

## TECHNICAL SUPPORT DOCUMENT (TSD)

### **I. GENERAL COMMENTS:**

#### **A. Company Information**

Business Name: Freeport Minerals Corporation – Technology Center - Tucson

Facility Address: 3350 E. Valencia Road  
Tucson, Arizona 85706

#### **B. Background**

Freeport-Minerals Corporation - Technology Center – Tucson (FMC-TCT) submitted a renewal application on March 14, 2018. This is the facility's second 5 year air quality permit.

FMC-TCT supplied documentation in the renewal application to support the insignificant equipment designation for the research and development (R & D) and other laboratory activities. Per Pima County Code (PCC) 17.04.340.A.114, the Pima County Department of Environmental Quality (PDEQ) has determined all research and development equipment at the facility to be insignificant. In addition, the facility cooling tower emissions provided in the permit renewal application have also been determined to be insignificant.

##### Permitting History

The facility first applied for emergency generators on March 1, 2013. The facility is a Research and Development (R&D) center and contains mostly existing equipment that was relocated from Freeport's Process Technology Center in Safford, AZ. The building was formerly occupied by American Airlines who vacated the premises in 2012.

#### **C. Attainment Classification**

This facility is located in a region that is currently designated as attainment for all criteria pollutants.

### **II. SOURCE DESCRIPTION:**

This air quality permit is issued to FMC-TCT, for the operation of two facility boilers and emergency generators. FMC-TCT is operated as an R & D center. The facility is located on Valencia road close to the Tucson International Airport. As an R & D center, FMC-TCT will operate the following processes: Analytical Lab and Processes; Mineralogy Lab and Processes; Mineral Processing; Process Developmental lab; Environmental Technology lab; Wastewater Treatment Unit; and various outdoor support equipment.

All air pollutant-emitting activities (operations) at the facility fall under the following SIC Code:

- 8734 (NAICS 541380)

**A. Process Description and Operating Hours**

The operating schedule (business hours) at the facility is not limited and the equipment can operate 7 days/week, 24 hours a day, 365 days a year subject to the permits limitations. The facility operates two boilers and two 1500 hp emergency generators. The emergency generators are limited to 100 hours of maintenance & readiness testing, and qualified non-emergency operation for up to 50 hours in accordance with the federal requirements. There are no limitations for operation of the emergency generators during true emergencies. The operating hours of the boilers is not limited.

**B. Air Pollution Control Equipment**

None.

**III. REGULATORY HISTORY:**

**A. Testing & Inspections**

No testing is required of the boilers or emergency generators. The facility will be inspected following PDEQ procedures.

**B. Permit Deviation Reports**

None.

**IV. EMISSION ESTIMATES:**

Based on the facility application, FMC-TCT, is a **Class II; True Minor Source** for all regulated pollutants. The facility has two cooling towers located at the property for which the application for renewal included the potential to emit (PTE) 9.47 tons of PM10 and PM2.5 as a result of the cooling towers drift. PDEQ has reviewed the cooling tower emission estimates and determined the emissions to be insignificant in accordance with PCC 17.04.340.A(114).j.

The following table summarizes the potential to emit of the source. These emission values are taken from applicable emission standards and/or Air Pollutant Emission Factors compiled in US EPA’s AP-42.

Controlled Facility-Wide Potential Emissions of Pollutants <sup>1</sup> (tons/yr)										
Conventional or Criteria Air Pollutant								NSPS	HAPs	
PM <sub>2.5</sub>	PM <sub>10</sub>	PM	NO <sub>x</sub>	VOC	CO	SO <sub>2</sub>	Lead	N/A	Total	Single
0.39	0.41	0.44	5.97	0.53	5.91	0.02	Negligible	-	0.07	< 0.07

<sup>1</sup> Boiler PTE is calculated on unlimited operation when firing natural gas. Emergency generator engine PTE is calculated on maintenance and readiness testing limitations (100 hour/year). Emergency generator operation during true emergencies is not limited.

## **V. APPLICABLE REQUIREMENTS**

### **40 CFR, Part 60 Standards of Performance for New Stationary Sources (NSPS)**

Appendix A      Test Methods

### **40 CFR, Part 63 National Emission Standards for Hazardous Air Pollutants Source Categories (NESHAP)**

Subpart A      General Provisions  
Subpart ZZZZ      NESHAP for Stationary Reciprocating Internal Combustion Engines

### **Pima County Code Title 17, Chapter 17.11 – General Provisions for Permits**

#### **Article I – General Provisions**

17.11.010      Statutory Authority  
17.11.020      Planning, Constructing, or Operating Without a Permit

#### **Article II – General Provisions for Stationary Source Permits**

17.11.060      Permit Display or Posting  
17.11.120      Material permit condition  
17.11.160      Test methods and procedures  
17.11.210      Performance tests

### **Pima County Code Title 17, Chapter 17.13 – Individual and General Permits and Permit Revisions for Class II and Class III Permits**

#### **Article I – General Provisions**

17.13.010      Application processing procedures  
17.13.020      Permit contents

#### **Article II – Permit Revisions, Renewals and Transfers for Class II and Class III Permits**

17.13.100      Facility changes that require a permit revision  
17.13.110      Procedures for certain changes that do not require a permit revision  
17.13.130      Minor revisions  
17.13.140      Significant revisions  
17.13.150      Reopening, revocation, or termination

#### **Article III – Emissions for Class II and Class III Sources**

17.13.180      Annual Emissions Inventory Questionnaire  
17.13.190      Excess Emissions reporting requirements

#### **Article V – Fees for Class II, Class III, and General Permits**

17.13.240      Fees related to Class II and Class III permits

## **Pima County Code Title 17, Chapter 17.14 – Activity Permits**

17.14.040	Fugitive Dust Activity permits
17.14.060	Asbestos NESHAP activity permits
17.14.080	Open burning permits

## **Pima County Code Title 17, Chapter 17.16 – Emission Limiting Standards**

### **Article I – General Provisions**

17.16.010	Local rules and standards; Applicability of more than one standard
17.16.020	Noncompliance with applicable standards
17.16.030	Odor limiting standards

### **Article II – Visible Emission Standards**

17.16.040	Standards and applicability (includes NESHAP)
17.16.050	Visibility limiting standard

### **Article IV – New and Existing Stationary Source Performance Standards**

17.16.130	Applicability
17.16.165	Standards of performance for fossil fuel fired industrial and commercial equipment
17.16.230.D	Standards of performance for storage vessels for petroleum liquids
17.16.340	Standards of performance for stationary rotating machinery
17.16.400.A	Organic solvents and other organic materials
17.16.430.F	Standards of performance for unclassified sources

## **Pima County Code Title 17, Chapter 17.20 – Emissions Source Testing and Monitoring**

17.20.010	Source sampling, monitoring and testing
17.20.040	Concealment of emissions

## **Pima County Code Title 17, Chapter 17.24 – Emission Source Recordkeeping and Reporting**

17.24.020	Recordkeeping for compliance determination
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## **VI. REQUIREMENTS SPECIFICALLY IDENTIFIED AS NON-APPLICABLE**

NSPS Subpart LL, Standards of Performance for Stationary Metallic Mineral Processing Plants does not apply to the source because, per 40 CFR 60.380, crushers and mills are not located at an open pit mine or at a mill/concentrator.

## **VII. PERMIT CONTENTS AND APPLICABILITY DETERMINATIONS**

### **A. Permit and Permit Summary:**

Specific Conditions have been organized into permit sections specific to the equipment and emission source categories at the facility.

## **B. General Conditions**

The General Conditions (Conditions 1-7) are conditions that are required in all Class II/III permits relating to compliance, excess emissions and emergency reporting, property rights, fee payment, duty to provide information to the Control Officer, and permit severability.

## **C. Specific Conditions:**

### §1 – General Applicability (Conditions 8-12)

This section of the permit provides a reference to the statutory authority to regulate emissions from the facility, the permit classification, SIC Code, identified facility sources, and permit sections.

### §2 – Facility-Wide Operations (Conditions 13 – 32)

This section contains local County provisions that are applicable to all sources of air contaminants in Pima County and to the facility and Permittee in general. This section serves to streamline general provisions from the other sections of the permit and also includes general provisions for monitoring, recordkeeping, reporting requirements, facility changes, and testing. The facility-wide standards in this section that apply generally to the facility include: operating hours; general control requirements; general materials and VOC handling; odor; opacity; visibility; and the requirement to obtain activity permits (as applicable).

### §3 – Fossil Fuel Fired Industrial and Commercial Equipment (Conditions 33 – 36)

This section contains local County requirements and operating limitations for boilers, heaters, and fuel fired equipment. The boilers are limited in this section to firing natural gas only. The definition for natural gas in this section is a broad definition that also includes LPG or Propane for use in temporary boilers or as an alternate fuel if required.

### §4 – NESHAP for CI RICE (Emergency Designated Engines) (Conditions 37-45)

This section contains applicable National Emission Standards for Hazardous Air Pollutants (NESHAP), found in Title 40, Code of Federal Regulations (CFR), Part 63, Subpart ZZZZ for Reciprocating Internal Combustion Engines (RICE) that apply to the two 1500 hp compression ignition (CI) emergency engines. All federal conditions found in this section are requirements directly from the CFR, applicable, and cited in the permit. This section also includes the following local County monitoring conditions for the engines:

a. Operating Limitation (Conditions 37, 42, 43.a, 44.a):

The Permittee is limited from operating the engines in excess of 100 hours for maintenance and readiness testing, and no more than 50 hours for qualified non-emergency operation in accordance with the federal requirements for emergency designated engines. The Permittee is required to monitor the number of hours operated each month through the run hour meter and calculate and record the 12-consecutive month total to monitor compliance with the limits.

b. Fuel Limitation (Conditions 39, 43.d, 44.d):

c. Opacity (Conditions 40, 43.e, 44.e):

The Permittee cannot allow any equipment to emit effluents (such as exhaust from a generator) that exceed specific values of opacity (the degree to which light cannot pass through the plume of effluent/exhaust.) The Permittee demonstrates compliance by checking the exhaust from the emergency generator at least quarterly while the generator is operating, and keeping complete records of these checks.

## §5 – Specific Applicability Provisions (Conditions 46-48)

This section of the permit includes specific applicability criteria that relate all applicable standards to the facility and the authorized facility equipment and/or operations listed in the permit equipment list (Attachment 3 of the permit).

### **VIII. PERIODIC MONITORING**

This is a Class II/III permit and as such does not include the submittal of a semiannual summary report of required monitoring or an annual compliance certification to the Control Officer. The permit only requires the facility to maintain the required periodic monitoring records on site and their submittal as requested by the Control Officer in order to demonstrate compliance.

### **IX. CONTROL TECHNOLOGY DETERMINATION**

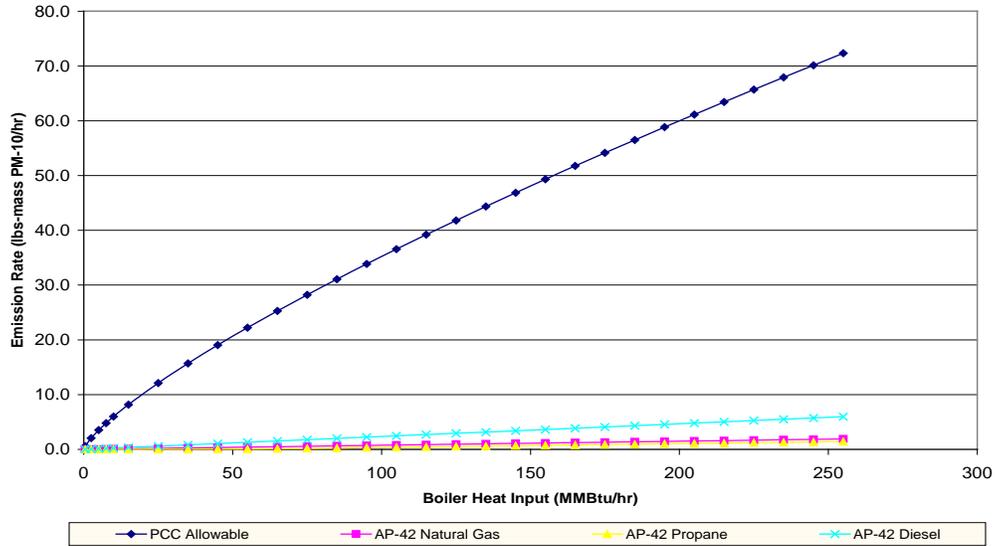
No control technologies to be determined; the source is not subject to RACT, BACT or LAER.

### **X. EXCLUSION OF PCC PARTICULATE MATTER DISCHARGE RATE STANDARDS**

The applicable PCC rule for limiting the maximum particulate matter discharge rates for certain sources is not normally included in Class II and III area source permits as explained below.

- For particulate matter sources, the calculated maximum particulate matter discharge rate, as provided in Title 17, yields maximum rates that far exceed the emissions expected from most typical area sources. For example a 200 ton/hour process source, which is typical for an average construction aggregate screening operation, would be limited to a maximum particulate matter discharge rate of 40.4 lbs/hour or 177 tons/year. This limit far exceeds estimated emissions from typical sources using EPA AP-42 emission factors and the source is far more likely to exceed opacity and visibility limiting standards well before reaching this limit.
- With regard to fuel burning equipment, PCC 17.16.165.C limits the emissions of particulate matter from commercial and industrial fossil-fuel fired equipment (including but not limited to boilers). This limit is also not included in Class II or III permits because allowable emissions are consistently over an entire order of magnitude higher than EPA AP-42 estimated potential emissions. The chart over page, illustrates the point.

Comparison of Emissions of PM-10 for Boilers: PCC Allowable vs AP-42 Estimated



Comparative Chart of Allowable Particulate Emissions Under Pima County Code, Title 17, and Estimated Potential Emissions based on EPA AP-42 Estimates for External Combustion Sources. Allowable emissions are consistently over ten times estimated potential emissions. Therefore, it is not necessary to include the standard in the permit explicitly, but by reference in Attachment 1 of the permit.

## XI. EXCLUSION OF PCC SULFUR DIOXIDE EMISSION STANDARDS

Compliance with the fuel sulfur limitation requirements in the permit shall ensure compliance with the Sulfur Dioxide Standards of PCC 17.16.165.E and 17.16.340.F; which limit the emission of SO<sub>2</sub> to 1.0 pound per million BTU of heat input when burning low sulfur fuel. The definition of low sulfur fuel (PCC 17.04.340.A. “Low Sulfur Fuel”) is fuel oil containing less than 0.9 percent sulfur by weight. “High Sulfur Fuel” is defined as fuel oil containing 0.9% wt. or more Sulfur. In accordance with EPA AP-42 Appendix A, page A-5, the heating value of diesel fuel is estimated at 137,000 BTU per gallon. Thus, 1 million BTU of heat input is equivalent to 7.3 gallons of diesel. At 7.05 lb per gallon, 51.47 lb of diesel will produce 1 million BTU. At 0.9% 51.47 lb of diesel contains 0.46 lb of sulfur. Combined with Oxygen to form SO<sub>2</sub>, and assuming 100% of the sulfur in the fuel forms SO<sub>2</sub>, this would yield 0.92 lb SO<sub>2</sub> per 1MMBtu. Thus, low sulfur fuel oil will produce 0.92 lb of SO<sub>2</sub> per million BTU of heat input. This is roughly 8% less than the prescribed 1.0 pound SO<sub>2</sub> per million BTU limit.

An excess emissions report is required to be submitted to the control officer should the fuel oils fired in fuel burning equipment, to include stationary rotating machinery, contain 0.9% wt. Sulfur or greater since the permit explicitly prohibits the use of high sulfur oil by the Permittee, in condition 14.b.

Natural gas, gasoline, No. 1 and 2 distillate fuel oils, jet fuel, and diesel delivered to Pima County consistently show sulfur levels below this limit as shown in fuel supplier certifications which verify the sulfur content of the fuel fired. The equipment specific sulfur content limitations in the permit and the prohibition to use high sulfur oil allow for the omission of PCC 17.16.165.E and PCC 17.16.340.F; the rules are incorporated by reference in Attachment 1 of the permit.

## XII. INSIGNIFICANT ACTIVITIES

FMC-TCT submitted information regarding insignificant activities at the facility in the renewal application. PDEQ is in agreement and has determined that all equipment on the list in Attachment 4 are insignificant per PCC 17.04.340.A(114).j.