustion (KY2-BA01 - KY2-BA10) | NA | NA | KY2-BA01_S - KY2-BA10_S | 0.03 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.02 | NA | 0.07 | NA |
| | | | | | | | 0.03 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.01 | NA | 0.06 | NA |
| | | | | | | | 0.03 | CO | 37.70 | Burner Specification | NA | NA | 1.11 | NA | 4.86 | NA |
| | | | | | | | 0.03 | NOX | 68.13 | Burner Specification | NA | NA | 2.00 | NA | 8.78 | NA |
| | | | | | | | 0.03 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.02 | NA | 0.08 | NA |
| | | | | | | | 0.03 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.16 | NA | 0.71 | NA |
| | | | | | | | 0.03 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0000 | NA | 0.00 | NA |
| | | | | | | | 0.03 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 3,509 | NA | 15,371 | NA |
| | | | | | | | 0.03 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.07 | NA | 0.29 | NA |
| | | | | | | | 0.03 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.01 | NA | 0.03 | NA |
| | | | | | | | 0.03 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | NA |
| KY2-15 | Natural Gas-fired Office AHUs | 1 | Office AHU Natural Gas Combustion (KY2-OA01 - KY2-OA10) | NA | NA | KY2-OA01_S - KY2-OA10_S | 0.03 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.02 | NA | 0.07 | NA |
| | | | | | | | 0.03 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.01 | NA | 0.06 | NA |
| | | | | | | | 0.03 | CO | 37.70 | Burner Specification | NA | NA | 1.11 | NA | 4.86 | NA |
| | | | | | | | 0.03 | NOX | 68.13 | Burner Specification | NA | NA | 2.00 | NA | 8.78 | NA |
| | | | | | | | 0.03 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.02 | NA | 0.08 | NA |
| | | | | | | | 0.03 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.16 | NA | 0.71 | NA |
| | | | | | | | 0.03 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0000 | NA | 0.00 | NA |
| | | | | | | | 0.03 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 3,509 | NA | 15,371 | NA |
| | | | | | | | 0.03 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.07 | NA | 0.29 | NA |
| | | | | | | | 0.03 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.01 | NA | 0.03 | NA |
| | | | | | | | 0.03 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | 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) |
| KY2-16 | Natural Gas-fired Coater Oven AHUs | 1 | Coater Oven AHU Natural Gas Combustion - Direct (KY2-CO01 - KY2-CO16) | NA | NA | KY2-CO01_S - KY2-CO16_S | 0.08 | PM/PM10 | 0.52 | 2014 NEI Data | NA | NA | 0.04 | NA | 0.18 | NA |
| | | | | | | | 0.08 | PM2.5 | 0.43 | 2014 NEI Data | NA | NA | 0.03 | NA | 0.15 | NA |
| | | | | | | | 0.08 | CO | 37.70 | Burner Specification | NA | NA | 3.05 | NA | 13.34 | NA |
| | | | | | | | 0.08 | NOX | 30.97 | Burner Specification | NA | NA | 2.50 | NA | 10.96 | NA |
| | | | | | | | 0.08 | SO2 | 0.60 | AP-42 Section 1.4 | NA | NA | 0.05 | NA | 0.21 | NA |
| | | | | | | | 0.08 | VOC | 5.50 | AP-42 Section 1.4 | NA | NA | 0.44 | NA | 1.95 | NA |
| | | | | | | | 0.08 | Lead | 0.0005 | AP-42 Section 1.4 | NA | NA | 0.0000 | NA | 0.00 | NA |
| | | | | | | | 0.08 | CO2 | 119,317 | 40 CFR 98 Subpart C | NA | NA | 9,639 | NA | 42,219 | NA |
| | | | | | | | 0.08 | CH4 | 2.25 | 40 CFR 98 Subpart C | NA | NA | 0.18 | NA | 0.80 | NA |
| | | | | | | | 0.08 | N2O | 0.22 | 40 CFR 98 Subpart C | NA | NA | 0.02 | NA | 0.08 | NA |
| | | | | | | | 0.08 | n-Hexane | 0.01 | AP-42 Section 1.4 | NA | NA | 0.00 | NA | 0.00 | NA |

Division for Air Quality

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# DEP7007V
## Applicable Requirements and Compliance Activities

___ Section V.1: Emission and Operating Limitation(s)
___ Section V.2: Monitoring Requirements
___ Section V.3: Recordkeeping Requireme
___ Section V.4: Reporting Requirements
___ Section V.5: Testing Requirements
___ Section V.6: Notes, Comments, and Explanations

**Additional Documentation**

___ Complete DEP7007AI

**Source Name:** BlueOval SK, LLC
**KY EIS (AFS) 21-** 093-00176
**Permit #:** V-21-041 R1
**Agency Interest (AI) II** 170550
**Date:** 12/3/2024

## 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) |
|---|---|---|---|---|---|---|---|
| KY1-01 | Electrode Manufacturing (Cathode Preparation Processes) | NESHAP CCCCCCC: 40 CFR 63.11601(a)(1) | HAP (Nickel) | N/A | N/A | Operate a capture system that minimizes fugitive particulate emissions during the addition of nickel-containing solids to process vessels or grinding and milling equipment. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(2) | | | | Capture particulate emissions and route them to a particulate control device meeting the requirements of this section during the addition of nickel-containing solids to a process vessel. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(3) | | | | When adding nickel-containing material to grinding and milling processes, either capture particulate emissions and route them to a control device meeting the requirements of this section or add these materials only in paste, slurry, or liquid form. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(4) | | | | For grinding and milling equipment processing nickel-containing material, either capture particulate emissions and route them to a control device meeting the requirements of this section, fully enclose the associated equipment while in operation, or ensure the solids are in solution during these processes. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(5) | Opacity | 10% | N/A | Ensure that visible emissions from particulate control devices that vent to the atmosphere do not exceed 10% opacity. | Conduct initial and ongoing quarterly visual determinations of emissions and maintain associated records. |

| 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) |
|---|---|---|---|---|---|---|---|
| KY1-08-1 | Fire Pump Engine Diesel Combustion (KY1-FPE01 - KY1- | NESHAP ZZZZ: 40 CFR 63.6590(c) | N/A | N/A | N/A | Meet the requirements of NESHAP ZZZZ by complying with NSPS IIII. | Comply with NSPS IIII. |
| | | NSPS IIII: 40 CFR 60.4205(c), 60.4206, Table 4, Tier 3 Emission Standards | NMHC + NOx<br>CO<br>PM | 4.0 g/kW-hr<br>3.5 g/kW-hr<br>0.20 g/kW-hr | N/A<br>N/A<br>N/A | Tier 3 emission standard is applicable over the entire life of the engine. | Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4211(c)). |
| | | NSPS IIII: 40 CFR 60.4207(b) | N/A | N/A | N/A | Use diesel fuel that meets requirements of 40 CFR 80.510(b) for nonroad diesel fuel. | Purchase only compliant diesel fuel. |
| | | NSPS IIII: 40 CFR 60.4211(a) | N/A | N/A | N/A | Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions. Change only those emission-related settings that are permitted by the manufacturer. Meet the requirements of 40 CFR parts 89, 94, and/or 1068, as they apply to you. | Maintain records of maintenance conducted on the engine consistent with the operating requirements of 40 CFR 60.4206 and 40 CFR 60.4211(a). |
| | | NSPS IIII: 40 CFR 60.4211(f) | N/A | N/A | N/A | Operate according to the requirements in (f)(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. |
| KY1-08-2 | Generator Engine Diesel Combustion (KY1-GE01 - KY1-GE05) | NESHAP ZZZZ: 40 CFR 63.6590(c) | N/A | N/A | N/A | Meet the requirements of NESHAP ZZZZ by complying with NSPS IIII. | Comply with NSPS IIII. |
| | | NSPS IIII: 40 CFR 60.4205(b), 60.4202(a)(2), Tier 2 Emission Standards from Table 2 to 40 CFR 1039, Appendix I | NMHC + NOx<br>CO<br>PM | 6.4 g/kW-hr<br>3.5 g/kW-hr<br>0.20 g/kW-hr | N/A<br>N/A<br>N/A | Tier 2 emission standard is applicable over the entire life of the engine. | Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4211(c)). |
| | | NSPS IIII: 40 CFR 60.4207(b) | N/A | N/A | N/A | Use diesel fuel that meets requirements of 40 CFR 80.510(b) for nonroad diesel fuel. | Purchase only compliant diesel fuel. |
| | | NSPS IIII: 40 CFR 60.4211(a) | N/A | N/A | N/A | Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions. Change only those emission-related settings that are permitted by the manufacturer. Meet the requirements of 40 CFR parts 89, 94, and/or 1068, as they apply to you. | Maintain records of maintenance conducted on the engine consistent with the operating requirements of 40 CFR 60.4206 and 40 CFR 60.4211(a). |
| | | NSPS IIII: 40 CFR 60.4211(f) | N/A | N/A | N/A | Operate according to the requirements in (f)(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. |

| 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) |
|---|---|---|---|---|---|---|---|
| **Section V.1: Emission and Operating Limitation(s)** | | | | | | | |
| KY2-01 | Electrode Manufacturing (Cathode Preparation Processes) | NESHAP CCCCCCC: 40 CFR 63.11601(a)(1) | HAP (Nickel) | N/A | N/A | Operate a capture system that minimizes fugitive particulate emissions during the addition of nickel-containing solids to process vessels or grinding and milling equipment. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(2) | | | | Capture particulate emissions and route them to a particulate control device meeting the requirements of this section during the addition of nickel-containing solids to a process vessel. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(3) | | | | When adding nickel-containing material to grinding and milling processes, either capture particulate emissions and route them to a control device meeting the requirements of this section or add these materials only in paste, slurry, or liquid form. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(4) | | | | For grinding and milling equipment processing nickel-containing material, either capture particulate emissions and route them to a control device meeting the requirements of this section, fully enclose the associated equipment while in operation, or ensure the solids are in solution during these processes. | Conduct initial and ongoing inspections and monitoring activities in accordance with 40 CFR 63.11602 and maintain associated records. |
| | | NESHAP CCCCCCC: 40 CFR 63.11601(a)(5) | Opacity | 10% | N/A | Ensure that visible emissions from particulate control devices that vent to the atmosphere do not exceed 10% opacity. | Conduct initial and ongoing quarterly visual determinations of emissions and maintain associated records. |
| KY2-08-2 | Generator Engine Diesel Combustion (KY2-GE01 - KY2-[illegible] | NESHAP ZZZZ: 40 CFR 63.6590(c) | N/A | N/A | N/A | Meet the requirements of NESHAP ZZZZ by complying with NSPS IIII. | Comply with NSPS IIII. |
| | | NSPS IIII: 40 CFR 60.4205(b), 60.4202(a)(2), Tier 2 Emission Standards from Table 2 to 40 CFR 1039, Appendix I | NMHC + NOx<br>CO<br>PM | 6.4 g/kW-hr<br>3.5 g/kW-hr<br>0.20 g/kW-hr | N/A<br>N/A<br>N/A | Tier 2 emission standard is applicable over the entire life of the engine. | Purchase engine certified to the emission standards and install and configure according to the manufacturer specifications (60.4211(c)). |
| | | NSPS IIII: 40 CFR 60.4207(b) | N/A | N/A | N/A | Use diesel fuel that meets requirements of 40 CFR 80.510(b) for nonroad diesel fuel. | Purchase only compliant diesel fuel. |
| | | NSPS IIII: 40 CFR 60.4211(a) | N/A | N/A | N/A | Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions. Change only those emission-related settings that are permitted by the manufacturer. Meet the requirements of 40 CFR parts 89, 94, and/or 1068, as they apply to you. | Maintain records of maintenance conducted on the engine consistent with the operating requirements of 40 CFR 60.4206 and 40 CFR 60.4211(a). |
| | | NSPS IIII: 40 CFR 60.4211(f) | N/A | N/A | N/A | Operate according to the requirements in (f)(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 |
|---|---|---|---|---|---|
| KY1-01 | Electrode Manufacturing (Cathode Preparation Processes) | HAP (Nickel) | NESHAP CCCCCCC: 40 CFR 63.11602(a)(1)(ii) & 40 CFR 63.11602(a)(2)(ii) | Control Device Inspections | Conduct initial control device inspections in accordance with this section (i.e., visually inspect system ductwork and control unit for leaks, inspect interior of control system for structural integrity and condition) within 180 days of the compliance date (or prior to startup if control device not operated within 60 days of compliance date). On a weekly basis, conduct ongoing inspections of flexible ductwork to check for leaks. Every 12 months, conduct ongoing inspections of rigid, stationary ductwork to check for leaks and of interior of control system to check for structural integrity and to determine the condition of the fabric filter. |
| | | Opacity | NESHAP CCCCCCC: 40 CFR 63.11602(a)(1)(iv) & 40 CFR 63.11602(a)(2)(iii) | Visible Emissions | Conduct an initial visible emissions test of the control device exhaust consisting of three 1-minute test runs using Method 203C during the addition of nickel-containing solids to a process vessel or grinding and milling equipment within 180 days of the compliance date (or prior to startup if control device not operated within 60 days of compliance date). Every 3 months, conduct a 5-minute visual determination of emissions from the control device during the addition of nickel-containing solids to a process vessel or grinding and milling equipment using Method 22. If visible emissions are observed for two minutes of the 5-minute observation period, complete the additional requirements identified by this section. |

## Section V.2: Monitoring Requirements

| Emission Unit # | Emission Unit Description | Pollutant | Applicable Regulation or Requirement | Parameter Monitored | Description of Monitoring |
|---|---|---|---|---|---|
| KY2-01 | Electrode Manufacturing (Cathode Preparation Processes) | HAP (Nickel) | NESHAP CCCCCCC: 40 CFR 63.11602(a)(1)(ii) & 40 CFR 63.11602(a)(2)(ii) | Control Device Inspections | Conduct initial control device inspections in accordance with this section (i.e., visually inspect system ductwork and control unit for leaks, inspect interior of control system for structural integrity and condition) within 180 days of the compliance date (or prior to startup if control device not operated within 60 days of compliance date). On a weekly basis, conduct ongoing inspections of flexible ductwork to check for leaks. Every 12 months, conduct ongoing inspections of rigid, stationary ductwork to check for leaks and of interior of control system to check for structural integrity and to determine the condition of the fabric filter. |
| | | Opacity | NESHAP CCCCCCC: 40 CFR 63.11602(a)(1)(iv) & 40 CFR 63.11602(a)(2)(iii) | Visible Emissions | Conduct an initial visible emissions test of the control device exhaust consisting of three 1-minute test runs using Method 203C during the addition of nickel-containing solids to a process vessel or grinding and milling equipment within 180 days of the compliance date (or prior to startup if control device not operated within 60 days of compliance date). Every 3 months, conduct a 5-minute visual determination of emissions from the control device during the addition of nickel-containing solids to a process vessel or grinding and milling equipment using Method 22. If visible emissions are observed for two minutes of the 5-minute observation period, complete the additional requirements identified by this section. |

## Section V.3: Recordkeeping Requirements

| Emission Unit # | Emission Unit Description | Pollutant | Applicable Regulation or Requirement | Parameter Recorded | Description of Recordkeeping |
|---|---|---|---|---|---|
| KY1-01 | Electrode Manufacturing (Cathode Preparation Processes) | HAP (Nickel) | NESHAP CCCCCCC: 40 CFR 63.11602(b) & 40 CFR 63.11602(c) | Control Device Inspections | For each control device inspection, record the associated date/place/time, person conducting the inspection, method used, operating conditions during inspection, results of inspection, and description of corrective actions taken (if applicable). Maintain these records, as well as notifications and reports required by this regulation, for a period of 5 years following the date of each recorded action. These records must be kept onsite for at least 2 years. |
| | | Opacity | NESHAP CCCCCCC: 40 CFR 63.11602(b) & 40 CFR 63.11602(c) | Visible Emissions | For each visible emissions observation/test, record the associated date/place/time, person conducting the observation, method used, operating conditions during observation, results of observation, and description of corrective actions taken (if applicable). Maintain these records for a period of 5 years following the date of each recorded action. These records must be kept onsite for at least 2 years. |

## Section V.3: Recordkeeping Requirements

| Emission Unit # | Emission Unit Description | Pollutant | Applicable Regulation or Requirement | Parameter Recorded | Description of Recordkeeping |
|---|---|---|---|---|---|
| KY2-01 | Electrode Manufacturing (Cathode Preparation Processes) | HAP (Nickel) | NESHAP CCCCCCC: 40 CFR 63.11602(b) & 40 CFR 63.11602(c) | Control Device Inspections | For each control device inspection, record the associated date/place/time, person conducting the inspection, method used, operating conditions during inspection, results of inspection, and description of corrective actions taken (if applicable). Maintain these records, as well as notifications and reports required by this regulation, for a period of 5 years following the date of each recorded action. These records must be kept onsite for at least 2 years. |
| | | Opacity | NESHAP CCCCCCC: 40 CFR 63.11602(b) & 40 CFR 63.11602(c) | Visible Emissions | For each visible emissions observation/test, record the associated date/place/time, person conducting the observation, method used, operating conditions during observation, results of observation, and description of corrective actions taken (if applicable). Maintain these records for a period of 5 years following the date of each recorded action. These records must be kept onsite for at least 2 years. |

## Section V.4: Reporting Requirements

| Emission Unit # | Emission Unit Description | Pollutant | Applicable Regulation or Requirement | Parameter Reported | Description of Reporting |
|---|---|---|---|---|---|
| KY1-01 | Electrode Manufacturing (Cathode Preparation Processes) | N/A | NESHAP CCCCCCC: 40 CFR 63.11603(a)(1) | Initial Notification | Submit an initial notification no later than 180 days after initial startup of the operations. The notification must include the information in paragraphs (a)(1)(i)-(iii) of this section. |
| | | N/A | NESHAP CCCCCCC: 40 CFR 63.11603(a)(2) | Notification of Compliance Status | Submit a Notification of Compliance Status (NOCS) within 180 days after initial startup. The NOCS must include the information in paragraphs (a)(2)(i)-(ii) of this section. |
| | | N/A | NESHAP CCCCCCC: 40 CFR 63.11603(b) | Annual Compliance Certification Reports | Annual compliance certification reports for each calendar year must be prepared by January 31st of the following year in accordance with the requirements of paragraphs (b)(1)-(3) of this section and maintained onsite. If a deviation from the requirements of this subpart occurred during the annual period, then this report must be submitted along with a deviation report and postmarked by February 15th. If a deviation report is required, it must include a description of the deviation(s), the associated time period(s), and the corresponding corrective action(s). |

## Section V.4: Reporting Requirements

| Emission Unit # | Emission Unit Description | Pollutant | Applicable Regulation or Requirement | Parameter Reported | Description of Reporting |
|---|---|---|---|---|---|
| KY2-01 | Electrode Manufacturing (Cathode Preparation Processes) | N/A | NESHAP CCCCCCC: 40 CFR 63.11603(a)(1) | Initial Notification | Submit an initial notification no later than 180 days after initial startup of the operations. The notification must include the information in paragraphs (a)(1)(i)-(iii) of this section. |
| | | N/A | NESHAP CCCCCCC: 40 CFR 63.11603(a)(2) | Notification of Compliance Status | Submit a Notification of Compliance Status (NOCS) within 180 days after initial startup. The NOCS must include the information in paragraphs (a)(2)(i)-(ii) of this section. |
| | | N/A | NESHAP CCCCCCC: 40 CFR 63.11603(b) | Annual Compliance Certification Reports | Annual compliance certification reports for each calendar year must be prepared by January 31st of the following year in accordance with the requirements of paragraphs (b)(1)-(3) of this section and maintained onsite. If a deviation from the requirements of this subpart occurred during the annual period, then this report must be submitted along with a deviation report and postmarked by February 15th. If a deviation report is required, it must include a description of the deviation(s), the associated time period(s), and the corresponding corrective action(s). |

## Section V.5: Testing Requirements

| Emission Unit # | Emission Unit Description | Pollutant | Applicable Regulation or Requirement | Parameter Tested | Description of Testing |
|---|---|---|---|---|---|
| KY1-01 | Electrode Manufacturing (Cathode Preparation Processes) | Opacity | NESHAP CCCCCCC: 40 CFR 63.11602(a)(1)(iv) | Visible Emissions (Initial) | For each particulate control device, conduct an initial visible emission test consisting of three 1-minute test runs using Method 203C (40 CFR 51, Appendix M). The visible emission test runs must be performed during the addition of nickel-containing solids to a process vessel or grinding and milling equipment. If the average test results indicate an opacity greater than 10%, take corrective action and retest within 15 days. |
| | | | NESHAP CCCCCCC: 40 CFR 63.11602(a)(2)(iii) | Visible Emissions (Ongoing) | For each particulate control device, conduct ongoing visible emission determinations over a 5-minute observation period using Method 22 (40 CFR 60, Appendix A-7) during the addition of nickel-containing solids to a process vessel or grinding and milling equipment. If visible emissions are observed for two minutes of the 5-minute observation period, conduct a Method 203C (40 CFR 51, Appendix M) test within 15 days using the same methodology described for the initial visible emissions test. If the test result exceeds 10% opacity, take corrective action and retest using Method 203C within 15 days. |

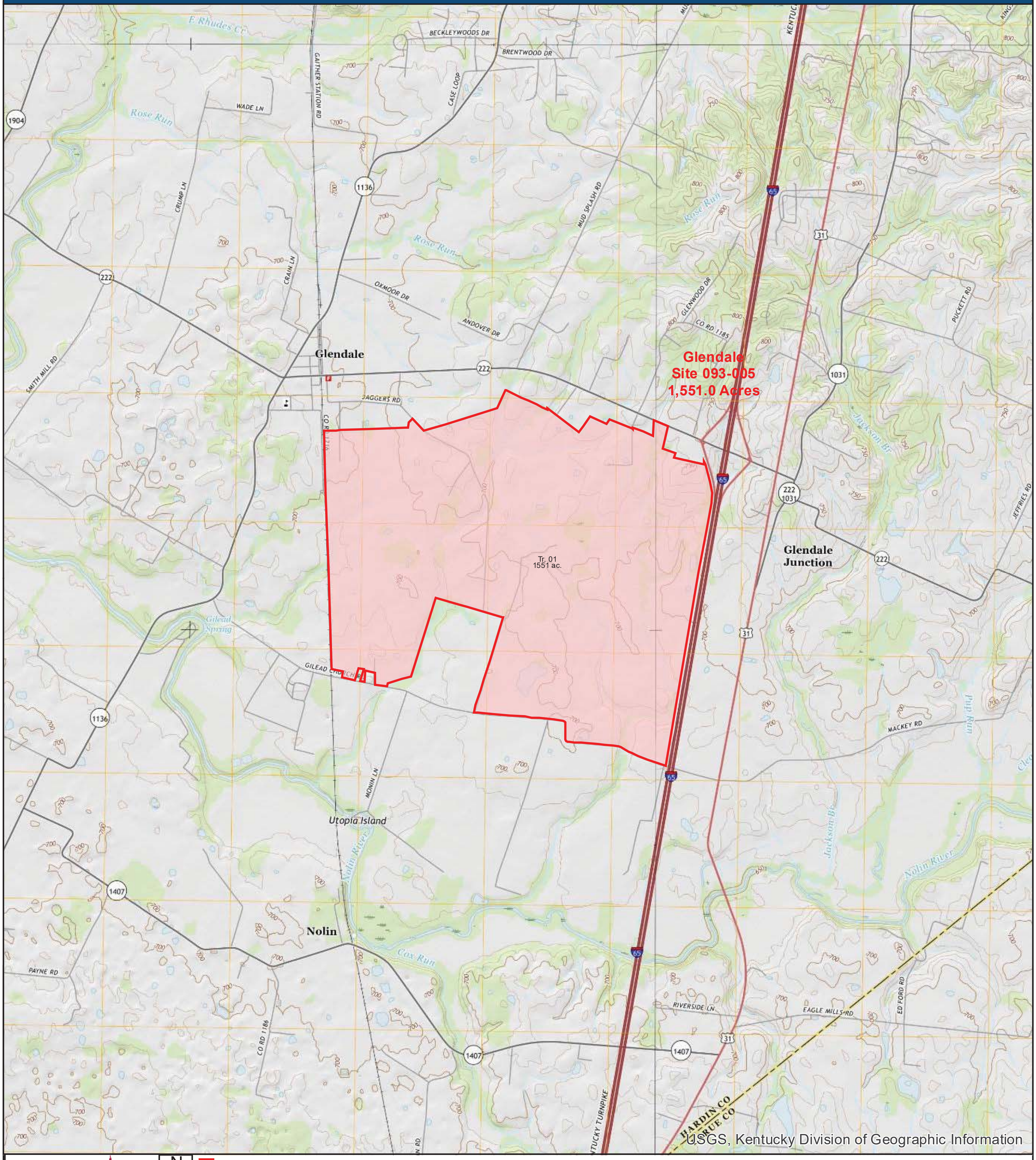
## Section V.5: Testing Requirements

| Emission Unit # | Emission Unit Description | Pollutant | Applicable Regulation or Requirement | Parameter Tested | Description of Testing |
|---|---|---|---|---|---|
| KY2-01 | Electrode Manufacturing (Cathode Preparation Processes) | Opacity | NESHAP CCCCCCC: 40 CFR 63.11602(a)(1)(iv) | Visible Emissions (Initial) | For each particulate control device, conduct an initial visible emission test consisting of three 1-minute test runs using Method 203C (40 CFR 51, Appendix M). The visible emission test runs must be performed during the addition of nickel-containing solids to a process vessel or grinding and milling equipment. If the average test results indicate an opacity greater than 10%, take corrective action and retest within 15 days. |
| | | | NESHAP CCCCCCC: 40 CFR 63.11602(a)(2)(iii) | Visible Emissions (Ongoing) | For each particulate control device, conduct ongoing visible emission determinations over a 5-minute observation period using Method 22 (40 CFR 60, Appendix A-7) during the addition of nickel-containing solids to a process vessel or grinding and milling equipment. If visible emissions are observed for two minutes of the 5-minute observation period, conduct a Method 203C (40 CFR 51, Appendix M) test within 15 days using the same methodology described for the initial visible emissions test. If the test result exceeds 10% opacity, take corrective action and retest using Method 203C within 15 days. |

| **Section V.6: Notes, Comments, and Explanations** |
|---|
| These DEP7007V forms are limited to changes in regulatory applicability relative to the current permit (V-21-041 R1). Specifically, updated emission standards for the emergency engines (KY1-08 and KY2-08) and the revised regulatory applicability for electrode manufacturing processes (KY1-01 and KY2-01) are included. |
| Based on the BOSK site's reclassification as an area source of HAP emissions, the federal standards for major sources of HAP (40 CFR 63 Subparts DDDDD and HHHHH) no longer apply and should be removed from the permit. |
| As an area source of HAP emissions, the initial notification requirements of 40 CFR 63 Subpart ZZZZ no longer apply. Specifically, per 40 CFR 63.6590(c), the engines meet the requirements of 40 CFR 63 Subpart ZZZZ by meeting the requirements of 40 CFR 60 Subpart IIII and "No further requirements apply for such engines under this part." |
| |
| |
| |
| |
| |
| |

# APPENDIX B. SITE PLAN

# Glendale MegaSite
## Glendale, KY | Hardin County
## Site 093-005 | 1,551.0 Acres Available




SELECT KENTUCKY

N

Shovel Ready Site Boundary
Vacant Tract

0 750 1,500 3,000 Feet
0 150 300 600 Meters

All information regarding property is from sources deemed reliable, but no warranty or representation is made by the Commonwealth of Kentucky or any of its agencies as to its accuracy. It is subject to errors, omissions, change of price, prior sale, lease or withdrawal without our knowledge. Further, no warranty or representation is made as to the environmental suitability or condition of the property.

Map Date: 3/12/2021

Datasheet: https://properties.zoomprospector.com/KENTUCKY/property/admin/38b42f31-83fe-4928-b6cb-bcc98298959e Google Map: http://maps.google.com/maps?t=h&q=37.58706,-85.88731

# APPENDIX C. DETAILED EMISSION CALCULATIONS

## BlueOval SK, LLC Glendale, KY Plant
## PSD Applicability Summary

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| EU ID(s) | Source Group | PM (tpy) | $PM_{10}$ (tpy) | $PM_{2.5}$ (tpy) | CO (tpy) | $NO_X$ (tpy) | $SO_2$ (tpy) | VOC (tpy) | Lead (tpy) | $CO_2e$ [3] (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|
| 06 & 07 | Fossil-Fuel Boilers and Heaters | 1.74 | 1.74 | 1.44 | 126.24 | 67.50 | 2.01 | 18.41 | 1.7E-03 | 399,487 |
| 01 | Electrode Manufacturing | 1.76 | 1.76 | 1.76 | -- | -- | -- | 297.56 | -- | -- |
| 02 | Battery Assembly | 0.27 | 0.27 | 0.27 | -- | -- | -- | 16.75 | -- | -- |
| 03 | Battery Formation | -- | -- | -- | -- | -- | -- | 91.22 | -- | -- |
| 04 | Cell Discharge | -- | -- | -- | -- | -- | -- | 23.57 | -- | -- |
| 05 | Lab Activities | -- | -- | -- | -- | -- | -- | 23.17 | -- | -- |
| 08 | Emergency Engines | 1.13 | 1.13 | 1.13 | 19.85 | 35.13 | 0.65 | 35.13 | -- | 3,952 |
| 09 | Cooling Towers | 1.05 | 0.90 | 3.9E-03 | -- | -- | -- | -- | -- | -- |
| 10 | Storage Tanks | -- | -- | -- | -- | -- | -- | 0.23 | -- | -- |
| 11 & 12 | Fugitive Sources (Roadways, Printing) | 10.21 | 2.08 | 0.49 | -- | -- | -- | 1.90 | -- | -- |
| 13 & 16 | Misc. Natural Gas Combustion - Direct (Fug) | 0.78 | 0.78 | 0.64 | 41.58 | 109.02 | 0.42 | 8.24 | 7.5E-04 | 178,799 |
| 13-16 | Misc. Natural Gas Combustion - Indirect | 0.27 | 0.27 | 0.22 | 19.43 | 35.11 | 0.31 | 2.83 | 2.6E-04 | 61,547 |
| N/A | Nested Sources Total | 2.0 | 2.0 | 1.7 | 145.7 | 102.6 | 2.3 | 21.2 | 1.9E-03 | 461,034 |
| **Facility-Wide PTE - Point Sources** | | **6.2** | **6.1** | **4.8** | **165.5** | **137.7** | **3.0** | **508.9** | **1.9E-03** | **464,986** |
| **Facility-Wide PTE - All Sources** | | **17.2** | **8.9** | **6.0** | **207.1** | **246.7** | **3.4** | **519.0** | **2.7E-03** | **643,785** |
| **PSD Major - Nested Source [1]** | | **No** | **No** | **No** | **Yes** | **Yes** | **No** | **No** | **No** | **Yes** |
| **PSD Major - Facility-Wide Point [2]** | | **No** | **No** | **No** | **No** | **No** | **No** | **Yes** | **No** | **--** |
| **Significant Emission Rates** | | **25** | **15** | **10** | **100** | **40** | **40** | **40** | **0.6** | **75,000** |
| **Major Modification [3]** | | **No** | **No** | **No** | **--** | **--** | **No** | **--** | **No** | **--** |
| **PSD Triggered** | | **No** | **No** | **No** | **Yes** | **Yes** | **No** | **Yes** | **No** | **Yes** |

1. Fossil-fuel boilers totalling more than 250 MMBtu/hr heat input is a listed source under 401 KAR 51:001, Section 1(118)(a). Therefore, these sources alone are a nested source within the facility. Major source status is determined by a 100 tpy threshold.
2. The entire facility, including the nested fossil fuel boilers, becomes major with respect to PSD if the facility-wide emissions exceed 250 tpy. Since the facility as a whole is not a listed source, fugitive emissions are excluded pursuant to 401 KAR 51:001, Section
3. Once a facility has triggered PSD for a pollutant, remaining pollutants are compared to the significant emission rates to determine if a major modification is occurring. If only the nested source is major (i.e., the facility-wide PTE does not exceed 250 tpy for any pollutant), only the nested source emissions are compared to the significant emission rates. Otherwise, the facility-wide source emissions are compared to the significant emission rates.

**BlueOval SK, LLC Glendale, KY Plant**
**KY1 Emissions Summary**

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | CAS | EU KY1-01: Electrode Manufacturing | | EU KY1-02: Battery Assembly | | EU KY1-03: Battery Formation | | EU KY1-04: Cell Discharge | | EU KY1-05: Laboratories | | EU KY1-06: Natural Gas-fired Boilers & EU KY1-07: Natural Gas-fired Hot Oil Heaters | | EU KY1-08: Emergency Engines | | EU KY1-09: Cooling Towers | | EU KY1-10: Storage Tanks | | EU KY1-11: Printing | | EU KY1-12: Paved Haul Roads | | EUs KY2-13 - KY2-16: Misc. Natural Gas Combustion | | Facility Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) |
| PM | N/A | 0.17 | 0.99 | 6.13E-02 | 0.27 | -- | -- | -- | -- | -- | -- | 0.20 | 0.87 | 2.58 | 0.64 | 1.2E-01 | 0.53 | -- | -- | -- | -- | 2.38 | 10.21 | 0.12 | 0.52 | 5.63 | 14.04 |
| $PM_{10}$ | N/A | 0.17 | 0.99 | 6.13E-02 | 0.27 | -- | -- | -- | -- | -- | -- | 0.20 | 0.87 | 2.58 | 0.64 | 1.0E-01 | 0.45 | -- | -- | -- | -- | 0.48 | 2.08 | 0.12 | 0.52 | 3.71 | 5.82 |
| $PM_{2.5}$ | N/A | 0.17 | 0.99 | 6.13E-02 | 0.27 | -- | -- | -- | -- | -- | -- | 0.16 | 0.72 | 2.58 | 0.64 | 4.5E-04 | 2.0E-03 | -- | -- | -- | -- | 0.11 | 0.49 | 0.10 | 0.43 | 3.19 | 3.55 |
| CO | 630-08-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.41 | 63.12 | 45.08 | 11.27 | -- | -- | -- | -- | -- | -- | -- | -- | 6.96 | 30.50 | 66.46 | 104.89 |
| $NO_X$ | N/A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.71 | 33.75 | 77.71 | 19.43 | -- | -- | -- | -- | -- | -- | -- | -- | 16.45 | 72.06 | 101.87 | 125.24 |
| $SO_2$ | 7446-09-5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.23 | 1.00 | 2.53 | 0.63 | -- | -- | -- | -- | -- | -- | -- | -- | 0.14 | 0.60 | 2.90 | 2.24 |
| VOC | N/A | 30.45 | 133.39 | 1.91 | 8.37 | 10.41 | 45.61 | 3.70 | 16.21 | 2.45 | 10.74 | 2.10 | 9.21 | 77.71 | 19.43 | -- | -- | 2.6E-02 | 0.11 | 0.22 | 0.95 | -- | -- | 1.26 | 5.54 | 130.25 | 249.55 |
| Lead | 7439-92-1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.9E-04 | 8.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.15E-04 | 5.03E-04 | 3.06E-04 | 1.34E-03 |
| $CO_2$ | 124-38-9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45,604 | 199,743.73 | 8,943 | 2,236 | -- | -- | -- | -- | -- | -- | -- | -- | 27,419 | 120,097 | 81,966 | 322,077 |
| $CH_4$ | 74-82-8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.86 | 3.76 | 0.36 | 0.09 | -- | -- | -- | -- | -- | -- | -- | -- | 0.52 | 2.26 | 1.74 | 6.12 |
| $N_2O$ | 10024-97-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.09 | 0.38 | 7.3E-02 | 1.8E-02 | -- | -- | -- | -- | -- | -- | -- | -- | 0.05 | 0.23 | 0.21 | 0.62 |
| $CO_2e$ | N/A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45,651 | 199,950 | 8,973 | 2,243 | -- | -- | -- | -- | -- | -- | -- | -- | 27,448 | 120,221 | 82,072 | 322,415 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | CAS | EU KY1-01: Electrode Manufacturing | | EU KY1-02: Battery Assembly | | EU KY1-03: Battery Formation | | EU KY1-04: Cell Discharge | | EU KY1-05: Laboratories | | EU KY1-06: Natural Gas-fired Boilers & EU KY1-07: Natural Gas-fired Hot Oil Heaters | | EU KY1-08: Emergency Engines | | EU KY1-09: Cooling Towers | | EU KY1-10: Storage Tanks | | EU KY1-11: Printing | | EU KY1-12: Paved Haul Roads | | EUs KY2-13 - KY2-16: Misc. Natural Gas Combustion | | Facility Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) |
| 1,3-Butadiene | 106-99-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.3E-04 | 8.2E-05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.3E-04 | 8.2E-05 |
| 1,3-Propane Sultone | 1120-71-4 | -- | -- | 0.16 | 0.69 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.7E-05 | 3.8E-04 | -- | -- | -- | -- | -- | -- | 0.16 | 0.69 |
| Acetaldehyde | 75-07-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2E-03 | 2.9E-04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.2E-03 | 2.9E-04 |
| Acetonitrile | 75-05-8 | -- | -- | 0.60 | 2.64 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.60 | 2.64 |
| Acrolein | 107-02-8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.7E-04 | 9.2E-05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.7E-04 | 9.2E-05 |
| Arsenic | 7440-38-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.6E-05 | 3.3E-04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.6E-05 | 2.0E-04 | 1.2E-04 | 5.4E-04 |
| Benzene | 71-43-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.0E-04 | 3.5E-03 | 3.6E-02 | 9.0E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 4.8E-04 | 2.1E-03 | 3.7E-02 | 1.5E-02 |
| Beryllium | 7440-41-7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.6E-06 | 2.0E-05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.8E-06 | 1.2E-05 | 7.3E-06 | 3.2E-05 |
| Cadmium | 7440-43-6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.2E-04 | 1.8E-03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.5E-04 | 1.1E-03 | 6.7E-04 | 2.9E-03 |
| Chromium | 7440-47-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.4E-04 | 2.3E-03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.2E-04 | 1.4E-03 | 8.6E-04 | 3.8E-03 |
| Cobalt | 7440-48-4 | 3.3E-04 | 2.7E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 3.2E-05 | 1.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.9E-05 | 8.5E-05 | 3.9E-04 | 2.9E-03 |
| Dichlorobenzene | 106-46-7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.6E-04 | 2.0E-03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.8E-04 | 1.2E-03 | 7.3E-04 | 3.2E-03 |
| Formaldehyde | 50-00-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.9E-02 | 0.13 | 3.7E-03 | 9.2E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.7E-02 | 7.5E-02 | 5.0E-02 | 0.20 |
| Hexane, n- | 110-54-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.01 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.00 | 0.01 | 0.00 | 0.01 |
| Hydrochloric acid | 7647-01-0 | -- | -- | -- | -- | -- | -- | 0.49 | 2.16 | 0.25 | 1.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.74 | 3.26 |
| Lead | 7439-92-1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.9E-04 | 8.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.1E-04 | 5.0E-04 | 3.1E-04 | 1.3E-03 |
| Manganese | 7439-96-5 | 2.6E-04 | 2.1E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.5E-04 | 6.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.7E-05 | 3.8E-04 | 4.9E-04 | 3.1E-03 |
| Mercury | 7439-97-6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.9E-05 | 4.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6.0E-05 | 2.6E-04 | 1.6E-04 | 7.0E-04 |
| Naphthalene | 91-20-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.3E-04 | 1.0E-03 | 6.0E-03 | 1.5E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.4E-04 | 6.1E-04 | 6.4E-03 | 3.1E-03 |
| Nickel | 7440-02-0 | 4.1E-04 | 3.3E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 8.0E-04 | 3.5E-03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.8E-04 | 2.1E-03 | 1.7E-03 | 8.9E-03 |
| POM | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.7E-04 | 1.2E-03 | 9.8E-03 | 2.5E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.6E-04 | 7.0E-04 | 1.0E-02 | 4.3E-03 |
| Selenium | 7782-49-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.2E-06 | 4.0E-05 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.3E-07 | 2.3E-06 | 9.7E-06 | 4.2E-05 |
| Toluene | 108-88-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3E-03 | 5.7E-03 | 1.3E-02 | 3.3E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 4.0E-08 | 1.7E-07 | 1.4E-02 | 9.0E-03 |
| Xylenes | 1330-20-7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.0E-03 | 2.2E-03 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.0E-03 | 2.2E-03 |
| **Max HAP** | | **4.1E-04** | **3.3E-03** | **0.60** | **2.64** | **--** | **--** | **0.49** | **2.16** | **0.25** | **1.10** | **0.02** | **0.09** | **3.0E-02** | **7.5E-03** | **--** | **--** | **8.7E-05** | **3.8E-04** | **--** | **--** | **--** | **--** | **0.02** | **0.08** | **0.74** | **3.26** |
| **Total HAP** | | **1.0E-03** | **8.1E-03** | **0.76** | **3.33** | **--** | **--** | **0.49** | **2.16** | **0.25** | **1.10** | **0.02** | **0.11** | **0.06** | **1.5E-02** | **--** | **--** | **8.7E-05** | **3.8E-04** | **--** | **--** | **--** | **--** | **0.02** | **0.10** | **1.61** | **6.82** |

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-01: Electrode Manufacturing

**Calculation Inputs**

| | |
|---|---|
| Cathode Composition[1] | |
| Nickel Compounds | 0.625 % |
| Cobalt Compounds | 0.513 % |
| Manganese Compounds | 0.400 % |
| NMP Molecular Weight | 99.13 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

1. Nickel compounds and manganese compounds concentrations based on testing data at a similar facility. Cobalt compounds concentration assumed to be the average of nickel compounds and manganese compounds.

**Solids Processing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions[1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions[1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions[1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Powder Room: Anode Measure | 1 | KY1-PR01 - KY1-PR08 | KY1-DC01 - KY1-DC27 | Controlled by KY1-DC01 - KY1-DC27 | | | | | | | | | | |
| Powder Room: Cathode Measure | 2 | KY1-PR09 - KY1-PR16 | KY1-DC01 - KY1-DC27 | | | | | | | | | | | |
| Powder Room: Anode Feed | 3 | KY1-PR17 - KY1-PR24 | KY1-DC01 - KY1-DC27 | | | | | | | | | | | |
| Powder Room: Cathode Feed | 4 | KY1-PR25 - KY1-PR32 | KY1-DC01 - KY1-DC27 | | | | | | | | | | | |
| Cathode Powder Vacuum Pump | 5 | KY1-PR33 - KY1-PR40 | N/A | 706 | 0.01 | 90% | 8 | N/A | 6.1E-03 | 2.7E-02 | 6.1E-03 | 2.7E-02 | 4.84E-02 | 2.12E-01 |
| | | | KY1-DC01 - KY1-DC06 | 2,580 | 8.54E-05 | 0% | 30 | 5 | 3.8E-04 | 1.7E-03 | 1.9E-03 | 8.3E-03 | 1.13E-02 | 4.96E-02 |
| Cathode Powder | 6 | KY1-PR41 - KY1-PR75 | KY1-DC07 | 2,580 | 8.54E-05 | 0% | 3 | 3 | 6.3E-04 | 2.8E-03 | 1.9E-03 | 8.3E-03 | 1.89E-03 | 2.48E-01 |
| | | | KY1-DC08 - KY1-DC09 | 361 | 5.98E-04 | 0% | 2 | 1 | 1.8E-03 | 8.1E-03 | 1.8E-03 | 8.1E-03 | 3.70E-03 | 1.62E-02 |
| | | | KY1-DC10 - KY1-DC18 | 2,580 | 8.54E-05 | 0% | 63 | 7 | 2.7E-04 | 1.2E-03 | 1.9E-03 | 8.3E-03 | 1.70E-02 | 7.44E-02 |
| Anode Powder | 9 | KY1-PR92 - KY1-PR172 | KY1-DC19 | 2,580 | 8.54E-05 | 0% | 10 | 10 | 1.9E-04 | 8.3E-04 | 1.9E-03 | 8.3E-03 | 1.89E-03 | 8.27E-03 |
| | | | KY1-DC20 - KY1-DC24 | 361 | 5.98E-04 | 0% | 5 | 1 | 1.8E-03 | 8.1E-03 | 1.8E-03 | 8.1E-03 | 9.25E-03 | 4.05E-02 |
| | | | KY1-DC24 - KY1-DC27 | 361 | 5.98E-04 | 0% | 3 | 1 | 1.8E-03 | 8.1E-03 | 1.8E-03 | 8.1E-03 | 5.55E-03 | 2.43E-02 |
| Anode Mixer Vacuum Pump | 7 | KY1-PR76 - KY1-PR83 | N/A | 353 | 0.01 | 90% | 8 | N/A | 3.0E-03 | 1.3E-02 | 3.0E-03 | 1.3E-02 | 2.42E-02 | 1.06E-01 |
| Anode Powder Vacuum Pump | 8 | KY1-PR84 - KY1-PR91 | N/A | 706 | 0.01 | 90% | 8 | N/A | 6.1E-03 | 2.7E-02 | 6.1E-03 | 2.7E-02 | 4.84E-02 | 2.12E-01 |
| **Totals** | | | | | | | | | **2.21E-02** | **9.70E-02** | **2.82E-02** | **1.24E-01** | **0.17** | **0.99** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. TCEQ RG 058 February 2002, Table 7

**Solids Processing - Hazardous Air Pollutant Potential Emissions**

| Pollutant | Process ID | Per Source Potential Emissions[1] (lb/hr) | (tpy) | Per Stack Potential Emissions[1] (lb/hr) | (tpy) | Total Potential Emissions[1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|
| Nickel Compounds | 2, 4, 5, 6 | 5.6E-05 | 2.4E-04 | 7.3E-05 | 3.2E-04 | 4.1E-04 | 3.3E-03 |
| Cobalt Compounds | 2, 4, 5, 6 | 4.6E-05 | 2.0E-04 | 6.0E-05 | 2.6E-04 | 3.3E-04 | 2.7E-03 |
| Manganese Compounds | 2, 4, 5, 6 | 3.6E-05 | 1.6E-04 | 4.7E-05 | 2.0E-04 | 2.6E-04 | 2.1E-03 |
| **Max HAP** | | **5.6E-05** | **2.4E-04** | **7.3E-05** | **3.2E-04** | **4.1E-04** | **3.3E-03** |
| **Total HAP** | | **1.4E-04** | **6.0E-04** | **1.8E-04** | **7.9E-04** | **1.0E-03** | **8.1E-03** |

1. PTE (tpy) = [Cathode Measure PM PTE (tpy) + Cathode Feed PM PTE (tpy) + Cathode Powder Vacuum Pump (tpy) + Cathode Powder (tpy)] x Cathode Composition

**Electrode Processing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | VOC as NMP Concentration (ppmv) | Number of Sources[1] | Number of Sources per Control Device | VOC Per Source Potential Emissions[2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions[2] (lb/hr) | (tpy) | VOC Total Potential Emissions[2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode/Anode Processing | 10 | KY1-CP01 - KY1-CP60 | KY1-AC01 | 13,014 | 4.5 | 60 | 60 | 1.5E-02 | 6.6E-02 | 0.90 | 3.96 | 0.90 | 3.96 |
| Electrode Cleaning | 11 | KY1-CR01 - KY1-CR21 | KY1-AC02 | 15,270 | 4.5 | 12 | 12 | 0.09 | 0.39 | 1.06 | 4.65 | 1.06 | 4.65 |
| | | | KY1-AC03 | 12,840 | 4.5 | 9 | 9 | 0.10 | 0.43 | 0.89 | 3.91 | 0.89 | 3.91 |
| **Totals** | | | | | | | | **0.20** | **0.89** | **2.86** | **12.51** | **2.86** | **12.51** |

1. KY1-AC01 is connected to 33 emission sources and 27 day tanks. KY1-AC02 is connected to 8 emission sources and 4 lab exhausts. KY1-AC03 is connected to 9 lab exhausts.
2. PTE (tpy) = Air Flow (scfm) x VOC as NMP Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x NMP Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

**Cathode Drying - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | VOC as NMP Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | VOC Per Source Potential Emissions[1] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions[1] (lb/hr) | (tpy) | VOC Total Potential Emissions[1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Drying | 12 | KY1-DR01 - KY1-DR08 | KY1-SC01 - KY1-SC08 | 111,732 | 2 | 8 | 1 | 3.45 | 15.11 | 3.45 | 15.11 | 27.60 | 120.87 |
| **Totals** | | | | | | | | **3.45** | **15.11** | **3.45** | **15.11** | **27.60** | **120.87** |

1. PTE (tpy) = Air Flow (scfm) x VOC as NMP Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x NMP Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-02: Battery Assembly

**Calculation Inputs**

| | |
|---|---|
| NMP Molecular Weight | 99.13 lb/lb-mol |
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Electrode Notching Processing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Notching | 1 | KY1-CN01 - KY1-CN56 | KY1-DC28 - KY1-DC34 | 16,150 | 5.25E-07 | 90% | 56 | 8 | 9.1E-07 | 4.0E-06 | 7.3E-06 | 3.2E-05 | 5.1E-05 | 2.23E-04 |
| Anode Notching | 2 | KY1-AN01 - KY1-AN56 | KY1-DC35 - KY1-DC41 | 16,150 | 5.25E-07 | 90% | 56 | 8 | 9.1E-07 | 4.0E-06 | 7.3E-06 | 3.2E-05 | 5.1E-05 | 2.23E-04 |
| **Totals** | | | | | | | | | **1.8E-06** | **8.0E-06** | **1.5E-05** | **6.37E-05** | **1.02E-04** | **4.46E-04** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. TCEQ RG 058 February 2002, Table 7

**Anode / Cathode Press - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Press | 6 | KY1-CS01 - KY1-CS13 | KY1-DC42 - KY1-DC43 | 7,044 | 1.20E-06 | 0% | 8 | 4 | 1.81E-05 | 7.94E-05 | 7.2E-05 | 3.18E-04 | 1.45E-04 | 6.35E-04 |
| Anode Press | 7 | KY1-AS01 - KY1-AS17 | KY1-DC44 - KY1-DC45 | 13,102 | 6.46E-07 | 0% | 8 | 4 | 1.81E-05 | 7.94E-05 | 7.2E-05 | 3.18E-04 | 1.45E-04 | 6.35E-04 |
| **Totals** | | | | | | | | | **3.62E-05** | **1.59E-04** | **1.45E-04** | **6.35E-04** | **2.90E-04** | **1.27E-03** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. Vents outdoors (no internal venting).

**Anode / Cathode Press - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [2] (lb/hr) | (tpy) | VOC Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Press | 6 | KY1-CS01 - KY1-CS13 | KY1-AC06 | E-FAN-2111-A | 3,818 | 6 | 13 | 13 | 2.9E-02 | 1.3E-01 | 0.38 | 1.67 | 0.38 | 1.67 |
| Anode Press | 7 | KY1-AS01 - KY1-AS17 | KY1-AC07 | A-FAN-2231-A | 6,966 | 6 | 17 | 17 | 4.1E-02 | 1.8E-01 | 0.70 | 3.05 | 0.70 | 3.05 |
| **Totals** | | | | | | | | | **7.0E-02** | **3.1E-01** | **1.08** | **4.72** | **1.08** | **4.72** |

1. KY1-AC06 connected to 8 emission sources and 5 lab exhausts. KY1-AC07 connected to 8 emission sources and 9 lab exhausts.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton; where VOC includes acetonitrile contribution.

**Anode / Cathode Slitting - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Slitting | 3 | KY1-CL01 - KY1-CL10 | KY1-DC42 - KY1-DC43 | 7,754 | 1.07E-06 | 0% | 10 | 5 | 1.43E-05 | 6.25E-05 | 7.1E-05 | 3.13E-04 | 1.43E-04 | 6.25E-04 |
| Anode Slitting | 4 | KY1-AL01 - KY1-AL10 | KY1-DC44 - KY1-DC45 | 7,754 | 1.07E-06 | 0% | 10 | 5 | 1.43E-05 | 6.25E-05 | 7.1E-05 | 3.13E-04 | 1.43E-04 | 6.25E-04 |
| **Totals** | | | | | | | | | **2.85E-05** | **1.25E-04** | **1.43E-04** | **6.25E-04** | **2.85E-04** | **1.25E-03** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. Vents outdoors (no internal venting).

**Tab Welding - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ultrasonic Welding of Anode and Cathode Tabs (BME) | 8 | KY1-WB01 - KY1-WB16 | KY1-DC50 - KY1-DC53 | 12,308 | 6.83E-07 | 90% | 16 | 4 | 1.80E-06 | 7.89E-06 | 7.2E-06 | 3.2E-05 | 2.9E-05 | 1.26E-04 |
| Ultrasonic Welding of Anode and Cathode Tabs (SK) | 9 | KY1-WS01 - KY1-WS16 | KY1-DC54 - KY1-DC69 | 960 | 1.46E-06 | 0% | 16 | 1 | 1.20E-05 | 5.25E-05 | 1.2E-05 | 5.2E-05 | 1.9E-04 | 8.40E-04 |
| **Totals** | | | | | | | | | **1.4E-05** | **6.0E-05** | **1.9E-05** | **8.4E-05** | **2.2E-04** | **9.66E-04** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. TCEQ RG 058 February 2002, Table 7

**Cathode Drying - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [2] (lb/hr) | (tpy) | VOC Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vacuum Dryer (Cathode) | 5 | KY1-VD01 - KY1-VD224 | KY1-AC04 | A-FAN-2221-A | 4,511 | 6 | 224 | 224 | 2.0E-03 | 8.8E-03 | 0.45 | 1.98 | 0.45 | 1.98 |
| **Totals** | | | | | | | | | **2.0E-03** | **8.8E-03** | **0.45** | **1.98** | **0.45** | **1.98** |

1. KY1-AC04 is connected to 56 emission sources and 168 vacuum dryers.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton; where VOC includes acetonitrile contribution.

**Electrolyte Filling and Sealing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | VOC Per Source Potential Emissions [1] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [1] (lb/hr) | (tpy) | VOC Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electrolyte Filling, Sealing | 5 | KY1-EL01 - KY1-EL56 | KY1-AC05 | A-FAN-2211-A | 3,818 | 6 | 56 | 56 | 6.8E-03 | 3.0E-02 | 0.38 | 1.67 | 0.38 | 1.67 |
| **Totals** | | | | | | | | | **6.8E-03** | **3.0E-02** | **0.38** | **1.67** | **0.38** | **1.67** |

1. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton; where VOC includes 1,3-propane sultone contribution.

**Electrolyte Filling and Sealing - Hazardous Air Pollutant Pollutant Potential Emissions**

| Pollutant | Process ID | Potential Material Usage (lb/yr) | Control Efficiency [1] | Number of Sources | Number of Sources per Control Device | Per Source Potential Emissions [2] (lb/hr) | (tpy) | Per Stack Potential Emissions [2] (lb/hr) | (tpy) | Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetonitrile | 5 | 26,400 | 80% | 56 | 8 | 1.1E-02 | 0.05 | 0.09 | 0.38 | 0.60 | 2.64 |
| 1,3-Propane Sultone | 5 | 277,800 | 99.5% | 16 | 8 | 9.9E-03 | 0.04 | 0.08 | 0.35 | 0.16 | 0.69 |
| **Max HAP** | | | | | | **1.1E-02** | **0.05** | **0.09** | **0.38** | **0.60** | **2.64** |
| **Total HAP** | | | | | | **2.1E-02** | **0.09** | **0.17** | **0.72** | **0.76** | **3.33** |

1. Assume 99.5% control for 1,3-propane sultone.
2. PTE (tpy) = Potential Material Usage (lb/yr) / 2,000 lb/ton x (100% - Control Efficiency)

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-02: Battery Assembly
## (Module Assembly)

**Calculation Inputs**

| | |
|---|---|
| Potential Operation | 8,760 hr/yr |

**Tab Welding - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tab Welding (SK) | KY1-MA | KY1-MA01 - KY1-MA32 | KY1-DC70 - KY1-DC101 | 921.6 | 2.39E-04 | 0% | 32 | 1 | 1.9E-03 | 8.3E-03 | 1.9E-03 | 8.3E-03 | 6.0E-02 | 2.6E-01 |
| **Totals** | | | | | | | | | **1.9E-03** | **8.3E-03** | **1.9E-03** | **8.3E-03** | **6.0E-02** | **2.6E-01** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. TCEQ RG 058 February 2002, Table 7

**BlueOval SK, LLC Glendale, KY Plant**
**EU KY1-03: Battery Formation**

**Calculation Inputs**

| | |
|---|---|
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Cell Degassing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | VOC Per Source Potential Emissions [1] (lb/hr) | VOC Per Source Potential Emissions [1] (tpy) | VOC Per Stack Potential Emissions [1] (lb/hr) | VOC Per Stack Potential Emissions [1] (tpy) | VOC Total Potential Emissions [1] (lb/hr) | VOC Total Potential Emissions [1] (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cell Degassing | 1 | KY1-DG01 - KY1-DG56 | KY1-AC08 - KY1-AC15 | F-FAN-2311-A, F-FAN-2321-A, F-FAN-2331-A, F-FAN-2341-A, F-FAN-2351-A, F-FAN-2361-A, F-FAN-2371-A, F-FAN-2381-A | 13,014 | 6 | 56 | 7 | 0.19 | 0.81 | 1.30 | 5.70 | 10.41 | 45.61 |
| **Totals** | | | | | | | | | **0.19** | **0.81** | **1.30** | **5.70** | **10.41** | **45.61** |

1. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-04: Cell Discharge

**Calculation Inputs**

| | |
|---|---|
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| HCl Molecular Weight | 36.46 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Cell Discharge - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [2] (lb/hr) | (tpy) | VOC Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cell Discharge | 1 | KY1-CD01 - KY1-CD04 | KY1-AC16 - KY1-AC17 | 18,497 | 6 | 4 | 2 | 0.92 | 4.05 | 1.85 | 8.10 | 3.70 | 16.21 |
| **Totals** | | | | | | | | **0.92** | **4.05** | **1.85** | **8.10** | **3.70** | **16.21** |

1. KY1-AC16 and KY1-AC17 are each connected to 3 work areas and 1 dehydration room.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

**Cell Discharge - Hazardous Air Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | HCl Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | HCl Per Source Potential Emissions [1] (lb/hr) | (tpy) | HCl Per Stack Potential Emissions [1] (lb/hr) | (tpy) | HCl Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cell Discharge | 1 | KY1-CD01 - KY1-CD08 | KY1-SC09 | 69,461 | 1.25 | 4 | 4 | 1.2E-01 | 0.54 | 0.49 | 2.16 | 0.49 | 2.16 |
| **Totals** | | | | | | | | **1.2E-01** | **0.54** | **0.49** | **2.16** | **0.49** | **2.16** |

1. PTE (tpy) = Air Flow (scfm) x HCl Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x HCl Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-05: Laboratories

**Calculation Inputs**

| | |
|---|---|
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| HCl Molecular Weight | 36.46 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Quality Control Laboratories - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [2] (lb/hr) | (tpy) | VOC Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quality Evaluation 1 | 1 | KY1-QE01 - KY1-QE12 | KY1-AC18 | 9,107 | 6 | 24 | 24 | 0.04 | 0.17 | 0.91 | 3.99 | 1.72 | 7.52 |
| | | | KY1-AC19 | 8,053 | | 1 | 1 | 0.81 | 3.53 | 0.81 | 3.53 | | |
| Quality Evaluation 2 | 2 | N/A | KY1-AC20 | 7,038 | 6 | EMERGENCY USE ONLY - EXCLUDE | | | | | | | |
| | | | KY1-AC21 | 7,353 | | 3 | 3 | 0.25 | 1.07 | 0.74 | 3.22 | 0.74 | 3.22 |
| **Totals** | | | | | | | | **1.09** | **4.77** | **2.45** | **10.74** | **2.45** | **10.74** |

1. KY1-AC18 is connected to 11 emission sources and 13 lab exhausts. KY1-AC19 is connected to 1 disassembly station. KY1-AC20 is emergency only. KY1-AC21 is connected to 3 lab exhausts.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

**ICP and Raw Material Laboratories - Hazardous Air Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | HCl Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | HCl Per Source Potential Emissions [1] (lb/hr) | (tpy) | HCl Per Stack Potential Emissions [1] (lb/hr) | (tpy) | HCl Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ICP Lab | 3 | KY1-LB01 - KY1-LB03 | KY1-SC10 - KY1-SC12 | 3,531 | 2.5 | 3 | 1 | 5.0E-02 | 0.22 | 5.0E-02 | 0.22 | 0.15 | 0.66 |
| Raw Material Inspection Lab | 4 | KY1-LB04 - KY1-LB05 | KY1-SC13 - KY1-SC14 | 3,531 | 2.5 | 2 | 1 | 5.0E-02 | 0.22 | 5.0E-02 | 0.22 | 0.10 | 0.44 |
| **Totals** | | | | | | | | **1.0E-01** | **0.44** | **0.10** | **0.44** | **0.25** | **1.10** |

1. PTE (tpy) = Air Flow (scfm) x HCl Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x HCl Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-06: Natural Gas-fired Boilers

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 12.0 | MMBtu/hr |
| Number of Identical Units | 11 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 6.1E-03 | 0.03 | 0.07 | 0.29 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 6.1E-03 | 0.03 | 0.07 | 0.29 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 5.1E-03 | 0.02 | 0.06 | 0.24 |
| CO | 37.70 | 3.70E-02 | 0.44 | 1.94 | 4.88 | 21.37 |
| $NO_X$ | 11.15 | 1.09E-02 | 0.13 | 0.57 | 1.44 | 6.32 |
| $SO_2$ | 0.6 | 5.88E-04 | 7.1E-03 | 0.03 | 0.08 | 0.34 |
| VOC | 5.5 | 5.39E-03 | 0.06 | 0.28 | 0.71 | 3.12 |
| Lead | 0.0005 | 4.90E-07 | 5.9E-06 | 2.6E-05 | 6.5E-05 | 2.8E-04 |
| $CO_2$ | 119,317 | 117.0 | 1,403.73 | 6,148.33 | 15,441.00 | 67,631.58 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.03 | 0.12 | 0.29 | 1.27 |
| $N_2O$ | 0.22 | 2.2E-04 | 2.6E-03 | 1.2E-02 | 0.03 | 0.13 |
| $CO_2e$ [7] | 119,440 | 117.1 | 1,405.18 | 6,154.68 | 15,456.95 | 67,701.43 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 9 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 9 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 2.4E-06 | 1.0E-05 | 2.6E-05 | 1.1E-04 |
| Benzene | 2.1E-03 | 2.06E-06 | 2.5E-05 | 1.1E-04 | 2.7E-04 | 1.2E-03 |
| Beryllium | 1.2E-05 | 1.18E-08 | 1.4E-07 | 6.2E-07 | 1.6E-06 | 6.8E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 1.3E-05 | 5.7E-05 | 1.4E-04 | 6.2E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 1.6E-05 | 7.2E-05 | 1.8E-04 | 7.9E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 9.9E-07 | 4.3E-06 | 1.1E-05 | 4.8E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 1.4E-05 | 6.2E-05 | 1.6E-04 | 6.8E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 8.8E-04 | 3.9E-03 | 0.01 | 0.04 |
| Hexane, n-[5] | 0.0046 | 4.51E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 5.9E-06 | 2.6E-05 | 6.5E-05 | 2.8E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 4.5E-06 | 2.0E-05 | 4.9E-05 | 2.2E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 3.1E-06 | 1.3E-05 | 3.4E-05 | 1.5E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 7.2E-06 | 3.1E-05 | 7.9E-05 | 3.5E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 2.5E-05 | 1.1E-04 | 2.7E-04 | 1.2E-03 |
| POM | 7.0E-04 | 6.85E-07 | 8.2E-06 | 3.6E-05 | 9.0E-05 | 4.0E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 2.8E-07 | 1.2E-06 | 3.1E-06 | 1.4E-05 |
| Toluene | 3.4E-03 | 3.33E-06 | 4.0E-05 | 1.8E-04 | 4.4E-04 | 1.9E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.01** | **0.04** |
| **Total HAP [4]** | **0.09** | **9.12E-05** | **0.00** | **0.00** | **0.01** | **0.05** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-07: Natural Gas-fired Hot Oil Heaters

**Calculation Inputs - Cathode**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 27.8 | MMBtu/hr |
| Number of Identical Units | 5 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | (tpy) | Total Potential Emissions [6] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.4E-02 | 6.2E-02 | 0.07 | 0.31 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.4E-02 | 6.2E-02 | 0.07 | 0.31 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.2E-02 | 5.1E-02 | 0.06 | 0.26 |
| CO | 37.70 | 3.70E-02 | 1.03 | 4.50 | 5.13 | 22.48 |
| $NO_X$ | 24.77 | 2.43E-02 | 0.67 | 2.95 | 3.37 | 14.77 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.6E-02 | 7.2E-02 | 0.08 | 0.36 |
| VOC | 5.5 | 5.39E-03 | 0.15 | 0.66 | 0.75 | 3.28 |
| Lead | 0.0005 | 4.90E-07 | 1.4E-05 | 6.0E-05 | 6.8E-05 | 3.0E-04 |
| $CO_2$ | 119,317 | 117.0 | 3,248.46 | 14,228.25 | 16,242.29 | 71,141.25 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.06 | 0.27 | 0.31 | 1.34 |
| $N_2O$ | 0.22 | 2.2E-04 | 6.1E-03 | 2.7E-02 | 0.03 | 0.13 |
| $CO_2e$ [7] | 119,440 | 117.1 | 3,251.81 | 14,242.95 | 16,259.07 | 71,214.73 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 20 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 20 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 5.4E-06 | 2.4E-05 | 2.7E-05 | 1.2E-04 |
| Benzene | 2.1E-03 | 2.06E-06 | 5.7E-05 | 2.5E-04 | 2.9E-04 | 1.3E-03 |
| Beryllium | 1.2E-05 | 1.18E-08 | 3.3E-07 | 1.4E-06 | 1.6E-06 | 7.2E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 3.0E-05 | 1.3E-04 | 1.5E-04 | 6.6E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 3.8E-05 | 1.7E-04 | 1.9E-04 | 8.3E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.3E-06 | 1.0E-05 | 1.1E-05 | 5.0E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 3.3E-05 | 1.4E-04 | 1.6E-04 | 7.2E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 2.0E-03 | 8.9E-03 | 1.0E-02 | 0.04 |
| Hexane, n-[5] | 0.0046 | 4.51E-06 | 1.3E-04 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.4E-05 | 6.0E-05 | 6.8E-05 | 3.0E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.0E-05 | 4.5E-05 | 5.2E-05 | 2.3E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 7.1E-06 | 3.1E-05 | 3.5E-05 | 1.6E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.7E-05 | 7.3E-05 | 8.3E-05 | 3.6E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 5.7E-05 | 2.5E-04 | 2.9E-04 | 1.3E-03 |
| POM | 7.0E-04 | 6.85E-07 | 1.9E-05 | 8.3E-05 | 9.5E-05 | 4.2E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 6.5E-07 | 2.9E-06 | 3.3E-06 | 1.4E-05 |
| Toluene | 3.4E-03 | 3.33E-06 | 9.3E-05 | 4.1E-04 | 4.6E-04 | 2.0E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **2.0E-03** | **0.01** | **0.01** | **0.04** |
| **Total HAP [4]** | **0.09** | **9.12E-05** | **2.5E-03** | **0.01** | **0.01** | **0.06** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

**Calculation Inputs - Anode**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 23.8 | MMBtu/hr |
| Number of Identical Units | 5 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.2E-02 | 5.3E-02 | 0.06 | 0.27 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.2E-02 | 5.3E-02 | 0.06 | 0.27 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.0E-02 | 4.4E-02 | 0.05 | 0.22 |
| CO | 37.70 | 3.70E-02 | 0.88 | 3.85 | 4.40 | 19.27 |
| $NO_X$ | 24.77 | 2.43E-02 | 0.58 | 2.53 | 2.89 | 12.66 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.4E-02 | 6.1E-02 | 0.07 | 0.31 |
| VOC | 5.5 | 5.39E-03 | 0.13 | 0.56 | 0.64 | 2.81 |
| Lead | 0.0005 | 4.90E-07 | 1.2E-05 | 5.1E-05 | 5.8E-05 | 2.6E-04 |
| $CO_2$ | 119,317 | 117.0 | 2,784.06 | 12,194.18 | 13,920.30 | 60,970.90 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.05 | 0.23 | 0.26 | 1.15 |
| $N_2O$ | 0.22 | 2.2E-04 | 5.2E-03 | 2.3E-02 | 0.03 | 0.11 |
| $CO_2e$ [7] | 119,440 | 117.1 | 2,786.93 | 12,206.77 | 13,934.67 | 61,033.87 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx". https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

Conversion factor: $\frac{1 \text{ atm}}{527.67 \text{ R}} \cdot \frac{1 \text{ lb-mol R}}{0.7302 \text{ scf atm}} \cdot \frac{28.01 \text{ lb}}{\text{lb-mol}}$ = 0.0727 lb/scf

CO concentration: 50 ppm
$O_2$ content: 3 %
$F_d$ factor: 8,710 dscf/MMBtu

4. Burner Specification for $NO_X$: 20 ppm @ 3% $O_2$. See calculation below.

Conversion factor: $\frac{1 \text{ atm}}{527.67 \text{ R}} \cdot \frac{1 \text{ lb-mol R}}{0.7302 \text{ scf atm}} \cdot \frac{46.01 \text{ lb}}{\text{lb-mol}}$ = 0.1194 lb/scf

$NO_X$ concentration: 20 ppm
$O_2$ content: 3 %
$F_d$ factor: 8,710 dscf/MMBtu

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 4.7E-06 | 2.0E-05 | 2.3E-05 | 1.0E-04 |
| Benzene | 2.1E-03 | 2.06E-06 | 4.9E-05 | 2.1E-04 | 2.5E-04 | 1.1E-03 |
| Beryllium | 1.2E-05 | 1.18E-08 | 2.8E-07 | 1.2E-06 | 1.4E-06 | 6.1E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 2.6E-05 | 1.1E-04 | 1.3E-04 | 5.6E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 3.3E-05 | 1.4E-04 | 1.6E-04 | 7.2E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.0E-06 | 8.6E-06 | 9.8E-06 | 4.3E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 2.8E-05 | 1.2E-04 | 1.4E-04 | 6.1E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 1.8E-03 | 7.7E-03 | 8.8E-03 | 0.04 |
| Hexane, n-[5] | 0.0046 | 4.51E-06 | 1.1E-04 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.2E-05 | 5.1E-05 | 5.8E-05 | 2.6E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 8.9E-06 | 3.9E-05 | 4.4E-05 | 1.9E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 6.1E-06 | 2.7E-05 | 3.0E-05 | 1.3E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.4E-05 | 6.2E-05 | 7.1E-05 | 3.1E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 4.9E-05 | 2.1E-04 | 2.5E-04 | 1.1E-03 |
| POM | 7.0E-04 | 6.85E-07 | 1.6E-05 | 7.1E-05 | 8.1E-05 | 3.6E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 5.6E-07 | 2.5E-06 | 2.8E-06 | 1.2E-05 |
| Toluene | 3.4E-03 | 3.33E-06 | 7.9E-05 | 3.5E-04 | 4.0E-04 | 1.7E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **1.8E-03** | **0.01** | **0.01** | **0.04** |
| **Total HAP [4]** | **0.09** | **9.12E-05** | **2.2E-03** | **0.01** | **0.01** | **0.05** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-08: Emergency Engines, Process ID 1

**Calculation Inputs**

| | | |
|---|---|---|
| Engine Rating | 399 | hp |
| Number of Identical Units | 3 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. Conversion factor taken from footnote a of AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/hp-hr) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3,4] (lb/hr) | (tpy) | Total Potential Emissions [3,4] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 1.3E-01 | 3.3E-02 | 0.39 | 9.8E-02 |
| $PM_{10}$ | 3.3E-04 | -- | 1.3E-01 | 3.3E-02 | 0.39 | 9.8E-02 |
| $PM_{2.5}$ | 3.3E-04 | -- | 1.3E-01 | 3.3E-02 | 0.39 | 9.8E-02 |
| CO | 5.8E-03 | -- | 2.30 | 0.57 | 6.89 | 1.72 |
| $NO_X$ | 6.6E-03 | -- | 2.62 | 0.66 | 7.87 | 1.97 |
| $SO_2$ [5] | 2.05E-03 | -- | 0.82 | 0.20 | 2.45 | 0.61 |
| VOC | 6.6E-03 | -- | 2.62 | 0.66 | 7.87 | 1.97 |
| $CO_2$ | -- | 163.1 | 455.41 | 113.85 | 1,366.23 | 341.56 |
| $CH_4$ | -- | 6.6E-03 | 1.8E-02 | 4.6E-03 | 5.5E-02 | 1.4E-02 |
| $N_2O$ | -- | 1.3E-03 | 3.7E-03 | 9.2E-04 | 1.1E-02 | 2.8E-03 |
| $CO_2e$ [6] | -- | 163.6 | 456.97 | 114.24 | 1,370.92 | 342.73 |

1. Factors converted from g to lb. Engines will be certified to Tier 3 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2).
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb/
5. $SO_2$ emission factor from AP-42 Section 3.3 "Gasoline and Diesel Industrial Engines" (10/96).
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMBtu) | Per Unit Potential Emissions [2] (lb/hr) | Per Unit Potential Emissions [2] (tpy) | Total Potential Emissions [2] (lb/hr) | Total Potential Emissions [2] (tpy) |
|---|---|---|---|---|---|
| 1,3-Butadiene | 3.91E-05 | 1.1E-04 | 2.7E-05 | 3.3E-04 | 8.2E-05 |
| Acetaldehyde | 7.67E-04 | 2.1E-03 | 5.4E-04 | 6.4E-03 | 1.6E-03 |
| Acrolein | 9.25E-05 | 2.6E-04 | 6.5E-05 | 7.8E-04 | 1.9E-04 |
| Benzene | 9.33E-04 | 2.6E-03 | 6.5E-04 | 7.8E-03 | 2.0E-03 |
| Formaldehyde | 1.18E-03 | 3.3E-03 | 8.2E-04 | 9.9E-03 | 2.5E-03 |
| Napthalene | 8.48E-05 | 2.4E-04 | 5.9E-05 | 7.1E-04 | 1.8E-04 |
| POM | 1.68E-04 | 4.7E-04 | 1.2E-04 | 1.4E-03 | 3.5E-04 |
| Toluene | 4.09E-04 | 1.1E-03 | 2.9E-04 | 3.4E-03 | 8.6E-04 |
| Xylenes | 2.85E-04 | 8.0E-04 | 2.0E-04 | 2.4E-03 | 6.0E-04 |
| **Max HAP** | **1.2E-03** | **3.3E-03** | **8.2E-04** | **9.9E-03** | **2.5E-03** |
| **Total HAP [3]** | **3.9E-03** | **1.1E-02** | **2.7E-03** | **3.2E-02** | **8.1E-03** |

1. Emission factors taken from AP-42 Section 3.3 "Gasoline and Diesel Industrial Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb/
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-08: Emergency Engines, Process ID 2

**Calculation Inputs**

| | | |
|---|---|---|
| Engine Rating | 1,250 | kW |
| | 1,676 | hp |
| Number of Identical Units | 2 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. MMBtu/hr is calculated assuming an average BSFC of 7,000 Btu/hp-hr, consistent with footnote c in AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor[1] (lb/hp-hr) | Emission Factor[2] (lb/MMBtu) | Per Unit Potential Emissions[3,4] (lb/hr) | (tpy) | Total Potential Emissions[3,4] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 0.55 | 0.14 | 1.10 | 0.28 |
| $PM_{10}$ | 3.3E-04 | -- | 0.55 | 0.14 | 1.10 | 0.28 |
| $PM_{2.5}$ | 3.3E-04 | -- | 0.55 | 0.14 | 1.10 | 0.28 |
| CO | 5.8E-03 | -- | 9.65 | 2.41 | 19.29 | 4.82 |
| $NO_X$ | 1.1E-02 | -- | 17.64 | 4.41 | 35.27 | 8.82 |
| $SO_2$[5] | 1.2E-05 | -- | 0.02 | 0.01 | 0.04 | 0.01 |
| VOC | 1.1E-02 | -- | 17.64 | 4.41 | 35.27 | 8.82 |
| $CO_2$ | -- | 163.1 | 1,913 | 478 | 3,826.53 | 956.63 |
| $CH_4$ | -- | 6.6E-03 | 0.08 | 0.02 | 1.6E-01 | 3.9E-02 |
| $N_2O$ | -- | 1.3E-03 | 0.02 | 0.004 | 3.1E-02 | 7.8E-03 |
| $CO_2e$[6] | -- | 163.6 | 1,920 | 480 | 3,839.66 | 959.92 |

1. Factors converted from g to lb. Engines will be certified to Tier 2 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2)
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
5. $SO_2$ emission factor from AP-42, Table 3.4-1 for Large Stationary Diesel Engines. Assume 0.0015% sulfur content for ULSD.
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor[1] (lb/MMBtu) | Per Unit Potential Emissions[2] (lb/hr) | (tpy) | Total Potential Emissions[2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 3.0E-04 | 7.4E-05 | 5.9E-04 | 1.5E-04 |
| Acrolein | 7.88E-06 | 9.2E-05 | 2.3E-05 | 1.8E-04 | 4.6E-05 |
| Benzene | 7.76E-04 | 9.1E-03 | 2.3E-03 | 1.8E-02 | 4.6E-03 |
| Formaldehyde | 7.89E-05 | 9.3E-04 | 2.3E-04 | 1.9E-03 | 4.6E-04 |
| Napthalene | 1.30E-04 | 1.5E-03 | 3.8E-04 | 3.1E-03 | 7.6E-04 |
| POM | 2.12E-04 | 2.5E-03 | 6.2E-04 | 5.0E-03 | 1.2E-03 |
| Toluene | 2.81E-04 | 3.3E-03 | 8.2E-04 | 6.6E-03 | 1.6E-03 |
| Xylenes | 1.93E-04 | 2.3E-03 | 5.7E-04 | 4.5E-03 | 1.1E-03 |
| **Max HAP** | **7.8E-04** | **9.1E-03** | **2.3E-03** | **1.8E-02** | **4.6E-03** |
| **Total HAP[3]** | **1.6E-03** | **1.8E-02** | **4.6E-03** | **3.7E-02** | **9.2E-03** |

1. Emission factors taken from AP-42 Section 3.4 "Large Stationary Diesel And All Stationary Dual-fuel Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

## Appendix B. Detailed Emission Calculations

### Calculation Inputs

| | | |
|---|---|---|
| Engine Rating | 1,000 | kW |
| | 1,341 | hp |
| Number of Identical Units | 1 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. MMBtu/hr is calculated assuming an average BSFC of 7,000 Btu/hp-hr, consistent with footnote c in AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

### Criteria Pollutant and Greenhouse Gas Potential Emissions

| Pollutant | Emission Factor [1] (lb/hp-hr) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3,4] (lb/hr) | Per Unit Potential Emissions [3,4] (tpy) | Total Potential Emissions [3,4] (lb/hr) | Total Potential Emissions [3,4] (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 0.44 | 0.11 | 0.44 | 0.11 |
| $PM_{10}$ | 3.3E-04 | -- | 0.44 | 0.11 | 0.44 | 0.11 |
| $PM_{2.5}$ | 3.3E-04 | -- | 0.44 | 0.11 | 0.44 | 0.11 |
| CO | 5.8E-03 | -- | 7.72 | 1.93 | 7.72 | 1.93 |
| $NO_X$ | 1.1E-02 | -- | 14.11 | 3.53 | 14.11 | 3.53 |
| $SO_2$ [5] | 1.2E-05 | -- | 0.02 | 0.00 | 0.02 | 0.00 |
| VOC | 1.1E-02 | -- | 14.11 | 3.53 | 14.11 | 3.53 |
| $CO_2$ | -- | 163.1 | 1,531 | 383 | 1,530.61 | 382.65 |
| $CH_4$ | -- | 6.6E-03 | 0.06 | 0.02 | 0.06 | 0.02 |
| $N_2O$ | -- | 1.3E-03 | 0.01 | 0.003 | 0.01 | 3.1E-03 |
| $CO_2e$ [6] | -- | 163.6 | 1,536 | 384 | 1,535.86 | 383.97 |

1. Factors converted from g to lb. Engines will be certified to Tier 2 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2)
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
5. $SO_2$ emission factor from AP-42, Table 3.4-1 for Large Stationary Diesel Engines. Assume 0.0015% sulfur content for ULSD.
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

### Hazardous Air Pollutant Potential Emissions

| Pollutant | Emission Factor [1] (lb/MMBtu) | Per Unit Potential Emissions [2] (lb/hr) | Per Unit Potential Emissions [2] (tpy) | Total Potential Emissions [2] (lb/hr) | Total Potential Emissions [2] (tpy) |
|---|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 2.4E-04 | 5.9E-05 | 2.4E-04 | 5.9E-05 |
| Acrolein | 7.88E-06 | 7.4E-05 | 1.8E-05 | 7.4E-05 | 1.8E-05 |
| Benzene | 7.76E-04 | 7.3E-03 | 1.8E-03 | 7.3E-03 | 1.8E-03 |
| Formaldehyde | 7.89E-05 | 7.4E-04 | 1.9E-04 | 7.4E-04 | 1.9E-04 |
| Napthalene | 1.30E-04 | 1.2E-03 | 3.1E-04 | 1.2E-03 | 3.1E-04 |
| POM | 2.12E-04 | 2.0E-03 | 5.0E-04 | 2.0E-03 | 5.0E-04 |
| Toluene | 2.81E-04 | 2.6E-03 | 6.6E-04 | 2.6E-03 | 6.6E-04 |
| Xylenes | 1.93E-04 | 1.8E-03 | 4.5E-04 | 1.8E-03 | 4.5E-04 |
| **Max HAP** | **7.8E-04** | **7.3E-03** | **1.8E-03** | **7.3E-03** | **1.8E-03** |
| **Total HAP [3]** | **1.6E-03** | **1.5E-02** | **3.7E-03** | **1.5E-02** | **3.7E-03** |

1. Emission factors taken from AP-42 Section 3.4 "Large Stationary Diesel And All Stationary Dual-fuel Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

**Calculation Inputs**

| | | |
|---|---|---|
| Engine Rating | 600 | kW |
| | 805 | hp |
| Number of Identical Units | 1 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. MMBtu/hr is calculated assuming an average BSFC of 7,000 Btu/hp-hr, consistent with footnote c in AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/hp-hr) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3,4] (lb/hr) | (tpy) | Total Potential Emissions [3,4] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 0.26 | 0.07 | 0.26 | 0.07 |
| $PM_{10}$ | 3.3E-04 | -- | 0.26 | 0.07 | 0.26 | 0.07 |
| $PM_{2.5}$ | 3.3E-04 | -- | 0.26 | 0.07 | 0.26 | 0.07 |
| CO | 5.8E-03 | -- | 4.63 | 1.16 | 4.63 | 1.16 |
| $NO_X$ | 1.1E-02 | -- | 8.47 | 2.12 | 8.47 | 2.12 |
| $SO_2$ [5] | 1.2E-05 | -- | 0.01 | 0.00 | 0.01 | 0.00 |
| VOC | 1.1E-02 | -- | 8.47 | 2.12 | 8.47 | 2.12 |
| $CO_2$ | -- | 163.1 | 918 | 230 | 918.37 | 229.59 |
| $CH_4$ | -- | 6.6E-03 | 0.04 | 0.01 | 0.04 | 0.01 |
| $N_2O$ | -- | 1.3E-03 | 0.01 | 0.002 | 0.01 | 1.9E-03 |
| $CO_2e$ [6] | -- | 163.6 | 922 | 230 | 921.52 | 230.38 |

1. Factors converted from g to lb. Engines will be certified to Tier 2 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2)
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
5. $SO_2$ emission factor from AP-42, Table 3.4-1 for Large Stationary Diesel Engines. Assume 0.0015% sulfur content for ULSD.
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMBtu) | Per Unit Potential Emissions [2] (lb/hr) | (tpy) | Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 1.4E-04 | 3.5E-05 | 1.4E-04 | 3.5E-05 |
| Acrolein | 7.88E-06 | 4.4E-05 | 1.1E-05 | 4.4E-05 | 1.1E-05 |
| Benzene | 7.76E-04 | 4.4E-03 | 1.1E-03 | 4.4E-03 | 1.1E-03 |
| Formaldehyde | 7.89E-05 | 4.4E-04 | 1.1E-04 | 4.4E-04 | 1.1E-04 |
| Napthalene | 1.30E-04 | 7.3E-04 | 1.8E-04 | 7.3E-04 | 1.8E-04 |
| POM | 2.12E-04 | 1.2E-03 | 3.0E-04 | 1.2E-03 | 3.0E-04 |
| Toluene | 2.81E-04 | 1.6E-03 | 4.0E-04 | 1.6E-03 | 4.0E-04 |
| Xylenes | 1.93E-04 | 1.1E-03 | 2.7E-04 | 1.1E-03 | 2.7E-04 |
| **Max HAP** | **7.8E-04** | **4.4E-03** | **1.1E-03** | **4.4E-03** | **1.1E-03** |
| **Total HAP [3]** | **1.6E-03** | **8.9E-03** | **2.2E-03** | **8.9E-03** | **2.2E-03** |

1. Emission factors taken from AP-42 Section 3.4 "Large Stationary Diesel And All Stationary Dual-fuel Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

**Calculation Inputs**

| | | |
|---|---|---|
| Engine Rating | 850 | kW |
| | 1,140 | hp |
| Number of Identical Units | 1 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. MMBtu/hr is calculated assuming an average BSFC of 7,000 Btu/hp-hr, consistent with footnote c in AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/hp-hr) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3,4] (lb/hr) | (tpy) | Total Potential Emissions [3,4] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 0.37 | 0.09 | 0.37 | 0.09 |
| $PM_{10}$ | 3.3E-04 | -- | 0.37 | 0.09 | 0.37 | 0.09 |
| $PM_{2.5}$ | 3.3E-04 | -- | 0.37 | 0.09 | 0.37 | 0.09 |
| CO | 5.8E-03 | -- | 6.56 | 1.64 | 6.56 | 1.64 |
| $NO_X$ | 1.1E-02 | -- | 11.99 | 3.00 | 11.99 | 3.00 |
| $SO_2$ [5] | 1.2E-05 | -- | 0.01 | 0.00 | 0.01 | 0.00 |
| VOC | 1.1E-02 | -- | 11.99 | 3.00 | 11.99 | 3.00 |
| $CO_2$ | -- | 163.1 | 1,301 | 325 | 1,301.02 | 325.26 |
| $CH_4$ | -- | 6.6E-03 | 0.05 | 0.01 | 0.05 | 0.01 |
| $N_2O$ | -- | 1.3E-03 | 0.01 | 0.003 | 0.01 | 0.00 |
| $CO_2e$ [6] | -- | 163.6 | 1,305 | 326 | 1,305.48 | 326.37 |

1. Factors converted from g to lb. Engines will be certified to Tier 2 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2)
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
5. $SO_2$ emission factor from AP-42, Table 3.4-1 for Large Stationary Diesel Engines. Assume 0.0015% sulfur content for ULSD.
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMBtu) | Per Unit Potential Emissions [2] (lb/hr) | (tpy) | Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 2.0E-04 | 5.0E-05 | 2.0E-04 | 5.0E-05 |
| Acrolein | 7.88E-06 | 6.3E-05 | 1.6E-05 | 6.3E-05 | 1.6E-05 |
| Benzene | 7.76E-04 | 6.2E-03 | 1.5E-03 | 6.2E-03 | 1.5E-03 |
| Formaldehyde | 7.89E-05 | 6.3E-04 | 1.6E-04 | 6.3E-04 | 1.6E-04 |
| Napthalene | 1.30E-04 | 1.0E-03 | 2.6E-04 | 1.0E-03 | 2.6E-04 |
| Acenaphthylene | 9.23E-06 | 7.4E-05 | 1.8E-05 | 7.4E-05 | 1.8E-05 |
| Acenaphthene | 4.68E-06 | 3.7E-05 | 9.3E-06 | 3.7E-05 | 9.3E-06 |
| Fluorene | 1.28E-05 | 1.0E-04 | 2.6E-05 | 1.0E-04 | 2.6E-05 |
| Phenanthrene | 4.08E-05 | 3.3E-04 | 8.1E-05 | 3.3E-04 | 8.1E-05 |
| Anthracene | 1.23E-06 | 9.8E-06 | 2.5E-06 | 9.8E-06 | 2.5E-06 |
| Fluoranthene | 4.03E-06 | 3.2E-05 | 8.0E-06 | 3.2E-05 | 8.0E-06 |
| Pyrene | 3.71E-06 | 3.0E-05 | 7.4E-06 | 3.0E-05 | 7.4E-06 |
| Benzo(a)anthracene | 6.22E-07 | 5.0E-06 | 1.2E-06 | 5.0E-06 | 1.2E-06 |
| Chrysene | 1.53E-06 | 1.2E-05 | 3.1E-06 | 1.2E-05 | 3.1E-06 |
| Benzo(b)fluoranthene | 1.11E-06 | 8.9E-06 | 2.2E-06 | 8.9E-06 | 2.2E-06 |
| Benzo(k)fluoranthene | 2.18E-07 | 1.7E-06 | 4.3E-07 | 1.7E-06 | 4.3E-07 |
| Benzo(a)pyrene | 2.57E-07 | 2.1E-06 | 5.1E-07 | 2.1E-06 | 5.1E-07 |
| Indeno(1,2,3-cd)pyrene | 4.14E-07 | 3.3E-06 | 8.3E-07 | 3.3E-06 | 8.3E-07 |
| Dibenz(a,h)anthracene | 3.46E-07 | 2.8E-06 | 6.9E-07 | 2.8E-06 | 6.9E-07 |
| Benzo(g,h,l)perylene | 5.56E-07 | 4.4E-06 | 1.1E-06 | 4.4E-06 | 1.1E-06 |
| POM | 2.12E-04 | 1.7E-03 | 4.2E-04 | 1.7E-03 | 4.2E-04 |
| Toluene | 2.81E-04 | 2.2E-03 | 5.6E-04 | 2.2E-03 | 5.6E-04 |
| Xylenes | 1.93E-04 | 1.5E-03 | 3.8E-04 | 1.5E-03 | 3.8E-04 |
| **Max HAP** | **7.8E-04** | **6.2E-03** | **1.5E-03** | **6.2E-03** | **1.5E-03** |
| **Total HAP [3]** | **1.6E-03** | **1.3E-02** | **3.1E-03** | **1.3E-02** | **3.1E-03** |

1. Emission factors taken from AP-42 Section 3.4 "Large Stationary Diesel And All Stationary Dual-fuel Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 lb
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-09: Cooling Towers

**Calculation Inputs**

| | | |
|---|---|---|
| Unit Circulating Water Flow Rate | 7,507 | gpm |
| Total Dissolved Solids[1] | 800 | ppmw |
| Drift Rate[2] | 0.0005 | % |
| Number of Identical Units | 4 | |
| Density of Water | 8.34 | lb/gal |
| Potential Operation | 8,760 | hr/yr |

1. Total dissolved solids assumed from Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA.
2. Represents BACT-level control for mist eliminator.

**Criteria Pollutant Potential Emissions**

| Pollutant | Particle Size Distribution[1] | Emission Factor (lb/MMgal) | Per Unit Potential Emissions [2,3] (lb/hr) | Per Unit Potential Emissions [2,3] (tpy) | Total Potential Emissions [2,3] (lb/hr) | Total Potential Emissions [2,3] (tpy) |
|---|---|---|---|---|---|---|
| PM | -- | 3.3E-02 | 1.5E-02 | 6.6E-02 | 6.0E-02 | 0.26 |
| $PM_{10}$ | 85% | 2.8E-02 | 1.3E-02 | 5.6E-02 | 5.1E-02 | 0.22 |
| $PM_{2.5}$ | 0.37% | 1.2E-04 | 5.6E-05 | 2.4E-04 | 2.2E-04 | 9.8E-04 |

1. PTE (tpy) = Circulating Water Flow Rate (gpm) x 60 min/hr x Density of Water (lb/gal) x Drift Rate x Total Dissolved Solids (ppmw) / $10^6$
2. $PM_{10}$ and $PM_{2.5}$ percentages estimated based on the methods presented in *Calculating Realistic $PM_{10}$ from Cooling Towers* ("Document") by Joel Reisman and Gordan Frisbie (2002). See detailed calculations below.

**Particle Size Distribution Calculation**

| Drift Droplet Diameter ($D_d$) (μm) | Drift Droplet Volume[1] ($V_{droplet}$) ($μm^3$) | Drift Droplet Mass[2] ($M_{droplet}$) (μg) | Droplet Particle Mass[3] ($M_{TDS}$) (μg) | Solid Particle Diameter[4] ($D_{TDS}$) (μm) | EPRI Cumulative % Mass Smaller[5] (%) | Interpolation Value for $PM_{2.5}$[6] (%) | Interpolation Value for $PM_{10}$[6] (%) |
|---|---|---|---|---|---|---|---|
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.000 | 0.000 | -- | -- |
| 10 | 5.24E+02 | 5.24E-04 | 4.19E-07 | 0.714 | 0.000 | -- | -- |
| 20 | 4.19E+03 | 4.19E-03 | 3.35E-06 | 1.428 | 0.196 | -- | -- |
| 30 | 1.41E+04 | 1.41E-02 | 1.13E-05 | 2.141 | 0.226 | -- | -- |
| 40 | 3.35E+04 | 3.35E-02 | 2.68E-05 | 2.855 | 0.514 | 0.371 | -- |
| 50 | 6.54E+04 | 6.54E-02 | 5.24E-05 | 3.569 | 1.816 | -- | -- |
| 60 | 1.13E+05 | 1.13E-01 | 9.05E-05 | 4.283 | 5.702 | -- | -- |
| 70 | 1.80E+05 | 1.80E-01 | 1.44E-04 | 4.996 | 21.348 | -- | -- |
| 90 | 3.82E+05 | 3.82E-01 | 3.05E-04 | 6.424 | 49.812 | -- | -- |
| 110 | 6.97E+05 | 6.97E-01 | 5.58E-04 | 7.851 | 70.509 | -- | -- |
| 130 | 1.15E+06 | 1.15E+00 | 9.20E-04 | 9.279 | 82.023 | -- | -- |
| 150 | 1.77E+06 | 1.77E+00 | 1.41E-03 | 10.706 | 88.012 | -- | 85.048 |
| 180 | 3.05E+06 | 3.05E+00 | 2.44E-03 | 12.848 | 91.032 | -- | -- |
| 210 | 4.85E+06 | 4.85E+00 | 3.88E-03 | 14.989 | 92.468 | -- | -- |
| 240 | 7.24E+06 | 7.24E+00 | 5.79E-03 | 17.130 | 94.091 | -- | -- |
| 300 | 1.41E+07 | 1.41E+01 | 1.13E-02 | 21.413 | 96.288 | -- | -- |
| 350 | 2.24E+07 | 2.24E+01 | 1.80E-02 | 24.982 | 97.011 | -- | -- |
| 400 | 3.35E+07 | 3.35E+01 | 2.68E-02 | 28.551 | 98.340 | -- | -- |
| 450 | 4.77E+07 | 4.77E+01 | 3.82E-02 | 32.119 | 99.071 | -- | -- |
| 600 | 1.13E+08 | 1.13E+02 | 9.05E-02 | 42.826 | 100.000 | -- | -- |

1. $V_{droplet} = 4/3\ π\ (D_d/2)^3$ [Equation 2 of the Document]
2. $M_{droplet}$ = density ($ρ_w$) of water * $V_{droplet}$ = $ρ_w * 4/3\ π\ (D_d/2)^3$
   $ρ_w$ = 1.00E-06 μg/$μm^3$
3. $M_{TDS}$ = TDS * $M_{droplet}$ [Equation 3 of the Document, with TDS in units of ppm]
   TDS = 800 ppm
4. $M_{TDS} = (ρ_{TDS})(V_{TDS}) = (ρ_{TDS})(4/3)π(D_{TDS}/2)^3$ [Equation 5 of the Document]
   Therefore, the equation can be solved for $D_{TDS}$: $D_{TDS} = \{M_{TDS}/[(ρ_{TDS}) * 4/3 * π]\}^{1/3} \times 2$
   Assume solid particulates have the same density ($ρ_{TDS}$) as sodium chloride per the Document: 2.20E-06 μg/$μm^3$
5. Based on drift eliminator test data from a test conducted by Environmental Systems Corporation (ESC) at the Electric Power Research Institute (EPRI) test facility in Houston, Texas in 1988 (Aull, 1999) as documented in Table 1 of the Document.
6. $D_{TDS}$ represents the particle size of collected material in droplet. The EPRI cumulative % mass smaller indicates the percentage of material in that specific water droplet size that has a diameter smaller than $D_{TDS}$. Therefore, linear interpolation between calculated $D_{TDS}$ is necessary to ascertain the specific mass percentages to estimate $PM_{10}$ and $PM_{2.5}$ emissions. For example, at 800 mg/L TDS:
$\%PM_{10} = \%<10\ D_{TDS} + [(10 - D_{TDS}<10) / (D_{TDS}>10 - D_{TDS}<10)] * (\%>10\ D_{TDS} - \%<10\ D_{TDS})$
i.e. 85.048% = 82.023% + [ (10 - 9.279) / (10.706 - 9.279) ] * (88.012% - 82.023%)

**Calculation Inputs**

| | | |
|---|---|---|
| Unit Circulating Water Flow Rate | 3,804 | gpm |
| Total Dissolved Solids[1] | 800 | ppmw |
| Drift Rate[2] | 0.0005 | % |
| Number of Identical Units | 3 | |
| Density of Water | 8.34 | lb/gal |
| Potential Operation | 8,760 | hr/yr |

1. Total dissolved solids assumed from Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA.
2. Represents BACT-level control for mist eliminator.

**Criteria Pollutant Potential Emissions**

| Pollutant | Particle Size Distribution[1] | Emission Factor (lb/MMgal) | Per Unit Potential Emissions [2,3] (lb/hr) | (tpy) | Total Potential Emissions [2,3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | -- | 3.3E-02 | 1.5E-02 | 6.6E-02 | 6.0E-02 | 0.26 |
| $PM_{10}$ | 85% | 2.8E-02 | 1.3E-02 | 5.6E-02 | 5.1E-02 | 0.22 |
| $PM_{2.5}$ | 0.37% | 1.2E-04 | 5.6E-05 | 2.4E-04 | 2.2E-04 | 9.8E-04 |

1. PTE (tpy) = Circulating Water Flow Rate (gpm) x 60 min/hr x Density of Water (lb/gal) x Drift Rate x Total Dissolved Solids (ppmw) / $10^6$
2. $PM_{10}$ and $PM_{2.5}$ percentages estimated based on the methods presented in *Calculating Realistic $PM_{10}$ from Cooling Towers* ("Document") by Joel Reisman and Gordan Frisbie (2002). See detailed calculations below.

**Particle Size Distribution Calculation**

| Drift Droplet Diameter ($D_d$) (μm) | Drift Droplet Volume[1] ($V_{droplet}$) (μm³) | Drift Droplet Mass[2] ($M_{droplet}$) (μg) | Droplet Particle Mass[3] ($M_{TDS}$) (μg) | Solid Particle Diameter[4] ($D_{TDS}$) (μm) | EPRI Cumulative % Mass Smaller[5] (%) | Interpolation Value for $PM_{2.5}$[6] (%) | Interpolation Value for $PM_{10}$[6] (%) |
|---|---|---|---|---|---|---|---|
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.000 | 0.000 | -- | -- |
| 10 | 5.24E+02 | 5.24E-04 | 4.19E-07 | 0.714 | 0.000 | -- | -- |
| 20 | 4.19E+03 | 4.19E-03 | 3.35E-06 | 1.428 | 0.196 | -- | -- |
| 30 | 1.41E+04 | 1.41E-02 | 1.13E-05 | 2.141 | 0.226 | -- | -- |
| 40 | 3.35E+04 | 3.35E-02 | 2.68E-05 | 2.855 | 0.514 | 0.371 | -- |
| 50 | 6.54E+04 | 6.54E-02 | 5.24E-05 | 3.569 | 1.816 | -- | -- |
| 60 | 1.13E+05 | 1.13E-01 | 9.05E-05 | 4.283 | 5.702 | -- | -- |
| 70 | 1.80E+05 | 1.80E-01 | 1.44E-04 | 4.996 | 21.348 | -- | -- |
| 90 | 3.82E+05 | 3.82E-01 | 3.05E-04 | 6.424 | 49.812 | -- | -- |
| 110 | 6.97E+05 | 6.97E-01 | 5.58E-04 | 7.851 | 70.509 | -- | -- |
| 130 | 1.15E+06 | 1.15E+00 | 9.20E-04 | 9.279 | 82.023 | -- | -- |
| 150 | 1.77E+06 | 1.77E+00 | 1.41E-03 | 10.706 | 88.012 | -- | 85.048 |
| 180 | 3.05E+06 | 3.05E+00 | 2.44E-03 | 12.848 | 91.032 | -- | -- |
| 210 | 4.85E+06 | 4.85E+00 | 3.88E-03 | 14.989 | 92.468 | -- | -- |
| 240 | 7.24E+06 | 7.24E+00 | 5.79E-03 | 17.130 | 94.091 | -- | -- |
| 300 | 1.41E+07 | 1.41E+01 | 1.13E-02 | 21.413 | 96.288 | -- | -- |
| 350 | 2.24E+07 | 2.24E+01 | 1.80E-02 | 24.982 | 97.011 | -- | -- |
| 400 | 3.35E+07 | 3.35E+01 | 2.68E-02 | 28.551 | 98.340 | -- | -- |
| 450 | 4.77E+07 | 4.77E+01 | 3.82E-02 | 32.119 | 99.071 | -- | -- |
| 600 | 1.13E+08 | 1.13E+02 | 9.05E-02 | 42.826 | 100.000 | -- | -- |

1. $V_{droplet} = 4/3\ \pi\ (D_d/2)^3$ [Equation 2 of the Document]
2. $M_{droplet}$ = density ($\rho_w$) of water * $V_{droplet}$ = $\rho_w * 4/3\ \pi\ (D_d/2)^3$

$\rho_w =$ 1.00E-06 μg/μm³

3. $M_{TDS} = TDS * M_{droplet}$ [Equation 3 of the Document, with TDS in units of ppm]

TDS = 800 ppm

4. $M_{TDS} = (\rho_{TDS})(V_{TDS}) = (\rho_{TDS})(4/3)\pi(D_{TDS}/2)^3$ [Equation 5 of the Document]

Therefore, the equation can be solved for $D_{TDS}$: $D_{TDS} = \{M_{TDS}/[(\rho_{TDS}) * 4/3 * \pi]\}^{1/3} \times 2$

Assume solid particulates have the same density ($\rho_{TDS}$) as sodium chloride per the Document: 2.20E-06 μg/μm³

5. Based on drift eliminator test data from a test conducted by Environmental Systems Corporation (ESC) at the Electric Power Research Institute (EPRI) test facility in Houston, Texas in 1988 (Aull, 1999) as documented in Table 1 of the Document.
6. $D_{TDS}$ represents the particle size of collected material in droplet. The EPRI cumulative % mass smaller indicates the percentage of material in that specific water droplet size that has a diameter smaller than $D_{TDS}$. Therefore, linear interpolation between calculated $D_{TDS}$ is necessary to ascertain the specific mass percentages to estimate $PM_{10}$ and $PM_{2.5}$ emissions. For example, at 800 mg/L TDS:

$\%PM_{10} = \%<10\ D_{TDS} + [(10 - D_{TDS}<10) / (D_{TDS}>10 - D_{TDS}<10)] * (\%>10\ D_{TDS} - \%<10\ D_{TDS})$

i.e. 85.048% = 82.023% + [ (10 - 9.279) / (10.706 - 9.279) ] * (88.012% - 82.023%)

**BlueOval SK, LLC Glendale, KY Plant**
**EU KY1-10: Storage Tanks**

**Criteria Pollutant Potential Emissions**

| Tank Category | Process ID | Tank ID | Number of Identical Tanks | Tank Type | Tank Capacity (gal) | Throughput per Tank (gal/yr) | Tank Diameter (ft) | Tank Height (ft) | Tank Color | Working Loss Emission Factor (lb/Mgal) | Working Losses (tpy/tank) | Standing Loss Emission Factor (lb/Mgal capacity-yr) | Standing Losses (tpy/tank) | VOC Per Tank Potential Emissions[1,2] (lb/hr) | VOC Per Tank Potential Emissions[1,2] (tpy) | VOC Total Potential Emissions[1,2] (lb/hr) | VOC Total Potential Emissions[1,2] (tpy) | HAP (1,3-Propane Sultone) Per Tank Potential Emissions[1,2] (lb/hr) | HAP (1,3-Propane Sultone) Per Tank Potential Emissions[1,2] (tpy) | HAP (1,3-Propane Sultone) Total Potential Emissions[1,2] (lb/hr) | HAP (1,3-Propane Sultone) Total Potential Emissions[1,2] (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NMP Raw Material | 1 | RT01 - RT04 | 4 | Vert., Fixed Roof | 13,800 | 1,112,661 | 10.17 | 22.67 | White | 4.8E-03 | 2.65E-03 | | | 7.15E-04 | 3.13E-03 | 2.9E-03 | 1.3E-02 | N/A | N/A | N/A | N/A |
| | 2 | RT01 - RT04 | | | | | | | | | | 7.05E-02 | 4.86E-04 | | | | | | | | |
| NMP Waste | 3 | WT01 - WT08 | 8 | Vert., Fixed Roof | 13,800 | 695,413 | 10.17 | 22.67 | White | 6.7E-03 | 2.32E-03 | | | 6.40E-04 | 2.81E-03 | 5.1E-03 | 2.2E-02 | N/A | N/A | N/A | N/A |
| | 4 | WT01 - WT08 | | | | | | | | | | 7.05E-02 | 4.86E-04 | | | | | | | | |
| Electrolyte Storage | 5 | ET01 - ET08 | 8 | Vert., Fixed Roof | 13,800 | 653,213 | 9.84 | 19.03 | White | 2.5E-02 | 8.03E-03 | | | 2.15E-03 | 9.41E-03 | 1.72E-02 | 7.52E-02 | 1.05E-05 | 4.61E-05 | 8.42E-05 | 3.69E-04 |
| | 6 | ET01 - ET08 | | | | | | | | | | 0.20 | 1.38E-03 | | | | | | | | |
| Electrolyte Separator (1) | 7 | EST0101 | 1 | Vert., Fixed Roof | 790 | 52,257 | 6.23 | 2.62 | White | 1.0E-02 | 2.73E-04 | | | 8.40E-05 | 3.68E-04 | 8.40E-05 | 3.68E-04 | 4.12E-07 | 1.80E-06 | 4.12E-07 | 1.80E-06 |
| | 8 | EST0101 | | | | | | | | | | 0.24 | 9.51E-05 | | | | | | | | |
| Electrolyte Separator (2) | 9 | EST0201 | 1 | Vert., Fixed Roof | 1,850 | 52,257 | 6.23 | 6.23 | White | 2.9E-02 | 7.54E-04 | | | 2.16E-04 | 9.47E-04 | 2.16E-04 | 9.47E-04 | 1.06E-06 | 4.64E-06 | 1.06E-06 | 4.64E-06 |
| | 10 | EST0201 | | | | | | | | | | 0.21 | 1.94E-04 | | | | | | | | |
| Electrolyte Waste | 11 | EWT01 | 1 | Vert., Fixed Roof | 1,320 | 52,257 | 6.20 | 6.56 | White | 3.0E-02 | 7.91E-04 | | | 2.26E-04 | 9.91E-04 | 2.26E-04 | 9.91E-04 | 1.11E-06 | 4.86E-06 | 1.11E-06 | 4.86E-06 |
| | 12 | EWT01 | | | | | | | | | | 0.30 | 2.00E-04 | | | | | | | | |
| **Total** | | | | | | | | | | | | | | **4.0E-03** | **1.8E-02** | **2.6E-02** | **0.11** | **1.3E-05** | **5.7E-05** | **8.7E-05** | **3.80E-04** |

1. Emission rates for identical tanks taken from Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA.
2. Hourly emissions estimated from annual totals based on potential operation of 8,760 hr/yr.
3. Electrolyte tank throughput (gal/yr) calculated using a density of 1.3 g/cm$^3$ from SDS.

# BlueOval SK, LLC Glendale, KY Plant
# EU KY1-11: Printing

### Criteria Pollutant Potential Emissions

| Material | Process ID | Potential Usage (gal/yr) | Density [1] (lb/gal) | VOC Content [1] (%) | Emission Factor (lb/Mgal) | Potential Emissions [2,3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|
| Ink | 1 | 100 | 7.21 | 77.5 | 5,584 | 0.06 | 0.28 |
| Make-up 1 | 2 | 100 | 6.65 | 100 | 6,652 | 0.08 | 0.33 |
| Make-up 2 | 3 | 100 | 6.76 | 100 | 6,755 | 0.08 | 0.34 |
| **Total VOC** | | | | | | **0.22** | **0.95** |

1. Material specifications taken from supplier SDS.
2. PTE (tpy) = Potential Usage (gal/yr) x Density (lb/gal) / 2,000 lb/ton x VOC Content (%)
3. Hourly emissions estimated from annual totals based on potential operation of 8,760 hr/yr.

### Hazardous Air Pollutant Potential Emissions

| Material | Process ID | Potential Usage (gal/yr) | Density [1] (lb/gal) | HAP Content [1] (%) | Emission Factor (lb/Mgal) | Potential Emissions [2,3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|
| Ink | 1 | 100 | 7.21 | 0 | 0 | 0 | 0 |
| Make-up 1 | 2 | 100 | 6.65 | 0 | 0 | 0 | 0 |
| Make-up 2 | 3 | 100 | 6.76 | 0 | 0 | 0 | 0 |
| **Total VOC** | | | | | | **0** | **0** |

1. Material specifications taken from supplier SDS. These materials contain no HAP.
2. PTE (tpy) = Potential Usage (gal/yr) x Density (lb/gal) / 2,000 lb/ton x VOC Content (%)
3. Hourly emissions estimated from annual totals based on potential operation of 8,760 hr/yr.

# BlueOval SK, LLC Glendale, KY Plant
# EU KY1-12: Paved Haul Roads

### Calculation Inputs

| | |
|---|---|
| Facility-Wide Vehicle Miles Traveled [1] | |
| Short Term | 8.2 VMT/hr |
| Long Term | 70,420 VMT/yr |
| Potential Operation | 8,760 hr/yr |

1. Total vehicle miles traveled taken from Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA. A scaling factor of 10 was applied to account for variations in plant size and setup.

### Criteria Pollutant Potential Emissions

| Pollutant | Short Term Emission Factor[1] (lb/VMT) | Potential Emissions [2,3] (lb/hr) | (tpy) |
|---|---|---|---|
| PM | 0.29 | 2.38 | 10.21 |
| $PM_{10}$ | 0.059 | 0.48 | 2.08 |
| $PM_{2.5}$ | 0.014 | 0.11 | 0.49 |

1. Short term emission factors assumed to be the highest rate for each segment presented in Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA. Short term factors were also conservatively applied to annual emissions. The short term factors do not account for reductions related to annual rainfall.
2. PTE (tpy) = Long Term VMT (VMT/yr) x Short Term Emission Factor (lb/VMT) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-13: Natural Gas-fired Dehumidification Units
## Process ID 1: Direct-Fired

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 2.0 | MMBtu/hr |
| Number of Identical Units | 46 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | (tpy) | Total Potential Emissions [6] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.0E-03 | 0.004 | 0.05 | 0.21 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.0E-03 | 0.004 | 0.05 | 0.21 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 8.4E-04 | 0.004 | 0.04 | 0.17 |
| CO | 18.85 | 1.85E-02 | 0.04 | 0.16 | 1.70 | 7.45 |
| $NO_X$ | 110.24 | 1.08E-01 | 0.22 | 0.95 | 9.94 | 43.55 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.2E-03 | 0.01 | 0.05 | 0.24 |
| VOC | 5.5 | 5.39E-03 | 0.01 | 0.05 | 0.50 | 2.17 |
| Lead | 0.0005 | 4.90E-07 | 9.8E-07 | 4.3E-06 | 4.5E-05 | 2.0E-04 |
| $CO_2$ | 119,317 | 117.0 | 233.95 | 1,024.72 | 10,761.91 | 47,137.16 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.00 | 0.02 | 0.20 | 0.89 |
| $N_2O$ | 0.22 | 2.2E-04 | 4.4E-04 | 1.9E-03 | 0.02 | 0.09 |
| $CO_2e$ [7] | 119,440 | 117.1 | 234.20 | 1,025.78 | 10,773.02 | 47,185.85 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx". https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 25 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 25 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 89 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 89 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 3.9E-07 | 1.7E-06 | 1.8E-05 | 7.9E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 4.1E-06 | 1.8E-05 | 1.9E-04 | 8.3E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 2.4E-08 | 1.0E-07 | 1.1E-06 | 4.7E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 2.2E-06 | 9.4E-06 | 9.9E-05 | 4.3E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 2.7E-06 | 1.2E-05 | 1.3E-04 | 5.5E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 1.6E-07 | 7.2E-07 | 7.6E-06 | 3.3E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 2.4E-06 | 1.0E-05 | 1.1E-04 | 4.7E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 1.5E-04 | 6.4E-04 | 0.01 | 0.03 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 9.8E-07 | 4.3E-06 | 4.5E-05 | 2.0E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 7.5E-07 | 3.3E-06 | 3.4E-05 | 1.5E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 5.1E-07 | 2.2E-06 | 2.3E-05 | 1.0E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.2E-06 | 5.2E-06 | 5.5E-05 | 2.4E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 4.1E-06 | 1.8E-05 | 1.9E-04 | 8.3E-04 |
| POM | 7.0E-04 | 6.85E-07 | 1.4E-06 | 6.0E-06 | 6.3E-05 | 2.8E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 4.7E-08 | 2.1E-07 | 2.2E-06 | 9.5E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 6.7E-06 | 2.9E-05 | 3.1E-04 | 1.3E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.01** | **0.03** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.01** | **0.04** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-14: Natural Gas-fired Building AHUs
## Process ID 1: Indirect-Fired

**Calculation Inputs**

| | |
|---|---|
| Heat Input Capacity, Per Unit | 3.0 MMBtu/hr |
| Number of Identical Units | 10 |
| AP-42 Conversion Factor | 1,020 Btu/scf |
| Potential Operation | 8,760 hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.3E-03 | 0.006 | 0.01 | 0.06 |
| CO | 37.70 | 3.70E-02 | 0.11 | 0.49 | 1.11 | 4.86 |
| $NO_X$ | 68.13 | 6.68E-02 | 0.20 | 0.88 | 2.00 | 8.78 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.8E-03 | 0.01 | 0.02 | 0.08 |
| VOC | 5.5 | 5.39E-03 | 0.02 | 0.07 | 0.16 | 0.71 |
| Lead | 0.0005 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| $CO_2$ | 119,317 | 117.0 | 350.93 | 1,537.08 | 3,509.32 | 15,370.81 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.03 | 0.07 | 0.29 |
| $N_2O$ | 0.22 | 2.2E-04 | 6.6E-04 | 2.9E-03 | 0.01 | 0.03 |
| $CO_2e$ [7] | 119,440 | 117.1 | 351.29 | 1,538.67 | 3,512.94 | 15,386.69 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 55 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 55 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 5.9E-07 | 2.6E-06 | 5.9E-06 | 2.6E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 3.5E-08 | 1.5E-07 | 3.5E-07 | 1.5E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 3.2E-06 | 1.4E-05 | 3.2E-05 | 1.4E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 4.1E-06 | 1.8E-05 | 4.1E-05 | 1.8E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.5E-07 | 1.1E-06 | 2.5E-06 | 1.1E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 3.5E-06 | 1.5E-05 | 3.5E-05 | 1.5E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 2.2E-04 | 9.7E-04 | 0.00 | 0.01 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.1E-06 | 4.9E-06 | 1.1E-05 | 4.9E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 7.6E-07 | 3.3E-06 | 7.6E-06 | 3.3E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.8E-06 | 7.9E-06 | 1.8E-05 | 7.9E-05 |
| Nickel | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| POM | 7.0E-04 | 6.85E-07 | 2.1E-06 | 9.0E-06 | 2.1E-05 | 9.0E-05 |
| Selenium | 2.4E-05 | 2.35E-08 | 7.1E-08 | 3.1E-07 | 7.1E-07 | 3.1E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.0E-05 | 4.4E-05 | 1.0E-04 | 4.4E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.01** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.00** | **0.01** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-15: Natural Gas-fired Office AHUs
## Process ID 1: Indirect-Fired

**Calculation Inputs**

| | |
|---|---|
| Heat Input Capacity, Per Unit | 3.0 MMBtu/hr |
| Number of Identical Units | 10 |
| AP-42 Conversion Factor | 1,020 Btu/scf |
| Potential Operation | 8,760 hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.3E-03 | 0.006 | 0.01 | 0.06 |
| CO | 37.70 | 3.70E-02 | 0.11 | 0.49 | 1.11 | 4.86 |
| $NO_X$ | 68.13 | 6.68E-02 | 0.20 | 0.88 | 2.00 | 8.78 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.8E-03 | 0.01 | 0.02 | 0.08 |
| VOC | 5.5 | 5.39E-03 | 0.02 | 0.07 | 0.16 | 0.71 |
| Lead | 0.0005 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| $CO_2$ | 119,317 | 117.0 | 350.93 | 1,537.08 | 3,509.32 | 15,370.81 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.03 | 0.07 | 0.29 |
| $N_2O$ | 0.22 | 2.2E-04 | 6.6E-04 | 2.9E-03 | 0.01 | 0.03 |
| $CO_2e$ [7] | 119,440 | 117.1 | 351.29 | 1,538.67 | 3,512.94 | 15,386.69 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx". https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 55 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 55 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 5.9E-07 | 2.6E-06 | 5.9E-06 | 2.6E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 3.5E-08 | 1.5E-07 | 3.5E-07 | 1.5E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 3.2E-06 | 1.4E-05 | 3.2E-05 | 1.4E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 4.1E-06 | 1.8E-05 | 4.1E-05 | 1.8E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.5E-07 | 1.1E-06 | 2.5E-06 | 1.1E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 3.5E-06 | 1.5E-05 | 3.5E-05 | 1.5E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 2.2E-04 | 9.7E-04 | 0.00 | 0.01 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.1E-06 | 4.9E-06 | 1.1E-05 | 4.9E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 7.6E-07 | 3.3E-06 | 7.6E-06 | 3.3E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.8E-06 | 7.9E-06 | 1.8E-05 | 7.9E-05 |
| Nickel | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| POM | 7.0E-04 | 6.85E-07 | 2.1E-06 | 9.0E-06 | 2.1E-05 | 9.0E-05 |
| Selenium | 2.4E-05 | 2.35E-08 | 7.1E-08 | 3.1E-07 | 7.1E-07 | 3.1E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.0E-05 | 4.4E-05 | 1.0E-04 | 4.4E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.01** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.00** | **0.01** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY1-16: Natural Gas-fired Coater Oven AHUs
## Process ID 1: Direct-Fired

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 5.0 | MMBtu/hr |
| Number of Identical Units | 12 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 2.5E-03 | 0.011 | 0.03 | 0.13 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 2.5E-03 | 0.011 | 0.03 | 0.13 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 2.1E-03 | 0.009 | 0.03 | 0.11 |
| CO | 37.70 | 3.70E-02 | 0.18 | 0.81 | 2.22 | 9.71 |
| $NO_X$ | 30.97 | 3.04E-02 | 0.15 | 0.66 | 1.82 | 7.98 |
| $SO_2$ | 0.6 | 5.88E-04 | 2.9E-03 | 0.01 | 0.04 | 0.15 |
| VOC | 5.5 | 5.39E-03 | 0.03 | 0.12 | 0.32 | 1.42 |
| Lead | 0.0005 | 4.90E-07 | 2.5E-06 | 1.1E-05 | 2.9E-05 | 1.3E-04 |
| $CO_2$ | 119,317 | 117.0 | 584.89 | 2,561.80 | 7,018.64 | 30,741.63 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.05 | 0.13 | 0.58 |
| $N_2O$ | 0.22 | 2.2E-04 | 1.1E-03 | 4.8E-03 | 0.01 | 0.06 |
| $CO_2e$ [7] | 119,440 | 117.1 | 585.49 | 2,564.45 | 7,025.89 | 30,773.38 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx". https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 25 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 25 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 9.8E-07 | 4.3E-06 | 1.2E-05 | 5.2E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 1.0E-05 | 4.5E-05 | 1.2E-04 | 5.4E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 5.9E-08 | 2.6E-07 | 7.1E-07 | 3.1E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 5.4E-06 | 2.4E-05 | 6.5E-05 | 2.8E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 6.9E-06 | 3.0E-05 | 8.2E-05 | 3.6E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 4.1E-07 | 1.8E-06 | 4.9E-06 | 2.2E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 5.9E-06 | 2.6E-05 | 7.1E-05 | 3.1E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 3.7E-04 | 1.6E-03 | 0.00 | 0.02 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 2.5E-06 | 1.1E-05 | 2.9E-05 | 1.3E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.9E-06 | 8.2E-06 | 2.2E-05 | 9.8E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 1.3E-06 | 5.6E-06 | 1.5E-05 | 6.7E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 3.0E-06 | 1.3E-05 | 3.6E-05 | 1.6E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 1.0E-05 | 4.5E-05 | 1.2E-04 | 5.4E-04 |
| POM | 7.0E-04 | 6.85E-07 | 3.4E-06 | 1.5E-05 | 4.1E-05 | 1.8E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 1.2E-07 | 5.2E-07 | 1.4E-06 | 6.2E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.7E-05 | 7.3E-05 | 2.0E-04 | 8.8E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.02** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.01** | **0.02** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 5.6 | MMBtu/hr |
| Number of Identical Units | 4 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | (tpy) | Total Potential Emissions [6] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 2.9E-03 | 0.013 | 0.01 | 0.05 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 2.9E-03 | 0.013 | 0.01 | 0.05 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 2.4E-03 | 0.010 | 0.01 | 0.04 |
| CO | 37.70 | 3.70E-02 | 0.21 | 0.91 | 0.83 | 3.63 |
| $NO_X$ | 30.97 | 3.04E-02 | 0.17 | 0.74 | 0.68 | 2.98 |
| $SO_2$ | 0.6 | 5.88E-04 | 3.3E-03 | 0.01 | 0.01 | 0.06 |
| VOC | 5.5 | 5.39E-03 | 0.03 | 0.13 | 0.12 | 0.53 |
| Lead | 0.0005 | 4.90E-07 | 2.7E-06 | 1.2E-05 | 1.1E-05 | 4.8E-05 |
| $CO_2$ | 119,317 | 117.0 | 655.07 | 2,869.22 | 2,620.29 | 11,476.87 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.05 | 0.05 | 0.22 |
| $N_2O$ | 0.22 | 2.2E-04 | 1.2E-03 | 5.4E-03 | 0.00 | 0.02 |
| $CO_2e$ [7] | 119,440 | 117.1 | 655.75 | 2,872.18 | 2,623.00 | 11,488.73 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx". https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

Conversion factor: $\frac{1 \text{ atm}}{527.67 \text{ R}} \Big| \frac{1 \text{ lb-mol R}}{0.7302 \text{ scf atm}} \Big| \frac{28.01 \text{ lb}}{\text{lb-mol}}$ 0.0727 lb/scf

CO concentration: 50 ppm
$O_2$ content: 3 %
$F_d$ factor: 8,710 dscf/MMBtu

4. Burner Specification for $NO_X$: 25 ppm @ 3% $O_2$. See calculation below.

Conversion factor: $\frac{1 \text{ atm}}{527.67 \text{ R}} \Big| \frac{1 \text{ lb-mol R}}{0.7302 \text{ scf atm}} \Big| \frac{46.01 \text{ lb}}{\text{lb-mol}}$ 0.1194 lb/scf

$NO_X$ concentration: 25 ppm
$O_2$ content: 3 %
$F_d$ factor: 8,710 dscf/MMBtu

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 1.1E-06 | 4.8E-06 | 4.4E-06 | 1.9E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 1.2E-05 | 5.0E-05 | 4.6E-05 | 2.0E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 6.6E-08 | 2.9E-07 | 2.6E-07 | 1.2E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 6.0E-06 | 2.6E-05 | 2.4E-05 | 1.1E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 7.7E-06 | 3.4E-05 | 3.1E-05 | 1.3E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 4.6E-07 | 2.0E-06 | 1.8E-06 | 8.1E-06 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 6.6E-06 | 2.9E-05 | 2.6E-05 | 1.2E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 4.1E-04 | 1.8E-03 | 1.65E-03 | 0.01 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 2.7E-06 | 1.2E-05 | 1.1E-05 | 4.8E-05 |
| Manganese | 3.8E-04 | 3.73E-07 | 2.1E-06 | 9.1E-06 | 8.3E-06 | 3.7E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 1.4E-06 | 6.3E-06 | 5.7E-06 | 2.5E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 3.3E-06 | 1.5E-05 | 1.3E-05 | 5.9E-05 |
| Nickel | 2.1E-03 | 2.06E-06 | 1.2E-05 | 5.0E-05 | 4.6E-05 | 2.0E-04 |
| POM | 7.0E-04 | 6.85E-07 | 3.8E-06 | 1.7E-05 | 1.5E-05 | 6.7E-05 |
| Selenium | 2.4E-05 | 2.35E-08 | 1.3E-07 | 5.8E-07 | 5.3E-07 | 2.3E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.9E-05 | 8.2E-05 | 7.5E-05 | 3.3E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.01** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.00** | **0.01** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## KY2 Emissions Summary

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | CAS | EU KY2-01: Electrode Manufacturing | | EU KY2-02: Battery Assembly | | EU KY2-03: Battery Formation | | EU KY2-04: Cell Discharge | | EU KY2-05: Laboratories | | EU KY2-06: Natural Gas-fired Boilers & EU KY2-07: Natural Gas-fired Hot Oil Heaters | | EU KY2-08: Emergency Engines | | EU KY2-09: Cooling Towers | | EU KY2-10: Storage Tanks | | EU KY2-11: Printing | | EUs KY2-13 - KY2-16: Misc. Natural Gas Combustion | | Facility Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) |
| PM | N/A | 0.18 | 0.77 | 6.76E-04 | 2.96E-03 | -- | -- | -- | -- | -- | -- | 0.20 | 0.87 | 1.96 | 0.49 | 1.2E-01 | 0.53 | -- | -- | -- | -- | 0.12 | 0.52 | 2.58 | 3.18 |
| $PM_{10}$ | N/A | 0.18 | 0.77 | 6.76E-04 | 2.96E-03 | -- | -- | -- | -- | -- | -- | 0.20 | 0.87 | 1.96 | 0.49 | 1.0E-01 | 0.45 | -- | -- | -- | -- | 0.12 | 0.52 | 2.56 | 3.10 |
| $PM_{2.5}$ | N/A | 0.18 | 0.77 | 6.76E-04 | 2.96E-03 | -- | -- | -- | -- | -- | -- | 0.16 | 0.72 | 1.96 | 0.49 | 4.5E-04 | 2.0E-03 | -- | -- | -- | -- | 0.10 | 0.43 | 2.40 | 2.42 |
| CO | 630-08-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14.41 | 63.12 | 34.34 | 8.58 | -- | -- | -- | -- | -- | -- | 6.96 | 30.50 | 55.71 | 102.21 |
| $NO_X$ | N/A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.71 | 33.75 | 62.79 | 15.70 | -- | -- | -- | -- | -- | -- | 16.45 | 72.06 | 86.95 | 121.51 |
| $SO_2$ | 7446-09-5 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.23 | 1.00 | 0.07 | 0.02 | -- | -- | -- | -- | -- | -- | 0.14 | 0.60 | 0.44 | 1.63 |
| VOC | N/A | 37.48 | 164.17 | 1.91 | 8.37 | 10.41 | 45.61 | 1.68 | 7.37 | 2.84 | 12.43 | 2.10 | 9.21 | 62.79 | 15.70 | -- | -- | 2.6E-02 | 0.11 | 0.22 | 0.95 | 1.26 | 5.54 | 120.72 | 269.45 |
| Lead | 7439-92-1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.9E-04 | 8.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.15E-04 | 5.03E-04 | 3.06E-04 | 1.34E-03 |
| $CO_2$ | 124-38-9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45,604 | 199,743.73 | 6,811.22 | 1,702.81 | -- | -- | -- | -- | -- | -- | 27,419 | 120,097 | 79,834 | 321,544 |
| $CH_4$ | 74-82-8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.86 | 3.76 | 0.28 | 0.07 | -- | -- | -- | -- | -- | -- | 0.52 | 2.26 | 1.65 | 6.10 |
| $N_2O$ | 10024-97-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.09 | 0.38 | 0.06 | 0.01 | -- | -- | -- | -- | -- | -- | 0.05 | 0.23 | 0.19 | 0.62 |
| $CO_2e$ | N/A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45,651 | 199,950 | 6,834.60 | 1,708.65 | -- | -- | -- | -- | -- | -- | 27,448 | 120,221 | 79,933 | 321,880 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | CAS | EU KY2-01: Electrode Manufacturing | | EU KY2-02: Battery Assembly | | EU KY2-03: Battery Formation | | EU KY2-04: Cell Discharge | | EU KY2-05: Laboratories | | EU KY2-06: Natural Gas-fired Boilers & EU KY2-07: Natural Gas-fired Hot Oil Heaters | | EU KY2-08: Emergency Engines | | EU KY2-09: Cooling Towers | | EU KY2-10: Storage Tanks | | EU KY2-11: Printing | | EUs KY2-13 - KY2-16: Misc. Natural Gas Combustion | | Facility Totals | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) |
| 1,3-Butadiene | 106-99-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.0E+00 | 0.0E+00 |
| 1,3-Propane Sultone | 1120-71-4 | -- | -- | 0.16 | 0.69 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.7E-05 | 3.8E-04 | -- | -- | -- | -- | 0.16 | 0.69 |
| Acetaldehyde | 75-07-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.1E-03 | 2.6E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.1E-03 | 2.6E-04 |
| Acetonitrile | 75-05-8 | -- | -- | 0.60 | 2.64 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.60 | 2.64 |
| Acrolein | 107-02-8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.3E-04 | 8.2E-05 | -- | -- | -- | -- | -- | -- | -- | -- | 3.3E-04 | 8.2E-05 |
| Arsenic | 7440-38-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.6E-05 | 3.3E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 4.6E-05 | 2.0E-04 | 1.2E-04 | 5.4E-04 |
| Benzene | 71-43-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.0E-04 | 3.5E-03 | 3.2E-02 | 8.1E-03 | -- | -- | -- | -- | -- | -- | 4.8E-04 | 2.1E-03 | 3.4E-02 | 1.4E-02 |
| Beryllium | 7440-41-7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.6E-06 | 2.0E-05 | -- | -- | -- | -- | -- | -- | -- | -- | 2.8E-06 | 1.2E-05 | 7.3E-06 | 3.2E-05 |
| Cadmium | 7440-43-6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.2E-04 | 1.8E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 2.5E-04 | 1.1E-03 | 6.7E-04 | 2.9E-03 |
| Chromium | 7440-47-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5.4E-04 | 2.3E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 3.2E-04 | 1.4E-03 | 8.6E-04 | 3.8E-03 |
| Cobalt | 7440-48-4 | 3.4E-04 | 1.5E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 3.2E-05 | 1.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.9E-05 | 8.5E-05 | 4.0E-04 | 1.7E-03 |
| Dichlorobenzene | 106-46-7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.6E-04 | 2.0E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 2.8E-04 | 1.2E-03 | 7.3E-04 | 3.2E-03 |
| Formaldehyde | 50-00-0 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.9E-02 | 1.3E-01 | 3.3E-03 | 8.2E-04 | -- | -- | -- | -- | -- | -- | 1.7E-02 | 7.5E-02 | 4.9E-02 | 0.20 |
| Hexane, n- | 110-54-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.8E-03 | 7.7E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.4E-03 | 6.3E-03 | 0.00 | 0.01 |
| Hydrochloric acid | 7647-01-0 | -- | -- | -- | -- | -- | -- | 0.22 | 0.97 | 0.25 | 1.10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.47 | 2.07 |
| Lead | 7439-92-1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.9E-04 | 8.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 1.1E-04 | 5.0E-04 | 3.1E-04 | 1.3E-03 |
| Manganese | 7439-96-5 | 2.7E-04 | 1.2E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 1.5E-04 | 6.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 8.7E-05 | 3.8E-04 | 5.0E-04 | 2.2E-03 |
| Mercury | 7439-97-6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.9E-05 | 4.4E-04 | -- | -- | -- | -- | -- | -- | -- | -- | 6.0E-05 | 2.6E-04 | 1.6E-04 | 7.0E-04 |
| Naphthalene | 91-20-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.3E-04 | 1.0E-03 | 5.4E-03 | 1.4E-03 | -- | -- | -- | -- | -- | -- | 1.4E-04 | 6.1E-04 | 5.8E-03 | 3.0E-03 |
| Nickel | 7440-02-0 | 4.2E-04 | 1.8E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 8.0E-04 | 3.5E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 4.8E-04 | 2.1E-03 | 1.7E-03 | 7.5E-03 |
| POM | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.7E-04 | 1.2E-03 | 8.8E-03 | 2.2E-03 | -- | -- | -- | -- | -- | -- | 1.6E-04 | 7.0E-04 | 9.3E-03 | 4.1E-03 |
| Selenium | 7782-49-2 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.2E-06 | 4.0E-05 | -- | -- | -- | -- | -- | -- | -- | -- | 5.3E-07 | 2.3E-06 | 9.7E-06 | 4.2E-05 |
| Toluene | 108-88-3 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.3E-03 | 5.7E-03 | 1.2E-02 | 2.9E-03 | -- | -- | -- | -- | -- | -- | 4.0E-08 | 1.7E-07 | 1.3E-02 | 8.6E-03 |
| Xylenes | 1330-20-7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.1E-03 | 2.0E-03 | -- | -- | -- | -- | -- | -- | -- | -- | 8.1E-03 | 2.0E-03 |
| **Max HAP** | | **4.2E-04** | **1.8E-03** | **0.60** | **2.64** | **--** | **--** | **0.22** | **0.97** | **0.25** | **1.10** | **0.02** | **0.09** | **3.2E-02** | **8.1E-03** | **--** | **--** | **8.7E-05** | **3.8E-04** | **--** | **--** | **0.02** | **0.08** | **0.60** | **2.64** |
| **Total HAP** | | **1.0E-03** | **4.5E-03** | **0.76** | **3.33** | **--** | **--** | **0.22** | **0.97** | **0.25** | **1.10** | **0.02** | **0.11** | **0.07** | **1.6E-02** | **--** | **--** | **8.7E-05** | **3.8E-04** | **--** | **--** | **0.02** | **0.10** | **1.35** | **5.63** |

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-01: Electrode Manufacturing

**Calculation Inputs**

| | |
|---|---|
| Cathode Composition[1] | |
| Nickel Compounds | 0.625 % |
| Cobalt Compounds | 0.513 % |
| Manganese Compounds | 0.400 % |
| NMP Molecular Weight | 99.13 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

1. Nickel compounds and manganese compounds concentrations based on testing data at a similar facility. Cobalt compounds concentration assumed to be the average of nickel compounds and manganese compounds.

**Solids Processing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions[1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions[1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions[1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Powder Room: Anode Measure | 1 | KY2-PR01 - KY2-PR08 | KY2-DC01 - KY2-DC29 | Controlled by KY2-DC01 - KY2-DC29 | | | | | | | | | | |
| Powder Room: Cathode Measure | 2 | KY2-PR09 - KY2-PR16 | KY2-DC01 - KY2-DC29 | | | | | | | | | | | |
| Powder Room: Anode Feed | 3 | KY2-PR17 - KY2-PR24 | KY2-DC01 - KY2-DC29 | | | | | | | | | | | |
| Powder Room: Cathode Feed | 4 | KY2-PR25 - KY2-PR32 | KY2-DC01 - KY2-DC29 | | | | | | | | | | | |
| Cathode Powder Vacuum Pump | 5 | KY2-PR33 - KY2-PR40 | N/A | 706 | 0.01 | 90% | 8 | N/A | 6.1E-03 | 2.7E-02 | 6.1E-03 | 2.7E-02 | 4.84E-02 | 2.12E-01 |
| | | | KY2-DC01 - KY2-DC07 | 2,580 | 8.54E-05 | 0% | 35 | 5 | 3.8E-04 | 1.7E-03 | 1.9E-03 | 8.3E-03 | 1.32E-02 | 5.79E-02 |
| Cathode Powder | 6 | KY2-PR41 - KY2-PR81 | KY2-DC08 | 2,580 | 8.54E-05 | 0% | 4 | 4 | 4.7E-04 | 2.1E-03 | 1.9E-03 | 8.3E-03 | 1.89E-03 | 8.27E-03 |
| | | | KY2-DC09 - KY2-DC10 | 361 | 5.98E-04 | 0% | 2 | 1 | 1.8E-03 | 8.1E-03 | 1.8E-03 | 8.1E-03 | 3.70E-03 | 1.62E-02 |
| | | | KY2-DC11 - KY2-DC20 | 2,580 | 8.54E-05 | 0% | 70 | 7 | 2.7E-04 | 1.2E-03 | 1.9E-03 | 8.3E-03 | 1.89E-02 | 8.27E-02 |
| Anode Powder | 9 | KY2-PR98 - KY2-PR190 | KY2-DC21 | 2,580 | 8.54E-05 | 0% | 10 | 10 | 1.9E-04 | 8.3E-04 | 1.9E-03 | 8.3E-03 | 1.89E-03 | 8.27E-03 |
| | | | KY2-DC22 - KY2-DC26 | 361 | 5.98E-04 | 0% | 10 | 2 | 9.2E-04 | 4.1E-03 | 1.8E-03 | 8.1E-03 | 9.25E-03 | 4.05E-02 |
| | | | KY2-DC27 - KY2-DC29 | 361 | 5.98E-04 | 0% | 3 | 1 | 1.8E-03 | 8.1E-03 | 1.8E-03 | 8.1E-03 | 5.55E-03 | 2.43E-02 |
| Anode Mixer Vacuum Pump | 7 | KY2-PR82 - KY2-PR89 | N/A | 353 | 0.01 | 90% | 8 | N/A | 3.0E-03 | 1.3E-02 | 3.0E-03 | 1.3E-02 | 2.42E-02 | 1.06E-01 |
| Anode Powder Vacuum Pump | 8 | KY2-PR90 - KY2-PR97 | N/A | 706 | 0.01 | 90% | 8 | N/A | 6.1E-03 | 2.7E-02 | 6.1E-03 | 2.7E-02 | 4.84E-02 | 2.12E-01 |
| **Totals** | | | | | | | | | **2.11E-02** | **9.22E-02** | **2.82E-02** | **1.24E-01** | **0.18** | **0.77** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. TCEQ RG 058 February 2002, Table 7

**Solids Processing - Hazardous Air Pollutant Potential Emissions**

| Pollutant | Process ID | Per Source Potential Emissions[1] (lb/hr) | (tpy) | Per Stack Potential Emissions[1] (lb/hr) | (tpy) | Total Potential Emissions[1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|
| Nickel Compounds | 2, 4, 5, 6 | 5.5E-05 | 2.4E-04 | 7.3E-05 | 3.2E-04 | 4.2E-04 | 1.8E-03 |
| Cobalt Compounds | 2, 4, 5, 6 | 4.5E-05 | 2.0E-04 | 6.0E-05 | 2.6E-04 | 3.4E-04 | 1.5E-03 |
| Manganese Compounds | 2, 4, 5, 6 | 3.5E-05 | 1.5E-04 | 4.7E-05 | 2.0E-04 | 2.7E-04 | 1.2E-03 |
| **Max HAP** | | **5.5E-05** | **2.4E-04** | **7.3E-05** | **3.2E-04** | **4.2E-04** | **1.8E-03** |
| **Total HAP** | | **1.3E-04** | **5.9E-04** | **1.8E-04** | **7.9E-04** | **1.0E-03** | **4.5E-03** |

1. PTE (tpy) = [Cathode Measure PM PTE (tpy) + Cathode Feed PM PTE (tpy) + Cathode Powder Vacuum Pump (tpy) + Cathode Powder (tpy)] x Cathode Composition

**Electrode Processing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as NMP Concentration (ppmv) | Number of Sources[1] | Number of Sources per Control Device | VOC Per Source Potential Emissions[2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions[2] (lb/hr) | (tpy) | VOC Total Potential Emissions[2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode/Anode Processing | 10 | KY2-CP01 - KY2-CP57 | KY2-AC01 | E-FAN-2131-A | 13,014 | 4.5 | 57 | 57 | 1.6E-02 | 6.9E-02 | 0.90 | 3.96 | 0.90 | 3.96 |
| Electrode Cleaning | 11 | KY2-CR01 - KY2-CR34 | KY2-AC02 | E-FAN-2151-A | 15,270 | 4.5 | 12 | 12 | 0.09 | 0.39 | 1.06 | 4.65 | 1.06 | 4.65 |
| | | | KY2-AC03 | E-FAN-2121-A | 9,023 | 4.5 | 22 | 22 | 0.03 | 0.12 | 0.63 | 2.75 | 0.63 | 2.75 |
| **Totals** | | | | | | | | | **0.13** | **0.58** | **2.59** | **11.35** | **2.59** | **11.35** |

1. KY2-AC01 is connected to 35 emission sources and 21 day tanks. KY2-AC02 is connected to 8 emission sources and 4 lab exhausts. KY1-AC03 is connected to 22 lab exhausts.
2. PTE (tpy) = Air Flow (scfm) x VOC as NMP Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x NMP Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

**Cathode Drying - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | VOC as NMP Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | VOC Per Source Potential Emissions[1] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions[1] (lb/hr) | (tpy) | VOC Total Potential Emissions[1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Drying | 12 | KY2-DR01 - KY2-DR08 | KY2-SC01 - KY2-SC08 | 141,264 | 2 | 8 | 1 | 4.36 | 19.10 | 4.36 | 19.10 | 34.89 | 152.82 |
| **Totals** | | | | | | | | **4.36** | **19.10** | **4.36** | **19.10** | **34.89** | **152.82** |

1. PTE (tpy) = Air Flow (scfm) x VOC as NMP Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x NMP Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-02: Battery Assembly

**Calculation Inputs**

| | |
|---|---|
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Electrode Notching Processing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Notching | 1 | KY2-CN01 - KY2-CN35 | KY2-DC30 - KY2-DC34 | 16,113 | 5.25E-07 | 90% | 35 | 7 | 1.0E-06 | 4.5E-06 | 7.2E-06 | 3.2E-05 | 3.6E-05 | 1.59E-04 |
| Anode Notching | 2 | KY2-AN01 - KY2-AN35 | KY2-DC35 - KY2-DC39 | 16,113 | 5.25E-07 | 90% | 35 | 7 | 1.0E-06 | 4.5E-06 | 7.2E-06 | 3.2E-05 | 3.6E-05 | 1.59E-04 |
| **Totals** | | | | | | | | | **2.1E-06** | **9.1E-06** | **1.4E-05** | **6.35E-05** | **7.25E-05** | **3.18E-04** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. TCEQ RG 058 February 2002, Table 7

**Anode / Cathode Press - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Press | 4 | KY2-CS01 - KY2-CS11 | KY2-DC40 | 6,954 | 1.18E-06 | 0% | 6 | 6 | 1.17E-05 | 5.13E-05 | 7.0E-05 | 3.08E-04 | 1.41E-04 | 6.17E-04 |
| | | | KY2-DC41 | 8,384 | 9.82E-07 | 0% | 5 | 5 | 1.41E-05 | 6.18E-05 | 7.1E-05 | 3.09E-04 | | |
| Anode Press | 5 | KY2-AS01 - KY2-AS11 | KY2-DC42 | 9,078 | 6.61E-07 | 0% | 3 | 3 | 1.71E-05 | 7.51E-05 | 5.1E-05 | 2.25E-04 | 2.42E-04 | 1.06E-03 |
| | | | KY2-DC43 - KY2-DC44 | 12,362 | 9.00E-07 | 0% | 8 | 4 | 2.39E-05 | 1.04E-04 | 9.5E-05 | 4.18E-04 | | |
| **Totals** | | | | | | | | | **6.68E-05** | **2.93E-04** | **2.88E-04** | **1.26E-03** | **3.83E-04** | **1.68E-03** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. Vents outdoors (no internal venting).

**Anode / Cathode Press - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [2] (lb/hr) | (tpy) | VOC Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cathode Press | 4 | KY2-CS01 - KY2-CS11 | KY2-AC06 | E-FAN-2111-A | 3,818 | 6 | 13 | 13 | 2.9E-02 | 1.3E-01 | 0.38 | 1.67 | 0.38 | 1.67 |
| Anode Press | 5 | KY2-AS01 - KY2-AS11 | KY2-AC07 | A-FAN-2231-A | 6,966 | 6 | 17 | 17 | 4.1E-02 | 1.8E-01 | 0.70 | 3.05 | 0.70 | 3.05 |
| **Totals** | | | | | | | | | **7.0E-02** | **3.1E-01** | **1.08** | **4.72** | **1.08** | **4.72** |

1. KY2-AC06 connected to 8 emission sources and 5 lab exhausts. KY2-AC07 connected to 8 emission sources and 9 lab exhausts.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton; where VOC includes acetonitrile contribution.

**Tab Welding - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | Outlet Grain Loading (gr/scf) | Internal Venting Control[2] (%) | Number of Sources | Number of Sources per Control Device | $PM/PM_{10}/PM_{2.5}$ Per Source Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Per Stack Potential Emissions [1] (lb/hr) | (tpy) | $PM/PM_{10}/PM_{2.5}$ Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ultrasonic Welding of Anode and Cathode Tabs (BME) | 6 | KY2-WB01 - KY2-WB16 | KY2-DC45 - KY2-DC48 | 12,308 | 6.83E-07 | 90% | 16 | 4 | 1.80E-06 | 7.89E-06 | 7.2E-06 | 3.2E-05 | 2.9E-05 | 1.26E-04 |
| Ultrasonic Welding of Anode and Cathode Tabs (SK) | 7 | KY2-WS01 - KY2-WS16 | KY2-DC49 - KY2-DC64 | 960 | 1.46E-06 | 0% | 16 | 1 | 1.20E-05 | 5.25E-05 | 1.2E-05 | 5.2E-05 | 1.9E-04 | 8.40E-04 |
| **Totals** | | | | | | | | | **1.4E-05** | **6.0E-05** | **1.9E-05** | **8.4E-05** | **2.2E-04** | **9.66E-04** |

1. PTE (tpy) = Air Flow (scfm) x Outlet Grain Loading (gr/scf) x (1 - % Control)/ 7,000 gr/lb x 60 min/hr x Potential Operation (hr/yr) / 2,000 lb/ton
2. TCEQ RG 058 February 2002, Table 7

**Cathode Drying - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [2] (lb/hr) | (tpy) | VOC Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vacuum Dryer (Cathode) | 3 | KY2-VD01 - KY2-VD214 | KY2-AC04 | A-FAN-2211-A | 4,511 | 6 | 214 | 214 | 2.1E-03 | 9.2E-03 | 0.45 | 1.98 | 0.45 | 1.98 |
| **Totals** | | | | | | | | | **2.1E-03** | **9.2E-03** | **0.45** | **1.98** | **0.45** | **1.98** |

1. KY2-AC04 is connected to 56 emission sources and 158 vacuum dryers.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton; where VOC includes acetonitrile contribution.

**Electrolyte Filling and Sealing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | VOC Per Source Potential Emissions [1] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [1] (lb/hr) | (tpy) | VOC Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electrolyte Filling, Sealing | 3 | KY2-EL01 - KY2-EL56 | KY2-AC05 | A-FAN-2211-A | 3,818 | 6 | 56 | 56 | 6.8E-03 | 3.0E-02 | 0.38 | 1.67 | 0.38 | 1.67 |
| **Totals** | | | | | | | | | **6.8E-03** | **3.0E-02** | **0.38** | **1.67** | **0.38** | **1.67** |

1. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton; where VOC includes 1,3-propane sultone contribution.

**Electrolyte Filling and Sealing - Hazardous Air Pollutant Pollutant Potential Emissions**

| Pollutant | Process ID | Potential Material Usage (lb/yr) | Control Efficiency [1] | Number of Sources | Number of Sources per Control Device | Per Source Potential Emissions [2] (lb/hr) | (tpy) | Per Stack Potential Emissions [2] (lb/hr) | (tpy) | Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetonitrile | 3 | 26,400 | 80% | 16 | 8 | 3.8E-02 | 0.17 | 0.30 | 1.32 | 0.60 | 2.64 |
| 1,3-Propane Sultone | 3 | 277,800 | 99.5% | 16 | 16 | 9.9E-03 | 0.04 | 0.16 | 0.69 | 0.16 | 0.69 |
| **Max HAP** | | | | | | **3.8E-02** | **0.17** | **0.30** | **1.32** | **0.60** | **2.64** |
| **Total HAP** | | | | | | **4.8E-02** | **0.21** | **0.46** | **2.01** | **0.76** | **3.33** |

1. Assume 99.5% control for 1,3-propane sultone.
2. PTE (tpy) = Potential Material Usage (lb/yr) / 2,000 lb/ton x (100% - Control Efficiency)

**BlueOval SK, LLC Glendale, KY Plant**
**EU KY2-03: Battery Formation**

**Calculation Inputs**

| | |
|---|---|
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Cell Degassing - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | VOC Per Source Potential Emissions [1] (lb/hr) | (tpy) | VOC Per Stack Potential Emissions [1] (lb/hr) | (tpy) | VOC Total Potential Emissions [1] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cell Degassing | 1 | KY2-DG01 - KY2-DG56 | KY2-AC08 - KY2-AC15 | F-FAN-2311-A, F-FAN-2321-A, F-FAN-2331-A, F-FAN-2341-A, F-FAN-2351-A, F-FAN-2361-A, F-FAN-2371-A, F-FAN-2381-A | 13,014 | 6 | 56 | 7 | 0.19 | 0.81 | 1.30 | 5.70 | 10.41 | 45.61 |
| **Totals** | | | | | | | | | **0.19** | **0.81** | **1.30** | **5.70** | **10.41** | **45.61** |

1. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

**BlueOval SK, LLC Glendale, KY Plant**
**EU KY2-04: Cell Discharge**

**Calculation Inputs**

| | |
|---|---|
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| HCl Molecular Weight | 36.46 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Cell Discharge - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] | | VOC Per Stack Potential Emissions [2] | | VOC Total Potential Emissions [2] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) |
| Cell Discharge | 1 | KY2-CD01 - KY2-CD04 | KY2-AC16 - KY2-AC17 | W-FAN-6711-A, W-FAN-6721-A | 8,407 | 6 | 4 | 2 | 0.42 | 1.84 | 0.84 | 3.68 | 1.68 | 7.37 |
| **Totals** | | | | | | | | | **0.42** | **1.84** | **0.84** | **3.68** | **1.68** | **7.37** |

1.TEVC-AC16 and TEVC-AC17 are each connected to 3 work areas and 1 dehydration room.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

**Cell Discharge - Hazardous Air Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | HCl Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | HCl Per Source Potential Emissions [1] | | HCl Per Stack Potential Emissions [1] | | HCl Total Potential Emissions [1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | (lb/hr) | (tpy) | (lb/hr) | (tpy) | (lb/hr) | (tpy) |
| Cell Discharge | 1 | KY2-CD01 - KY2-CD08 | KY2-SC09 | W-SCFAN-6701-A | 31,257 | 1.25 | 4 | 4 | 5.5E-02 | 0.24 | 0.22 | 0.97 | 0.22 | 0.97 |
| **Totals** | | | | | | | | | **5.5E-02** | **0.24** | **0.22** | **0.97** | **0.22** | **0.97** |

1. PTE (tpy) = Air Flow (scfm) x HCl Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x HCl Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-05: Laboratories

**Calculation Inputs**

| | |
|---|---|
| Electrolyte Molecular Weight | 107.05 lb/lb-mol |
| HCl Molecular Weight | 36.46 lb/lb-mol |
| Standard Molar Volume | 385.3 scf/lb-mol |
| Potential Operation | 8,760 hr/yr |

**Quality Control Laboratories - Criteria Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Fan Tag | Air Flow (scfm) | VOC as Electrolyte Concentration (ppmv) | Number of Sources [1] | Number of Sources per Control Device | VOC Per Source Potential Emissions [2] (lb/hr) | VOC Per Source Potential Emissions [2] (tpy) | VOC Per Stack Potential Emissions [2] (lb/hr) | VOC Per Stack Potential Emissions [2] (tpy) | VOC Total Potential Emissions [2] (lb/hr) | VOC Total Potential Emissions [2] (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Quality Evaluation 1 | 1 | KY2-QE01 - KY2-QE13 | KY2-AC18 | E-FAN-2161-A | 12,961 | 6 | 12 | 12 | 0.11 | 0.47 | 1.30 | 5.68 | 2.10 | 9.21 |
| | | | KY2-AC19 | E-FAN-2141-A | 8,053 | | 1 | 1 | 0.07 | 0.29 | 0.81 | 3.53 | | |
| Quality Evaluation 2 | 2 | N/A | KY2-AC20 | B-FAN-7311-A | 7,038 | 6 | EMERGENCY USE ONLY - EXCLUDE | | | | | | | |
| | | | KY2-AC21 | B-FAN-7321-A | 7,353 | | 3 | 3 | 0.25 | 1.07 | 0.74 | 3.22 | 0.74 | 3.22 |
| **Totals** | | | | | | | | | **0.42** | **1.84** | **2.84** | **12.43** | **2.84** | **12.43** |

1. KY2-AC18 is connected to 5 mixers, 7 vacuum pumps (0 lab exhausts). KY2-AC19 is connected to 1 disassembly station. KY2-AC20 is emergency only. KY2-AC21 is connected to 3 lab exhausts.
2. PTE (tpy) = Air Flow (scfm) x VOC as Electrolyte Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x Electrolyte Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

**ICP and Raw Material Laboratories - Hazardous Air Pollutant Potential Emissions**

| Source Description | Process ID | Source ID | Control Device ID | Air Flow (scfm) | HCl Concentration (ppmv) | Number of Sources | Number of Sources per Control Device | HCl Per Source Potential Emissions [1] (lb/hr) | HCl Per Source Potential Emissions [1] (tpy) | HCl Per Stack Potential Emissions [1] (lb/hr) | HCl Per Stack Potential Emissions [1] (tpy) | HCl Total Potential Emissions [1] (lb/hr) | HCl Total Potential Emissions [1] (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ICP Lab | 3 | KY2-LB01 - KY2-LB03 | KY2-SC10 - KY2-SC12 | 3,531 | 2.5 | 3 | 1 | 5.0E-02 | 0.22 | 5.0E-02 | 0.22 | 0.15 | 0.66 |
| Raw Material Inspection Lab | 4 | KY2-LB04 - KY2-LB05 | KY2-SC13 - KY2-SC14 | 3,531 | 2.5 | 2 | 1 | 5.0E-02 | 0.22 | 5.0E-02 | 0.22 | 0.10 | 0.44 |
| **Totals** | | | | | | | | **1.0E-01** | **0.44** | **0.10** | **0.44** | **0.25** | **1.10** |

1. PTE (tpy) = Air Flow (scfm) x HCl Concentration (ppmv) / $10^6$ x 60 min/hr / Standard Molar Volume (scf/lb-mol) x HCl Molecular Weight (lb/lb-mol) x Potential Operation (hr/yr) / 2,000 lb/ton

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-06: Natural Gas-fired Boilers

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 12.0 | MMBtu/hr |
| Number of Identical Units | 11 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 6.1E-03 | 0.03 | 0.07 | 0.29 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 6.1E-03 | 0.03 | 0.07 | 0.29 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 5.1E-03 | 0.02 | 0.06 | 0.24 |
| CO | 37.70 | 3.70E-02 | 0.44 | 1.94 | 4.88 | 21.37 |
| $NO_X$ | 11.15 | 1.09E-02 | 0.13 | 0.57 | 1.44 | 6.32 |
| $SO_2$ | 0.6 | 5.88E-04 | 7.1E-03 | 0.03 | 0.08 | 0.34 |
| VOC | 5.5 | 5.39E-03 | 0.06 | 0.28 | 0.71 | 3.12 |
| Lead | 0.0005 | 4.90E-07 | 5.9E-06 | 2.6E-05 | 6.5E-05 | 2.8E-04 |
| $CO_2$ | 119,317 | 117.0 | 1,403.73 | 6,148.33 | 15,441.00 | 67,631.58 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.03 | 0.12 | 0.29 | 1.27 |
| $N_2O$ | 0.22 | 2.2E-04 | 2.6E-03 | 1.2E-02 | 0.03 | 0.13 |
| $CO_2e$ [7] | 119,440 | 117.1 | 1,405.18 | 6,154.68 | 15,456.95 | 67,701.43 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

Conversion factor: $\frac{1\ \text{atm}}{527.67\ \text{R}} \Big| \frac{1\ \text{lb-mol R}}{0.7302\ \text{scf atm}} \Big| \frac{28.01\ \text{lb}}{\text{lb-mol}}$ 0.0727 lb/scf

CO concentration: 50 ppm
$O_2$ content: 3 %
$F_d$ factor: 8,710 dscf/MMBtu

4. Burner Specification for $NO_X$: 9 ppm @ 3% $O_2$. See calculation below.

Conversion factor: $\frac{1\ \text{atm}}{527.67\ \text{R}} \Big| \frac{1\ \text{lb-mol R}}{0.7302\ \text{scf atm}} \Big| \frac{46.01\ \text{lb}}{\text{lb-mol}}$ 0.1194 lb/scf

$NO_X$ concentration: 9 ppm
$O_2$ content: 3 %
$F_d$ factor: 8,710 dscf/MMBtu

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 2.4E-06 | 1.0E-05 | 2.6E-05 | 1.1E-04 |
| Benzene | 2.1E-03 | 2.06E-06 | 2.5E-05 | 1.1E-04 | 2.7E-04 | 1.2E-03 |
| Beryllium | 1.2E-05 | 1.18E-08 | 1.4E-07 | 6.2E-07 | 1.6E-06 | 6.8E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 1.3E-05 | 5.7E-05 | 1.4E-04 | 6.2E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 1.6E-05 | 7.2E-05 | 1.8E-04 | 7.9E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 9.9E-07 | 4.3E-06 | 1.1E-05 | 4.8E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 1.4E-05 | 6.2E-05 | 1.6E-04 | 6.8E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 8.8E-04 | 3.9E-03 | 0.01 | 0.04 |
| Hexane, n-[5] | 0.0046 | 4.51E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 5.9E-06 | 2.6E-05 | 6.5E-05 | 2.8E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 4.5E-06 | 2.0E-05 | 4.9E-05 | 2.2E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 3.1E-06 | 1.3E-05 | 3.4E-05 | 1.5E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 7.2E-06 | 3.1E-05 | 7.9E-05 | 3.5E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 2.5E-05 | 1.1E-04 | 2.7E-04 | 1.2E-03 |
| POM | 7.0E-04 | 6.85E-07 | 8.2E-06 | 3.6E-05 | 9.0E-05 | 4.0E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 2.8E-07 | 1.2E-06 | 3.1E-06 | 1.4E-05 |
| Toluene | 3.4E-03 | 3.33E-06 | 4.0E-05 | 1.8E-04 | 4.4E-04 | 1.9E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.01** | **0.04** |
| **Total HAP [4]** | **0.09** | **9.12E-05** | **0.00** | **0.00** | **0.01** | **0.05** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-07: Natural Gas-fired Hot Oil Heaters

**Calculation Inputs - Cathode**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 27.8 | MMBtu/hr |
| Number of Identical Units | 5 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | (tpy) | Total Potential Emissions [6] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.4E-02 | 6.2E-02 | 0.07 | 0.31 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.4E-02 | 6.2E-02 | 0.07 | 0.31 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.2E-02 | 5.1E-02 | 0.06 | 0.26 |
| CO | 37.70 | 3.70E-02 | 1.03 | 4.50 | 5.13 | 22.48 |
| $NO_X$ | 24.77 | 2.43E-02 | 0.67 | 2.95 | 3.37 | 14.77 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.6E-02 | 7.2E-02 | 0.08 | 0.36 |
| VOC | 5.5 | 5.39E-03 | 0.15 | 0.66 | 0.75 | 3.28 |
| Lead | 0.0005 | 4.90E-07 | 1.4E-05 | 6.0E-05 | 6.8E-05 | 3.0E-04 |
| $CO_2$ | 119,317 | 117.0 | 3,248.46 | 14,228.25 | 16,242.29 | 71,141.25 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.06 | 0.27 | 0.31 | 1.34 |
| $N_2O$ | 0.22 | 2.2E-04 | 6.1E-03 | 2.7E-02 | 0.03 | 0.13 |
| $CO_2e$ [7] | 119,440 | 117.1 | 3,251.81 | 14,242.95 | 16,259.07 | 71,214.73 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx". https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 20 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 20 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 5.4E-06 | 2.4E-05 | 2.7E-05 | 1.2E-04 |
| Benzene | 2.1E-03 | 2.06E-06 | 5.7E-05 | 2.5E-04 | 2.9E-04 | 1.3E-03 |
| Beryllium | 1.2E-05 | 1.18E-08 | 3.3E-07 | 1.4E-06 | 1.6E-06 | 7.2E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 3.0E-05 | 1.3E-04 | 1.5E-04 | 6.6E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 3.8E-05 | 1.7E-04 | 1.9E-04 | 8.3E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.3E-06 | 1.0E-05 | 1.1E-05 | 5.0E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 3.3E-05 | 1.4E-04 | 1.6E-04 | 7.2E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 2.0E-03 | 8.9E-03 | 1.0E-02 | 0.04 |
| Hexane, n-[5] | 0.0046 | 4.51E-06 | 1.3E-04 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.4E-05 | 6.0E-05 | 6.8E-05 | 3.0E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.0E-05 | 4.5E-05 | 5.2E-05 | 2.3E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 7.1E-06 | 3.1E-05 | 3.5E-05 | 1.6E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.7E-05 | 7.3E-05 | 8.3E-05 | 3.6E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 5.7E-05 | 2.5E-04 | 2.9E-04 | 1.3E-03 |
| POM | 7.0E-04 | 6.85E-07 | 1.9E-05 | 8.3E-05 | 9.5E-05 | 4.2E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 6.5E-07 | 2.9E-06 | 3.3E-06 | 1.4E-05 |
| Toluene | 3.4E-03 | 3.33E-06 | 9.3E-05 | 4.1E-04 | 4.6E-04 | 2.0E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **2.0E-03** | **0.01** | **0.01** | **0.04** |
| **Total HAP [4]** | **0.09** | **9.12E-05** | **2.5E-03** | **0.01** | **0.01** | **0.06** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

**Calculation Inputs - Anode**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 23.8 | MMBtu/hr |
| Number of Identical Units | 5 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | (tpy) | Total Potential Emissions [6] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.2E-02 | 5.3E-02 | 0.06 | 0.27 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.2E-02 | 5.3E-02 | 0.06 | 0.27 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.0E-02 | 4.4E-02 | 0.05 | 0.22 |
| CO | 37.70 | 3.70E-02 | 0.88 | 3.85 | 4.40 | 19.27 |
| $NO_X$ | 24.77 | 2.43E-02 | 0.58 | 2.53 | 2.89 | 12.66 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.4E-02 | 6.1E-02 | 0.07 | 0.31 |
| VOC | 5.5 | 5.39E-03 | 0.13 | 0.56 | 0.64 | 2.81 |
| Lead | 0.0005 | 4.90E-07 | 1.2E-05 | 5.1E-05 | 5.8E-05 | 2.6E-04 |
| $CO_2$ | 119,317 | 117.0 | 2,784.06 | 12,194.18 | 13,920.30 | 60,970.90 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.05 | 0.23 | 0.26 | 1.15 |
| $N_2O$ | 0.22 | 2.2E-04 | 5.2E-03 | 2.3E-02 | 0.03 | 0.11 |
| $CO_2e$ [7] | 119,440 | 117.1 | 2,786.93 | 12,206.77 | 13,934.67 | 61,033.87 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 20 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 20 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 4.7E-06 | 2.0E-05 | 2.3E-05 | 1.0E-04 |
| Benzene | 2.1E-03 | 2.06E-06 | 4.9E-05 | 2.1E-04 | 2.5E-04 | 1.1E-03 |
| Beryllium | 1.2E-05 | 1.18E-08 | 2.8E-07 | 1.2E-06 | 1.4E-06 | 6.1E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 2.6E-05 | 1.1E-04 | 1.3E-04 | 5.6E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 3.3E-05 | 1.4E-04 | 1.6E-04 | 7.2E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.0E-06 | 8.6E-06 | 9.8E-06 | 4.3E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 2.8E-05 | 1.2E-04 | 1.4E-04 | 6.1E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 1.8E-03 | 7.7E-03 | 8.8E-03 | 0.04 |
| Hexane, n-[5] | 0.0046 | 4.51E-06 | 1.1E-04 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.2E-05 | 5.1E-05 | 5.8E-05 | 2.6E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 8.9E-06 | 3.9E-05 | 4.4E-05 | 1.9E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 6.1E-06 | 2.7E-05 | 3.0E-05 | 1.3E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.4E-05 | 6.2E-05 | 7.1E-05 | 3.1E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 4.9E-05 | 2.1E-04 | 2.5E-04 | 1.1E-03 |
| POM | 7.0E-04 | 6.85E-07 | 1.6E-05 | 7.1E-05 | 8.1E-05 | 3.6E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 5.6E-07 | 2.5E-06 | 2.8E-06 | 1.2E-05 |
| Toluene | 3.4E-03 | 3.33E-06 | 7.9E-05 | 3.5E-04 | 4.0E-04 | 1.7E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **1.8E-03** | **0.01** | **0.01** | **0.04** |
| **Total HAP [4]** | **0.09** | **9.12E-05** | **2.2E-03** | **0.01** | **0.01** | **0.05** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-08: Emergency Engines, Process ID 2

**Calculation Inputs**

| | | |
|---|---|---|
| Engine Rating | 800 | kW |
| | 1,073 | hp |
| Number of Identical Units | 2 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Maximum Fuel Consumption[1] | 53.8 | gal/hr/unit |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. MMBtu/hr is calculated assuming an average BSFC of 7,000 Btu/hp-hr, consistent with footnote c in AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/hp-hr) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3,4] (lb/hr) | (tpy) | Total Potential Emissions [3,4] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 0.35 | 0.09 | 0.71 | 0.18 |
| $PM_{10}$ | 3.3E-04 | -- | 0.35 | 0.09 | 0.71 | 0.18 |
| $PM_{2.5}$ | 3.3E-04 | -- | 0.35 | 0.09 | 0.71 | 0.18 |
| CO | 5.8E-03 | -- | 6.17 | 1.54 | 12.35 | 3.09 |
| $NO_X$ | 1.1E-02 | -- | 11.29 | 2.82 | 22.58 | 5.64 |
| $SO_2$ [5] | 1.2E-05 | -- | 0.01 | 0.00 | 0.03 | 0.01 |
| VOC | 1.1E-02 | -- | 11.29 | 2.82 | 22.58 | 5.64 |
| $CO_2$ | -- | 163.1 | 1,224 | 306 | 2,448.98 | 612.24 |
| $CH_4$ | -- | 6.6E-03 | 0.05 | 0.01 | 9.9E-02 | 2.5E-02 |
| $N_2O$ | -- | 1.3E-03 | 0.01 | 0.002 | 2.0E-02 | 5.0E-03 |
| $CO_2e$ [6] | -- | 163.6 | 1,229 | 307 | 2,457.38 | 614.35 |

1. Factors converted from g to lb. Engines will be certified to Tier 2 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2)
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,00
5. $SO_2$ emission factor from AP-42, Table 3.4-1 for Large Stationary Diesel Engines. Assume 0.0015% sulfur content for ULSD.
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMBtu) | Per Unit Potential Emissions [2] (lb/hr) | (tpy) | Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 1.9E-04 | 4.7E-05 | 3.8E-04 | 9.5E-05 |
| Acrolein | 7.88E-06 | 5.9E-05 | 1.5E-05 | 1.2E-04 | 3.0E-05 |
| Benzene | 7.76E-04 | 5.8E-03 | 1.5E-03 | 1.2E-02 | 2.9E-03 |
| Formaldehyde | 7.89E-05 | 5.9E-04 | 1.5E-04 | 1.2E-03 | 3.0E-04 |
| Napthalene | 1.30E-04 | 9.8E-04 | 2.4E-04 | 2.0E-03 | 4.9E-04 |
| POM | 2.12E-04 | 1.6E-03 | 4.0E-04 | 3.2E-03 | 7.9E-04 |
| Toluene | 2.81E-04 | 2.1E-03 | 5.3E-04 | 4.2E-03 | 1.1E-03 |
| Xylenes | 1.93E-04 | 1.4E-03 | 3.6E-04 | 2.9E-03 | 7.2E-04 |
| **Max HAP** | **7.8E-04** | **5.8E-03** | **1.5E-03** | **1.2E-02** | **2.9E-03** |
| **Total HAP [3]** | **1.6E-03** | **1.2E-02** | **3.0E-03** | **2.4E-02** | **5.9E-03** |

1. Emission factors taken from AP-42 Section 3.4 "Large Stationary Diesel And All Stationary Dual-fuel Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,00
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

**Calculation Inputs**

| | | |
|---|---|---|
| Engine Rating | 1,250 | kW |
| | 1,676 | hp |
| Number of Identical Units | 1 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. MMBtu/hr is calculated assuming an average BSFC of 7,000 Btu/hp-hr, consistent with footnote c in AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/hp-hr) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3,4] (lb/hr) | (tpy) | Total Potential Emissions [3,4] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 0.55 | 0.14 | 0.55 | 0.14 |
| $PM_{10}$ | 3.3E-04 | -- | 0.55 | 0.14 | 0.55 | 0.14 |
| $PM_{2.5}$ | 3.3E-04 | -- | 0.55 | 0.14 | 0.55 | 0.14 |
| CO | 5.8E-03 | -- | 9.65 | 2.41 | 9.65 | 2.41 |
| $NO_X$ | 1.1E-02 | -- | 17.64 | 4.41 | 17.64 | 4.41 |
| $SO_2$ [5] | 1.2E-05 | -- | 0.02 | 0.01 | 0.02 | 0.01 |
| VOC | 1.1E-02 | -- | 17.64 | 4.41 | 17.64 | 4.41 |
| $CO_2$ | -- | 163.1 | 1,913 | 478 | 1,913.27 | 478.32 |
| $CH_4$ | -- | 6.6E-03 | 0.08 | 0.02 | 0.08 | 0.02 |
| $N_2O$ | -- | 1.3E-03 | 0.02 | 0.004 | 0.02 | 3.9E-03 |
| $CO_2e$ [6] | -- | 163.6 | 1,920 | 480 | 1,919.83 | 479.96 |

1. Factors converted from g to lb. Engines will be certified to Tier 2 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2)
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000
5. $SO_2$ emission factor from AP-42, Table 3.4-1 for Large Stationary Diesel Engines. Assume 0.0015% sulfur content for ULSD.
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMBtu) | Per Unit Potential Emissions [2] (lb/hr) | (tpy) | Total Potential Emissions [2] (lb/hr) | (tpy) |
|---|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 3.0E-04 | 7.4E-05 | 3.0E-04 | 7.4E-05 |
| Acrolein | 7.88E-06 | 9.2E-05 | 2.3E-05 | 9.2E-05 | 2.3E-05 |
| Benzene | 7.76E-04 | 9.1E-03 | 2.3E-03 | 9.1E-03 | 2.3E-03 |
| Formaldehyde | 7.89E-05 | 9.3E-04 | 2.3E-04 | 9.3E-04 | 2.3E-04 |
| Napthalene | 1.30E-04 | 1.5E-03 | 3.8E-04 | 1.5E-03 | 3.8E-04 |
| POM | 2.12E-04 | 2.5E-03 | 6.2E-04 | 2.5E-03 | 6.2E-04 |
| Toluene | 2.81E-04 | 3.3E-03 | 8.2E-04 | 3.3E-03 | 8.2E-04 |
| Xylenes | 1.93E-04 | 2.3E-03 | 5.7E-04 | 2.3E-03 | 5.7E-04 |
| **Max HAP** | **7.8E-04** | **9.1E-03** | **2.3E-03** | **9.1E-03** | **2.3E-03** |
| **Total HAP [3]** | **1.6E-03** | **1.8E-02** | **4.6E-03** | **1.8E-02** | **4.6E-03** |

1. Emission factors taken from AP-42 Section 3.4 "Large Stationary Diesel And All Stationary Dual-fuel Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

**Calculation Inputs**

| | | |
|---|---|---|
| Engine Rating | 1,600 | kW |
| | 2,146 | hp |
| Number of Identical Units | 1 | |
| Fuel | ULSD | |
| Heating Value | 137,000 | Btu/gal |
| Brake-Specific Fuel Consumption[1] | 7,000 | Btu/hp-hr |
| Potential Operation[2] | 500 | hr/yr |

1. MMBtu/hr is calculated assuming an average BSFC of 7,000 Btu/hp-hr, consistent with footnote c in AP-42 Table 3.3-1.
2. Seitz, John S. *Calculating Potential to Emit (PTE) for Emergency Generators.* (09/95)

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/hp-hr) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3,4] (lb/hr) | Per Unit Potential Emissions [3,4] (tpy) | Total Potential Emissions [3,4] (lb/hr) | Total Potential Emissions [3,4] (tpy) |
|---|---|---|---|---|---|---|
| PM | 3.3E-04 | -- | 0.71 | 0.18 | 0.71 | 0.18 |
| $PM_{10}$ | 3.3E-04 | -- | 0.71 | 0.18 | 0.71 | 0.18 |
| $PM_{2.5}$ | 3.3E-04 | -- | 0.71 | 0.18 | 0.71 | 0.18 |
| CO | 5.8E-03 | -- | 12.35 | 3.09 | 12.35 | 3.09 |
| $NO_X$ | 1.1E-02 | -- | 22.58 | 5.64 | 22.58 | 5.64 |
| $SO_2$ [5] | 1.2E-05 | -- | 0.03 | 0.01 | 0.03 | 0.01 |
| VOC | 1.1E-02 | -- | 22.58 | 5.64 | 22.58 | 5.64 |
| $CO_2$ | -- | 163.1 | 2,449 | 612 | 2,448.98 | 612.24 |
| $CH_4$ | -- | 6.6E-03 | 0.10 | 0.02 | 0.10 | 0.02 |
| $N_2O$ | -- | 1.3E-03 | 0.02 | 0.005 | 0.02 | 5.0E-03 |
| $CO_2e$ [6] | -- | 163.6 | 2,457 | 614 | 2,457.38 | 614.35 |

1. Factors converted from g to lb. Engines will be certified to Tier 2 standards under 40 CFR 1039 Appendix I (Jan 2023) pursuant to 40 CFR 60.4202(a)(2)
2. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb
3. PTE (tpy) = Engine Rating (hp) x Emission Factor (lb/hp-hr) x Potential Operation (hr/yr) / 2,000 lb/ton
4. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000
5. $SO_2$ emission factor from AP-42, Table 3.4-1 for Large Stationary Diesel Engines. Assume 0.0015% sulfur content for ULSD.
6. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMBtu) | Per Unit Potential Emissions [2] (lb/hr) | Per Unit Potential Emissions [2] (tpy) | Total Potential Emissions [2] (lb/hr) | Total Potential Emissions [2] (tpy) |
|---|---|---|---|---|---|
| Acetaldehyde | 2.52E-05 | 3.8E-04 | 9.5E-05 | 3.8E-04 | 9.5E-05 |
| Acrolein | 7.88E-06 | 1.2E-04 | 3.0E-05 | 1.2E-04 | 3.0E-05 |
| Benzene | 7.76E-04 | 1.2E-02 | 2.9E-03 | 1.2E-02 | 2.9E-03 |
| Formaldehyde | 7.89E-05 | 1.2E-03 | 3.0E-04 | 1.2E-03 | 3.0E-04 |
| Napthalene | 1.30E-04 | 2.0E-03 | 4.9E-04 | 2.0E-03 | 4.9E-04 |
| POM | 2.12E-04 | 3.2E-03 | 7.9E-04 | 3.2E-03 | 7.9E-04 |
| Toluene | 2.81E-04 | 4.2E-03 | 1.1E-03 | 4.2E-03 | 1.1E-03 |
| Xylenes | 1.93E-04 | 2.9E-03 | 7.2E-04 | 2.9E-03 | 7.2E-04 |
| **Max HAP** | **7.8E-04** | **1.2E-02** | **2.9E-03** | **1.2E-02** | **2.9E-03** |
| **Total HAP [3]** | **1.6E-03** | **2.4E-02** | **5.9E-03** | **2.4E-02** | **5.9E-03** |

1. Emission factors taken from AP-42 Section 3.4 "Large Stationary Diesel And All Stationary Dual-fuel Engines" (10/96).
2. PTE (tpy) = Engine Rating (hp) / Brake-Specific Fuel Consumption (Btu/hp-hr) / $10^6$ Btu/MMBtu x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000
3. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-09: Cooling Towers

**Calculation Inputs**

| | | |
|---|---|---|
| Unit Circulating Water Flow Rate | 7,507 | gpm |
| Total Dissolved Solids[1] | 800 | ppmw |
| Drift Rate[2] | 0.0005 | % |
| Number of Identical Units | 4 | |
| Density of Water | 8.34 | lb/gal |
| Potential Operation | 8,760 | hr/yr |

1. Total dissolved solids assumed from Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA.
2. Represents BACT-level control for mist eliminator.

**Criteria Pollutant Potential Emissions**

| Pollutant | Particle Size Distribution[1] | Emission Factor (lb/MMgal) | Per Unit Potential Emissions [2,3] (lb/hr) | (tpy) | Total Potential Emissions [2,3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | -- | 3.3E-02 | 1.5E-02 | 6.6E-02 | 6.0E-02 | 0.26 |
| $PM_{10}$ | 85% | 2.8E-02 | 1.3E-02 | 5.6E-02 | 5.1E-02 | 0.22 |
| $PM_{2.5}$ | 0.37% | 1.2E-04 | 5.6E-05 | 2.4E-04 | 2.2E-04 | 9.8E-04 |

1. PTE (tpy) = Circulating Water Flow Rate (gpm) x 60 min/hr x Density of Water (lb/gal) x Drift Rate x Total Dissolved Solids (ppmw) / $10^6$
2. $PM_{10}$ and $PM_{2.5}$ percentages estimated based on the methods presented in *Calculating Realistic $PM_{10}$ from Cooling Towers* ("Document") by Joel Reisman and Gordan Frisbie (2002). See detailed calculations below.

**Particle Size Distribution Calculation**

| Drift Droplet Diameter ($D_d$) (µm) | Drift Droplet Volume[1] ($V_{droplet}$) (µm³) | Drift Droplet Mass[2] ($M_{droplet}$) (µg) | Droplet Particle Mass[3] ($M_{TDS}$) (µg) | Solid Particle Diameter[4] ($D_{TDS}$) (µm) | EPRI Cumulative % Mass Smaller[5] (%) | Interpolation Value for $PM_{2.5}$[6] (%) | Interpolation Value for $PM_{10}$[6] (%) |
|---|---|---|---|---|---|---|---|
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.000 | 0.000 | -- | -- |
| 10 | 5.24E+02 | 5.24E-04 | 4.19E-07 | 0.714 | 0.000 | -- | -- |
| 20 | 4.19E+03 | 4.19E-03 | 3.35E-06 | 1.428 | 0.196 | -- | -- |
| 30 | 1.41E+04 | 1.41E-02 | 1.13E-05 | 2.141 | 0.226 | -- | -- |
| 40 | 3.35E+04 | 3.35E-02 | 2.68E-05 | 2.855 | 0.514 | 0.371 | -- |
| 50 | 6.54E+04 | 6.54E-02 | 5.24E-05 | 3.569 | 1.816 | -- | -- |
| 60 | 1.13E+05 | 1.13E-01 | 9.05E-05 | 4.283 | 5.702 | -- | -- |
| 70 | 1.80E+05 | 1.80E-01 | 1.44E-04 | 4.996 | 21.348 | -- | -- |
| 90 | 3.82E+05 | 3.82E-01 | 3.05E-04 | 6.424 | 49.812 | -- | -- |
| 110 | 6.97E+05 | 6.97E-01 | 5.58E-04 | 7.851 | 70.509 | -- | -- |
| 130 | 1.15E+06 | 1.15E+00 | 9.20E-04 | 9.279 | 82.023 | -- | -- |
| 150 | 1.77E+06 | 1.77E+00 | 1.41E-03 | 10.706 | 88.012 | -- | 85.048 |
| 180 | 3.05E+06 | 3.05E+00 | 2.44E-03 | 12.848 | 91.032 | -- | -- |
| 210 | 4.85E+06 | 4.85E+00 | 3.88E-03 | 14.989 | 92.468 | -- | -- |
| 240 | 7.24E+06 | 7.24E+00 | 5.79E-03 | 17.130 | 94.091 | -- | -- |
| 300 | 1.41E+07 | 1.41E+01 | 1.13E-02 | 21.413 | 96.288 | -- | -- |
| 350 | 2.24E+07 | 2.24E+01 | 1.80E-02 | 24.982 | 97.011 | -- | -- |
| 400 | 3.35E+07 | 3.35E+01 | 2.68E-02 | 28.551 | 98.340 | -- | -- |
| 450 | 4.77E+07 | 4.77E+01 | 3.82E-02 | 32.119 | 99.071 | -- | -- |
| 600 | 1.13E+08 | 1.13E+02 | 9.05E-02 | 42.826 | 100.000 | -- | -- |

1. $V_{droplet} = 4/3\ \pi\ (D_d/2)^3$ [Equation 2 of the Document]
2. $M_{droplet}$ = density ($\rho_w$) of water * $V_{droplet} = \rho_w * 4/3\ \pi\ (D_d/2)^3$
$\rho_w =$ 1.00E-06 µg/µm³
3. $M_{TDS} = TDS * M_{droplet}$ [Equation 3 of the Document, with TDS in units of ppm]
TDS = 800 ppm
4. $M_{TDS} = (\rho_{TDS})(V_{TDS}) = (\rho_{TDS})(4/3)\pi (D_{TDS}/2)^3$ [Equation 5 of the Document]
Therefore, the equation can be solved for $D_{TDS}$: $D_{TDS} = \{M_{TDS}/[(\rho_{TDS}) * 4/3 * \pi]\}^{1/3} \times 2$
Assume solid particulates have the same density ($\rho_{TDS}$) as sodium chloride per the Document: 2.20E-06 µg/µm³
5. Based on drift eliminator test data from a test conducted by Environmental Systems Corporation (ESC) at the Electric Power Research Institute (EPRI) test facility in Houston, Texas in 1988 (Aull, 1999) as documented in Table 1 of the Document.
6. $D_{TDS}$ represents the particle size of collected material in droplet. The EPRI cumulative % mass smaller indicates the percentage of material in that specific water droplet size that has a diameter smaller than $D_{TDS}$. Therefore, linear interpolation between calculated $D_{TDS}$ is necessary to ascertain the specific mass percentages to estimate $PM_{10}$ and $PM_{2.5}$ emissions. For example, at 800 mg/L TDS:
$\%PM_{10} = \%<10\ D_{TDS} + [\ (10 - D_{TDS}<10) / (D_{TDS}>10 - D_{TDS}<10)\ ] * (\%>10\ D_{TDS} - \%<10\ D_{TDS})$
i.e. 85.048% = 82.023% + [ (10 - 9.279) / (10.706 - 9.279) ] * (88.012% - 82.023%)

**Calculation Inputs**

| | |
|---|---|
| Unit Circulating Water Flow Rate | 3,804 gpm |
| Total Dissolved Solids[1] | 800 ppmw |
| Drift Rate[2] | 0.0005 % |
| Number of Identical Units | 3 |
| Density of Water | 8.34 lb/gal |
| Potential Operation | 8,760 hr/yr |

1. Total dissolved solids assumed from Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA.
2. Represents BACT-level control for mist eliminator.

**Criteria Pollutant Potential Emissions**

| Pollutant | Particle Size Distribution[1] | Emission Factor (lb/MMgal) | Per Unit Potential Emissions [2,3] (lb/hr) | Per Unit Potential Emissions [2,3] (tpy) | Total Potential Emissions [2,3] (lb/hr) | Total Potential Emissions [2,3] (tpy) |
|---|---|---|---|---|---|---|
| PM | -- | 3.3E-02 | 1.5E-02 | 6.6E-02 | 6.0E-02 | 0.26 |
| $PM_{10}$ | 85% | 2.8E-02 | 1.3E-02 | 5.6E-02 | 5.1E-02 | 0.22 |
| $PM_{2.5}$ | 0.37% | 1.2E-04 | 5.6E-05 | 2.4E-04 | 2.2E-04 | 9.8E-04 |

1. PTE (tpy) = Circulating Water Flow Rate (gpm) x 60 min/hr x Density of Water (lb/gal) x Drift Rate x Total Dissolved Solids (ppmw) / $10^6$
2. $PM_{10}$ and $PM_{2.5}$ percentages estimated based on the methods presented in *Calculating Realistic $PM_{10}$ from Cooling Towers* ("Document") by Joel Reisman and Gordan Frisbie (2002). See detailed calculations below.

**Particle Size Distribution Calculation**

| Drift Droplet Diameter ($D_d$) (μm) | Drift Droplet Volume[1] ($V_{droplet}$) ($\mu m^3$) | Drift Droplet Mass[2] ($M_{droplet}$) (μg) | Droplet Particle Mass[3] ($M_{TDS}$) (μg) | Solid Particle Diameter[4] ($D_{TDS}$) (μm) | EPRI Cumulative % Mass Smaller[5] (%) | Interpolation Value for $PM_{2.5}$[6] (%) | Interpolation Value for $PM_{10}$[6] (%) |
|---|---|---|---|---|---|---|---|
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.000 | 0.000 | -- | -- |
| 10 | 5.24E+02 | 5.24E-04 | 4.19E-07 | 0.714 | 0.000 | -- | -- |
| 20 | 4.19E+03 | 4.19E-03 | 3.35E-06 | 1.428 | 0.196 | -- | -- |
| 30 | 1.41E+04 | 1.41E-02 | 1.13E-05 | 2.141 | 0.226 | -- | -- |
| 40 | 3.35E+04 | 3.35E-02 | 2.68E-05 | 2.855 | 0.514 | 0.371 | -- |
| 50 | 6.54E+04 | 6.54E-02 | 5.24E-05 | 3.569 | 1.816 | -- | -- |
| 60 | 1.13E+05 | 1.13E-01 | 9.05E-05 | 4.283 | 5.702 | -- | -- |
| 70 | 1.80E+05 | 1.80E-01 | 1.44E-04 | 4.996 | 21.348 | -- | -- |
| 90 | 3.82E+05 | 3.82E-01 | 3.05E-04 | 6.424 | 49.812 | -- | -- |
| 110 | 6.97E+05 | 6.97E-01 | 5.58E-04 | 7.851 | 70.509 | -- | -- |
| 130 | 1.15E+06 | 1.15E+00 | 9.20E-04 | 9.279 | 82.023 | -- | -- |
| 150 | 1.77E+06 | 1.77E+00 | 1.41E-03 | 10.706 | 88.012 | -- | 85.048 |
| 180 | 3.05E+06 | 3.05E+00 | 2.44E-03 | 12.848 | 91.032 | -- | -- |
| 210 | 4.85E+06 | 4.85E+00 | 3.88E-03 | 14.989 | 92.468 | -- | -- |
| 240 | 7.24E+06 | 7.24E+00 | 5.79E-03 | 17.130 | 94.091 | -- | -- |
| 300 | 1.41E+07 | 1.41E+01 | 1.13E-02 | 21.413 | 96.288 | -- | -- |
| 350 | 2.24E+07 | 2.24E+01 | 1.80E-02 | 24.982 | 97.011 | -- | -- |
| 400 | 3.35E+07 | 3.35E+01 | 2.68E-02 | 28.551 | 98.340 | -- | -- |
| 450 | 4.77E+07 | 4.77E+01 | 3.82E-02 | 32.119 | 99.071 | -- | -- |
| 600 | 1.13E+08 | 1.13E+02 | 9.05E-02 | 42.826 | 100.000 | -- | -- |

1. $V_{droplet} = 4/3\ \pi\ (D_d/2)^3$ [Equation 2 of the Document]
2. $M_{droplet}$ = density ($\rho_w$) of water * $V_{droplet}$ = $\rho_w * 4/3\ \pi\ (D_d/2)^3$
$\rho_w =$ 1.00E-06 $\mu g/\mu m^3$
3. $M_{TDS}$ = TDS * $M_{droplet}$ [Equation 3 of the Document, with TDS in units of ppm]
TDS = 800 ppm
4. $M_{TDS} = (\rho_{TDS})(V_{TDS}) = (\rho_{TDS})(4/3)\pi(D_{TDS}/2)^3$ [Equation 5 of the Document]
Therefore, the equation can be solved for $D_{TDS}$: $D_{TDS} = \{M_{TDS}/[(\rho_{TDS}) * 4/3 * \pi]\}^{1/3} \times 2$
Assume solid particulates have the same density ($\rho_{TDS}$) as sodium chloride per the Document: 2.20E-06 $\mu g/\mu m^3$
5. Based on drift eliminator test data from a test conducted by Environmental Systems Corporation (ESC) at the Electric Power Research Institute (EPRI) test facility in Houston, Texas in 1988 (Aull, 1999) as documented in Table 1 of the Document.
6. $D_{TDS}$ represents the particle size of collected material in droplet. The EPRI cumulative % mass smaller indicates the percentage of material in that specific water droplet size that has a diameter smaller than $D_{TDS}$. Therefore, linear interpolation between calculated $D_{TDS}$ is necessary to ascertain the specific mass percentages to estimate $PM_{10}$ and $PM_{2.5}$ emissions. For example, at 800 mg/L TDS:
$\%PM_{10} = \%<10\ D_{TDS} + [(10 - D_{TDS}<10) / (D_{TDS}>10 - D_{TDS}<10)] * (\%>10\ D_{TDS} - \%<10\ D_{TDS})$
i.e. 85.048% = 82.023% + [ (10 - 9.279) / (10.706 - 9.279) ] * (88.012% - 82.023%)

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-10: Storage Tanks

**Criteria Pollutant Potential Emissions**

| Tank Category | Process ID | Tank ID | Number of Identical Tanks | Tank Type | Tank Capacity (gal) | Throughput per Tank (gal/yr) | Tank Diameter (ft) | Tank Height (ft) | Tank Color | Working Loss Emission Factor (lb/Mgal) | Working Losses (tpy/tank) | Standing Loss Emission Factor (lb/Mgal capacity-yr) | Standing Losses (tpy/tank) | VOC Per Tank Potential Emissions[1,2] (lb/hr) | VOC Per Tank Potential Emissions[1,2] (tpy) | VOC Total Potential Emissions[1,2] (lb/hr) | VOC Total Potential Emissions[1,2] (tpy) | HAP (1,3-Propane Sultone) Per Tank Potential Emissions[1,2] (lb/hr) | HAP (1,3-Propane Sultone) Per Tank Potential Emissions[1,2] (tpy) | HAP (1,3-Propane Sultone) Total Potential Emissions[1,2] (lb/hr) | HAP (1,3-Propane Sultone) Total Potential Emissions[1,2] (tpy) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NMP Raw Material | 1 | RT01 - RT04 | 4 | Vert., Fixed Roof | 13,800 | 1,112,661 | 10.17 | 22.67 | White | 4.8E-03 | 2.65E-03 | | | 7.15E-04 | 3.13E-03 | 2.9E-03 | 1.3E-02 | N/A | N/A | N/A | N/A |
| | 2 | RT01 - RT04 | | | | | | | | | | 7.05E-02 | 4.86E-04 | | | | | | | | |
| NMP Waste | 3 | WT01 - WT08 | 8 | Vert., Fixed Roof | 13,800 | 695,413 | 10.17 | 22.67 | White | 6.7E-03 | 2.32E-03 | | | 6.40E-04 | 2.81E-03 | 5.1E-03 | 2.2E-02 | N/A | N/A | N/A | N/A |
| | 4 | WT01 - WT08 | | | | | | | | | | 7.05E-02 | 4.86E-04 | | | | | | | | |
| Electrolyte Storage | 5 | ET01 - ET08 | 8 | Vert., Fixed Roof | 13,800 | 653,213 | 9.84 | 19.03 | White | 2.5E-02 | 8.03E-03 | | | 2.15E-03 | 9.41E-03 | 1.72E-02 | 7.52E-02 | 1.05E-05 | 4.61E-05 | 8.42E-05 | 3.69E-04 |
| | 6 | ET01 - ET08 | | | | | | | | | | 0.20 | 1.38E-03 | | | | | | | | |
| Electrolyte Separator (1) | 7 | EST0101 | 1 | Vert., Fixed Roof | 790 | 52,257 | 6.23 | 2.62 | White | 1.0E-02 | 2.73E-04 | | | 8.40E-05 | 3.68E-04 | 8.40E-05 | 3.68E-04 | 4.12E-07 | 1.80E-06 | 4.12E-07 | 1.80E-06 |
| | 8 | EST0101 | | | | | | | | | | 0.24 | 9.51E-05 | | | | | | | | |
| Electrolyte Separator (2) | 9 | EST0201 | 1 | Vert., Fixed Roof | 1,850 | 52,257 | 6.23 | 6.23 | White | 2.9E-02 | 7.54E-04 | | | 2.16E-04 | 9.47E-04 | 2.16E-04 | 9.47E-04 | 1.06E-06 | 4.64E-06 | 1.06E-06 | 4.64E-06 |
| | 10 | EST0201 | | | | | | | | | | 0.21 | 1.94E-04 | | | | | | | | |
| Electrolyte Waste | 11 | EWT01 | 1 | Vert., Fixed Roof | 1,320 | 52,257 | 6.20 | 6.56 | White | 3.0E-02 | 7.91E-04 | | | 2.26E-04 | 9.91E-04 | 2.26E-04 | 9.91E-04 | 1.11E-06 | 4.86E-06 | 1.11E-06 | 4.86E-06 |
| | 12 | EWT01 | | | | | | | | | | 0.30 | 2.00E-04 | | | | | | | | |
| **Total** | | | | | | | | | | | | | | **4.0E-03** | **1.8E-02** | **2.6E-02** | **0.11** | **1.3E-05** | **5.7E-05** | **8.7E-05** | **3.80E-04** |

1. Emission rates for identical tanks taken from Appendix B of the Phase 2 SIP Construction and Operation Permit Application for the SK Battery American Plant in Commerce, GA.
2. Hourly emissions estimated from annual totals based on potential operation of 8,760 hr/yr.
3. Electrolyte tank throughput (gal/yr) calculated using a density of 1.3 $g/cm^3$ from SDS.

# BlueOval SK, LLC Glendale, KY Plant
# EU KY2-11: Printing

## Criteria Pollutant Potential Emissions

| Material | Process ID | Potential Usage (gal/yr) | Density [1] (lb/gal) | VOC Content [1] (%) | Emission Factor (lb/Mgal) | Potential Emissions [2,3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|
| Ink | 1 | 100 | 7.21 | 77.5 | 5,584 | 0.06 | 0.28 |
| Make-up 1 | 2 | 100 | 6.65 | 100 | 6,652 | 0.08 | 0.33 |
| Make-up 2 | 3 | 100 | 6.76 | 100 | 6,755 | 0.08 | 0.34 |
| **Total VOC** | | | | | | **0.22** | **0.95** |

1. Material specifications taken from supplier SDS.
2. PTE (tpy) = Potential Usage (gal/yr) x Density (lb/gal) / 2,000 lb/ton x VOC Content (%)
3. Hourly emissions estimated from annual totals based on potential operation of 8,760 hr/yr.

## Hazardous Air Pollutant Potential Emissions

| Material | Process ID | Potential Usage (gal/yr) | Density [1] (lb/gal) | HAP Content [1] (%) | Emission Factor (lb/Mgal) | Potential Emissions [2,3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|---|
| Ink | 1 | 100 | 7.21 | 0 | 0 | 0 | 0 |
| Make-up 1 | 2 | 100 | 6.65 | 0 | 0 | 0 | 0 |
| Make-up 2 | 3 | 100 | 6.76 | 0 | 0 | 0 | 0 |
| **Total VOC** | | | | | | **0** | **0** |

1. Material specifications taken from supplier SDS. These materials contain no HAP.
2. PTE (tpy) = Potential Usage (gal/yr) x Density (lb/gal) / 2,000 lb/ton x VOC Content (%)
3. Hourly emissions estimated from annual totals based on potential operation of 8,760 hr/yr.

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-13: Natural Gas-fired Dehumidification Units
## Process ID 1: Direct-Fired

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 2.0 | MMBtu/hr |
| Number of Identical Units | 46 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.0E-03 | 0.004 | 0.05 | 0.21 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.0E-03 | 0.004 | 0.05 | 0.21 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 8.4E-04 | 0.004 | 0.04 | 0.17 |
| CO | 18.85 | 1.85E-02 | 0.04 | 0.16 | 1.70 | 7.45 |
| $NO_X$ | 110.24 | 1.08E-01 | 0.22 | 0.95 | 9.94 | 43.55 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.2E-03 | 0.01 | 0.05 | 0.24 |
| VOC | 5.5 | 5.39E-03 | 0.01 | 0.05 | 0.50 | 2.17 |
| Lead | 0.0005 | 4.90E-07 | 9.8E-07 | 4.3E-06 | 4.5E-05 | 2.0E-04 |
| $CO_2$ | 119,317 | 117.0 | 233.95 | 1,024.72 | 10,761.91 | 47,137.16 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.00 | 0.02 | 0.20 | 0.89 |
| $N_2O$ | 0.22 | 2.2E-04 | 4.4E-04 | 1.9E-03 | 0.02 | 0.09 |
| $CO_2e$ [7] | 119,440 | 117.1 | 234.20 | 1,025.78 | 10,773.02 | 47,185.85 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 25 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 25 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 89 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 89 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 3.9E-07 | 1.7E-06 | 1.8E-05 | 7.9E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 4.1E-06 | 1.8E-05 | 1.9E-04 | 8.3E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 2.4E-08 | 1.0E-07 | 1.1E-06 | 4.7E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 2.2E-06 | 9.4E-06 | 9.9E-05 | 4.3E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 2.7E-06 | 1.2E-05 | 1.3E-04 | 5.5E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 1.6E-07 | 7.2E-07 | 7.6E-06 | 3.3E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 2.4E-06 | 1.0E-05 | 1.1E-04 | 4.7E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 1.5E-04 | 6.4E-04 | 0.01 | 0.03 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 9.8E-07 | 4.3E-06 | 4.5E-05 | 2.0E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 7.5E-07 | 3.3E-06 | 3.4E-05 | 1.5E-04 |
| Mercury | 2.6E-04 | 2.55E-07 | 5.1E-07 | 2.2E-06 | 2.3E-05 | 1.0E-04 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.2E-06 | 5.2E-06 | 5.5E-05 | 2.4E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 4.1E-06 | 1.8E-05 | 1.9E-04 | 8.3E-04 |
| POM | 7.0E-04 | 6.85E-07 | 1.4E-06 | 6.0E-06 | 6.3E-05 | 2.8E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 4.7E-08 | 2.1E-07 | 2.2E-06 | 9.5E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 6.7E-06 | 2.9E-05 | 3.1E-04 | 1.3E-03 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.01** | **0.03** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.01** | **0.04** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

# BlueOval SK, LLC Glendale, KY Plant
# EU KY2-14: Natural Gas-fired Building AHUs
# Process ID 1: Indirect-Fired

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 3.0 | MMBtu/hr |
| Number of Identical Units | 10 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.3E-03 | 0.006 | 0.01 | 0.06 |
| CO | 37.70 | 3.70E-02 | 0.11 | 0.49 | 1.11 | 4.86 |
| $NO_X$ | 68.13 | 6.68E-02 | 0.20 | 0.88 | 2.00 | 8.78 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.8E-03 | 0.01 | 0.02 | 0.08 |
| VOC | 5.5 | 5.39E-03 | 0.02 | 0.07 | 0.16 | 0.71 |
| Lead | 0.0005 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| $CO_2$ | 119,317 | 117.0 | 350.93 | 1,537.08 | 3,509.32 | 15,370.81 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.03 | 0.07 | 0.29 |
| $N_2O$ | 0.22 | 2.2E-04 | 6.6E-04 | 2.9E-03 | 0.01 | 0.03 |
| $CO_2e$ [7] | 119,440 | 117.1 | 351.29 | 1,538.67 | 3,512.94 | 15,386.69 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 55 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 55 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | Per Unit Potential Emissions [3] (tpy) | Total Potential Emissions [3] (lb/hr) | Total Potential Emissions [3] (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 5.9E-07 | 2.6E-06 | 5.9E-06 | 2.6E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 3.5E-08 | 1.5E-07 | 3.5E-07 | 1.5E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 3.2E-06 | 1.4E-05 | 3.2E-05 | 1.4E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 4.1E-06 | 1.8E-05 | 4.1E-05 | 1.8E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.5E-07 | 1.1E-06 | 2.5E-06 | 1.1E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 3.5E-06 | 1.5E-05 | 3.5E-05 | 1.5E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 2.2E-04 | 9.7E-04 | 0.00 | 0.01 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.1E-06 | 4.9E-06 | 1.1E-05 | 4.9E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 7.6E-07 | 3.3E-06 | 7.6E-06 | 3.3E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.8E-06 | 7.9E-06 | 1.8E-05 | 7.9E-05 |
| Nickel | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| POM | 7.0E-04 | 6.85E-07 | 2.1E-06 | 9.0E-06 | 2.1E-05 | 9.0E-05 |
| Selenium | 2.4E-05 | 2.35E-08 | 7.1E-08 | 3.1E-07 | 7.1E-07 | 3.1E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.0E-05 | 4.4E-05 | 1.0E-04 | 4.4E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.01** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.00** | **0.01** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-15: Natural Gas-fired Office AHUs
## Process ID 1: Indirect-Fired

**Calculation Inputs**

| | |
|---|---|
| Heat Input Capacity, Per Unit | 3.0 MMBtu/hr |
| Number of Identical Units | 10 |
| AP-42 Conversion Factor | 1,020 Btu/scf |
| Potential Operation | 8,760 hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 1.5E-03 | 0.007 | 0.02 | 0.07 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 1.3E-03 | 0.006 | 0.01 | 0.06 |
| CO | 37.70 | 3.70E-02 | 0.11 | 0.49 | 1.11 | 4.86 |
| $NO_X$ | 68.13 | 6.68E-02 | 0.20 | 0.88 | 2.00 | 8.78 |
| $SO_2$ | 0.6 | 5.88E-04 | 1.8E-03 | 0.01 | 0.02 | 0.08 |
| VOC | 5.5 | 5.39E-03 | 0.02 | 0.07 | 0.16 | 0.71 |
| Lead | 0.0005 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| $CO_2$ | 119,317 | 117.0 | 350.93 | 1,537.08 | 3,509.32 | 15,370.81 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.03 | 0.07 | 0.29 |
| $N_2O$ | 0.22 | 2.2E-04 | 6.6E-04 | 2.9E-03 | 0.01 | 0.03 |
| $CO_2e$ [7] | 119,440 | 117.1 | 351.29 | 1,538.67 | 3,512.94 | 15,386.69 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 55 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 55 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 5.9E-07 | 2.6E-06 | 5.9E-06 | 2.6E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 3.5E-08 | 1.5E-07 | 3.5E-07 | 1.5E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 3.2E-06 | 1.4E-05 | 3.2E-05 | 1.4E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 4.1E-06 | 1.8E-05 | 4.1E-05 | 1.8E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 2.5E-07 | 1.1E-06 | 2.5E-06 | 1.1E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 3.5E-06 | 1.5E-05 | 3.5E-05 | 1.5E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 2.2E-04 | 9.7E-04 | 0.00 | 0.01 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 1.5E-06 | 6.4E-06 | 1.5E-05 | 6.4E-05 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.1E-06 | 4.9E-06 | 1.1E-05 | 4.9E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 7.6E-07 | 3.3E-06 | 7.6E-06 | 3.3E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 1.8E-06 | 7.9E-06 | 1.8E-05 | 7.9E-05 |
| Nickel | 2.1E-03 | 2.06E-06 | 6.2E-06 | 2.7E-05 | 6.2E-05 | 2.7E-04 |
| POM | 7.0E-04 | 6.85E-07 | 2.1E-06 | 9.0E-06 | 2.1E-05 | 9.0E-05 |
| Selenium | 2.4E-05 | 2.35E-08 | 7.1E-08 | 3.1E-07 | 7.1E-07 | 3.1E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.0E-05 | 4.4E-05 | 1.0E-04 | 4.4E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.01** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.00** | **0.01** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

## BlueOval SK, LLC Glendale, KY Plant
## EU KY2-16: Natural Gas-fired Coater Oven AHUs
## Process ID 1: Direct-Fired

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 5.0 | MMBtu/hr |
| Number of Identical Units | 12 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | Per Unit Potential Emissions [6] (tpy) | Total Potential Emissions [6] (lb/hr) | Total Potential Emissions [6] (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 2.5E-03 | 0.011 | 0.03 | 0.13 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 2.5E-03 | 0.011 | 0.03 | 0.13 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 2.1E-03 | 0.009 | 0.03 | 0.11 |
| CO | 37.70 | 3.70E-02 | 0.18 | 0.81 | 2.22 | 9.71 |
| $NO_X$ | 30.97 | 3.04E-02 | 0.15 | 0.66 | 1.82 | 7.98 |
| $SO_2$ | 0.6 | 5.88E-04 | 2.9E-03 | 0.01 | 0.04 | 0.15 |
| VOC | 5.5 | 5.39E-03 | 0.03 | 0.12 | 0.32 | 1.42 |
| Lead | 0.0005 | 4.90E-07 | 2.5E-06 | 1.1E-05 | 2.9E-05 | 1.3E-04 |
| $CO_2$ | 119,317 | 117.0 | 584.89 | 2,561.80 | 7,018.64 | 30,741.63 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.05 | 0.13 | 0.58 |
| $N_2O$ | 0.22 | 2.2E-04 | 1.1E-03 | 4.8E-03 | 0.01 | 0.06 |
| $CO_2e$ [7] | 119,440 | 117.1 | 585.49 | 2,564.45 | 7,025.89 | 30,773.38 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 25 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 25 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 9.8E-07 | 4.3E-06 | 1.2E-05 | 5.2E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 1.0E-05 | 4.5E-05 | 1.2E-04 | 5.4E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 5.9E-08 | 2.6E-07 | 7.1E-07 | 3.1E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 5.4E-06 | 2.4E-05 | 6.5E-05 | 2.8E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 6.9E-06 | 3.0E-05 | 8.2E-05 | 3.6E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 4.1E-07 | 1.8E-06 | 4.9E-06 | 2.2E-05 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 5.9E-06 | 2.6E-05 | 7.1E-05 | 3.1E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 3.7E-04 | 1.6E-03 | 0.00 | 0.02 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 2.5E-06 | 1.1E-05 | 2.9E-05 | 1.3E-04 |
| Manganese | 3.8E-04 | 3.73E-07 | 1.9E-06 | 8.2E-06 | 2.2E-05 | 9.8E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 1.3E-06 | 5.6E-06 | 1.5E-05 | 6.7E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 3.0E-06 | 1.3E-05 | 3.6E-05 | 1.6E-04 |
| Nickel | 2.1E-03 | 2.06E-06 | 1.0E-05 | 4.5E-05 | 1.2E-04 | 5.4E-04 |
| POM | 7.0E-04 | 6.85E-07 | 3.4E-06 | 1.5E-05 | 4.1E-05 | 1.8E-04 |
| Selenium | 2.4E-05 | 2.35E-08 | 1.2E-07 | 5.2E-07 | 1.4E-06 | 6.2E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.7E-05 | 7.3E-05 | 2.0E-04 | 8.8E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.02** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.01** | **0.02** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

**Calculation Inputs**

| | | |
|---|---|---|
| Heat Input Capacity, Per Unit | 5.6 | MMBtu/hr |
| Number of Identical Units | 4 | |
| AP-42 Conversion Factor | 1,020 | Btu/scf |
| Potential Operation | 8,760 | hr/yr |

**Criteria Pollutant and Greenhouse Gas Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2,3,4,5] (lb/MMBtu) | Per Unit Potential Emissions [6] (lb/hr) | (tpy) | Total Potential Emissions [6] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| PM | 0.52 | 5.10E-04 | 2.9E-03 | 0.013 | 0.01 | 0.05 |
| $PM_{10}$ | 0.52 | 5.10E-04 | 2.9E-03 | 0.013 | 0.01 | 0.05 |
| $PM_{2.5}$ | 0.43 | 4.22E-04 | 2.4E-03 | 0.010 | 0.01 | 0.04 |
| CO | 37.70 | 3.70E-02 | 0.21 | 0.91 | 0.83 | 3.63 |
| $NO_X$ | 30.97 | 3.04E-02 | 0.17 | 0.74 | 0.68 | 2.98 |
| $SO_2$ | 0.6 | 5.88E-04 | 3.3E-03 | 0.01 | 0.01 | 0.06 |
| VOC | 5.5 | 5.39E-03 | 0.03 | 0.13 | 0.12 | 0.53 |
| Lead | 0.0005 | 4.90E-07 | 2.7E-06 | 1.2E-05 | 1.1E-05 | 4.8E-05 |
| $CO_2$ | 119,317 | 117.0 | 655.07 | 2,869.22 | 2,620.29 | 11,476.87 |
| $CH_4$ | 2.25 | 2.2E-03 | 0.01 | 0.05 | 0.05 | 0.22 |
| $N_2O$ | 0.22 | 2.2E-04 | 1.2E-03 | 5.4E-03 | 0.00 | 0.02 |
| $CO_2e$ [7] | 119,440 | 117.1 | 655.75 | 2,872.18 | 2,623.00 | 11,488.73 |

1. Criteria pollutant emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98), except for PM, $PM_{10}$, and $PM_{2.5}$ which are taken from the 2014 National Emissions Inventory (NEI) data. See "Emission Factors for Particulate Matter from Natural Gas Combustion.xlsx".
https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data
2. Emission factors converted to terms of lb/MMBtu per footnote a of Tables 1.4-1 and 1.4-2.
3. Burner Specification for CO: 50 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 28.01 lb / lb-mol | 0.0727 lb/scf |
| CO concentration: | 50 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

4. Burner Specification for $NO_X$: 25 ppm @ 3% $O_2$. See calculation below.

| | | | | |
|---|---|---|---|---|
| Conversion factor: | 1 atm / 527.67 R | 1 lb-mol R / 0.7302 scf atm | 46.01 lb / lb-mol | 0.1194 lb/scf |
| $NO_X$ concentration: | 25 ppm | | | |
| $O_2$ content: | 3 % | | | |
| $F_d$ factor: | 8,710 dscf/MMBtu | | | |

5. Greenhouse gas pollutant emission factors taken from 40 CFR 98 Tables C-1 and C-2 (12/16). Factors converted from kg to lb.
6. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
7. $CO_2e$ emissions quantified based on global warming potentials provided in 40 CFR 98 Table A-1 (12/14).

| | |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

**Hazardous Air Pollutant Potential Emissions**

| Pollutant | Emission Factor [1] (lb/MMscf) | Emission Factor [2] (lb/MMBtu) | Per Unit Potential Emissions [3] (lb/hr) | (tpy) | Total Potential Emissions [3] (lb/hr) | (tpy) |
|---|---|---|---|---|---|---|
| Arsenic | 2.0E-04 | 1.96E-07 | 1.1E-06 | 4.8E-06 | 4.4E-06 | 1.9E-05 |
| Benzene | 2.1E-03 | 2.06E-06 | 1.2E-05 | 5.0E-05 | 4.6E-05 | 2.0E-04 |
| Beryllium | 1.2E-05 | 1.18E-08 | 6.6E-08 | 2.9E-07 | 2.6E-07 | 1.2E-06 |
| Cadmium | 1.1E-03 | 1.08E-06 | 6.0E-06 | 2.6E-05 | 2.4E-05 | 1.1E-04 |
| Chromium | 1.4E-03 | 1.37E-06 | 7.7E-06 | 3.4E-05 | 3.1E-05 | 1.3E-04 |
| Cobalt | 8.4E-05 | 8.24E-08 | 4.6E-07 | 2.0E-06 | 1.8E-06 | 8.1E-06 |
| Dichlorobenzene | 1.2E-03 | 1.18E-06 | 6.6E-06 | 2.9E-05 | 2.6E-05 | 1.2E-04 |
| Formaldehyde | 7.5E-02 | 7.35E-05 | 4.1E-04 | 1.8E-03 | 1.65E-03 | 0.01 |
| Hexane, n-[5] | 0.0063 | 6.18E-06 | 0.00 | 0.00 | 0.00 | 0.00 |
| Lead | 5.0E-04 | 4.90E-07 | 2.7E-06 | 1.2E-05 | 1.1E-05 | 4.8E-05 |
| Manganese | 3.8E-04 | 3.73E-07 | 2.1E-06 | 9.1E-06 | 8.3E-06 | 3.7E-05 |
| Mercury | 2.6E-04 | 2.55E-07 | 1.4E-06 | 6.3E-06 | 5.7E-06 | 2.5E-05 |
| Naphthalene | 6.1E-04 | 5.98E-07 | 3.3E-06 | 1.5E-05 | 1.3E-05 | 5.9E-05 |
| Nickel | 2.1E-03 | 2.06E-06 | 1.2E-05 | 5.0E-05 | 4.6E-05 | 2.0E-04 |
| POM | 7.0E-04 | 6.85E-07 | 3.8E-06 | 1.7E-05 | 1.5E-05 | 6.7E-05 |
| Selenium | 2.4E-05 | 2.35E-08 | 1.3E-07 | 5.8E-07 | 5.3E-07 | 2.3E-06 |
| Toluene | 3.4E-03 | 3.33E-06 | 1.9E-05 | 8.2E-05 | 7.5E-05 | 3.3E-04 |
| **Max HAP** | **0.08** | **7.35E-05** | **0.00** | **0.00** | **0.00** | **0.01** |
| **Total HAP [4]** | **0.09** | **9.29E-05** | **0.00** | **0.00** | **0.00** | **0.01** |

1. Emission factors taken from AP-42 Section 1.4 "Natural Gas Combustion" (07/98).
2. Emission factors converted to terms of lb/MMBtu per footnote a of Table 1.4-3.
3. PTE (tpy) = Heat Input Capacity (MMBtu/hr) x Emission Factor (lb/MMBtu) x Potential Operation (hr/yr) / 2,000 (lb/ton)
4. Naphthalene, which is also classified as POM, is excluded from the total to avoid double counting emissions.
5. Emission Factor taken from Ventura Count California Combution Emission Factors "Natural Gas Fired External Combustion Equipment"

# APPENDIX D. CALCULATION SUPPORTING DOCUMENTATION

# Material Safety Data Sheet (MSDS)

MSDS

| Product Name | E-Lyte : CEL748 |
|---|---|

## SECTION 1. IDENTIFICATION

| | |
|---|---|
| 1.1. Product Name | E-Lyte : CEL748 |
| 1.2. Relevant identified uses of the substance and uses advised against. | |
| Recommended use of the product | Electrolyte, R&D, Reagent |
| Restrictions on use of the product | No information available |
| 1.3. Details of the supplier of the safety data sheet. | |
| Company Name | Enchem America, Inc |
| Address | 648 Highway 334, Commerce, GA 30530, USA |
| Emergency Tel | +1-706-335-7000 |

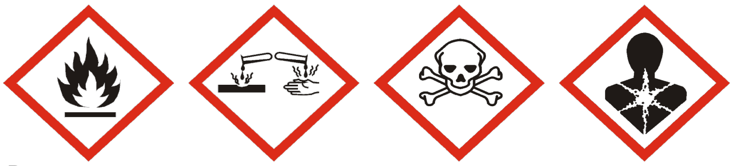
## SECTION 2. HAZARD IDENTIFICATION

2.1. Classification of the substance or mixture

Flammable liquids : Category 3
Acute toxicity(Oral) : Category 3
Skin corrosion/irritation : Category 1A
Serious eye damage/eye irritation : Category 1
Skin sensitization : Category 1
Carcinogenicity : Category 1B
Specific target organ toxicity(Repeated exposure) : Category 1

2.2. GHS label elements, including precautionary statements

Hazard symbols



Signal word: Danger

Hazard statement:
H226 Flammable liquid and vapour
H302 Harmful if swallowed
H314 Causes severe skin burns and eye damage
H317 May cause an allergic skin reaction
H318 Causes serious eye damage
H350 May cause cancer
H372 Causes damage to organs through prolonged or repeated exposure

Precautionary statements

Prevention:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/etc] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash face, hands and any exposed skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

Response:
P310 Immediately call a POISON CENTER/doctor/etc(other health care workers).
P314 Get medical advice/attention if you feel unwell.
P321 Give first aid
P330 Rinse mouth.

| | |
|---|---|
| | P363 Wash contaminated clothing before reuse. |
| | P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/etc(other health care workers) if you feel unwell. |
| | P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| | P302+P352 IF ON SKIN: Wash with plenty of water. |
| | P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. |
| | P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| | P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and eazy to do. Continue rinsing. |
| | P308+P313 IF exposed or concerned: Get medical advice/attention. |
| | P333+P313 If skin irritation or rash occurs: Get medical advice/attention. |
| | P362+P364 Take off contaminated clothing and wash it before reuse. |
| | P370+P378 In case of fire: Use suitable extinguishing media to extinguish. |
| Storage | P405 Store locked up. |
| | P403+P235 Store in a well-ventilated place. Keep cool. |
| Disposal | P501 Dispose of contents/container to an approved waste disposal plant. |

2.3. Other hazards which do not result in classification(NFPA)

Health: 1, Flammability 3, Instability: 1

## SECTION 3. COMPOSION/INFORMATION ON INGREDIENTS

3.1. This product is a mixture

| Abbreviation | Chemical Name | EC No | CAS No | Contents (%) |
|---|---|---|---|---|
| EC | Ethylene Carbonate | 202-510-0 | 96-49-1 | 20.13 ~ 21.17 |
| EMC | Ethyl methyl carbonate | 433-480-9 | 623-53-0 | 61.76 ~ 64.92 |
| LiPF6 | Lithium hexafluorophosphate | 244-334-7 | 21324-40-3 | 12.31 ~ 12.95 |
| FEC | 4-Fluoro-1,3-dioxolan-2-one | 483-360-5 | 114435-02-8 | 1.41 ~ 1.49 |
| W3 | Lithium Difluorophosphate | 643-080-8 | 24389-25-1 | 0.95 ~ 0.99 |
| PRS | 5H-1,2-Oxathiole, 2,2-dioxide | 606-834-7 | 21806-61-1 | 0.28 ~ 0.30 |
| PS | 1,3-Propane sultone | 214-317-9 | 1120-71-4 | 0.47 ~ 0.49 |
| VEC | Vinylene Ethylene Carbonate | 700-261-7 | 4427-96-7 | 0.19 ~ 0.19 |

## SECTION 4. FIRST-AID MEASURES

| | |
|---|---|
| 4.1. Eye contact | Get emergency medical attention |
| | Immediately flush eyes with plenty of water at least 20 min. |
| 4.2. Skin contact | If skin (or hair) gets on, remove all contaminated clothing. Wash skin with water/Take a shower |
| | Get emergency medical attention |
| | Remove contaminated clothing and shoes and isolate contaminated areas |
| | Prevent spread of contamination on mild skin contact |
| | In the case of burns, immediately cool the affected area for as long as possible by cold water, and do not remove any clothing adhering to the skin |
| | Flush skin with plenty of water and soap |
| 4.3. Inhalation | Move to a place with fresh air |
| | If not breathing, give artificial respiration |
| | If breathing is difficult, give oxygen |
| | Keep it warm and stable |
| 4.4. Ingestion | Get emergency medical attention |
| 4.5. Note to physician | Have medical personnel perceive the material and take protective measures |

## SECTION 5. FIRE-FIGHTING MEASURES

| | |
|---|---|
| 5.1. Suitable (Unsuitable) extinguishing media | |
| Suitable extinguishing media | Suitable extinguishing media : Dry chemical, carbon dioxide fire extinguisher, foam fire extinguisher, water spray |
| | Use dry sand or earth when digesting |
| Unsuitable extinguishing media | A large amount of water spray |
| 5.2. Hazardous products of combustion | Flammable liquid and vapour |
| | May cause irritating and highly toxic gases by thermal decomposition or combustion during burning |
| 5.3. Special firefighting procedures | Rescuers should wear appropriate protective equipment |
| | Keep your distance away from the area and digest it |
| | Approach the fire on the windy sid |
| | Use water spray to cool containers exposed to fire |

## SECTION 6. ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| 6.1. Personal Precautions | Ventilate the contaminated area<br>Avoid breathing vapors<br>Wear proper personal protective equipment and breathing apparatus |
| 6.2. Environmental Precautions | Prevent, by any means available, spillage from entering drains or water courses<br>If contamination of large spills, advise emergency services |
| 6.3. Methods and materials for containment and cleaning up | Ventilate the contaminated area<br>Absorb or clean up with inert absorbent material and transfer to appropriate container for disposal<br>Do not wash area down with water<br>Observe all Federal, State, and Local regulations regarding notifications of accidental Releases. |

## SECTION 7. HANDLING AND STORAGE

| | |
|---|---|
| 7.1. Precautions for safe handling | Use in a well-ventilated area<br>Avoid all personal contact<br>Prevent contamination by water |
| 7.2. Storage precautionary statements | Keep away from heat/sparks/open flames– No smoking<br>Keep container tightly closed in a well-ventilated area<br>Prevent to diffuse by barrier in charge place<br>Store in a well-ventilated place and keep at a low temperature<br>Around the storage area, surround low walls to prevent spreading |

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

| | |
|---|---|
| 8.1. Exposure limits | |
| Korea Administration Level/Exposure Limits | No information available |
| ACGIH Limits Values | No information available |
| Biological Exposure Limits | No information available |
| Other Exposure Limits | No information available |
| 8.2. Appropriate engineering controls | Use process isolation, local exhaust ventilation or other engineering controls to keep air levels below exposure<br>Install a washcloth and safety shower for facilities that store or use this material |
| 8.3. Personal protective equipment | |
| Respiratory protection | Wear respiratory protection according to the physicochemical properties of the material being exposed. |
| Eye protection | Wear splash resistant safety goggles |
| Hand protection | Wear suitable gloves |
| Body protection | Wear suitable impermeable protection |

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| 9.1. Appearance | |
| Appearance | Liquid |
| Color | colorless / very pale yellow |
| 9.2. Odour | Ether odour |
| 9.3. Odour threshold | No information available |
| 9.4. pH | 3 (100g/L 20°C) |
| 9.5. Melting point/freezing point | Below -20℃ |
| 9.6. Initial boiling point and boiling range | ≥ 90℃ |
| 9.7. Flash point | 32℃(closed cup) |
| 9.8. Evaporation rate | No information available |
| 9.9. Flammability(solid, gas) | Class 4 Second Petroleum |
| 9.10. Flamm. or expl. limits | 12.9% / 4.2% (lowest among ingredients) |
| 9.11. Vapour pressure | 11.3kpa(at 37.8℃) |
| 9.12. Solubilities | Water-insoluble (at 20°C) |
| 9.13. Vapour density | 3.1 (lowest level among ingredients) |
| 9.14. Density | 1.1 ~ 1.3g/cm3,25℃ |
| 9.15. Partition coefficient: n-octanol/water (Kow) | -1.93kow (lowest ingredient) |
| 9.16. Auto-ignition temperature | >443℃ |
| 9.17. Decomposition temperature | 300℃ (lowest ingredient) |
| 9.18. Viscosity | 3~5cP(25℃) |
| 9.19. Molecular Weight | No information available |

## SECTION 10. STABILITY AND REACTIVITY

| | |
|---|---|
| 10.1. Chemical stability and potential for adverse reactions | Stable during recommended storage and handling<br>Container may explode on heating<br>Some can ride, but not easily ignite<br>May cause irritation and poisonous gas in case of fire |
| 10.2. Conditions to avoid | heat/sparks/flames– No smoking |
| 10.3. Incompatible materials | Flammability matter, Reducing material |
| 10.4. Hazardous decomposition products | During burning, pyrolysis or combustion can produce irritating and highly toxic gases |

## SECTION 11. TOXICOLOGICAL INFORMATION

| | |
|---|---|
| 11.1. Information about possible routes of exposure | No information available |

11.2. Toxicity

| | |
|---|---|
| EC | <Oral> LD50 10000mg/kg Rat(NLM)<br><Dermal> LD50 >3000mg/kg Rabbit(NLM)<br><Inhale> No information available<br><Skin corrosion/irritation> The open draye test of rabbit shows light stimulus(NLM,HSDB)<br><Serious eye damage/eye irritation> Eye irritation test with rabbit results in mild irritation (TOMES;RTECS)<br><Respiratory sensitization> No information available<br><Skin sensitization> No information available<br><Carcinogenicity> No information available<br><Germ Cell Mutagenicity> No information available<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)> No information available<br><Specific target organ toxicity (Repeated exposure)> No information available<br><Aspiration hazard> No information available<br><Other Hazardous Effects> No information available |
| EMC | <Oral> LD50 10000mg/kg Rat(NLM)<br><Dermal> LD50 >3000mg/kg Rabbit(NLM)<br><Inhale> LD50 140mg/ℓ Rat<br><Skin corrosion/irritation> Non-irritating Rabbit<br><Serious eye damage/eye irritation> Weak irritation Rabbit<br><Respiratory sensitization> No information available<br><Skin sensitization> No information available<br><Carcinogenicity> No information available<br><Germ Cell Mutagenicity> No information available<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)> No information available<br><Specific target organ toxicity (Repeated exposure)> No information available<br><Aspiration hazard> No information available<br><Other Hazardous Effects>No information available |
| LiPF6 | <Oral> LD50 1,720 ㎎/㎏ Rat<br><Dermal> LD50 275mg/kg Rabbit<br><Inhale> LD50 20mg/ℓ Rat<br><Skin corrosion/irritation> Risk of skin damage/eye damage<br>There is a possibility of penetrating into the skin and creating blisters<br><Serious eye damage/eye irritation> Risk of eye damage<br><Respiratory sensitization> No information available<br><Skin sensitization> Refer to skin corrosion<br><Carcinogenicity> No information available<br><Germ Cell Mutagenicity> negative<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)> No information available<br><Specific target organ toxicity (Repeated exposure)> Fluoride deposits on the bones(Bone density increase, bone shape change, exomyeloma)Possibility of causing damage to bones and teeth<br><Aspiration hazard> No information available<br><Other Hazardous Effects>No information available |

| | |
|---|---|
| FEC | <Oral> No information available<br><Dermal> No information available<br><Inhale> No information available.<br><Skin corrosion/irritation> No information available<br><Serious eye damage/eye irritation>No information available<br><Respiratory sensitization> No information available<br><Skin sensitization> No information available<br><Carcinogenicity> No information available<br><Germ Cell Mutagenicity> No information available<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)> No information available<br><Specific target organ toxicity (Repeated exposure)> No information available<br><Aspiration hazard> No information available<br><Other Hazardous Effects>No information available |
| W3 | <Oral> LD50 50 ~ 300 ㎎/㎏ Rat(NICNAS)<br><Dermal> LD50 1000 ~ 2000㎎/㎏ Rat<br><Inhale> Classified as skin corrosive<br><Skin corrosion/irritation>corrosion Rabbit(NICNAS)<br><Serious eye damage/eye irritation> Weak irritation Rabbit<br><Respiratory sensitization>sensitization(NICNAS)<br><Skin sensitization> Irritability Guiea pig<br><Carcinogenicity> ACGIH A4<br><Germ Cell Mutagenicity>in vitro Ames test, S. typhimurium negative, in vitro chromosome aberration test, CHL cell positive, in vitro micronucleus test negative (NICNAS)<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)> No information available<br><Specific target organ toxicity (Repeated exposure)> No information available<br><Aspiration hazard> No information available<br><Other Hazardous Effects>No information available |
| PRS | <Oral> LD50 148 ㎎/㎏ Rat<br><Dermal> No information available<br><Inhale> No information available.<br><Skin corrosion/irritation> No information available<br><Serious eye damage/eye irritation>No information available<br><Respiratory sensitization> No information available<br><Skin sensitization> No information available<br><Carcinogenicity> No information available<br><Germ Cell Mutagenicity> No information available<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)> No information available<br><Specific target organ toxicity (Repeated exposure)> No information available<br><Aspiration hazard> No information available<br><Other Hazardous Effects>No information available |
| PS | <Oral> LD50 100 ~ 200 ㎎/㎏ Rat(ECHA)<br><Dermal> LD50 700 ~ 1400 ㎎/㎏ Mouse(ECHA)<br><Inhale> No information available.<br><Skin corrosion/irritation> irritation(ECHA)<br><Serious eye damage/eye irritation>An experiment with rabbits showed stimulation(ECHA)<br><Respiratory sensitization> No information available<br><Skin sensitization> Skin irritability test using guinea pigs showed non-irritation (ECHA)<br><Carcinogenicity> Ministry of Employment and Labor Notice 1B, IARC 2A, ACGIH A3, NTR R,<br>EU CLP 1B<br><Germ Cell Mutagenicity> Chromosomal aberration test, return mutation test, micronucleus test result Genotoxicity positive (ECHA)<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)>Oral: stimulate nose and throat in humans (NLM, ECHA)<br><Specific target organ toxicity (Repeated exposure)> No information available<br><Aspiration hazard> No information available<br><Other Hazardous Effects>No information available |

| | |
|---|---|
| VEC | <Oral> No information available<br><Dermal> No information available<br><Inhale> No information available.<br><Skin corrosion/irritation> No information available<br><Serious eye damage/eye irritation>No information available<br><Respiratory sensitization> No information available<br><Skin sensitization> No information available<br><Carcinogenicity> No information available<br><Germ Cell Mutagenicity> No information available<br><Reproductive toxicity> No information available<br><Specific target organ toxicity (Single exposure)> No information available<br><Specific target organ toxicity (Repeated exposure)> No information available<br><Aspiration hazard> No information available<br><Other Hazardous Effects>No information available |

## SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

| | |
|---|---|
| EC | <Ecotoxicity><br>-Fish: LC50 238.065mg/L 96hr(ECOSAR)<br>-Crustacea: LC50 9423.147mg/L 48hr(ECOSAR)<br>-Algae: LC50 17.388mg/L 96hr(ECOSAR)<br><Persistence and degradability><br>-Persistence: -0.340 log Kow(HSDB)<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: 3.2(HSDB)<br>-Biodegradable: No information available<br><Mobility in soil> 9.2(HSDB)<br><Other adverse effects> No information available |
| EMC | <Ecotoxicity><br>-Fish: No information available<br>-Crustacea: No information available<br>-Algae: No information available<br><Persistence and degradability><br>-Persistence: 104.105 log Kow(CRC)<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: 50.8(Estimate,EPISUITE)<br>-Biodegradable: No information available<br><Mobility in soil> No information available<br><Other adverse effects> No information available |
| LiPF6 | <Ecotoxicity><br>-Fish: No information available<br>-Crustacea: No information available<br>-Algae: No information available<br><Persistence and degradability><br>-Persistence: No information available<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: No information available<br>-Biodegradable: No information available<br><Mobility in soil> Due to its physicochemical properties, it may move to water and soil environments.<br><Other adverse effects> No information available |
| FEC | <Ecotoxicity><br>-Fish: No information available<br>-Crustacea: No information available<br>-Algae: No information available<br><Persistence and degradability><br>-Persistence: No information available<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: No information available<br>-Biodegradable: No information available<br><Mobility in soil> No information available<br><Other adverse effects> No information available |

| | |
|---|---|
| W3 | <Ecotoxicity><br>-Fish: LC50 >100 ㎎/ℓ 96 hr Oryzias latipes(NICNAS)<br>-Crustacea: EC50 7.19 ㎎/ℓ 48 hr Daphnia magna(NICNAS)<br>-Algae: ErC50 >100 ㎎/ℓ 72 hr other(Pseudokirchneriella subcapitata)(NICNAS)<br><Persistence and degradability><br>-Persistence: No information available<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: No information available<br>-Biodegradable: No information available<br><Mobility in soil> No information available<br><Other adverse effects> Acceptable water> 50 g / L, toxic classification results Aquatic environmental toxicity, chronic, Category 2 (NICNAS) |
| PRS | <Ecotoxicity><br>-Fish: No information available<br>-Crustacea: No information available<br>-Algae: No information available<br><Persistence and degradability><br>-Persistence: No information available<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: No information available<br>-Biodegradable: No information available<br><Mobility in soil> No information available<br><Other adverse effects> No information available |
| PS | <Ecotoxicity><br>-Fish: LC50 72.5 ㎎/ℓ 96 hr Leuciscus idus(ECHA)<br>-Crustacea: EC50 16 ㎎/ℓ 48 hr Daphnia magna(ECHA)<br>-Algae: ErC50 >320 ㎎/ℓ 72 hr other(ECHA)<br><Persistence and degradability><br>-Persistence: No information available<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: No information available<br>-Biodegradable: No information available<br><Mobility in soil> May destroy soil<br><Other adverse effects> Even a small amount of product can be dangerous to drinking water if it soaks into the ground. |
| VEC | <Ecotoxicity><br>-Fish: No information available<br>-Crustacea: No information available<br>-Algae: No information available<br><Persistence and degradability><br>-Persistence: No information available<br>-Degradability: No information available<br><Bioaccumulative potential><br>-Potential: No information available<br>-Biodegradable: No information available<br><Mobility in soil> No information available<br><Other adverse effects> No information available |

## SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Disposal methods

If two or more designated wastes are mixed and it is difficult to separate them, incineration Or similar methods.

Pre-treatment should be done by oil-water separation method to allow for oil separation

Incineration treatment

The residues should be incinerated after being treated by the evaporation method

After purification by distillation, extraction, filtration, etc., the residues should be incinerated

The residues generated after the treatment using the Neutralization, oxidation, reduction, polymerization, condensation reaction should be incinerated or re-treated by coagulation, precipitation, filtration, dehydration, and the residues should be incinerated

13.2. Precautions for disposal

Dispose of contents container according to applicable regulations.

## SECTION 14. TRANSPORT INDORMATION

14.1. UN number(UN No.) ADR/RID, DOT, IMDG, IATA

2920

| | |
|---|---|
| 14.2. Proper shipping name<br>ADR/RID, DOT, IMDG, IATA | CORROSIVE LIQUIDS, FLAMMABLE, N.O.S. |
| 14.3. Hazard class<br>ADR/RID, DOT, IMDG, IATA | 8 (3) |
| 14.4. Packing group<br>ADR/RID, DOT, IMDG, IATA | 2 |
| 14.5. Marine pollutant<br>ADR/RID, DOT, IMDG, IATA | No |

14.6. Special safety measures that the user needs or needs to know about transportation or transportation

| | |
|---|---|
| Emergency Schedules for FIRE | F-E |
| Emergency Schedules for SPILLAGE | S-C |

## SECTION 15. REGULATORY INFORMATION

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Please refer to any other regulations of each country.

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

## SECTION 16. OTHER INFORMATION

| | |
|---|---|
| 16.1. Reference | The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication as part of Enchem Co., LTD, product safety program. It is not intended to constitute performance information concerning the product. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein. |
| 16.2. MSDS Creation Date | 2024-01-19 |
| 16.3. Revision Number and Revision Date | |
| Revision Number | 0 |
| Revision Date | 2024-01-19 |
| 16.4. Other | No data available |

VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT
669 County Square Drive, Ventura CA 93003 805/ 645-1401 FAX 805/ 645-1444 www.vcapcd.org

# AB 2588 COMBUSTION EMISSION FACTORS

Emission factors for combustion of natural gas and diesel fuel were developed for use in AB 2588 emission inventory reports in 1990 and updated in 1991, 1992 and 1995. These factors have been updated again based on new data available from the USEPA (1) (10).

These emission factors are to be used where source testing or fuel analysis are not required by the AB 2588 Criteria and Guidelines Regulations, Appendix D. The factors are divided into external combustion sources (boilers, heaters, flares) and internal combustion sources (engines, turbines). Natural gas combustion factors are further divided into a number of sub-categories, based on equipment size and type.

If better source specific data such as manufacturer's data, source tests, or fuel analysis is available, it should be used rather than these emission factors.

## Natural Gas Combustion Factors

Natural gas combustion factors were developed for listed substances identified by the California Air Resources Board (CARB) as significant components of natural gas combustion emissions (2) and for some federal HAPs.

In the past, the VCAPCD has included emission factors for natural gas fired internal combustion equipment in this document. In 2000, the USEPA published air toxics emission factors for natural gas fired turbines and engines. For natural gas fired internal combustion equipment, the emission factors from the USEPA publication AP-42 (1) should be used.

For natural gas fired turbines, emission factors from Table 3.1-3 of AP-42, dated April 2000 should be used. For natural gas fired internal combustion engines, emission factors from Tables 3.2-1, 3.2-2, and 3.2-3 of AP-42, dated August 2000, as applicable, should be used.

### Natural Gas Fired External Combustion Equipment

| | <10 MMBTUh | 10-100 MMBTUh | >100 MMBTUh | flare |
|---|---|---|---|---|
| Pollutant | Emissions (lb/MMcf) | | | |
| benzene | 0.0080 | 0.0058 | 0.0017 | 0.159 |
| formaldehyde | 0.0170 | 0.0123 | 0.0036 | 1.169 |
| PAH's (including naphthalene) | 0.0004 | 0.0004 | 0.0004 | 0.014 |
| naphthalene | 0.0003 | 0.0003 | 0.0003 | 0.011 |
| acetaldehyde | 0.0043 | 0.0031 | 0.0009 | 0.043 |
| acrolein | 0.0027 | 0.0027 | 0.0008 | 0.010 |
| propylene | 0.7310 | 0.5300 | 0.01553 | 2.440 |
| toluene | 0.0366 | 0.0265 | 0.0078 | 0.058 |
| xylenes | 0.0272 | 0.0197 | 0.0058 | 0.029 |
| ethyl benzene | 0.0095 | 0.0069 | 0.0020 | 1.444 |
| hexane | 0.0063 | 0.0046 | 0.0013 | 0.029 |

External combustion equipment includes boilers, heaters, and steam generators.

**Derivation of Factors**

The emission factors for boilers, heaters, and steam generators were based on the results of source tests performed mostly on units rated at between 10 and 100 million BTU per hour. The following test data was used: benzene (3) (6) (16) (19); formaldehyde (3) (6) (19); PAH, naphthalene, toluene, xylenes, ethyl benzene (16) (19); acetaldehyde, acrolein, and propylene (19); and hexane (20).

The test results listed above were used directly to determine the emission factors for boilers, heaters, and steam generators with heat input ratings of 10-100 MMBTU/hr. For units <10 MMBTU/hr and >100 MMBTU/hr, were calculated by scaling the factors for 10-100 MMBTU/hr equipment by the ratios of their TOC emission factors (7).

For flares, the factors were developed by applying the CARB species profiles (8) to the USEPA TOC emission factor for flares (1). The internal combustion species profile was used as CARB stated that they had very little confidence in the external combustion profile, and they use only the internal combustion profile (9). Information on acrolein was not contained in the species profile used. It was therefore assumed that the ratio of acrolein to formaldehyde is the same for flares as for turbines. The PAH emission factor is from EPA (10)

## Diesel Combustion Factors

Diesel (#1, #2 fuel oil) combustion factors were developed for listed substances identified by the CARB as significant components of diesel fuel combustion emissions (2) and for federal HAPs for which data was available.

**Diesel Combustion Factors**

| | external combustion | internal combustion |
|---|---|---|
| Pollutant | Emissions (lb/1000 gal) | |
| benzene | 0.0044 | 0.1863 |
| formaldehyde | 0.3506 | 1.7261 |
| PAH's (including naphthalene) | 0.0498 | 0.0559 |
| naphthalene | 0.0053 | 0.0197 |
| acetaldehyde | 0.3506 | 0.7833 |
| acrolein | 0.3506 | 0.0339 |
| 1,3-butadiene | 0.0148 | 0.2174 |
| chlorobenzene | 0.0002 | 0.0002 |
| dioxins | ND | ND |
| furans | ND | ND |
| propylene | 0.0100 | 0.4670 |
| hexane | 0.0035 | 0.0269 |
| toluene | 0.0044 | 0.1054 |
| xylenes | 0.0016 | 0.0424 |
| ethyl benzene | 0.0002 | 0.0109 |
| hydrogen chloride | 0.1863 | 0.1863 |
| arsenic | 0.0016 | 0.0016 |
| beryllium | ND | ND |
| cadmium | 0.0015 | 0.0015 |
| total chromium | 0.0006 | 0.0006 |
| hexavalent chromium | 0.0001 | 0.0001 |
| copper | 0.0041 | 0.0041 |
| lead | 0.0083 | 0.0083 |
| manganese | 0.0031 | 0.0031 |
| mercury | 0.0020 | 0.0020 |
| nickel | 0.0039 | 0.0039 |
| selenium | 0.0022 | 0.0022 |
| zinc | 0.0224 | 0.0224 |

ND - not detected

## Derivation of Factors

For external combustion equipment, formaldehyde, PAH, and naphthalene emission factors for were developed using source test data (17). Based on information from CARB it was assumed that acetaldehyde and acrolein emissions would be the same as formaldehyde (14). Emission factors for toluene, xylenes, propylene, ethyl benzene, and hexane were based on USEPA emission factors for total organic compounds and CARB species profile (8) for substances identified by CARB as significant.

For internal combustion engines, emission factors for formaldehyde, PAH's, naphthalene, and metals were based on source testing (4), (5), (6), (18). Benzene, acetaldehyde, acrolein, toluene and xylenes emission factors were based on sources (4), (5), and (18). Propylene factors were based on source tests (4) and (5). 1,3-butadiene was based on (4). Ethyl benzene and hexane emission factors were based on (18).

For all oil combustion equipment, emission factors for chlorobenzene, hydrogen chloride, and metals were based on stack testing and fuel analyses (4), (5), (6), (12), (13), (18). It was assumed that 99.9% of the chlorine contained in the fuel was converted to hydrogen chloride (15), with the remainder converted to chlorobenzene. 5% of the chromium in the fuel samples was assumed to be emitted as hexavalent chromium (15).

Dioxins (PCDD's), furans (PCDF's), and beryllium were identified as potentially significant components of diesel combustion exhaust (2). However, the only test results for diesel combustion found (11) reported "not detected" for dioxins and furans. Beryllium has not been detected in any of the diesel fuel analyses reviewed (4), (5), (6), (12), (13), (18). For emission inventory reporting purposes, facilities should report these compounds on for PRO using an emission estimation code of "99" and writing "ND" for the emissions.

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