217/782-2113

CONSTRUCTION PERMIT – PSD APPROVAL

PERMITTEE

Washington Mills Hennepin, Inc.
Attn: Armand Ladage
13230 ESK Street
Hennepin, Illinois 61327

Application No.: 07070005 I.D. No.: 155801AAC
Applicant's Designation: Date Received: July 3, 2007
Construction of: Silicon Carbide Furnace Group 5
Date Issued: DRAFT JANUARY 6, 2009
Source Location:

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a fifth silicon carbide furnace group (Furnace Group 5), as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s).

In conjunction with this permit, approval is given with respect to the federal regulations for Prevention of Significant Deterioration of Air Quality (PSD) for the above referenced project, as described in the application, in that the Illinois Environmental Protection Agency (Illinois EPA) finds that the application fulfills all applicable requirements of 40 CFR 52.21. This approval is issued pursuant to the federal Clean Air Act, as amended, 42 U.S.C. 7401 et. seq., the Federal regulations promulgated thereunder at 40 CFR 52.21 for Prevention of Significant Deterioration of Air Quality (PSD), and a Delegation of Authority agreement between the United States Environmental Protection Agency and the Illinois EPA for the administration of the PSD Program. This approval becomes effective in accordance with the provisions of 40 CFR 124.15 and may be appealed in accordance with the provisions of 40 CFR 124.19. This approval is also based upon and subject to the findings and conditions which follow. Any significant departure from terms expressed in the application would need to receive prior written authorization of the Illinois EPA.

If you have any questions on this permit, please contact Kevin Hecht at 217/782-2113.

Edwin C. Bakowski, P.E. Date Issued: _____
Acting Manager, Permit Section
Division of Air Pollution Control

ECB:KLS:

cc: Region 1

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FINDINGS

1a. Washington Mill Hennepin, Inc. (Washington Mills), formerly Exolon-ESK Company, has applied for a construction permit for a fifth furnace group at its existing silicon carbide manufacturing plant. This furnace group would have the capacity to produce approximately 11,250 tons of silicon carbide annually and enable the plant to increase production of higher grades of silicon carbide. The emissions of the new furnace group would be controlled by the control system for the four existing furnace groups at the plant, which has the capacity to handle the byproduct gas from an additional furnace group. This control system consists of gas cleaning for particulate removal, a sulfur removal system and primary and secondary afterburners.

The existing process equipment and facilities at the plant have the capability to handle the sand and petroleum coke that are the raw materials for the new furnaces and the intermediate silicon carbide product from the furnaces.

b. In conjunction with the proposed project, Washington Mills has also requested revisions to the permitted emissions of particulate matter from its existing furnaces. This request has been made to address the results of recent emission testing for the furnaces.

2. The Washington Mills plant is located in Putnam County, which is designated attainment for all criteria pollutants.

3. a. This project is subject to PSD review for emissions of sulfur dioxide (SO_2) and particulate matter (PM). This is because the potential emissions of the project are significant for SO_2 and PM and the existing plant is already a major source for purposes of PSD.

b. This project is not significant for emissions of other PSD pollutants as summarized in Attachment 1.

4. After reviewing the application submitted by Washington Mills, the Illinois EPA has determined that the application for the proposed project shows (i) compliance with applicable state and federal emission standards, (ii) utilization of Best Available Control Technology (BACT) for the SO_2 emissions of the new furnace group, and (iii) utilization of BACT for PM emissions of the new furnace group and existing furnaces. (See the Control Technology Determinations in the unit-specific conditions of this permit for the determinations of BACT.)

5. The air quality analysis submitted for the project and reviewed by the Illinois EPA shows that the proposed project will not cause violations of the ambient air quality standards and applicable PSD increments for SO_2 and PM.

6. The Illinois EPA has determined that the application for the proposed project shows that it would comply with all applicable Illinois Pollution Control Board Regulations and the federal PSD regulations.

7. A copy of the application, the Illinois EPA’s summary for the review of the applications and a draft of the permit were forwarded to a location in the vicinity of the plant, and the public was given notice and

opportunity to examine this material, to submit comments, and to request and participate in a public hearing on this matter.

SECTION 1: SOURCE-WIDE CONDITIONS

1.1: Effect of Permit

a. This permit does not relieve the Permittee of the responsibility to comply with all local, state and federal regulations that are part of the applicable Illinois' State Implementation Plan, as well as all other applicable federal, state and local requirements.

b. In particular, this permit does not relieve the Permittee from the responsibility to carry out practices during the construction and operation of Furnace Group 5, such as application of water or dust suppressant sprays to unpaved traffic areas, as necessary to prevent an air pollution nuisance from fugitive dust, as prohibited by 35 IAC 201.141.

1.2: Validity of Permit and Commencement of Construction

a. As provided by 40 CFR 52.21(r)(2), this permit shall become invalid if construction is not commenced within 18 months of the PSD approval becoming effective, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable period of time. The Illinois EPA may extend the 18-month period upon a satisfactory showing that an extension is justified. This condition supersedes Standard Condition 1 of the permit. (See Attachment 4)

b. For purposes of the above provisions, the definitions of "construction" and "commence" at 40 CFR 52.21(b) (8) and (9) shall apply, which provide that to commence construction a source must enter into a binding agreement for on-site construction or begin actual on-site construction. (See also the definition of "begin actual construction," 40 CFR 52.21(b)(11)).

1.3: Applicability of PSD

a. In its application, the Permittee has addressed the applicability of PSD, 40 CFR 52.21, to the proposed project for emissions of SO_2 and PM. The conditions of this permit are intended to ensure that this project does not constitute a major project for purposes of PSD for pollutants other than SO_2 and PM. (See also Attachment 1)

1.4: Status of the Project for Emissions of Hazardous Air Pollutants (HAPs)

a. This permit is issued based on the Furnace Group 5 not being a major source for emissions of hazardous air pollutants (HAP). For this purpose, emissions of HAPs from Furnace Group 5 shall not exceed 8 tons per year of any individual HAP and 20 tons per year of total HAPs.

Note: This permit limits HAP emissions from Furnace Group 5 to less than the thresholds for a major source of HAPs, i.e., annual emissions of 10 tons or more of any individual HAP and 25 tons or more of total HAPs, with a substantial margin to assure that the actual emissions of this furnace group are both enforceably and practically constrained to levels at which it would not be a major source of HAPs.

1.5: Use of Natural Gas

a. Natural gas, as defined by 40 CFR 60.41, shall be the only fuel fired in the Sulferox solution heater and the product dryer.

1.6: State Emission Standards of General Applicability

a. In addition to other applicable requirements, each emission unit at the plant shall comply with 35 IAC 212.123(a), which provides that no person shall cause or allow emissions of smoke or other particulate matter with an opacity greater than 30 percent, except as allowed by 35 IAC 212.123(b) and 212.124. Compliance with this limit shall be determined in accordance with by 35 IAC 212.109, i.e., by 6-minute averages of opacity measurements in accordance with USEPA Method 9.

b. In addition to other applicable requirements, each emission unit at the plant shall comply with 35 IAC 212.301, which provides that no person shall cause or allow emissions of fugitive PM to be visible from any process, including any material handling or storage activity, when looking generally toward the zenith at a point beyond the property line of the source, except when the wind speed exceeds 25 miles per hour, as provided by 35 IAC 212.314.

c. In addition to other applicable requirements, each process emission unit at the plant shall comply with 35 IAC 214.301, which provides that no person shall cause or allow emissions of SO_2 from a process emission unit to exceed 2000 ppm.

1.7: Good Air Pollution Control Practices

The Permittee shall operate and maintain the emission units at this plant, including associated air pollution control equipment, in a manner consistent with good air pollution control practice, as follows:

a. At all times, including periods of startup, shutdown, malfunction or breakdown, operate as practicable to minimize emissions.

b. Conduct routine inspections and perform appropriate maintenance and repairs to facilitate proper functioning of equipment and minimize or prevent malfunctions and breakdowns.

c. Install, calibrate and maintain required monitoring devices and instrumentation in accordance with good monitoring practices, following the manufacturer’s recommended operating and maintenance procedures or such other procedures as otherwise necessary to assure reliable operation of such devices.

1.8: Compliance with Emissions Limitations

a. In this permit, the emission limitations for “particulate matter” or “PM” shall apply to particulate matter as would be measured by USEPA Reference Method 5, rather than to PM_{10} or $PM_{2.5}$.

b. Unless otherwise specified in a particular provision, compliance with annual limitations established by this permit shall be determined from a running total of 12 months of data, i.e., from

the sum of the data for the current month plus the preceding 11 months (12 month total).

1.9: Records for Required Monitoring Systems and Instrumentation

a. The Permittee shall keep records of the data measured by required monitoring systems and instrumentation. Unless otherwise provided in a particular condition of this permit, the following requirements shall apply to such recordkeeping:

i. For required monitoring systems, data shall be automatically recorded by a central data system, dedicated data logging system, chart recorder or other data recording device. If an electronic data logging system is used, the recorded data shall be the hourly average value of the particular parameter for each hour. During periods when the automatic recording device is out of service, data shall be recorded at least once per shift for periods when the associated emission unit(s) are in service.

ii. For required instrumentation, the measured data shall be recorded manually at least once per day, unless otherwise specified, with data and time both recorded, for periods when the associated emission unit(s) are in service, provided however that if data from an instrument is recorded automatically, the above provisions for recording of data from monitoring systems shall apply.

b. The Permittee shall keep records for the operation, calibration maintenance and repair of required monitoring systems and instrumentation.

1.10: Records of Opacity Measurements

a. The Permittee shall keep records for all opacity measurements made in accordance with USEPA Method 9 for emission units at the plant that it conducts or that are conducted on its behest by individuals who are qualified to make such observations. For each occasion on which such measurements are made, these records shall include the formal report for the measurements if conducted pursuant to this permit or a request from the Illinois EPA, or otherwise the identity of the observer, a description of the measurements that were made, the operating condition of the affected operations, the observed opacity, and copies of the raw data sheets for the measurements.

1.11: Retention and Availability of Required Records

a. The Permittee shall retain all records and logs required by this permit for at least five years from the date of entry (unless a longer retention period is specified by a particular provision), keep the records at a location at the plant that is readily accessible to the Illinois EPA and USEPA, and make records available for inspection and copying by the Illinois EPA or USEPA upon request.

b. The Permittee shall retrieve and print on paper during normal plant office hours any records retained in an electronic format (e.g.,

computer) in response to an Illinois EPA or USEPA request for records during the course of a plant inspection.

1.12: Illinois EPA Addresses

a. Any required reports and notifications shall be sent to the Illinois EPA at the following address unless otherwise indicated:

Illinois Environmental Protection Agency
Division of Air Pollution Control
Enforcement Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

Telephone: 217/782-5811 Fax: 217/524-4710

b. A copy of all required reports and notifications, except the Annual Emission Report required by 35 IAC Part 254, shall also be sent to the Illinois EPA at the following address:

Illinois Environmental Protection Agency
Division of Air Pollution Control
5415 North University
Peoria, Illinois 61614

Telephone: 309/693-5461 Fax: 309/693-5467

1.13: Authorization to Operate

a. The plant, including Furnace Group 5, may be operated under this construction permit until issuance of a new or revised CAAPP permit for the plant, provided that a timely and complete application for such permit is submitted that addresses Furnace Group 5, as provided by Section 39.5(5)(x) of the Act. This condition supersedes Standard Condition 6.

SECTION 2: UNIT-SPECIFIC CONDITIONS

2.1 Silicon Carbide Furnaces

2.1.1 Description

Washington Mills manufactures silicon carbide (SiC_2) from sand and petroleum coke in electrically heated “furnaces” that are located outdoors. The furnaces are large piles of a mixture of sand and petroleum coke, carefully arranged around a central graphite electrode. This permit addresses the construction of a fifth furnace group at the plant.

Each furnace group has four furnace positions and a single electrical transformer. Only one furnace position at a time in each group is heated, with electric power applied to the graphite electrode in the center of the pile. The duration of this “heating phase” for the furnace is approximately 10 days, varying due to the rate at which electric power is actually supplied to the furnace, which is managed to minimize peak electrical rates or match the demand for silicon carbide product. While one furnace in a furnace group is in the heating phase, the other three positions in the furnace group are either: 1) Being cooled, having just completed the heating phase, 2) Being dismantled to recover the raw silicon carbide, or 3) Being built up with fresh material in preparation for the heating phase.

During the heating phase, the hot furnaces generate an off-gas that is mainly steam and hydrogen (H_2) as a byproduct of the reactions by which silicon carbide is formed. This off-gas also contains particulate matter, carbon monoxide (CO), hydrogen sulfide (H_2S), carbon disulfide (CS_2), and carbonyl sulfide (COS). This off-gas is captured and ducted to an emission control system.

The off-gas is captured by slotted piping permanently buried in the porous rock foundation of each furnace position. The off-gas is also captured by a plastic tarp that is placed over the top of the furnace pile and exhausted through another “top” gas collection pipe. When electric power is applied to a furnace during the heating phase, the off-gas collected beneath the tarp lifts the tarp off the surface of the pile and an automatic pressure valve on the top gas collection pipe maintains a slight positive pressure under the tarp to keep the tarp from touching the surface of the pile. The bottom gas collection pipe from the piping beneath the furnace and the top gas collection pipe are merged and connected to the gas main, where blowers move the collected off-gas to the emission control system.

The emission control system consists of series of control devices. A “pre-quench” mist eliminator first removes the particulate matter that is entrained in the off-gases. This is followed by a Sulferox® control system to remove H_2S from the off-gas, recovering it as sulfur. The other gaseous pollutants pass through the Sulferox® system to a thermal oxidizer or an afterburner, in which the remaining H_2S and other sulfur compounds in the off-gas are combusted to SO_2, water and carbon dioxide

(CO_2) and the CO is combusted to CO_2. During periodic maintenance of the Sulferox system ®, which is necessary for its proper functioning, the off-gas bypasses this system and goes directly to the afterburner. (For Furnaces 1, 2 and 3, in the event of maintenance or other outage of the primary afterburner, by-passed off-gas goes to individual secondary afterburners, with 16 meter high stacks, rather than the primary afterburner, which has a 33 meter high stack.)

The off-gas collection and control systems also capture and control the residual off-gas in the furnaces while furnaces are in the initial cooling phase after the heating phase is completed and electric power to the furnace is disconnected. During the initial cooling phase, all off-gas under the tarp that can be collected is exhausted to the control system. The off-gas under the plastic tarp is automatically collected by the top gas collection pipe and exhausted to the control system until the pressure of the gas under the tarp drops to the level at which the valve on the gas collection pipe closes. The collection pipe is then manually opened and the remaining off-gas under the tarp that can be collected is exhausted to the control system. The “active cooling” phase then follows, with removal of the plastic tarp from the furnace pile, stripping of several feet of unreacted material from the top of the pile, and application of a water spray to rapidly cool the hot material that has been exposed. The bottom gas collection system continues to operate into the active cooling phase until the oxygen level in the collected off-gas reaches a level at which collection must be terminated to prevent unsafe levels of oxygen in the off-gas in the piping and gas main.

During outages of the capture or control system, emissions are minimized by reducing the operating level of furnace(s). This gradually slows generation of off-gases but does not stop them because of the residual heat and off-gases already contained in the furnace(s). In most cases, the power cannot be completely shut off because electric power must be kept at a level that assures that the integrity of the tarps is maintained.

2.1.2 List of Emission Units

Emission Unit	Description	Control Equipment
New Furnace Group 5: Four Furnace Positions (P-F-17 thru 20) & Associated Transformer	Furnace in Heating and Initial Cooling Phases	Mist Eliminator (C-007), Sulferox® System (C-008) and Primary Afterburner (C-001)
	Furnaces in Other Phases	Work Practices
Existing Furnace Groups 1 through 4: Four Furnace Positions in Each Group (P-F-1 thru 16) & Four Associated Transformers	Furnaces in Heating and Initial Cooling Phases	Mist Eliminator, Sulferox® System and Primary Afterburner (same as above) or Secondary Afterburners*
	Furnaces in Other Phases	Work Practices
Process Heater (supports operation of the Sulferox®	Small natural gas-fired heater for Sulferox® solution (Nominal rated	None

System)	heat input 2.5 mmBtu/Hr)	

* Furnace Groups 1 thru 3 are served by secondary afterburners, which receive collected off-gas from these furnace groups during outage of the primary afterburner.

2.1.3-1 Applicability Provisions

a. For the purpose of these unit-specific conditions:

i. “Furnace Group 5” is the proposed new furnace group and the “affected furnace groups” are the four existing furnace groups and proposed Furnace Group 5, as described in Conditions 2.1.1 and 2.1.2.

ii. The “affected furnaces” are the 20 individual furnaces at the plant after initial startup of proposed Furnace Group 5, as described in Conditions 2.1.1 and 2.1.2.

iii. A. The “heating phase” of the operation of furnaces is the period from initial application of electric power to a furnace to the beginning of the initial cooling phase, while off-gases from the furnace are or should be captured with a tarp.

B. The “initial cooling phase” of the operation of furnaces is the period from when the heating phase is concluded and the electric power to the furnace is turned off until the plastic tarp is removed from the furnace pile, when off-gases may continue to be collected from the furnace.

C. The “other phases” of the operation of furnaces are phases other than the heating phase and initial cooling phase, that is, the phases involving active cooling of the furnaces pile, dismantling of the pile or building the pile, when a furnace does not generate off-gas.

b. This permit does not revise the BACT determination for SO_2 emissions from the existing affected furnaces that was made in Construction Permit/PSD Approval 95060068, issued May 14, 2002, as provided below, which determination shall continue to apply to the existing furnaces after initial startup of Furnace Group 5.

i. The affected furnaces shall be equipped with a sulfur removal system to process the off-gas generated during the heating phase of operation to remove H_2S prior to oxidation.

A. The H_2S content of the off-gas prior to combustion shall not exceed 500 ppm, except as provided below.

B. Operation of the furnaces [i.e., the heating phase and initial cooling phase of operation] without the sulfur removal system is allowed during startup, shutdown, maintenance and malfunction for up to 21 days (504 hours) per year based on a running total of monthly data. For the purpose of this provision, the definition of "malfunction" at 40 CFR 60.2 shall apply. "Maintenance" means the carrying out of activities to keep equipment in proper operating condition, including inspection, adjustment, lubrication, cleaning, and repair and replacement of components. Maintenance may occur while equipment is operational or may require turndown or shutdown of equipment, which can be coordinated with equipment turndown or shutdown for other reasons.

ii. The sulfur removal system shall be installed and maintained with spares for critical pumps, air blowers, reliable operating instrumentation, and other features which might reasonably be used to minimize the frequency and duration of malfunctions.

iii. At all times, including periods of startup, shutdown, maintenance and malfunction, the affected furnaces and associated control system shall be maintained and operated in a manner consistent with good air pollution control practice for minimizing emissions of SO_2 and other pollutants.

iv. Practices shall be carried out to minimize and ameliorate failures in the tarp covering the affected furnaces that will result in release of off-gases from the furnaces directly to the atmosphere, including the following:

A. The Permittee shall adequately install the tarp covering a furnace before startup (i.e., application of electric power to the furnace);

B. The Permittee shall visually inspect the tarp during the heating period of a furnace, at least once per shift;

C. The Permittee shall promptly cool a furnace after the tarp is taken off, either as a result of completion of the furnace cycle or failure of the tarp.

Note: A complete copy of this BACT determination is included in Attachment 2.

c. This permit does not revise the BACT determination for emissions of pollutants other than SO_2 from the affected furnaces that was made in Construction Permit/PSD Approval

95060068, issued May 14, 2002, as provided below, which determinations shall continue to apply to the affected furnaces after initial startup of Furnace Group 5.

i. The off-gas from the furnaces shall be collected and oxidized by a flare or other combustion device prior to discharge to the atmosphere to control emissions from carbon monoxide (CO) and hydrogen sulfide (H_2S) and other sulfur compounds in the off-gas.

ii. A mist eliminator or other pretreatment system shall be operated to remove particulate matter (PM) from the off-gas from the furnaces prior to the off-gas entering the sulfur removal system.

iii. At all times, including periods of startup, shutdown, maintenance and malfunction, the furnaces and associated control system shall be maintained and operated in a manner consistent with good air pollution control practice for minimizing emissions of pollutants other than SO_2.

2.1.3-2 Control Technology Determination

a. i. SO_2 emissions from the affected furnaces, including Furnace Group 5, shall be controlled in accordance with Condition 2.1.3-1(b)(i) through (iv).

ii. During maintenance outages of the SO_2 control system for the affected furnaces or other incidents involving the capture and control system that result in more than 500 ppm H_2S in the gas stream to the afterburner or excess emissions of SO_2, the Permittee shall:

A. Expeditiously complete necessary maintenance or repairs to return the control system to normal operation, and

B. As soon as practicable, reduce the number of furnaces to which electric power is being applied to three furnaces and maintain this level of operation until the SO_2 control system is returned to service or excess emissions cease, provided however that electric power to furnaces in the heating phase shall not be reduced below the level reasonably necessary to ensure integrity of the tarp covering the furnace.

Note: This requirement replaces a provision of the prior BACT determination, which only addressed operation with four furnace groups.

b. i. The PM emissions from Furnace Group 5 shall be controlled in accordance with Condition 2.1.3-1(c).

ii. The stack emissions of PM from the affected furnaces and Furnace Group 5 shall not exceed the hourly limitations in Condition 4.1.6(a)(ii) and (b)(ii)(D).

Note: This condition sets "secondary," numerical BACT limits for the affected furnaces to accompany the equipment and work practice requirements established as BACT in Condition 2.1.3-1(c).

2.1.3-3 Applicable State Emission Standards

a. Each affected furnace is subject to 35 IAC 214.301, which provides that no person shall cause or allow the emissions of SO_2 into the atmosphere from any process emission unit to exceed 2,000 ppm.

b. Each affected furnace is subject to 35 IAC 215.301 and 215.302, which provides that emissions of organic material from a process emission unit using organic material shall not exceed 8 lb/hr if the organic material emissions are photochemically reactive as defined by 35 IAC 211.4690 or there is an odor nuisance, unless emissions are controlled by at least 85 percent by a flame or thermal incinerator (i.e., afterburner) or other control device.

Note: The emissions of organic material from the affected furnaces, which occur in the heating and initial cooling phases, are not photochemically reactive and are controlled by greater than 85 percent by the afterburner(s).

c. i. The affected furnaces are subject to 35 IAC 212.321, which limits the PM emissions based on the process weight rate of the furnaces. For this purpose, affected furnaces in the heating and initial cooling phases shall comply in aggregate with 35 IAC 212.321, as a group of similar sources. When in other phases, each affected furnace shall comply individually with 35 IAC 212.321. (See also Condition 3.1(a).)

ii. Notwithstanding 35 IAC 212.321, (Condition 2.1.3-3(c)(i), pursuant to 35 IAC 201.149 and 201.262, in the event of a malfunction or breakdown of the emission control system for the affected furnaces, the Permittee is authorized to continue operation of affected furnaces in the heating and initial cooling phases in violation of the applicable PM limit of 35 IAC 212.321, as necessary to prevent risk of injury to personnel or severe damage to equipment. This authorization is subject to the following requirements:

A. The Permittee shall implement operating and maintenance practices for the control system to minimize the frequency and duration of malfunction or breakdown events, including the maintenance of the control system in accordance with Condition 2.1.3-1(b)(ii) and 2.1.5(b).

B. Upon occurrence of a malfunction or breakdown with excess PM emissions, the Permittee shall also take the actions specified by Condition 2.1.3-2(b) and 2.1.5(b) to mitigate the incident.

C. The Permittee shall fulfill the applicable recordkeeping and reporting requirements of Conditions 2.1.9-1(f) and 2.1.10(c).

D. The Permittee shall comply with all reasonable directives of the Illinois EPA with respect to malfunction and breakdown events, as provided by 35 IAC 201.163.

E. This authorization does not relieve the Permittee from the continuing obligation to minimize excess emissions during malfunction or breakdown. As provided by 35 IAC 201.265, an authorization in a permit for continued operation with excess emissions during malfunction and breakdown does not shield the Permittee from enforcement for any such violation and only constitutes a prima facie defense to such an enforcement action provided that the Permittee has fully complied with all terms and conditions connected with such authorization.

2.1.4 Non-Applicability of Regulations of Concern

None

2.1.5 Operational Limits and Work Practices

a. The production of silicon carbide by Furnace Group 5 shall not exceed 2,250 tons/month and 11,250 tons/ year.

b. The affected furnaces, including associated emission capture and control systems, shall be operated and maintained in accordance with written operating procedure(s) developed and maintained by the Permittee that address the various work practice required by this permit and set forth good air control practice for normal operation, and startup, shutdown, and malfunction, which at a minimum include the following:

i. Operating and maintenance procedures for the furnaces during the heating and initial cooling phases, which include the measures to reduce generation of off-gases during periods when tarps are damaged or the capture and control system is not in service or is impaired.

ii. Operating procedures for the tarps that capture off-gases from the furnaces, which describe proper

installation, operation and removal procedures and any other practices to reduce damage and failure of the tarps with the direct release of off-gases to the atmosphere.

iii. Operating and maintenance procedures for emissions capture equipment and control devices, which procedures may incorporate the manufacturers' recommended procedures for control devices.

iv. Operating procedures for furnaces during phases other than the heating and initial cooling phases, which procedures serve to control and minimize fugitive emissions during these other phases.

2.1.6-1 Emission Limitations

a. The emissions from Furnace Group 5 during the heating and initial cooling phases shall not exceed the following limits:

i. SO_2 emissions: 507.4 tons/year.

ii. $PM/PM_{10}/PM_{2.5}$ (filterable only): 4.8 lb/ton and 27.0 tons/year.

iii. Other pollutants as provided below, excluding emissions from failures of the tarp, i.e., loss of or damage to a tarp of such extent and nature that it qualifies as an emergency for purposes of Section 39.5(7)(k) of the Environmental Protection Act, without regard to whether the limits are technology-based limits for purposes of Section 39.5(7)(k).

Pollutant	Captured Emissions (Control System)			Total
	Lb/Ton	Ton/Mo	Ton/Yr	Ton/Yr
NOx	6.7	7.5	37.7	37.7
CO	15.0	16.9	84.4	96.9
VOM[a]	5.3	5.4	27.0	32.0
H_2S	0.10[c]	1.6	4.0	8.0
TRS[b]	0.60[c]	1.6	8.0	9.0

Notes:
a. Includes CS_2 and COS
b. Total reduced sulfur, which consists of hydrogen sulfide (H_2S), carbon sulfide (CS_2) and carbonyl sulfide (COS).
c. During outage of the SO2 control system, H_2S and TRS emissions shall not exceed 1.9 and 2.4 lb/ton, respectively.

iv. The total emissions of hazardous air pollutants (HAPs) from Furnace Group 5, including fugitive emissions, shall not exceed 9.0 tons per year of any individual HAP and 22.50 tons per year for total HAPs.

b. i. The emissions of SO_2 from the affected furnaces shall not exceed the following limits:

A. Uncontrolled SO_2 emissions shall not exceed 2,400 lb/hr, based on 100 percent conversion of sulfur containing compounds in the off-gas stream to SO_2. Compliance with this limit shall be determined when the sulfur removal system is not operating on a 3-hour block average basis as measured by the required continuous emission monitoring system (CEMS).

B. Controlled SO_2 emissions shall not exceed 760 lb/hr when the sulfur removal system is operating. Compliance with this limit shall be determined on a 3-hour block average basis as measured by the required CEMS.

C. Annual emissions, including outage of the sulfur removal system, shall not exceed 2,150 tons/yr, with compliance determined from a running total of 365 days of data (rather than on a running 12 month basis). This limit is based on operation without the sulfur removal system at 2,400 lbs SO_2/hr for 504 hours in a year and at 760 lbs SO_2/hr for the remaining hours, as allowed by this permit.

ii. The emissions of pollutants other than SO_2 from the affected furnaces during the heating and initial cooling phases shall comply with the following limits excluding emissions from failures of the tarp, i.e., loss of or damage to a tarp of such extent and nature that it qualifies as an emergency for purposes of Section 39.5(7)(k) of the Environmental Protection Act, without regard to whether the limits are technology-based limits for purposes of Section 39.5(7)(k). The hourly limits do not apply to uncaptured emissions associated with failure of or damage to the tarp on a furnace, as addressed by Condition 2.1.3-1(b)(iv), without regard to whether the incident constitutes an “emergency” for purposes of Section 39.5(7)(k) of the Environmental Protection Act.

A. Emissions of CO shall not exceed 75.0 pounds/hr (or be below detection levels) and 480 tons/yr.

B. Emissions of reduced sulfur compounds (H_2S, CS_2 and COS) shall not exceed 11.0 pounds/hour (or be below detection levels) and 39.8 tons/yr.

C. Emissions of NOx not exceed 36.0 pounds/hr and 189 tons/yr.

D. Emissions of PM (filterable only) shall not exceed 22.5 pounds/hr and 135 tons/yr.

Note: These limitations, which address five furnace groups, supersede previous limitations for the affected furnaces, which only addressed four furnace groups at the plant.

c. For purposes of determining compliance with the emission limitations in Conditions 2.1.6-1(a) and (b), emissions shall be determined as follows:

i. Emissions of SO_2 shall be determined using data from the required continuous emission monitoring system (CEMS) and operating data and appropriate emission factors to address emissions that are not measured by the CEMS.

ii. Emissions of pollutants other than SO_2 shall be determined using operating data and appropriate emission factors, including the methodology set forth in Attachment 2 for determining uncaptured emissions resulting from damage to a tarp.

iii. Annual emissions shall be determined from a running total of 365 days of data for emissions of SO_2 and from a running total of 12 consecutive months of data for other pollutants.

iv. Emissions of Furnace Group 5 shall be determined from the total emissions of the affected furnaces, with the emissions of Furnace Group 5 pro-rated based on electrical input to the furnaces, unless the Illinois EPA approves an alternative approach to pro-rate some or all of the emissions, with associated recordkeeping.

2.1.6-2 Emissions Limitations - Sulferox® Process Heater

a. Emissions of NOx from the Sulferox® process heater shall not exceed 0.3 lb/hour and 1.3 tons/year.

2.1.7-1 Emissions Testing Requirements

a. Upon written request by the Illinois EPA, the Permittee shall have testing conducted for the affected furnaces (primary afterburner stack) in accordance with Condition 3.2 for emissions of PM, PM_{10}, NOx, CO, VOM, H_2S, CS_2 and COS, as specified by the request.

b. In addition to other required information, the written plan for this testing submitted to the Illinois EPA shall include a detailed description of the specific conditions under which testing will be performed, a discussion of why these conditions will be representative of maximum emissions, and a description of the means by which the operating parameters of the furnaces and the control system during testing will be determined.

c. In addition to other required information, the description of the conditions during testing in the Final Report for this testing shall include:

i. Detailed information on the operation of affected furnaces during each test run, i.e., number of furnaces operating, stage of operation, power level, etc. reading.

ii. Information confirming the integrity of the tarp on each furnace and the proper operation of the capture system.

iii. The composition of the captured off-gas as determined from representative gas samples using standard analysis methods. (Refer top Condition 2.1.7-3.)

iv. Detailed operating information for each control system, including information for the position of the bypass valve in the Sulferox® System.

v. SO_2 emissions from the affected furnaces during the period of testing, as measured by required continuous emissions monitoring system.

2.1.7-2 Opacity Observations

a. The Permittee shall conduct opacity observations for the affected furnaces in operating phases other than heating in accordance with Condition 3.3 upon written request by the Illinois EPA, which observations shall be conducted within 45 days of the request or such later date specified by the Illinois EPA.

b. The reports for these observations shall include a detailed description of the activities occurring at the furnace during each determination of opacity.

2.1.7-3 Sampling and Analysis of Off-Gas

a. The Permittee shall have representative samples of the captured off-gas before the Sulferox® system and treated off-gas after this system analyzed for CO, VOM, total sulfur, H_2S, CS_2 and COS by standard analysis methods, with a report for this activity, with the results of the analysis, submitted to the Illinois EPA.

i. Sampling and analysis shall be conducted and a reported submitted to the Illinois EPA within 90 days of initial startup of Furnace Group 5.

ii. Additional sampling and analysis shall be conducted upon written request from the Illinois EPA, with a report submitted to the Illinois EPA within 90 days of the request.

2.1.8 Monitoring and Instrumentation Requirements

a. The Permittee shall continue to operate and maintain a continuous emission monitoring system (CEMS) for the emissions of SO_2 from the affected furnaces, which CEMS shall be located on the exhaust from the primary afterburner. This CEMS must continue to meet the specifications in the CAM plan submitted in the CAAPP application for the source, including measurements of

operating parameters so that the measured SO_2 concentration may be converted to a mass emission rate in pounds/hr.

b. The Permittee shall continue to operate and maintain instrumentation to measure the operating parameters of the Sulferox® system, including the temperatures of the Sulferox® solution.

2.1.8-2 Inspection Requirements

a. The Permittee shall perform detailed operational inspections on at least a monthly basis of the equipment that is important to the performance of the capture of off-gases from the affected furnaces. Any deficiencies shall be noted and proper maintenance performed.

2.1.9-1 Recordkeeping Requirements

a. For the mist eliminator, Sulferox system, and each afterburner, the Permittee shall maintain a file containing the manufacturer’s specifications for the capacity and emissions performance of the device and any recommended operating and maintenance procedures.

b. The Permittee shall maintain records of the following items for the supply of petroleum coke to the affected furnaces:

i. The sulfur content of each shipment of petroleum coke to the plant (weight percent).

ii. The usage of petroleum coke (tons/month).

c. The Permittee shall keep monthly records of the following data for Furnace Group 5 and for all affected furnaces, in total:

i. Electricity input (MW-hr/month and MW-hr/year)

ii. Silicon carbide production (tons/month and tons/year).

d. The Permittee shall maintain the following logs or other similar records for the affected furnaces, including the associated emission capture and control systems:

i. Operating log(s), in accordance with Condition 3.4(a), which logs shall also include the following information on at least an hour-by-hour basis: The configuration and status of the capture and control system; the identity of furnaces in the heating and initial cooling phase and the power levels to individual furnaces, if power is being reduced because of outage or deficiency of the SO_2 control system; and the identity of furnaces that are in the active cooling phase with the tarp removed.

ii. Inspection, maintenance and repair log(s) in accordance with Condition 3.4(b), which logs shall also include information documenting that the tarps used to capture off-gases from the affected furnaces during the heating and initial cooling phase are inspected once per shift.

e. The Permittee shall maintain records of the following items for the Sulferox® system on a monthly basis:

i. The amount of sulfur compounds contained in the off-gas generated by the affected furnaces based upon emission factors developed from sampling and analysis of off-gas (tons sulfur equivalent/month).

ii. The amount of sulfur recovered (tons/month).

iii. The following records for malfunctions and breakdowns and routine maintenance of the Sulferox® system, in which this system is bypassed, and maintenance of the primary afterburner, which also necessitates bypassing of this system:

A. Records for operating time for the capture system (i.e. bypass directly to primary afterburner with a special note if off-gas is bypassed to the secondary afterburners), the pretreatment system, the sulfur removal systems, and monitoring equipment.

B. Duration of operation of furnaces in heating or initial cooling phases without the Sulferox® system (total hours and hours during startup, shutdown, maintenance or malfunction of the system, respectively) and without the primary afterburner (total hours).

C. A running 12-month log of times that the Sulferox® system was bypassed for malfunction and breakdown or repair purposes.

f. The Permittee shall maintain records for each deviation by affected furnaces from an applicable emission limit or emission control requirement, which records shall include the information specified by Condition 3.5(a) and the following information:

i. An estimate of the amount of emissions in excess of the applicable limit or requirement.

ii. For damage to or failure of a tarp on a furnace during the heating or initial cooling phases, if the damage is not repaired within one hour (60 minutes) the estimated volume of off-gas released directly to the atmosphere, with supporting information and calculations.

g. The Permittee shall maintain records of the following items related to emissions of the affected furnaces:

i. A file containing the emission factors (lbs/ton) used by the Permittee for estimating the emissions associated with the off-gas from the furnaces that is captured, which factors shall be based on site-specific test data, representative test data or emission determination methodology published by USEPA, with supporting explanation, documentation and calculations.

ii. A file containing the documentation supporting the methodology used by the Permittee for estimating the emissions associated with the off-gas from the furnaces that is not captured, which methodology shall reflect relevant engineering principles and consider on site-specific data for the composition and generation rate of off-gas, with supporting explanation and documentation.

iii. Records of emissions of SO_2 for periods when the CEMS is not operating or the CEMS is bypassed (i.e., the primary afterburner is out-of service) as determined from emission rates measured by the CEMS under similar operating conditions (i.e., number of furnaces in operation and the electric power levels to the furnaces).

iv. Records of the emissions of PM, PM_{10}, SO_2, NOx, VOM, CO, H_2S, CS_2 and COS (tons/month and tons/year), with supporting calculations.

h. The Permittee shall maintain records, pursuant to 35 IAC 201.263, of each incident when operation of affected furnace(s) continued during malfunctions and breakdown as authorized by Condition 2.1.3-3(c)(ii), which records as a minimum include:

i. Date and duration of the incident.

ii. A detailed description of the incident.

iii. An explanation why the furnace(s) could not be removed from service without risk of injury to personnel or severe damage to equipment and why the control system could not be repaired more quickly and the power level to the furnaces could not be reduced to a lower level during the incident;

iv. A description of the measures used to reduce the quantity of emissions and the duration of the incident.

v. A description of the steps taken to prevent similar incidents and reduce their frequency and severity.

vi. An estimate of the amount of emissions above typical emissions during the incident.

vii. Verification that applicable requirements of Condition 2.1.3-3(c)(ii) were met for the incident and the Illinois EPA's regional office was appropriately notified, with the identity of the person that was spoken to or notified and a summary of items discussed, including any instructions provided by the Illinois EPA.

2.1.9-2 Recordkeeping For the Process Heater for the Sulferox System

a. The Permittee shall keep the following records related to emissions of the process heater for the Sulferox System:

i. A file containing the CO and NOx and emission rates, in lb/mmBtu or lb/hr, used by the Permittee to determine the emissions of the heater, with supporting documentation.

ii. Records of the emissions of CO and NOx from the affected dryer, tons/month and tons/year, based on operating information and appropriate emission factors, with supporting calculations.

2.1.10 Notification and Reporting Requirements

a. The Permittee shall submit semi-annual reports for the operation of the emissions monitoring system to the Illinois EPA. These reports shall be submitted to the Illinois EPA within 45 days after the end of the reporting period.

b. The Permittee shall promptly notify the Illinois EPA of any deviations from the requirements of this permit for affected furnaces as follows. These notifications shall include the information specified by Condition 3.5. Applicable reporting requirements for an "emergency" shall also be met for deviations that the Permittee considers an emergency for purposes of Section 39.5(7)(k) of the Environmental Protection Act.

i. If there is a violation of 35 IAC 212.321 while one or more affected furnaces is in the heating or initial cooling phase due to a malfunction or breakdown, the Permittee shall notify the Illinois EPA in accordance with Condition 2.1.10(c).

ii. If a furnace continues operating in heating phase for more than one hour (60 minutes) after a failure of the tarp capturing off-gases from the furnace is identified and the tarp has not been repaired or initial cooling initiated, the Permittee shall expeditiously notify the Illinois. For this purpose, the Illinois EPA shall be notified within 24 hours or noon of the Illinois EPA's next business day,

whichever is later, unless the incident is accompanied by a ongoing fire or severe damage to equipment, in which case notification to the Illinois EPA shall be provided as soon as practicable. Failure of a tarp means damage to the tarp of such an extent that the installed tarp must be replaced and does not include a tear or other minor damage affecting only a small portion of the tarp and the damage is readily repaired with a patch or other corrective action to restore the integrity of the tarp.

iii. If a malfunction or other unplanned event interferes with operation of the Sulferox System® for control of SO_2 emissions for more than one hour (60 minutes), the Permittee shall also expeditiously notify the Illinois EPA as provided by Condition 2.1.10(b)(ii), above.

iv. If there is a deviation from other applicable requirements for PM emissions, opacity or visible emissions that is not repaired or otherwise corrected within four hours (240 minutes), the Permittee shall notify the Illinois EPA within 30 days.

v. If there is a deviation from Condition 2.1.3-1(b)(i)(B), i.e., in a 12-month period, the Sulferox® system is out of service for more than 504 hours while one or more affected furnaces is in the heat phase, the Permittee shall notify the Illinois EPA within 30 days.

vi. The deviations addressed above and all other deviations shall be reported in semi-annual compliance report, which shall be submitted with the monitoring report required by Condition 2.1.10(a).

c. i. Pursuant to 35 IAC 201.263, the Permittee shall immediately report to the Illinois EPA, Regional Office, by telephone or fax upon continued operation of an affected furnace in heat phase during a malfunction or breakdown of the furnace or associated control system when such continued operation would cause an exceedance or violation of the applicable state emission standard.

ii. The Permittee shall submit a written follow-up report to the Illinois EPA within five business days providing a detailed explanation of the event and explanation why continued operation of the unit was necessary, the length of time during which operation continued under such conditions, the measures by the Permittee to minimize and correct deficiencies with chronology, and when the repairs were completed or when the unit source was taken out of service.

d. The Permittee shall provide the following notification and reports to the Illinois EPA related to the operation and maintenance of the Sulferox® System and primary afterburner:

i. Notice of planned maintenance that will entail an outage of the system or interfere with control of SO_2 emissions shall be submitted 10 days before the start of such maintenance, or as soon as practicable if 10 days notice cannot be provided. Such notice shall provide a description, explanation, and schedule for the intended maintenance activities.

ii. A report that summarizes the nature and causes of outages of the Sulferox® System, describes operational or physical improvements that have been made to the system, and evaluates further changes that could be implemented to significantly reduce the duration and severity of outages shall be submitted every three years with the annual emission report.

2.2 Raw Material and Crude Product Handling and Processing

2.2.1 Description

The raw materials for the furnaces (petroleum coke and sand) are received, stockpiled, prepared by screening and crushing, and mixed together. Unreacted material from the furnaces is also recovered and reprocessed for incorporation into the coke and sand mixture for the furnaces.

The crude silicon carbide product from the furnaces also undergoes handling and processing for conversion into final products, storage and shipping. These processes include preliminary screening and crushing, drying, further crushing and screening, packaging and bag and bulk loadout, and associated storage silos and conveyors and material transfer equipment.

Based on the potential for PM emissions from different processes, PM emission controlled by the nature of the materials, including surface moisture, and enclosure or aspiration and use of add-on dust collectors. As part of this project, a dust collector will be installed on the mixing process for raw materials.

2.2.2 List of Emission Units

Description		Control Equipment*
Unit	Process Equipment	
Raw and Reused Material Processing		Collector C-013 (new)
P-001	Screener/Raw Coke	✓
P-002	Hammermill/Raw Coke	✓
P-003	Weigh Hopper/Coke & Sand	✓
P-004	Pugmill/Mixing Coke & Sand	✓
P-005	Screener/Graphite/Rock Mix	
P-006	Screener/Rock Mix	
Raw Product Processing		Collector C-002 (No. 1, APCW)
P-007	Conveyor/Feed to Crusher	
P-008	Jaw Crusher	✓
P-009	Conveyor/Crusher to Screener	
P-010	Feeder	✓
P-011	Vibratory Feeder	
P-012	Jaw Crusher	✓
P-013	Conveyor/Crusher to Elevator	✓
P-014	Bucket Elevator	✓
P-015	Screener/Oversize to P-016	✓
P-016	Cone Crusher	✓
P-017 thru 019	Conveyors	✓
P-020	Wet Bin	
P-021	Feeder	
P-022	Conveyor/To Dryer P-023	
Product Drying		
P-023	Rotary Dryer (Rated Heat Input 19.1 mmBtu/hr)	Collector C-003 (No. 3, APCH)
Finished Product Processing		Collector C-004 (No. 2, APCE)
P-024	Bucket Elevator	✓

Description		Control Equipment*
Unit	Process Equipment	
P-025	Conveyors	✓
P-026	Storage Silo: Crystalline	✓
P-027 & 028	Storage Silos: Metallurgical	✓
"Old" Finished Bagged Product Processing		Collector C-006 (No. 4, APCO)
P-029	Conveyor	✓
P-030	Screener	✓
P-031	Surge Hopper	✓
P-032	Old Bagging System	✓
"New" Finished Bagged Product Processing (Construction Permit 04020061)		Cartridge Collector C-005, (No. 5, APCN)
P-033	Conveyor	✓
P-034	Screener	✓
P-035	Silo	✓
P-036	New Bagging System	✓
45%/65% Product Crushing System (Construction Permit 04050031)		
P-038 thru P-041	Feeder, Crushers, Transfer and Loadout	None
Fine Product Crushing and Screening System (Construction Permit 06090027)		Cartridge Collector C-012
P-042 thru P-055	Feeder, Crusher, Screener, Conveyors, Bucket Elevator and Storage Silos	✓

* A check means that the unit is controlled by the listed device.

2.2.3-1 Applicability Provisions

a. The "affected units" for the purpose of these unit-specific conditions are the processes and equipment described in Conditions 2.2.1 and 2.2.2.

b. This permit does not revise the BACT determination for the emissions of PM from affected units that was made in Construction Permit 95060068, as repeated below, which determination shall continue to apply to affected units after initial startup of Furnace Group 5.

   i. There shall be no visible emissions of particulate matter from any building or operation at the source.

   ii. Emissions of particulate matter from all stacks on material handling and processing equipment shall not exceed 0.015 grains per dry standard cubic feet.

   iii. Finished products of the silicon carbide operation shall only be moved in trucks or railroad cars that are covered or enclosed.

c. This permit does not revise established requirements for the "New" Finished Bagged Product Processing (Construction Permit 04020061), 45%/65% Product Crushing System (Construction Permit 04050031) or Fine Product Crushing and Screening System (P-042 thru P-055)

2.2.3-2 Applicable State Emission Standards

a. The affected units are subject to 35 IAC 212.321. For this purpose, units shall comply in aggregate with 35 IAC 212.321, as similar emission units, if they are served by a common emissions control device. Units shall individually comply with 35 IAC 212.321 if they are not served by a common control device. (See also Condition 3.1(a).)

2.2.4 Non-Applicability Provisions

a. This permit is issued based on the affected units not being subject to the New Source Performance Standards (NSPS) for Nonmetallic Mineral Processing Plants, 40 CFR Part 60, Subpart OOO, or the NSPS for Calciners and Dryers in Mineral Industries, 40 CFR Part 60, Subpart UUU, because the lists of affected minerals in 40 CFR 60.671 and 60.731 do not include silicon carbide.

b. This permit is issued based on this project not requiring a new determination of BACT for the PM emissions of the affected units under the PSD rules pursuant to 40 CFR 52.21(j)(3). This is because this project will not entail increases in the PM emissions of the affected units as a result of physical changes or changes in the method of operation of the units.

c. i. This permit is issued based on annual increases in NOx and CO emissions from the affected product dryer associated with the operation of Furnace Group 5 of at most 1.67 and 1.41 tons per year for NOx and CO, respectively, so that the overall increases in emissions of NOx and CO from this project are not significant. (See also Condition 1.3.)

ii. The actual increases in NOx and CO emissions from the affected product dryer associated with the operation of Furnace Group 5 shall be determined comparing the baseline actual emissions and actual emissions of the affected units in accordance with 40 CFR 52.21(b)(41) and (48) and (r)(6), using operating information for the affected furnace groups, operating information for the affected units, standard emission calculation methodology, and appropriate emission factors as developed from representative emissions testing or factors published by USEPA, such as factors in USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42. This requirement and the requirements of Conditions 2.2.9-2(d)(iii) and 2.2.10(a)(ii), shall terminate 10 years (120 months) after the initial startup of Furnace Group 5, consistent with 40 CFR 52.21(r)(6)(iii)(*b*).

2.2.5 Control Requirements and Work Practices

a. The Permittee shall control fugitive particulate matter emissions from affected units in accordance with a written operating program prepared and maintained by the Permittee that identifies the potential points of such emissions and the features that are present and the measures that are used to minimize and control such emissions.

b. Any spills of material shall be collected in a manner that prevents such material from becoming air borne.

2.2.6 Emission Limitations

a. The particulate emissions of the affected units shall not exceed the following limits:

Affected Units		PM Emissions		$PM_{10}/PM_{2.5}$ Emissions	
Designation(s)	Description	lb/hr	t/yr	lb/hr	t/yr
P 001-004	Raw Material: Captured	2.46	3.29	2.46	3.29
P 001-006	Raw Material: Uncaptured	7.64	7.98	3.64	3.80
P 023	Product Dryer	1.31	1.36	1.31	1.36
P 008, 010, 012-019, 024-028, 029-036, 042-056	Product Other: Captured	5.84	5.55	5.84	5.55
P 007, 009, 011, 020-022, 038-041	Product Other: Uncaptured	20.71	16.43	3.65	1.82
	Totals	-	34.61	-	15.82

2.2.7-1 Emissions Testing Requirements for Affected Units

a. The Permittee shall have testing conducted for affected units in accordance with Condition 3.2 for stack emissions of PM and PM10 as requested by the Illinois EPA, within 45 days of a written request by the Illinois EPA or such later date agreed to by the Illinois EPA.

b. If visible emissions are observed from affected units during testing, as determined by Method 22, the Permittee shall also have observations of opacity conducted during testing in accordance with Method 9, which observations shall be reported to the Illinois EPA in accordance with Condition 3.2(e) and (f).

2.2.7-2 Additional Testing Requirements for the Affected Product Dryer

a. The Permittee shall have testing conducted for the affected dryer in accordance with Condition 3.2 for emissions of NOx and CO as requested by the Illinois EPA, within 45 days of a written request by the Illinois EPA or such later date agreed to by the Illinois EPA.

b. In addition to other required information, the Final Reports for these tests shall also include the following information:

i. Dryer load in mmBtu during the period of testing, and oxygen content in the flue gas from the dryer.

ii. Proposed emission factors for the dryer, expressed in terms of the pounds of NOx and CO emitted per mmBtu heat input and ton of material dried.

2.2.8-1 Operational Instrumentation

a. The Permittee shall install, operate and maintain a device to measure the pressure drop across the new dust collector for the affected mixing operation if it is not a cartridge type filter.

2.2.8-2 Inspection Requirements

a. The Permittee shall conduct inspections of the affected units on at least a quarterly basis with personnel who are not engaged in the operation of the units on a day-to-day basis for the purpose of verifying that units are functioning correctly as related to control of emissions and emission control measures are being properly implemented.

b. The Permittee shall keep records documenting the performance of these inspections and their findings, including the identity of any affected units from which visible emissions were observed.

2.2.9-1 Recordkeeping Requirements for Affected Units

a. The Permittee shall maintain a file containing the manufacturer’s specifications and recommended operating and maintenance procedures for the dust collectors for the affected units.

b. The Permittee shall maintain records of the throughput of the affected units, tons/month, by type of material.

c. The Permittee shall maintain the following logs or other similar records for the affected units:

i. Operating log(s), in accordance with Condition 3.4(a), which records shall include information addressing any incidents when dust was spilled.

ii. Inspection, maintenance and repair log(s) in accordance with Condition 3.4(b), which shall include records for the required periodic inspection of the dust collectors with date, individual performing the inspection, and nature of inspection.

d. The Permittee shall maintain records for each deviation from an applicable emission limit or emission control requirement, which records shall include the information specified by Condition 3.5(a) and an estimate of the amount

of emissions in excess of the applicable limit or requirement.

e. The Permittee shall maintain records of the following items related to emissions of the affected units:

i. A file containing the PM emission factors used by the Permittee to determine emissions from individual units or groups of related units, with supporting documentation.

ii. A file containing a demonstration that the maximum PM emission rates of each affected unit, when operating normally complies with the applicable emission limits of 35 IAC 212.321, with supporting documentation.

iii. Records of the emissions of PM and PM10 from individual units or groups of related units and from all units, in total, tons/month and ton/yr, with supporting calculations.

iv. Records of PM and PM10 emissions of affected units.

2.2.9-2 Recordkeeping Requirements for the Affected Product Dryer

a. The Permittee shall maintain a file that contains the rated heat input capacity of the affected dryer, with supporting documentation, a copy of the manufacturer specifications for the emissions of the unit, and a copy of any operating and maintenance procedures for the unit, including the burner system, recommended by the manufacturer.

b. The Permittee shall maintain records of the fuel usage of the affected dryer, million scf/month, either determined directly or indirectly from other operating records for the dryer.

c. The Permittee shall maintain the following logs or other similar records for the affected dryer as related to burner system in the dryer:

i. An operating log, in accordance with Condition 3.3(a).

ii. Inspection, maintenance and repair log(s) in accordance with Condition 3.4(b).

d. The Permittee shall keep the following records related to combustion emissions of the affected dryer:

i. A file containing the emission rates for CO and NOx, in lb/mmBtu or lb/hr, used by the Permittee to determine the emissions of the dryer, with supporting documentation.

ii. Records of the emissions of CO and NOx from the dryer, tons/month and tons/year, based on operating

information and appropriate emission factors, with supporting calculations.

iii. Records of CO and NOx emissions of the dryer in accordance with 40 CFR 52.21(r)(6)(*c*)(i) and (iii).

2.2.10 Notification and Reporting Requirements

a. The Permittee shall promptly notify the Illinois EPA of any deviations from the requirements of this permit for affected units as follows. These notifications shall include the information specified by Condition 3.5.

i. If an affected unit is damaged so there is a deviation from applicable requirements for visible emissions that is not repaired or otherwise corrected within 1 hour, the Permittee shall notify the Illinois EPA within 30 days.

ii. The deviations addressed above and all other deviations shall be reported with the semi-annual compliance report required by Condition 2.1.10(b)(vi).

2.3 Roadways

2.3.1 Description

Fugitive dust/particulate matter emissions will be generated on roadways and the area around each furnace by vehicle traffic associated with operation of the furnaces and other facilities at the plant and by wind erosion.

2.3.2 List of Emission Units and Pollution Control Equipment

Emission Unit	Description	Emission Control
Roadways	PM emissions from vehicle traffic and wind erosion	Fugitive Dust Control Program

2.3.3-1 Applicability Provisions

a. The affected units for the purpose of these unit-specific conditions are the units described in Conditions 2.3.1 and 2.3.2.

2.1.3-2 Control Technology Determination

a. The particulate emissions from new affected units associated with this project, i.e., construction and operation of new Furnace Group 5, shall be controlled by regular application of water or dust suppressant or, for units that are paved, regular treatment to collect or remove material deposited on such units.

2.3.3-3 Applicable State Regulations

a. The affected units shall comply with 35 IAC 212.123(a) and 212.301. (Refer to Conditions 1.5(a) and (b).)

2.3.4 Non-Applicability of Regulations of Concern

a. This permit is issued based on this project not requiring a determination of BACT for the particulate emissions of the existing affected units under the PSD rules pursuant to 40 CFR 52.21(j)(3). This is because this project will not entail increases in the particulate emissions of the affected units as a result of physical changes or changes in the method of operation of the units.

b. The affected units are not subject to the requirements of 35 IAC 212.321, because of the dispersed nature of these units. [35 IAC 212.323]

2.3.5 Work Practices

a. Good management practices shall be implemented for all affected units to prevent a nuisance from the affected units. These practices shall provide for regular treatment

of units (scraping, flushing, sweeping, or vacuuming) to remove any spilled material and to control fugitive dust.

a. The Permittee shall carry out control measures for fugitive dust for all affected units in accordance with a written control program maintained by the Permittee, which shall set forth the measures being implemented to demonstrate compliance with Conditions 2.3.3-2 and 2.3.5(a). This program shall include: (1) a description of the emissions control technique(s) (e.g., vacuuming or sweeping), that will routinely be implemented; (2) triggers for implementation of additional control, e.g., observation of extended dust plumes following passage of vehicles; and (3) the estimated effectiveness of the various control techniques in reducing PM emissions, with supporting documentation.

2.3.6 Emission Limitations

a. The emissions of particulate matter from affected units shall not exceed 8.0 and 1.6 tons per year for PM and $PM_{10}/PM_{2.5}$, respectively.

2.3.7 Testing Requirements

None

2.3.8 Inspections

a. The Permittee shall conduct inspections of the affected units on a monthly basis with personnel who do not implement the dust control program on a day-to-day basis for the specific purpose of verifying that the measures identified in the program and other measures required to control emissions from affected units are being properly implemented.

b. The Permittee shall keep records documenting the performance of these inspections and their findings.

2.3.9 Recordkeeping Requirements

a. The Permittee shall maintain a file containing:

i. The Permittee’s assumptions, with supporting explanation, for the typical and maximum quantity and nature of vehicle traffic from the affected units, including truck traffic at the plant associated with receipt of raw materials, transfer of materials and shipment of products.

ii. The maximum PM emissions from the affected units (tons/year), in total, with supporting calculations, based on the maximum vehicle traffic associated with the operation of the plant (as recorded above), the silt loading on the different classes of affected units, with supporting documentation, and the

effectiveness of the current fugitive dust control program (as addressed in Condition 2.3.5(a)).

b. The Permittee shall maintain records of the amount of different materials associated with the operation of the affected furnaces that are received at or shipped from the plant by truck (tons, by type of material).

c. The Permittee shall maintain records to document implementation of the operating program for the affected units including:

i. A map or diagram showing the location of all affected units, including the location, identification, length, and width of roadways;

ii. For each cleaning of affected unit(s) the date and time; the reason for treatment, if not routine;; the type of treatment; the identity of the treatment vehicle or equipment; and a description of any unusual observations or events related to control of dust that occurring during treatment;

iii. Detailed information for incidents when control measures were not carried out as scheduled or were not fully implemented and incidents when additional control measures were carried out, with description of each such incident and explanation. This log shall address any adjustments to the scheduling of control measures made by the Permittee due to weather conditions that either acted to reduce or increase the level of potential dust, such as extended periods of dry weather.

d. The Permittee shall maintain records on at least an annual basis of the PM emissions from the affected units using emission estimation techniques published by USEPA, such as appropriate methods in Section 13 of USEPA's *Compilation of Air Pollutant Emission Factors*, AP-42, with supporting documentation and calculations.

2.3.10 Notification and Reporting Requirements

a. The Permittee shall promptly notify the Illinois EPA of any deviations from the requirements of this permit for the affected units as follows. These notifications shall include the information specified by Condition 3.5.

i. If the availability of treatment for the affected units is interrupted for 7 or more days and there is a deviation from applicable requirements for the affected units, the Permittee shall notify the Illinois EPA within 30 days.

ii. The deviations addressed above and all other deviations shall be reported with the semi-annual compliance reports required by Condition

2.1.10(b)(vi).

SECTION 3: GENERAL CONDITIONS

3.1: State Standards and Control Requirements for PM Emissions

a. Emissions of PM from process emission units at the plant that are subject to 35 IAC 212.321 shall not exceed the applicable emission rate specified by 35 IAC 212.321(a) and (c).

Note: 35 IAC 212.123 provides that no person shall cause or allow the emission of PM into the atmosphere in any one hour period from a new process emission unit which, either alone or in combination with the emission of PM from all other similar new process emission at a source or premises, exceeds the allowable emission rates specified in 35 IAC 212.321(c).

3.2: Emission Testing Requirements

a. Emissions testing shall be conducted by an approved testing service at the expense of the Permittee. Unless otherwise specified by this permit or a request from the Illinois EPA for the performance of emission testing, emission testing shall be conducted while affected unit(s) are operating at maximum rate(s) and during other representative operating conditions of the unit(s) and associated control system(s).

b. i. USEPA test methods and procedures shall be used for measurement of emissions, including the following methods, unless other methods are specified in unit-specific condition of this permit or are approved by the Illinois EPA as part of the approval of a test plan. Refer to 40 CFR 60, Appendix A and 40 CFR 51, Appendix M for USEPA test methods.

NOx	Method 7
CO	Method 10
PM or PM10 (filterable)	Method 5
PM10[a]	Methods 5 and 202[b]
H_2S, CS_2 and COS	Method 15
VOM	Methods 18[c] and either 25 or 25A[d]

Notes:
a. PM10 tests shall include measurements of condensable particulate, as collected in the back half of the Method 5 sampling train or by separate measurements using USEPA Method 202 (40 CFR Part 51, Appendix M). For emission units for which the average stack gas temperature is less than 250 °F, such as the material handling systems, testing may be conducted at actual stack gas temperature without heating of the probe or filter holders.
b. USEPA's proposed "Dry Impinger Method" may be used as an alternative to Method 202.
c. Methane, ethane and other exempt compounds may be excluded from the results of VOM emission testing for emission unit(s) provided that Method 18, or other appropriate test procedure identified in the test plan approved by the Illinois EPA, is used to quantify and

adjust for the presence of such compounds in the exhaust from the unit(s).
d. Method 25 shall be used to measure emissions of VOM unless the concentration of organic compounds in the exhaust stream is less than 50 ppm.

ii. During measurements of PM or PM10 emissions, observations of visible emissions or opacity (if present) shall also be conducted in accordance with USEPA Methods 22 or 9.

c. The Permittee shall submit a written test plan to the Illinois EPA for review and approval for initial testing of an emission unit and if a significant change in the procedures for testing is planned from the procedures followed in the previous testing of an emission unit. This plan shall be submitted at least 60 days prior to the actual date of testing and include the following information as a minimum:

i. A description of the planned emission test.

ii. The person(s) who will be performing sampling and analysis and their experience with similar tests.

ii. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of the maximum emissions, the levels of operating parameters at or within which compliance is intended to be shown, if parameters for the process and any control equipment will be determined.

iii. The specific determination of emissions and operations intended to be made, including sampling and monitoring locations.

iv. The test methods that will be used, with the specific analysis method.

v. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification.

vi. A statement that the testing will be performed by a qualified independent testing service.

d. i. Prior to carrying out emission tests, the Permittee shall notify the Illinois EPA a minimum of 30 days prior to the scheduled date of these tests with the exact date, time and place of these tests, to enable the Illinois EPA to witness these tests.

ii. If the scheduled date for the test is changed, the Permittee shall inform the Illinois EPA within 5 working days of the scheduled test date and must specify the date and time of the rescheduled test.

iii. Notwithstanding the above, the Illinois EPA may at its discretion accept notifications with shorter advance notice

provided that the Illinois EPA will not accept such notifications if it interferes with the Illinois EPA's ability to observe testing.

e. The Permittee shall submit three copies of the Final Report(s) for emissions tests to the Illinois EPA no later than 60 days after completion of sampling. The Final Report shall include as a minimum:

i. General information, i.e., date of test, names of testing personnel, and names of Illinois EPA observers.

ii. A summary of the measured emissions of different pollutants in pounds per hour and other appropriate terms, e.g., lb/ton, lb/ton, gr/dscf or ppmv.

iii. A statement whether compliance was demonstrated

iv. A detailed description of operating conditions of the emission unit(s) during testing, including:

A. Process information, e.g., type or product and operating rate.

B. Control system operating parameters during testing

iv. Description of test method(s), including description of sampling points, sampling train, analysis equipment, and test schedule

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration.

vi. Conclusions.

f. The Permittee shall retain copies of emission test reports for at least five years beyond the date that an emission test is superseded by a more recent test.

3.3 Opacity Observations

a. Upon written request by the Illinois EPA, the Permittee shall conduct opacity observations for specific affected operation(s) or unit(s) within 45 calendar days of the request or on the date agreed upon by the Illinois EPA, whichever is later.

b. Opacity of emissions shall be determined during representative weather and operating conditions by a qualified observer in accordance with USEPA Test Method 9, as further specified below.

c. The duration of opacity observations for each test shall be at least 30 minutes (five 6-minute averages) unless the average opacities for the first 12 minutes of observations (two six-minute averages) are both no more than half of the most stringent requirement applying to opacity.

d. i. The Permittee shall notify the Illinois EPA at least 7 days in advance of the date and time of these tests, in order to allow the Illinois EPA to witness testing. This notification shall include the name and employer of the qualified observer(s).

ii. The Permittee shall promptly notify the Illinois EPA of any changes in the time or date for testing.

e. The Permittee shall provide a copy of its observer's readings to the Illinois EPA at the time of testing, if Illinois EPA personnel are present.

f. The Permittee shall submit a written report for this testing within 15 days of the date of testing. This report shall include:

i. Date and time of testing.

ii. Name and employer of qualified observer, with a copy of his or her current certification.

iii. Description of observation condition, including recent weather.

iv. Description of the operating conditions of the affected operation or unit.

v. Opacity determinations, accompanied by raw data.

vi. Conclusions.

g. The Permittee shall retain copies of test reports for at least three years after the date that a test is superseded by a more recent test.

3.4 General Requirements for "Logs" Or Similar Records

a. Operating logs or other similar records required by this permit shall, at a minimum, include the following information related to the emission units and associated emissions capture and control systems:

i. Information identifying periods when an emission unit or group of related emission units was not in service.

ii. For periods when a unit or group of related units is in service and operating normally, relevant process and control system information to generally confirm normal operation,

iii. For periods when a unit or group of related units is in service and is not operating normally, identification of each such period, with detailed information describing the operation of the unit(s), the potential consequences for additional emissions from the unit(s), the potential of any excess emissions from the affected unit(s), the actions

taken to restore normal operation, and any actions taken to prevent similar events in the future.

iv. Other information as may be appropriate to show that the emission unit or group of related emission units is operated in accordance with good air pollution control practices.

b. Inspection, maintenance and repair logs or other similar information required by this permit shall, at a minimum, include the following information related to the emission units and associated emissions capture and control systems:

i. Identification of equipment, with date, time, responsible employee and type of activity.

ii. For inspections, a description of the inspection, findings, and any recommended actions, with reason.

iii. For maintenance and repair activity, a description of actions taken, reason for action, e.g., preventative measure or corrective action as a result of inspection, probable cause for requiring maintenance or repair if not routine or preventative, and the condition of equipment following completion of the activity.

iv. Other information as may be appropriate to show that the emission unit or group of related emission units is maintained in accordance with good air pollution control practices, including prompt repair of defects that interfere with effective control of emissions.

c. The logs required by this permit may be kept in manual or electronic form, and may be part of a larger information database maintained by the Permittee provided that the information required to be kept in a log is readily accessible.

3.5 Reporting of Deviations

a. The Permittee shall include the following information in records and reports for deviations:

i. Identity of the deviation, with date, time, duration and description.

ii. Describe the effect of the deviation on compliance, with an estimate of the excess emissions that accompanied the deviation, if any.

iii. Describe the probable cause of the deviation and any corrective actions or preventive measures taken.

b. i. Unless otherwise specified in a particular condition of this permit, if deviation(s) from requirements of this permit occur, they shall be reported in a semi-annual compliance report submitted no later than 45 days after the end of the calendar half. This report shall also provide a

listing of all deviations for which individual reports were required, but need not include copies of the previously submitted information.

ii. If there are no deviations during a calendar quarter, the Permittee shall still submit a compliance report, which report shall state that no deviations occurred during the reporting period.

c. i. For the purpose of determining whether a deviation must be individually reported prior to the semiannual compliance report, a deviation shall be considered to continue even if operation an emission unit is interrupted if the deviation is still present when operation of the unit is resumed.

ii. When this permit requires immediate notification, such notification shall be provided by telephone and followed by facsimile or e-mail transmittal of a narrative report.

d. Upon issuance of a CAAPP permit for the plant, the provisions of the CAAPP permit with respect to reporting of deviations will supersede the requirements of this permit.

ATTACHMENT 1: SUMMARY OF PROJECT EMISSIONS

Summary of Project Emissions* (Tons/Year)

Operation	NO_x	CO	SO_2	VOM (w/CS_2 & COS)	PM	H_2S	TRS
Furnace Group 5*	37.8	96.9	507.4	32.0	27.0	8.0	9.0
Material Handling							
Raw Material Handling	-	-	-	-	2.3	-	-
Product Handling	-	-	-	-	4.7	-	-
Subtotal	-	-	-	-	7.0	-	-
Combustion Units							
Sulferox Heater	0.1	0.1	-	0.1	0.1	-	-
Product Dryer	0.4	0.3	-	0.1	0.1	-	-
Subtotal	0.5	0.4	-	0.2	0.2	-	-
Roadways	-	-	-	-	8.0	-	-
Total	**38.3**	**97.3**	**507.4**	**32.2**	**42.2**	**8.0**	**9.00**
PSD Significance Threshold	40	100	40	40	25/15/10	10	10
Greater Than Threshold?	No	No	Yes	No	Yes	No	No

* This summary does not account for fugitive emissions of pollutants other than SO_2, PM and HAPs from Furnace Group 5.

ATTACHMENT 2: DETERMINATION OF UNCAPTURED EMISSIONS WHEN A TARP IS DAMAGED

This attachment provides the procedures to be followed for determining the uncaptured emissions that accompany damage to the plastic tarp on a furnace pile. While the off-gas generated by a furnace during the heating and initial cooling phases is normally fully contained by the plastic tarp and ducted to the emission control system, this is not the case when the tarp is damaged. When the tarp is damaged, some or all of the off-gas that is being generated by a furnace is directly released to the atmosphere. The amount of the uncaptured emissions accompanying such releases is determined from the volume of off-gas that is released by the damage to the tarp and the concentrations of different pollutants in the off-gas. For this purpose, there are two classes of damage that can occur to a tarp, both of which are addressed by these procedures:

- Major damage to a tarp, i.e., damage to a tarp of such an extent that that a portion of the tarp or the entire tarp must be replaced; and

- Minor damage to a tarp, i.e., rips or tears that can be repaired by application of a patch without replacement of some or all of the tarp.

Determination of Uncaptured Emissions (Equation 1)

The uncaptured emissions of a pollutant when the tarp on a furnace is damaged shall be determined from the volume of off-gas released during the event, in actual cubic feet, and the pollutant concentration in the off-gas, in parts per million by volume (ppm_v), using the following equation:

$$E_P = V \times (293/T) \div 385 \times C_p \div 1{,}000{,}000 \times MW_p$$

Where E_P = mass of uncaptured emissions of a pollutant (lbs); and

V = volume of off-gas released (ft^3)
293 = standard temperature in Kelvin, i.e., 293 K
T = temperature of off-gas under the tarp, in Kelvin*
385 = volume of a pound-mole of gas at standard conditions
C_p = concentration of the pollutant in the off-gas, in ppm_v
1,000,000 = conversion from concentration in ppm_v to volume fraction
MW_p = molecular weight of the pollutant

* In the absence of data for the temperature of off-gas under the tarp during an event, the temperature shall be assumed to be 333 K, which reflects historical operating data for the furnaces for this parameter.

Applicable Pollutant Concentrations

The pollutants in the off-gas for which uncaptured emissions must be determined when a tarp is damaged, are hydrogen sulfide (H_2S), carbonyl sulfide (COS), carbon disulfide (CS_2), carbon monoxide (CO) and volatile organic material (VOM). (The uncaptured emissions of reduced sulfur compounds shall be determined as the sum of emissions of uncaptured emissions of H_2S, COS and CS_2.) In the absence of sampling and analysis of the captured off-gas during an event to obtain event-specific data for concentrations of H_2S, COS, CS_2 and CO in the off-gas, uncaptured emissions of these pollutants shall be determined using the concentrations below, which reflect historical measurements for the composition of off-gas. The concentration and molecular

weight of VOM in the off-gas shall reflect the results of the sampling and analysis of off-gas for its VOM content required by Condition 2.1.7-3.

Pollutant	Concentration (ppm_v)
H_2S	21,700
COS	4,700
CS_2	1,300
CO	519,900

Determination of Volume of Released Off-Gas from Major Tarp Damage

Upon the occurrence of major tarp damage, i.e., an event that requires replacement of a portion of the tarp or failure of the entire tarp with placement of a new tarp over the furnace pile, the volume of off-gas released to the atmosphere shall be assumed to be the entire working volume of the furnace pile beneath the damaged portion of the tarp is. Based on the normal dimensions and geometry of a furnace pile, the greatest volume of released off-gas, as applicable for failure of the tarp when the entire tarp on a furnace pile must be replaced, would be 100,000 ft^3.

Determination of Volume of Released Off-Gas from Minor Tarp Damage (Equation 2)

Upon the occurrence of minor tarp damage, typically a rip or tear in the tarp, the volume of the released off-gas shall be determined from the area of the opening in the tarp, the velocity of gas through the opening, and the duration of the release, using the following equation:

$$V = A \times v \times t$$

Where V = volume of off-gas released (ft^3); and

A = area of opening (ft^2)*
v = velocity of gas flow through the opening (feet per minute)**
t = duration of the release in minutes

* For a linear rip or tear in a tarp, the area of the opening shall be assumed to be an oval shape with a width that is approximately one third of the length of the tear. This is equivalent to an open area that is 30 percent of the area of a circle with a diameter equal to the length of the tear ($A = 0.30 \times 3.1416 \times (\text{length of tear}/2)^2$)
** In the absence of event-specific data for the operating pressure of a furnace, gas velocity through the opening shall be assumed to 1440 feet per minute, consistent with the normal pressure of off-gas under the tarp, i.e., 0.25 inches of water.

ATTACHMENT 3 – PRIOR BACT DETERMINATION FOR THE PLANT

Conditions 2 And 3 from Construction Permit/PSD Approval 95069968, Which Was Issued on May 14, 2002

2a. The off-gas from the silicon carbide furnaces shall be collected and oxidized by a flare or other combustion device prior to discharge to the atmosphere to convert hydrogen sulfide and other sulfur compounds in the off-gas to sulfur dioxide, water and carbon dioxide and the carbon monoxide in the off-gas to carbon dioxide.

b. The silicon carbide furnaces shall be equipped with a sulfur removal system to process the off-gas to remove hydrogen sulfide prior to oxidation.

i. The hydrogen sulfide content of the off-gas prior to combustion shall not exceed 500 ppm, except as provided below.

ii. Operation of the silicon carbide furnaces without the sulfur removal system is allowed during startup, shutdown, maintenance and malfunction for up to 21 days (504 hours) per year based on a running total of monthly data.

A. For the purpose of this provision, the definition of "malfunction" at 40 CFR 60.2 shall apply.

B. "Maintenance" means the carrying out of activities to keep equipment in proper operating condition, including inspection, adjustment, lubrication, cleaning, and repair and replacement of components. Maintenance may occur while equipment is operational or may require turndown or shutdown of equipment, which can be coordinated with equipment turndown or shutdown for other reasons.

c. i. The sulfur removal system shall be installed and maintained with spares for critical pumps, air blowers, reliable operating instrumentation, and other features which might reasonably be used to minimize the frequency and duration of malfunctions.

ii. At all times, including periods of startup, shutdown, maintenance and malfunction, the silicon carbide furnaces and associated control system shall be maintained and operated in a manner consistent with good air pollution control practice for minimizing emissions of sulfur dioxide and other pollutants, consistent with other provisions of this permit.

iii. Practices shall be carried out to minimize and ameliorate failures in the plastic tarp covering the furnace that will result in release of fugitive emission from the operation of the furnace, including the following:

A. The Permittee shall adequately install the plastic tarp covering the furnace before startup;

B. The Permittee shall visually inspect the plastic tarp during the heating period of the furnace, at least once per shift;

C. The Permittee shall promptly cool the furnace after the plastic tarp is taken off, either as a result of completion of the furnace cycle or failure of the tarp.

iv. The operating level of the silicon carbide furnaces shall be reduced as soon as practicable to 3 furnaces during outage of the sulfur removal system related to malfunction. If a fourth furnace cannot be completely shutdown due to the potential loss of pressure from process generated gases and subsequent collapse of the plastic tarp enclosing the process, then the electricity to the fourth furnace shall be maintained at a level reasonably necessary to maintain tarp integrity.

v. A. Notice of routine major maintenance shall be submitted to the Illinois EPA 10 days before the start of such maintenance, or as soon as practicable if 10 days notice cannot be provided. Such notice shall provide a description, explanation, and schedule for the intended maintenance activities.

B. Notice of plastic tarp failures and other malfunctions that are longer than one hour in duration shall be submitted to the Illinois EPA as soon as practicable but not more than 10 days after the start of malfunction. Such notice shall provide the date, time, duration, description, and explanation of the malfunction.

3a. A mist eliminator or other pretreatment system shall be operated to remove particulate matter from the off gas-prior to entering the sulfur removal system.

b. i. There shall be no visible emissions of particulate matter from any building or operation at the source.

ii. Emissions of particulate matter from all stacks on material handling and processing equipment shall not exceed 0.015 grains per dry standard cubic feet.

iii. Finished products of the silicon carbide operation shall only be moved in trucks or railroad cars that are covered or enclosed.

Condition 2 and 3 represent the application of the Best Available Control Technology as required by Section 165 of the Clean Air Act.

ATTACMENT 4: STANDARD PERMIT CONDITIONS

Standard Conditions for Construction/Development Permits Issued by the Illinois Environmental Protection Agency

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Illinois EPA and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Illinois EPA upon the presentation of credentials, at reasonable times:

    a. To enter the Permittee’s property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

    b. To have access to and to copy any records required to be kept under the terms and conditions of this permit,

    c. To inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

    d. To obtain and remove samples of any discharge or emissions of pollutants, and

    e. To enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

    a. Shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

b. Does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities.

c. Does not release the Permittee from compliance with other applicable statutes and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations.

d. Does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. In no manner implies or suggests that the Illinois EPA (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Illinois EPA before the equipment covered by this permit is placed into operation.

b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Illinois EPA may file a complaint with the Board for modification, suspension or revocation of a permit.

a. Upon discovery that the permit application contained misrepresentations, misinformation or false statement or that all relevant facts were not disclosed, or

b. Upon finding that any standard or special conditions have been violated, or

c. Upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.