

Commonwealth of Kentucky
Division for Air Quality
STATEMENT OF BASIS / SUMMARY

Title V, Construction/Operating
Permit: V-21-011 R3

Four Rivers Nuclear Partnership, LLC
5511 Hobbs Road
Kevil, (McCracken) KY 42053

January 2, 2025
Eric Amdahl, Reviewer

| | |
|------------------|--------------|
| SOURCE ID: | 21-145-00074 |
| AGENCY INTEREST: | 46094 |
| ACTIVITY: | APE20240001 |

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SECTION 1 – SOURCE DESCRIPTION

SIC Code and description: 2819, Industrial Inorganic Chemicals

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

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

28 Source Category ☒ Yes ☐ No If Yes, Category: Chemical process plants, except ethanol production facilities producing ethanol by natural fermentation under NAICS codes 325193 or 312140

County: McCracken

Nonattainment Area ☒ N/A ☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ Ozone ☐ Lead
If yes, list Classification:

PTE* greater than 100 tpy for any criteria air pollutant ☐ Yes ☒ No
If yes, for what pollutant(s)?
☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ VOC

PTE* greater than 250 tpy for any criteria air pollutant ☐ Yes ☒ No
If yes, for what pollutant(s)?
☐ PM₁₀ ☐ PM_{2.5} ☐ CO ☐ NO_x ☐ SO₂ ☐ VOC

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

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

*PTE does not include self-imposed emission limitations.

Description of Facility:

The Paducah Gaseous Diffusion Plant (PGDP) reservation is a 3,423 acre federal complex in the western Kentucky county of McCracken, approximately three miles south of the Ohio River. It contains the uranium enrichment facility that was owned and operated by the United States Department of Energy (DOE) from 1952 to 1993. In July of 1993, United States Enrichment Corporation (U.S. Enrichment Corporation) assumed operations at the plant. Six years later, on July 14, 1999, the United States Environmental Protection Agency (U.S. EPA) granted authority to the Commonwealth to regulate radioactive emissions to air. Until that time, Kentucky regulated non-radioactive emissions from the site through a series of more than 20 permits. After receiving jurisdiction for radionuclide emissions, the Commonwealth adopted federal regulation 40 CFR 61, Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon From Department of Energy Facilities. Even though the U.S. Enrichment Corporation was a private company and was solely responsible for daily operations of the enrichment plant, DOE retained ownership of the plant equipment and buildings and the responsibility for the waste products stored on the site. Because of this relationship and the location of the facility, Subpart H still applies to the enrichment operations and is the means for regulating radioactive emissions from this source.

In addition, the source is subject to 10 CFR Part 76—Certification of Gaseous Diffusion Plants, as well as 10 CFR Part 20—Standards for Protection against Radiation, which are not enforced by the Commonwealth but are in the purview of the Nuclear Regulatory Commission (NRC).

The U.S. Department of Energy (DOE) awarded a new contract for deactivation and remediation of the site to Four Rivers Nuclear Partnership (FRNP). Responsibility for all permitted emissions units transferred to FRNP at 12:01 a.m. on October 20, 2017. DOE's ownership of PGDP is not changed by this contract.

Formerly, in the enrichment process, solid uranium hexafluoride was heated to a gaseous state and then forced through a series of membrane barriers designed to separate the uranium isotopes so that the concentration of ^{235}U was increased (uranium was enriched). Many passes were required to reach the desired concentration of the correct uranium isotope, so the separation was achieved through a sequence of stages as the output of one stage became the input to adjoining stages. The arrangement of the hundreds of stages necessary to accomplish the goal was known as the cascade. In addition to the actual separators, a number of pumps/compressors were included in the cascade to provide compression of the gas at each stage. Adsorption traps treated effluent air from the processes to reduce radionuclide emissions prior to entering the C-310 stack. Radioactive emissions and flow rate through this stack were continuously sampled through a potassium hydroxide bubbler stack sampling system. This system was approved as the Continuous Emissions Monitoring (CEM) method/device for this site by the U.S. EPA in 1992 in accordance with the requirements of 40 CFR 61, Subpart H. However, the cascade has not operated to enrich uranium since October of 2014.

Package boilers provide steam for the facility.

Most process operations have ceased, and the facility is in various stages of cleanup and remediation. On February 2, 2015, the Nuclear Regulatory Commission (NRC) issued the termination of part 76 Certificate of Compliance for the United States Enrichment Corporation (Paducah Gaseous Diffusion Plant). This document transfers jurisdiction over the standards for radiological protection at the site from the NRC to the U.S. Department of Energy. The NRC will no longer perform site inspections or assessments.

As the facility is undergoing shutdown and cleaning, individual cascade cells and associated piping/equipment are cleaned using a wet air passivation process. Since deposits of UF_6 in a cell can react with moisture to create hydrogen fluoride gas, which is a highly corrosive hazardous air pollutant, wet air is introduced into the cell to force the reaction. This allows for control of the vapors that are treated in existing alumina traps prior to release through the 200 ft stack. The cleaning will be performed on one cell and/or section of piping at a time, over several days, to allow for purging of the equipment/sections after the initial evacuation.

SECTION 2 – CURRENT APPLICATION AND EMISSION SUMMARY FORM

Permit Number: V-21-011 R3

Activities: APE20240001

Received: October 31, 2024

Application Complete Date(s): December 20, 2024

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

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

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

Description of Action:

Four Rivers Nuclear Partnership, LLC, (FRNP), Paducah Gaseous Diffusion Plant submitted an application for a minor modification to their Title V permit, dated October 31, 2024. The purpose of this application is for the usage of EP 18-03 C-409 Stabilization Building lab hood. The hood is used to safely contain and ventilate hazardous fumes, vapors, gases and dusts generated by chemical processes performed in the hood. The pollutants contain uranium which is the main radioactive component of concern. This emission point is subject to the requirements in 40 CFR 61, Subpart H and has been added to Section B of the permit.

FRNP has also requested to the following changes to the permit:

- EU 03: Addition of test method 40 CFR 61, Appendix B, Method 114. The addition of alpha spectrometry is being requested to obtain lower detection values.
- The addition of the general regulation of 40 CFR Part 63, Subpart GGGGG to Section D of the permit. Subpart GGGGG was revised on December 22, 2022 to remove the previously included CERCLA and RCRA exemptions from Subpart GGGGG. Accordingly, this Subpart now applies to the facility as a whole, however, FRNP meets the requirements in 40 CFR 63.7881(c)(1) through (3) to be exempt from all other requirements in Subpart GGGGG. The provisions of Subpart GGGGG were required to be included in the permit the next time the permit was renewed, reopened, or revised for another reason. The requirements of the exemption have been incorporated into Section D of the permit, and are applied based on a calendar year. The Division has also added a requirement to submit a significant permit revision at the time the facility determines or can reasonably project that the total quantity of the HAP listed in Table 1 to 40 CFR 63, Subpart GGGGG that is contained in the remediation material excavated, extracted, pumped, or otherwise removed during all of the site remediations conducted will equal or exceed 1 Mg of HAPs annually.

| V-21-011 R3 Emission Summary | | | | |
|------------------------------|-------------------|--------------------------------|--------------|-------------------------------|
| Pollutant | 2023 Actual (tpy) | Previous PTE V-21-011 R2 (tpy) | Change (tpy) | Revised PTE V-21-011 R3 (tpy) |
| CO | 1.27 | 33.78 | 0.0 | 33.78 |
| NO _x | 1.17 | 39.90 | 0.0 | 39.90 |
| PT | 0.21 | 2.69 | 0.0 | 2.69 |
| PM ₁₀ | 0.21 | 5.60 | 0.0 | 5.60 |
| PM _{2.5} | 0.20 | 5.40 | 0.0 | 5.40 |

| V-21-011 R3 Emission Summary | | | | |
|--|-------------------|--------------------------------|--------------|-------------------------------|
| Pollutant | 2023 Actual (tpy) | Previous PTE V-21-011 R2 (tpy) | Change (tpy) | Revised PTE V-21-011 R3 (tpy) |
| SO ₂ | 0.07 | 2.00 | 0.0 | 2.00 |
| VOC | 0.14 | 3.98 | 0.0 | 3.98 |
| Lead | 0.000007 | 0.000193 | 0.0 | 0.000193 |
| Greenhouse Gases (GHGs) | | | | |
| Carbon Dioxide | 1730 | 43,118 | 0.0 | 43,118 |
| Methane | 0.033 | 0.841 | 0.0 | 0.841 |
| Nitrous Oxide | 0.0035 | 0.0894 | 0.0 | 0.0894 |
| CO ₂ Equivalent (CO ₂ e) | 1732 | 43,166 | 0.0 | 43,166 |
| Hazardous Air Pollutants (HAPs) | | | | |
| Hexane ¹ | --- | 0.63 | 0.0 | 0.63 |
| Hydrofluoric Acid (HF) | 0.03 | 28.36 | 0.0 | 28.36 |
| Radionuclides | 0.000003 | 0.00375 | +0.00021 | 0.00396 |
| Combined HAPs: | 0.03 | 29.19 | 0.0 | 29.19 |

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS

Emission Unit 03 (EU 03): C-310 Cascade Operations (C-310 Unit)

Initial Construction Date: 1952

Process Description:

The cascade is the portion of the process where uranium hexafluoride (UF₆) was separated and the concentration of the desired uranium-235 (²³⁵U) isotopes was increased (uranium enriched). During the deactivation stage, the cascade cells and associated piping/equipment will be cleaned, and exhaust gases will be routed to the C-310 200-foot stack. In some cases, a wet air passivation process is used to clean out the cells further prior to deactivation. When each cell is exposed to air, potential UF₆ deposits react with moisture in the air and could create HF gas. To minimize exposure to HF gas, wet air is introduced prior to the deactivation of cells to force the reaction process and allow treatment of the gases through the alumina traps in the 200-foot stack. Cleanout of the cells will be a batch process with evacuation of one cell and/or section of piping taking place over the course of several days to allow for purging of the equipment after the initial evacuation. Air emissions associated with the former cascade operations include radionuclides, gaseous fluorides, and chlorides. Prior to the evacuation of each cell, the concentration of radionuclides is determined in accordance with the approved Alternate Monitoring Procedure.

Size/Rated Capacity: 3040 Megawatts, 11 million Separative Work Units (SWU)

Controls (radionuclides): 26 Activated Alumina Adsorption Traps
14 Sodium Fluoride Adsorption Traps

Controls (fluorides, chlorides): None

Applicable Regulations:

401 KAR 50:050, *Monitoring*

401 KAR 53:010, *Ambient air quality standards*, applies to fluoride emissions.

40 CFR 61, Subpart H, *National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities*, applies to operations at any facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air.

40 CFR 190, Subpart B, *Environmental Standards for the Uranium Fuel Cycle*, applies to radiation doses received by members of the public in the general environment and to radioactive materials introduced into the general environment as the result of operations which are part of a nuclear fuel cycle.

State-Origin Requirements:

401 KAR 63:020, *Potentially hazardous matter or toxic substances*, applies to chloride emissions.

Comments:

The cascade has not operated to enrich uranium since October of 2014. As such, continuous operational monitoring is no longer valid for tracking emissions from Cascade Operations (EU 03). As required by 40 CFR 61, Subpart H, *National Emission Standards for Emissions of Radionuclides Other Than Radon From Department Of Energy Facilities* and the permit, while the facility was under full operation, existing point sources were periodically measured for flow rate and effluent streams were continuously monitored for radionuclides. This was accomplished using continuous sampling through a potassium hydroxide bubbler stack sampling system, the original Continuous Emissions Monitoring Method approved by the U.S. EPA in 1992. Composite samples were collected and sent to an on-site laboratory to be analyzed for total uranium content. Since the facility is no longer in continuous operation, and the cells/piping will be cleaned in an intermittent batch process, continuous sampling is no longer practical. Further, as various operations on site have been shutdown, the facility no longer has an on-site laboratory capable of analyzing the potassium hydroxide bubbler samples.

Emission Unit 03 (EU 03): C-310 Cascade Operations (C-310 Unit)

The compliance requirements of 40 CFR 60.93, *Emission monitoring and test procedures*, however, do allow for alternative methods when the established methods become unworkable. As outlined in 40 CFR 61.93, item d, when it is impractical to measure the effluent flow rate at a source in accordance with the requirements of Subpart H or to monitor or sample an effluent stream at a source in accordance with the site selection and sample extraction requirements of Subpart H, the facility owner or operator may use alternative effluent flow rate measurement procedures or site selection and sample extraction procedures provided that:

1. It can be shown that the requirements of paragraph (b)(1) or (2) or (c) of 40 CFR 61.93 are impractical for the effluent stream.
2. The alternative procedure will not significantly underestimate the emissions.
3. The alternative procedure is fully documented.
4. The owner or operator has received prior approval from EPA.

Additionally, per 40 CFR 61.93(b)(2)(ii), grab samples may be conducted with continuous sampling is not practical. As such, with the shutdown of continuous Cascade Operations (EU 03) and loss of on-site facilities for composite sample analysis, monitoring and verification can no longer be accomplished in the manner documented in previous permits for the site.

The permittee has proposed an alternate method(s) for ensuring compliance with radioactivity limits. Under the new scenario, emission calculations will be based on maximum concentrations of components pre-sampled in the cell and maximum flowrates. Emissions will therefore be overestimated because worst-case emissions for the entire volume of the cell and associated piping are assumed. In practice, uranium remaining in the equipment is converted back to a solid at the temperature present and is removed during cleaning operations rather than released as air emissions. The alternative procedure, as described below, will be fully documented in a sampling and analysis plan for the facility. This alternative monitoring procedure request is submitted in accordance with 40 CFR 61.13(h)(3).

Prior to evacuation of each cell, testing will be conducted to evaluate the concentrations of radionuclides. Three gaseous samples will be collected from each cell and analyzed for uranium isotopes using ASTM Method ASTM C799-12, EPA Method 6020A (SW-846), or an equivalent method. ASTM C799 is the Standard Test Methods for Chemical, Mass Spectrometrical, Nuclear, and Radiochemical Analysis of Nuclear-Grade Uranyl Nitrate Solutions, which contains a titration method to determine the amount of uranium in a solution. EPA Method 6020A is the method for Inductively Coupled Plasma/Mass Spectrometry. FRNP will use the maximum result out of the three collected samples for each cell to calculate the worst-case emissions.

The volume to be evacuated and the maximum hourly evacuation rate also are known for each cell. As a result, maximum hourly emissions and a maximum amount to be emitted for each cell can be calculated based on known volumes and the pre-evacuation sampling. Sampling will be conducted for each cell and daily worst-case emissions calculated; as a result, the sampling will be as at least as rigorous as previous daily sampling, if not more conservative, because emissions will be overestimated. FRN will also continue to operate and maintain the existing ambient air monitoring for radionuclides to confirm that the facility remains in compliance with dose limits at receptor locations.

Emission Unit 09 (EU 09): Cascade Cooling System

Initial Construction Date: 1952

Process Description: Compression of the UF₆ gas as it was diffused through the membranes caused heating in the cascade (EU 03). This coolant system previously provided cooling to the cascade system through the use of CFC-114 (“Freon”) coolant/refrigerant or through a U.S. EPA-approved alternate coolant.

Applicable Regulation:

40 CFR 82, *Protection of Stratospheric Ozone*

Comments: The emission of concern is the refrigerant itself, which is an ozone depleting substance. A substitute for the CFC-114 coolant may be used for Emission Unit 09, Cascade Cooling System, with prior approval by U.S. EPA under 40 CFR 82.

Emission Unit 18 (EU 18): C-409 Building Auxiliary Systems (18, 38)

Initial Construction Date: 1952

Process Description: This building also includes equipment that supported the uranium enrichment process. The emission points, discussed individually below, are the potential source of radionuclides (U, ⁹⁹Tc, ²³⁷Np, ²³⁹Pu, and ²³⁰Th). Building Ventilation is discussed under Emission Unit 65. Specific emission points for Emission Unit 18 are:

Emission Point 01 (EP 18-01): C-409 Cylinder Wash Station - uses water, sodium carbonate, and borated water to remove “heels” from processed cylinders so the cylinders may be reused.

Emission Point 02 (EP 18-02): C-409 Rotary Vacuum Filter - used to dissolve and precipitate the high assay uranium in solutions from the laboratory and other sources.

Emission Point 03 (EP 18-03): C-409 Lab Hood – Used to safely contain and ventilate hazardous fumes, vapors, gases and dusts generated by chemical sampling processes performed in the hood.

Controls: C-409 Cylinder Wash Station Scrubber, installed 1992
No other active controls, but the permittee utilizes administrative, procedural, and passive controls to minimize radionuclide emissions in accordance with ALARA principals.

Applicable Regulation:

401 KAR 50:050, *Monitoring*

401 KAR 53:010, *Ambient air quality standards*, applies to fluoride emissions.

40 CFR 61, Subpart H, *National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities*, applies to operations at any facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air.

40 CFR 190, Subpart B, *Environmental Standards for the Uranium Fuel Cycle*, applies to radiation doses received by members of the public in the general environment and to radioactive materials introduced into the general environment as the result of operations which are part of a nuclear fuel cycle.

Comments:

The “heel” is the residue left in the cylinder after it is heated in the autoclave and the UF₆ is unloaded. For

Emission Unit 18 (EU 18): C-409 Building Auxiliary Systems (18, 38)

EP 18-02: The solution is chemically treated to precipitate the uranium to form a slurry that is then passed through the rotary vacuum filter that collects the precipitate for disposition. The remaining filtrate is sampled and discharged. Radionuclide emissions may arise from the vent on the pump that pulls the slurry through the filter, but should be minimal since the vent is downstream and the uranium should be removed upstream. For EP 18-03, a single-fume hood is located in the laboratory area in C-409 and it is used to safely contain and ventilate hazardous fumes, vapors, gases and dusts generated by chemical processes. It is estimated that 0.385 grams of radionuclides consisting of uranium are emitted for each sample processed. The hood has the capability to process 500 samples per year.

Emission Unit 21 (EU 21): C-709/710 Lab

Initial Construction Date: 1952

Process Description: The C-709/710 Lab is the main facility for sample analysis and research at the Paducah site. The lab is a potential source of radionuclides (uranium). Insignificant quantities of various chemicals, used for testing, may also be released.

Controls: Various Chemical Traps.

The permittee also utilizes administrative, procedural, and passive controls to minimize radionuclide emissions in accordance with ALARA principles.

Applicable Regulations:

40 CFR 61, Subpart H, *National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities*, applies to operations at any facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air.

40 CFR 190, Subpart B, *Environmental Standards for the Uranium Fuel Cycle*, applies to radiation doses received by members of the public in the general environment and to radioactive materials introduced into the general environment as the result of operations which are part of a nuclear fuel cycle.

State-Origin Requirements:

401 KAR 63:020, *Potentially hazardous matter or toxic substances*.

Comments:

There are dozens of laboratory hoods and canopies in the building with the potential for use in radiological activities. Some of the hoods contain chemical traps to control emissions. The lab is a potential source of radionuclide emissions. Small amounts of chemicals such as hexane, methylene chloride, methyl ethyl ketone, and hydrochloric acid are used for the testing.

Emission Unit 54 (EU 54): Seal Exhaust/Wet Air System

Initial Construction Date: CFC-114/UF₆ Separation System: 1978, modified in 2004; Seal Exhausts / Wet Air Exhausts: 1952

Process Description: This group consists of the Seal Exhaust/Wet Air Systems and the UF₆/R-114 Separation System. EU 54 also includes cylinder disconnection activities for the C-310 burp station, the C-310 product withdrawal building, the C-315 tails withdrawal building, the C-333-A feed facility and the C-337-A feed facility. Descriptions of the individual components of this part of the group are included, below. Emissions of concern from this group consist of radionuclides (U, ⁹⁹Tc, ²³⁷Np, ²³⁹Pu, and ²³⁰Th).

Emission Unit 54 (EU 54): Seal Exhaust/Wet Air System

Seal Exhausts: The seals on cascade compressors are exhausted, and the air is pumped through various traps/filters. There are six seal exhaust systems and many seals.

Wet Air Exhausts: After maintenance on cascade piping and equipment, the humid ambient air is pumped from the system through traps/filters. Maintenance includes deactivation activities during which the cascade cells and associated piping/equipment will be cleaned, and exhaust gases could be routed to the wet air exhaust vents. In some cases, a wet air passivation process will be used to clean out the cells further prior to deactivation. There are five wet air exhaust systems.

CFC-114/UF₆ Separation System: This system is used to freeze out UF₆ from process gas that has become significantly contaminated with R-114 coolant.

Cylinder Disconnections: Cylinder valves are connected to the associated process via a “pigtail.” Although the pigtails are purged prior to disconnection and serviced by a high efficiency particulate air vacuum, there is a minor possibility of radionuclide emissions occurring when a pigtail is disconnected.

Controls: No active controls, but the permittee utilizes administrative, procedural, and passive controls to minimize radionuclide emissions in accordance with ALARA principles.

Applicable Regulation:

401 KAR 50:050, Monitoring

401 KAR 53:010, Ambient air quality standards, applies to fluoride emissions.

40 CFR 61, Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities, applies to operations at any facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air.

40 CFR 190, Subpart B, Environmental Standards for the Uranium Fuel Cycle, applies to radiation doses received by members of the public in the general environment and to radioactive materials introduced into the general environment as the result of operations which are part of a nuclear fuel cycle.

Comments: Chemical traps within the CFC-114/UF₆ Separation System were installed to protect equipment, only, and are not classified as add-on control devices since the emission reductions achieved are inherent to the process itself.

Emission Unit 62 (EU 62): C-631 Emergency Pump

Initial Construction Date: 1952

Process Description: An on-site (source related) emergency pump.

Size/Rated Capacity: 572 HP

Fuel: Diesel

Controls: None

Applicable Regulation:

401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, applies to stationary RICE at a major or area source of HAP

Emission Unit 62 (EU 62): C-631 Emergency Pump

emissions.

Non-applicable Regulation:

401 KAR 60:005, Section 2(2)(ddddd), 40 C.F.R. 60.4200 to 60.4219, Tables 1 to 8 (Subpart IIII), Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. (Note: This regulation will become applicable should EU 62 be modified or reconstructed in the future as defined under the Federal Regulation)

Comments:

Emissions calculated using AP-42, Chapter 3.3 and 40 CFR 98, Subpart C, and an assumption of 500 hrs/yr to account for emergency operation.

Emission Unit 65 (EU 65): Building Ventilation Systems

Initial Construction Date: 1952

Process Description: There are several buildings that have the potential to emit radionuclides through their ventilation systems. They include buildings C-310, C-315, C-331, C-333, C-333-A, C-335, C-337, C-337-A, C-360, C-400, C-631, C-709/C-710, and C-720.

Controls: No active controls, but the permittee utilizes administrative, procedural, and passive controls to minimize radionuclide emissions in accordance with ALARA principles.

Applicable Regulation:

401 KAR 50:050, Monitoring

401 KAR 53:010, Ambient air quality standards, applies to fluoride emissions.

40 CFR 61, Subpart H, National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities, applies to operations at any facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air.

40 CFR 190, Subpart B, Environmental Standards for the Uranium Fuel Cycle, applies to radiation doses received by members of the public in the general environment and to radioactive materials introduced into the general environment as the result of operations which are part of a nuclear fuel cycle.

State-Origin Requirements:

401 KAR 63:020, Potentially hazardous matter or toxic substances

Comments: The air in the buildings is generally sampled in accordance with U.S. Enrichment Corporation's Health Physics procedures. Results are used to monitor radiological emissions resulting from building activities, provide inputs for the source-wide dose calculations, and ensure compliance with regulatory emissions requirements.

SECTION 3 – EMISSIONS, LIMITATIONS AND BASIS (CONTINUED)

Testing Requirements/Results

| Emission Unit(s) | Control Device | Parameter | Regulatory Basis | Frequency | Test Method | Permit Limit | Test Result | Thruput and Operating Parameter(s) Established During Test | Activity Graybar | Date of last Compliance Testing |
|------------------|----------------|---|------------------|---------------|--------------|--------------|----------------------------|---|------------------|---------------------------------|
| 03 | None | HF | 401 KAR 53:010 | As requested | Method 26 | N/A | 392.40 ppm; 1.191 lb/hr | 900 MW | CMN20100017 | 6/2/2010 |
| 65 | None | Radionuclides: (U, ⁹⁹ Tc, ²³⁷ Np, ²³⁹ Pu, & ²³⁰ Th) | 40 CFR 61.92 | Every 5 years | Method 5/114 | < 1% of std | Totals | C-337 SX/WA Vent: 56 cells operating; C-331 SX Vent: 21 cells operating; C-331WA Vent: 1 cell operating | CMN20120024 | 10/10/2012–10/23/2012 |
| | | | | | | | U | 8.564 mg/hr | | |
| | | | | | | | ⁹⁹ Tc | 341 pCi/hr | | |
| | | | | | | | ²³⁷ Np | 0 pCi/hr | | |
| | | | | | | | ²³⁹ Pu | 0 pCi/hr | | |
| | | | | | | | ²³⁰ Th | 0.11 pCi/hr | | |
| 65 | None | Radionuclides: (U, ⁹⁹ Tc, ²³⁷ Np, ²³⁹ Pu, & ²³⁰ Th) | 40 CFR 61.92 | Every 5 years | Method 5/114 | < 1% of std | Totals | C-337 SX/WA Vent: 1 cell evacuated during each run | CMN20170024 | 9/12/2017 – 9/14/2017 |
| | | | | | | | U | 4.743 mg/hr | | |
| | | | | | | | ⁹⁹ Tc | 633.3 pCi/hr | | |
| | | | | | | | ²³⁷ Np | 0 pCi/hr | | |
| | | | | | | | ²³⁹ Pu | 0 pCi/hr | | |
| | | | | | | | ²³⁰ Th | 2.93 pCi/hr | | |

Footnotes:

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS

| Emission and Operating Limit | Regulation | Emission Unit |
|--|--------------------------|---------------|
| 10 mrem/yr annual dose equivalent | 40 CFR 61, Subpart H | Source-wide |
| < 1 Mg of HAP contained in remediation material excavated, extracted, pumped, or otherwise removed during all of the site remediations conducted | 40 CFR 63, Subpart GGGGG | Source-wide |

Table B - Summary of Applicable Regulations:

| Applicable Regulations | Emission Unit |
|---|---|
| 401 KAR 50:050, <i>Monitoring</i> , applies due to ambient monitoring required at the source by the Cabinet. | Source-wide |
| 401 KAR 53:010, <i>Ambient air quality standards</i> , applies to fluoride emissions. | Source-wide |
| 401 KAR 59:015, <i>New indirect heat exchangers</i> , applies to each indirect heat exchanger having a heat input capacity greater than 1 MMBtu/hr commenced on or after the classification date. | EU 89, EU 90, EU 91 |
| 401 KAR 60:005, Section 2(2)(d), 40 C.F.R. 60.40c to 60.48c (Subpart Dc), <i>Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units</i> , applies to each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/h)) or less, but greater than or equal to 2.9 MW (10 MMBtu/h). | EU 89, EU 90, EU 91 |
| 401 KAR 60:005, Section 2(2)(dddd), 40 C.F.R. 60.4200 to 60.4219, Tables 1 to 8 (Subpart IIII), <i>Standards of Performance for Stationary Compression Ignition Internal Combustion Engines</i> , applies to owners and operators of stationary compression ignition (CI) internal combustion engines (ICE) and other persons as specified in 40 CFR 60.4200(a)(1) through (4). For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator. | EU 67, EU 80, EU 81, EU 82, EU 83, EU 92, EU 94, EU 95 |
| 401 KAR 60:005, Section 2(2)(eeee), 40 C.F.R. 60.4230 to 60.4248, Tables 1 to 4 (Subpart JJJJ), <i>Standards of Performance for Stationary Spark Ignition Internal Combustion Engines</i> , applies to owners and operators of stationary spark ignition (SI) internal combustion engines (ICE) as specified in 40 CFR 60.7230(a)(1) through (6). For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator. | EU 93 |
| 401 KAR 63:002, Section 2(4)(eeee), 40 C.F.R. 63.6580 to 63.6675, Tables 1a to 8, and Appendix A (Subpart ZZZZ), <i>National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines</i> , applies to stationary RICE at a major or area source of HAP emissions. | EU 62, EU 66, EU 67, EU 68, EU 80, EU 81, EU 82, EU 83, EU 84, EU 85, EU 92, EU 93, |

| Applicable Regulations | Emission Unit |
|--|-----------------------------------|
| | EU 94, EU 95 |
| 401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7480 to 63.7575, Tables 1 to 13 (Subpart DDDDD) , <i>National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters</i> , applies to each industrial, commercial, or institutional boiler or process heater as defined in 40 CFR 63.7575 that is located at, or is part of, a major source of HAP. | EU 89, EU 90, EU 91 |
| 401 KAR 63:002, Section 2(4)(iiii), 40 C.F.R. 63.7880 through 63.7957, Tables 1 through 3 (Subpart GGGGG) , <i>National Emission Standards for Hazardous Air Pollutants: Site Remediation</i> , applies to owners and operators of a site remediation at which, cleans up remediation material; is co-located with one or more other stationary sources that emit HAP and meet an affected source definition specified for a source category that is regulated by another subpart under 40 CFR part 63; and the facility is a major source of HAPs. | Source-wide |
| 401 KAR 63:020 , <i>Potentially hazardous matter or toxic substances</i> , applies to each affected facility which emits or may emit potentially hazardous matter or toxic substances, provided such emissions are not elsewhere subject to the provisions of the administrative regulations of the Division for Air Quality. | EU 03, EU 21, EU 65 |
| <p>40 CFR 61, Subpart H, <i>National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities</i>, applies to operations at any facility owned or operated by the Department of Energy that emits any radionuclide other than radon-222 and radon-220 into the air.</p> <p>Under 40 CFR 61, Subpart H, only release points with the potential to discharge radionuclides in quantities that could cause a dose in excess of 1 percent of the standard must be continuously monitored.</p> <p>The results of the monitoring and calculated emissions are used to determine the total yearly dose of radiation coming from the facility that could impact a member of the public. Under 40 CFR 61, Subpart H, the maximum allowed public effective dose equivalent (EDE) due to exposure has been established at 10 millirem (mrem) per year from any DOE facility. Annual dose is determined through a computer modeling program that uses measurement of radionuclide releases as well as calculated amounts based on known emission factors, process knowledge, engineering estimates, and other U.S. EPA approved methods. The annual dose to the maximally exposed member of the public from the PGDP facility, including contributions from both enrichment activities by U.S. Enrichment Corporation and from DOE site remediation, waste storage and other activities, was at 0.012 mrem for 2006, or around 1/1000th of the dose allowed under federal law.</p> <p>The 10 mrem radiation dose limit is site-wide and applies to all three entities on the PGDP property, including DOE, FRNP, and the Depleted Uranium Hexafluoride Conversion Facility (DUF₆). FRNP must annually calculate its' contribution to the dose and include the dose resulting from the DOE owned/managed activities on the PGDP reservation in an annual National</p> | EU 03, EU 18, EU 21, EU 54, EU 65 |

| Applicable Regulations | Emission Unit |
|---|---------------|
| <p>Emission Standards for Hazardous Air Pollutants (NESHAPS) report to U.S. EPA and the Division. There is currently no increment allotment of the dose limit to individual entities on the site. However, the Division determined at the time of the original permit issuance that since U.S. Enrichment Corporation was the major contributor to radiological emissions, as most of the DOE emissions are considered to be sporadic due to various Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA) projects conducted on site, the application of the limit to U.S. Enrichment Corporation in the permit was appropriate. The Division has determined that the same requirements and limits are applicable to FRNP. It should be noted though, that if future radiological NESHAPS calculations show that a violation of the dose limit has occurred, an analysis of on-site activities, incidents, and previous reports would be performed to provide the information needed to determine which entity has experienced the dramatic increase in radiological output and likely caused the violation.</p> <p>40 CFR 61, Subpart H also provides for an alternate to the calculation and dispersion modeling method of demonstrating emissions compliance for radionuclides. Under 40 CFR 61.93(b)(5), sources may use environmental measurements of radionuclide air concentrations at critical receptor locations in lieu of the method currently used by the source. This means that the information provided by radioactivity monitors outside the source perimeter could be used to measure the radionuclides in the ambient air and demonstrate compliance with the federal dose standards established under Subpart H. The source must apply for and receive permission to use this alternate method from both the U.S. EPA and the Division and meet all requirements established under the specific section and all other applicable sections of the federal regulation. The monitoring, calculation, and dispersion modeling method is currently in use at the site.</p> <p>Cascade support activities, such as sampling the cylinders, decontaminating the cylinders, cleaning of protective clothing, recovery of uranium from cleaning solutions, etc., which involve the possible release of radioactive particles, are governed under 40 CFR 61, Subpart H. Although these support activities do not require continuous stack monitoring as the cascade does, the source uses U.S. EPA approved emissions estimating methods as well as Health Physics air sampling to monitor the amounts of radioactivity emitted from these support activities.</p> <p>In addition to the limits and requirements imposed by the Division, the source also employs administrative, procedural and passive controls to minimize radionuclide emissions from site activities in accordance with the NRC's As Low As Reasonably Achievable (ALARA) principals. The entire Paducah site is also subject to the requirements of the Kentucky Cabinet for Health and Family Services Department for Public Health Radioactive Materials Section. This Commonwealth agency retains jurisdiction over radiation hazards in the state and promulgates its own regulations with regard to ALARA requirements</p> | |

| Applicable Regulations | Emission Unit |
|---|-----------------------------------|
| and any radioactive materials that cross out of the boundary of the DOE-owned site. | |
| 40 CFR 190, Subpart B , <i>Environmental Standards for the Uranium Fuel Cycle</i> , applies to radiation doses received by members of the public in the general environment and to radioactive materials introduced into the general environment as the result of operations which are part of a nuclear fuel cycle. | EU 03, EU 18, EU 21, EU 54, EU 65 |

Table C - Summary of Precluded Regulations:

| Precluded Regulations | Emission Unit |
|-----------------------|---------------|
| N/A | |

SECTION 4 – SOURCE INFORMATION AND REQUIREMENTS (CONTINUED)

Table D - Summary of Non Applicable Regulations:

| Non Applicable Regulations | Emission Unit |
|---|-----------------------------------|
| 401 KAR 60:005, Section 2(2)(dddd) , 40 C.F.R. 60.4200 to 60.4219, Tables 1 to 8 (Subpart IIII) , <i>Standards of Performance for Stationary Compression Ignition Internal Combustion Engines</i> . This regulation will become applicable should any of these emission units be modified or reconstructed in the future as defined under the Federal Regulation. | EU 62, EU 66, EU 68, EU 84, EU 85 |

Ambient Air Quality Analysis

401 KAR 53:010, *Ambient air quality standards*, for fluorides.

The enrichment process at the site resulted in the release of fluorides. The permit establishes both facility-wide limits [related to atmospheric concentrations expressed in parts per million or billion (ppm or ppb)] for total fluorides (which includes both gaseous and particulate fluorides) and hourly emission limits (pounds per hour) for specific equipment (for gaseous fluorides). Gaseous fluoride emissions from the 200-foot cascade stack have been modeled within the standards. Gaseous fluoride emissions from activities that do not exit through the cascade stack have been determined through engineering calculations using material throughputs, hours of operation, procedures performed, and other applicable parameters. Past air dispersion modeling has shown this source to be in compliance with this standard based on this information. No major modifications of the facility have occurred since the prior modeling was conducted. Some fluoride sources have, in fact, been removed. Continued compliance was demonstrated by conducting a stack test and performing source-wide fluoride emissions modeling, using the current approved U.S. EPA methods. In addition, major modifications triggering a significant permit revision under 401 KAR 52:020, or changes that can increase emissions of gaseous fluorides or total fluorides above the projected emission rate that exceeds the Kentucky Ambient Air Quality Standard for gaseous fluorides or total fluorides, will require additional air dispersion modeling be submitted with the revision application.

Air Toxic Analysis

401 KAR 63:020, *Potentially Hazardous Matter or Toxic Substances*

The Division for Air Quality (Division) has previously performed AERMOD modeling of potentially hazardous matter or toxic substances that may be emitted by the facility based upon the

process rates, material formulations, stack heights and other pertinent information provided by the applicant. Since this modeling, emissions at the facility have decreased as equipment has been removed. Based upon this information, the Division has determined that the conditions outlined in this permit will assure compliance with the requirements of 401 KAR 63:020.

Single Source Determination

N/A

SECTION 5 – PERMITTING HISTORY

| Permit | Permit Type | Activity# | Complete Date | Issuance Date | Summary of Action | PSD/Syn Minor |
|-------------|-----------------|--------------------------|----------------------|---------------|--|---------------|
| O-84-172 | Operation | --- | 8/3/1984 | 10/18/1984 | Operation Permit | N/A |
| O-85-110 | Operation | --- | 7/18/1985 | 9/30/1985 | Operation Permit | N/A |
| C-87-081 | Const. | --- | 5/21/1987 | 8/6/1987 | Const. of High Assay Cylinder Washstand | N/A |
| C-94-005 | Const. | --- | 11/29/1993 | 1/24/1994 | Const. of C-410-K fluorine manifold facility | N/A |
| S-95-036 | State-Origin | --- | 12/7/1994 | 2/23/1995 | Re-activation of C-335 stack | N/A |
| S-95-036 R1 | Revision | --- | 8/6/1997 | 11/26/1997 | Addition of alt. op. scenario #3 and change to HF limits | N/A |
| F-97-004 | Initial FESOP | F176 | 4/24/1997 | 9/26/1997 | Installation of a boiler | Syn Minor |
| V-07-031 | Initial Title V | APE20040002 | 3/3/1999 | 8/7/2009 | Initial Title V Operating Permit | N/A |
| V-14-012 | Renewal | APE20140001 | 5/19/2014 | 2/25/2015 | Renewal & Operator Change | N/A |
| V-14-012 R1 | Sig. Revision | APE20150001 | 4/1/2015 | 8/28/2015 | Addition of 3 Gas Burning and 2 Dual-Fuel Burning Boilers | N/A |
| V-14-012 R2 | Minor Revision | APE20170001 | 6/30/2017 | 8/31/2017 | Remove 3 Boilers, 14 Emergency Motors, Add New Emergency Generator | N/A |
| V-14-012 R3 | Admin. Amend. | APE2017002 | 9/26/2017 | 10/20/2017 | Operator Change | N/A |
| V-14-012 R4 | Minor Revision | APE20190002; APE20190004 | 3/25/2019; 5/30/2019 | 9/15/2019 | Addition of Alternate Monitoring Method and an Emergency Generator | N/A |
| V-21-011 | Renewal | APE20190006 | 12/7/2019 | 9/15/2021 | Renewal | N/A |
| V-21-011 R1 | Minor Revision | APE20210002 | 11/2/2021 | 2/22/2022 | Addition of EU 94 | N/A |
| V-21-011 R2 | Minor Revision | APE20220001 | 8/16/2022 | 11/7/2022 | Addition of EU 95 | N/A |

SECTION 6 – PERMIT APPLICATION HISTORY

Permit Number: V-21-011

Activities: APE20190006

Received: August 21, 2019

Application Complete Date(s): October 20, 2019

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

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

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

- APE20190005 – 502(b)10 Change: Propane Tank Evacuation & Flare

Description of Action:

In this renewal application, FRNP applied to update the permit as deactivation and cleanup is continuing to occur. The following changes were made to the permit:

- Updates to the descriptions of EU 03, EU 09, and EU 54 to make them past-tense, as production has ceased at the facility and activities related to these emission units are slightly changed during deactivation and remediation.
- Removal of the 70-ft stack for EU 03 and all related permitting requirements and alternate operating scenarios. EU 03 is only allowed to operate with the 200 ft stack.
- Removal of emission units that have been removed from the facility or physically disconnected such that they cannot longer be operated, including the following:
 - EU 03 70-foot stack only
 - EU 05 C-360 Building equipment
 - EU 12 Incidental Wood Carpentry Shop
 - EU 19 C-400 Operations
 - EU 22 C-400 Cylinder Drying
 - EU 50 Surge Drum and Purge Vent
 - EU 86 C-400-A-1 Emergency Generator (70 HP)
 - EU 87 Package Boiler Number 3 (28.8 MMBtu/hr)
 - EU 88 Package Boiler Number 4 (27.2 MMBtu/hr)
 - Insignificant Activities: Coal Handling, C-710 Motor Spray Booth, C-720 Large Burn Off Oven, C-720 Small Burn Off Oven, Fly Ash Handling, 14 Cooling Tower Units (58 risers), C-720 Paint Shop, C-410-K Fluorine Manifold Facility, Chemical Storage Tanks (Sulfuric Acid, Nitric Acid), C-102 Medical Lab/X-ray Development, C-400 Chemical Vats
- The permit language was updated to be consistent and clear.

| V-21-011 Emission Summary | | |
|---------------------------|-------------------|--------------------|
| Pollutant | 2020 Actual (tpy) | PTE V-21-011 (tpy) |
| CO | 2.84 | 33.66 |
| NOx | 2.90 | 38.59 |
| PT | 0.45 | 2.67 |
| PM ₁₀ | 0.56 | 5.58 |
| PM _{2.5} | 0.20 | 5.38 |
| SO ₂ | 0.03 | 1.63 |
| VOC | 0.32 | 3.79 |
| Lead | 0.00002 | 0.0002 |

| V-21-011 Emission Summary | | |
|--|-------------------|--------------------|
| Pollutant | 2020 Actual (tpy) | PTE V-21-011 (tpy) |
| Greenhouse Gases (GHGs) | | |
| Carbon Dioxide | 5163 | 42914 |
| Methane | 0.10 | 0.83 |
| Nitrous Oxide | 0.03 | 0.09 |
| CO ₂ Equivalent (CO ₂ e) | 5174 | 42961 |
| Hazardous Air Pollutants (HAPs) | | |
| Hexane | --- | 0.63 |
| Hydrofluoric Acid (HF) | 0 | 28.36 |
| Radionuclides | 0 | 0.00375 |
| Combined HAPs: | 0.0016 | 29.18 |

Permit Number: V-21-011 R1

Activities: APE20210002

Received: October 9, 2021

Application Complete Date(s):

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

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

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

- APE20210001 – 502(b)10 Change: Addition of Lab Hood in C-409 Building

Description of Action:

In this minor revision, FRNP applied to add a 300kW, diesel fueled, compression ignition internal combustion engine, EU 94, to be used as an emergency generator for the C-360-A building. EU 94 has been added to Emission Group 1, and along with the other emission units in this group, has less than 500 HP, is constructed after June 12, 2006, and is subject to 40 CFR 60, Subpart IIII and 40 CFR 63, Subpart ZZZZ.

| V-21-011 R1 Emission Summary | | | | |
|------------------------------|-------------------|-----------------------------|--------------|-------------------------------|
| Pollutant | 2020 Actual (tpy) | Previous PTE V-21-011 (tpy) | Change (tpy) | Revised PTE V-21-011 R1 (tpy) |
| CO | 1.52 | 33.66 | 0.0443 | 33.71 |
| NO _x | 0.892 | 38.59 | 0.884 | 39.47 |
| PT | 0.225 | 2.67 | 0.00681 | 2.68 |
| PM ₁₀ | 0.225 | 5.58 | 0.00681 | 5.59 |
| PM _{2.5} | 0.064 | 5.38 | 0.00681 | 5.39 |
| SO ₂ | 0.0112 | 1.63 | 0.227 | 1.86 |
| VOC | 0.114 | 3.79 | 0.0131 | 3.8 |
| Lead | 0.0000097 | 0.0002 | 0 | 0.000193 |
| Greenhouse Gases (GHGs) | | | | |
| Carbon Dioxide | 2352 | 42914 | 127.69 | 43041.88 |
| Methane | 0.0448 | 0.83 | 0.00518 | 0.838 |
| Nitrous Oxide | 0.0125 | 0.09 | 0.00104 | 0.0888 |

| V-21-011 R1 Emission Summary | | | | |
|--|-------------------|-----------------------------|--------------|-------------------------------|
| Pollutant | 2020 Actual (tpy) | Previous PTE V-21-011 (tpy) | Change (tpy) | Revised PTE V-21-011 R1 (tpy) |
| CO ₂ Equivalent (CO ₂ e) | 2367 | 42961 | 128.3 | 43089.29 |
| Hazardous Air Pollutants (HAPs) | | | | |
| Hexane | --- | 0.63 | 0 | 0.63 |
| Hydrofluoric Acid (HF) | 0 | 28.36 | 0 | 28.36 |
| Radionuclides | 0 | 0.00375 | 0 | 0.00375 |
| Combined HAPs: | 0.000208 | 29.18 | 0 | 29.18 |

Permit Number: V-21-011 R2

Activities: APE20220001

Received: July 28, 2022

Application Complete Date(s): August 16, 2022

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

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

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

Description of Action:

In this minor revision, FRNP applied to add a 150-kilowatt diesel-fueled, emergency generator for the facility building C-105. The emission unit will be identified as EU 95, C-105 emergency generator. EU 95 has been added to emission group 1, and along with the other emission units in this group, has less than 500 HP, is constructed after June 12, 2006, and is subject to 40 CFR 60, Subpart IIII and 40 CFR 63, Subpart ZZZZ.

As part of this permitting action, the Vacatur language for emergency demand response in 40 CFR 60, Subpart IIII and Subpart JJJJ and 40 CFR 63, Subpart ZZZZ for the emergency engines was removed from the permit. The regulations were revised on August 10, 2022 to remove the vacated provisions of the referenced regulations, and the permit has been updated accordingly.

| V-21-011 R1 Emission Summary | | | | |
|------------------------------|-------------------|--------------------------------|--------------|-------------------------------|
| Pollutant | 2021 Actual (tpy) | Previous PTE V-21-011 R1 (tpy) | Change (tpy) | Revised PTE V-21-011 R2 (tpy) |
| CO | 0.81 | 33.71 | +0.07 | 33.78 |
| NO _x | 1.09 | 39.47 | +0.43 | 39.90 |
| PT | 0.144 | 2.68 | +0.01 | 2.69 |
| PM ₁₀ | 0.144 | 5.59 | +0.01 | 5.60 |
| PM _{2.5} | 0.137 | 5.39 | +0.01 | 5.40 |
| SO ₂ | 0.07 | 1.86 | +0.14 | 2.00 |
| VOC | 0.113 | 3.8 | +0.18 | 3.98 |
| Lead | 0.000004 | 0.000193 | 0 | 0.000193 |
| Greenhouse Gases (GHGs) | | | | |
| Carbon Dioxide | 900 | 43,042 | +76 | 43,118 |

| V-21-011 R1 Emission Summary | | | | |
|--|-------------------|--------------------------------|--------------|-------------------------------|
| Pollutant | 2021 Actual (tpy) | Previous PTE V-21-011 R1 (tpy) | Change (tpy) | Revised PTE V-21-011 R2 (tpy) |
| Methane | 0.018 | 0.838 | +0.003 | 0.841 |
| Nitrous Oxide | 0.002 | 0.0888 | +0.0006 | 0.0894 |
| CO ₂ Equivalent (CO ₂ e) | 901 | 43,089 | +77 | 43,166 |
| Hazardous Air Pollutants (HAPs) | | | | |
| Hexane | --- | 0.63 | 0 | 0.63 |
| Hydrofluoric Acid (HF) | 0.067 | 28.36 | 0 | 28.36 |
| Radionuclides | 0.0000089 | 0.00375 | 0 | 0.00375 |
| Combined HAPs: | 0.068 | 29.18 | +0.01 | 29.19 |

APPENDIX A – ABBREVIATIONS AND ACRONYMS

| | |
|-------------------|---|
| AAQS | – Ambient Air Quality Standards |
| BACT | – Best Available Control Technology |
| Btu | – British thermal unit |
| CAM | – Compliance Assurance Monitoring |
| CO | – Carbon Monoxide |
| Division | – Kentucky Division for Air Quality |
| ESP | – Electrostatic Precipitator |
| GHG | – Greenhouse Gas |
| HAP | – Hazardous Air Pollutant |
| HF | – Hydrogen Fluoride (Gaseous) |
| MSDS | – Material Safety Data Sheets |
| mmHg | – Millimeter of mercury column height |
| NAAQS | – National Ambient Air Quality Standards |
| NESHAP | – National Emissions Standards for Hazardous Air Pollutants |
| NO _x | – Nitrogen Oxides |
| NSR | – New Source Review |
| PM | – Particulate Matter |
| PM ₁₀ | – Particulate Matter equal to or smaller than 10 micrometers |
| PM _{2.5} | – Particulate Matter equal to or smaller than 2.5 micrometers |
| PSD | – Prevention of Significant Deterioration |
| PTE | – Potential to Emit |
| SO ₂ | – Sulfur Dioxide |
| TF | – Total Fluoride (Particulate & Gaseous) |
| VOC | – Volatile Organic Compounds |