STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 North Hilton • Boise, Idaho 83706 • (208) 373-0502
www.deq.idaho.gov

C.L. "Butch" Otter, Governor
Curt Fransen, Director

April 20, 2015

Jim McCulloch, Environmental Engineer
P4 Production LLC (TV Facility) 029-00001
P.O. Box 816
Soda Springs, Idaho 83276

RE: Facility ID No. 029-00001, P4 Production LLC (TV Facility), Soda Springs
Final Permit Letter

Dear Mr. McCulloch:

The Department of Environmental Quality (DEQ) is issuing Permit to Construct (PTC) No. P-2012.0055 Project 61469 to P4 Production LLC (TV Facility) 029-00001 located at Soda Springs for the correction and/ or clarification of permit conditions of permit P-2012.0055. This PTC is issued in accordance with IDAPA 58.01.01.200 through 228 (Rules for the Control of Air Pollution in Idaho) and is based on the certified information provided in your PTC application received January 13, 2015.

This permit is effective immediately and replaces PTC No. P-2012.0055 project no. 61103, issued on June 23, 2014. This permit does not release P4 Production LLC (TV Facility) 029-00001from compliance with all other applicable federal, state, or local laws, regulations, permits, or ordinances.

As requested, in accordance with IDAPA 58.01.01.209.05.a, the terms of the PTC will be incorporated into the Tier I permit at the time of renewal. P4 Production, LLC may operate the source after the PTC is issued so long as it does not violate any terms or conditions of the existing Tier I operating permit.

Pursuant to the Construction and Operation Notification General Provision of your permit, it is required that construction and operation notification be provided. Please provide this information as listed to DEQ's Pocatello Regional Office, 444 Hospital Way, #300, Pocatello, ID 83201, Fax (208) 236-6168.

In order to fully understand the compliance requirements of this permit, DEQ highly recommends that you schedule a meeting with Rick Elkins, Air Quality Analyst, at (208) 236-6160 to review and discuss the terms and conditions of this permit. Should you choose to schedule this meeting, DEQ recommends that the following representatives attend the meeting: your facility's plant manager, responsible official, environmental contact, and any other staff responsible for day-to-day compliance with permit conditions.

Pursuant to IDAPA 58.01.23, you, as well as any other entity, may have the right to appeal this final agency action within 35 days of the date of this decision. However, prior to filing a petition for a contested case, I encourage you to contact Robert Baldwin at (208) 373-0502 or robert.baldwin@deq.idaho.gov to address any questions or concerns you may have with the enclosed permit.

Sincerely,

Mike Simon
Stationary Source Program Manager
Air Quality Division

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Permit No. P-2012.0055 PROJ 61469

Enclosures

Air Quality

PERMIT TO CONSTRUCT

Permittee	P4 Production, LLC
Permit Number	P-2012.0055
Project ID	61469
Facility ID	029-00001
Facility Location	Two miles north of Soda Springs on Hwy 34 Soda Springs, ID 83276

Permit Authority

This permit (a) is issued according to the "Rules for the Control of Air Pollution in Idaho" (Rules), IDAPA 58.01.01.200–228; (b) pertains only to emissions of air contaminants regulated by the State of Idaho and to the sources specifically allowed to be constructed or modified by this permit; (c) has been granted on the basis of design information presented with the application; (d) does not affect the title of the premises upon which the equipment is to be located; (e) does not release the permittee from any liability for any loss due to damage to person or property caused by, resulting from, or arising out of the design, installation, maintenance, or operation of the proposed equipment; (f) does not release the permittee from compliance with other applicable federal, state, tribal, or local laws, regulations, or ordinances; and (g) in no manner implies or suggests that the Idaho Department of Environmental Quality (DEQ) or its officers, agents, or employees assume any liability, directly or indirectly, for any loss due to damage to person or property caused by, resulting from, or arising out of design, installation, maintenance, or operation of the proposed equipment. Changes in design, equipment, or operations may be considered a modification subject to DEQ review in accordance with IDAPA 58.01.01.200–228.

Date Issued April 20, 2015

Robert Baldwin, Permit Writer

Mike Simon, Stationary Source Manager

Contents

1 Permit Scope

Purpose

1.1 This is a modified permit to construct (PTC) to install and operate a new coke screening system to replace the existing coke screening system.

1.2 Those permit conditions that have been modified or revised by this permitting action are identified by the permit issue date citation located directly under the permit condition and on the right-hand margin.

1.3 This PTC replaces Permit to Construct No. P-2012.0055 project 61103 issued on June 24, 2014.

Regulated Sources

Table 1.1 lists all sources of regulated emissions in this permit.

Table 1.1. Regulated sources.

Permit Section	Source	Control Equipment
2	Kiln	Dust knockout chamber North spray tower Four parallel cyclonic separator pairs Four parallel Hydro-Sonic scrubbers and demisters LCDA SO_2 scrubbing system
2	Cooler	Cooler spray tower and demisters
3	Material handling and drying	Baghouse 104 Nodule reclaim baghouse SDM vent filter Dryer baghouse 836 Baghouse 105 Coke bunker baghouse (Coke baghouse) Scaleroom baghouse Coke screens baghouse No. 7 CO baghouse No. 8 CO baghouse No. 9 CO baghouse Main furnace stocking system baghouse (Main stock baghouse) Bulk storage bin baghouse No. 304 coke fines bin vent filter No. 305 coke fines bin vent filter No. 306 coke fines bin vent filter No. 307 coke fines bin vent filter No. 308 coke fines bin vent filter No. 309 coke fines bin vent filter Decon baghouse (Decon building baghouse)
4	Nodule crushing and screening	Scrubber
5	Furnaces No. 7, No. 8, and No. 9	Electrostatic precipitators Spray towers THFC's CO flare for furnaces Nos. 7 and 8 CO flare for Furnace No. 9 Balanced CO Gas Operation method and/or thermal oxidizer
6	A/U boiler	None

2 Phosphate Ore Nodulizing Kiln and Cooler

2.1 Process Description

Phosphate ore must be nodulized in a rotary kiln in preparation for use in the furnace feedstock. Blended ore is added to the kiln where it is heated to the point of incipient fusion. The tumbling action of the kiln causes the ore to agglomerate into balls referred to as raw nodules. These raw nodules pass through a cooling and crushing process. A portion of the resulting raw nodules is routed directly into the nodule crushing and screening process while the remainder of the raw nodules is stockpiled for future use. The kiln's exhaust gas is routed through an emission control system that includes a dust knockout chamber for large particulate removal, a spray tower used to capture soluble gases and fine particulate matter, and four parallel Hydro-Sonic scrubbing systems that remove submicron dust particles and entrained particulate-laden water. The nodule cooling process generates both point and fugitive particulate matter that is controlled by a wet scrubbing system.

The kiln is fueled by carbon monoxide (CO) from the furnaces, coal, and natural gas.

2.2 Control Device Descriptions

P4 Production's phosphate ore nodulizing kiln has particulate emissions, including polonium-210, and SO_2 emissions. The particulate emissions are controlled by a dust knockout chamber, North spray tower, four parallel cyclonic separator pairs, four parallel Hydro-Sonic scrubbers and demisters, and SO_2 scrubbing system. A spray tower controls emissions from the nodule cooler. The kiln SO_2 emissions are controlled by a lime concentrated dual alkali (LCDA) SO_2 scrubbing system. This system consists of Hydro-Sonic scrubbers that absorb SO_2 with a solution of sodium salts. Some sodium sulfate is produced. The spent solution of sodium sulfite/bisulfite/sulfate is continuously withdrawn to a dual-reactor system, where it is reacted with hydrated lime. The lime regenerates the scrubbing solution and precipitates calcium sulfite/sulfate solids. The solids are removed from the system through thickening and filtration, and the regenerated solution is returned to the scrubber as feed material. The LCDA installation includes raw material storage tanks, two reactor tanks, thickener/clarifier, filtration (feed tank with vacuum filtering process), and a double lined landfill with leachate collection.

Table 2.1. Kiln description.

Emissions Units / Processes	Control Devices
Kiln	Dust knockout chamber North spray tower Four parallel cyclonic separator pairs Four parallel Hydro-Sonic scrubbers Demisters LCDA SO_2 scrubbing system
Nodule Cooler	Cooler spray tower and demisters

Emission Limits

2.3 Emission Limits

The emissions from the kiln and cooler stacks shall not exceed any corresponding emissions rate limits listed in Table 2.2.

Table 2.2. Kiln and Cooler emission limits.

Source Description	PM_{10} [(b)] lb/hr [(c)]	SO_2 lb/hr [(c)]
Kiln (total from 4 stacks)	30.0	143
Cooler spray tower	27.0	177

a) In absence of any other credible evidence, compliance is assured by complying with permit operating, monitoring, and record keeping requirements.
b) Particulate matter with an aerodynamic diameter less than or equal to a nominal ten (10) micrometers, including condensable particulate as defined in IDAPA 58.01.01.006.81.
c) Pounds per hour, as determined by a test method prescribed by IDAPA 58.01.01.157, EPA reference method, or DEQ-approved alternative. (for SO_2 on a three-hour average)

[October 1, 2010]

2.4 Particulate Limit

No person shall emit to the atmosphere from any process or process equipment commencing operation prior to October 1, 1979, PM in excess of the amount shown by the following equation, where E is the allowable emission from the entire source in pounds per hour (lb/hr), and PW is the process weight in pounds per hour. Total process weight is that amount, in pounds per hour, fed to the nodulizing kiln during the compliance test. Total actual emissions are calculated by adding the emissions from the nodulizing kiln and cooler spray tower.

a. If PW is less than 17,000 lb/hr,

$$E = 0.045 (PW)^{0.60}$$

b. If PW is equal to or greater than 17,000 lb/hr,

$$E = 1.12 (PW)^{0.27}$$

[Operating Permit No. 13-0420-0001-02, 7/18/79; IDAPA 58.01.01.702, 4/5/00]

Operating Requirements

2.5 Throughput Limits

The throughput of phosphate ore and other feed through the kiln, measured as input to the kiln, shall not exceed the tons per hour production rate, as a 24-hour average, that is verified through source testing to not exceed the hourly emission limits established in Permit Condition 2.2.

[October 1, 2010]

2.6 pH Limit

The scrubbing solution pH, as measured in the recirculation tank, shall not be less than 6.1 on a one-hour average.

[October 1, 2010]

2.7 Hydro-Sonic Scrubbing System Operation

- When the kiln is in use, the Hydro-Sonic scrubbing system shall be operated continuously to scrub PM and PM_{10} emissions.
- The six hour average pressure drop across the venturi section of the scrubbing system shall be maintained at or above the pressure drop, in inches of water, established by performance tests that showed compliance with the PM and PM_{10} emissions limits.
- The three-hour average scrubbing media flow rate shall be maintained at or above the scrubbing media flow rate, in gallons per minute, established by performance tests that showed compliance with the PM and PM_{10} emissions limits.

[April 20, 2015]

2.8 Cooler Spray Tower

- When the nodule cooler is in use, the cooler spray tower scrubber shall be operated continuously to scrub PM and PM_{10} emissions.
- The three-hour average scrubbing media flow rate shall be maintained at or above the scrubbing media flow rate, in gallons per minute, as established by performance tests that showed compliance with the PM and PM_{10} emissions limits.

[October 1, 2010]

Monitoring and Recordkeeping Requirements

2.9 Operations and Maintenance Manual

Within 60 days after startup, the permittee shall have developed an O&M manual for the Hydro-Sonic scrubber system, the LCDA system, and the cooler spray tower system which describes the procedures that will be followed to comply with the general provisions for these systems. The manual shall be updated as needed to reflect any change in operating parameters from the most recent performance test that demonstrated compliance. This manual shall remain onsite at all times and shall be made available to Department representatives upon request.

[October 1, 2010]

2.10 Hydro-Sonic Scrubber Monitoring

- The permittee shall monitor and record the pH of the scrubbing solution in the recirculation tank after scrubbing at least once per hour when the system is operating. If more than one reading is taken each hour, the readings for that hour may be averaged to show compliance with the pH limit. The readings shall be taken in evenly-spaced time increments.
- The permittee shall monitor and record the pressure drop across the venturi section of the scrubbing system for each of the Hydro-Sonic scrubbers once per hour. If more than one reading is taken each hour, the readings for that hour may be averaged to show compliance with the pressure drop limit. The readings shall be taken in evenly-spaced time increments.
- The permittee shall monitor and record the total scrubbing media flow rate, in gallons per minute, across each of the Hydro-Sonic scrubbers once per hour. If more than one reading is taken each hour, the readings for that hour may be averaged to show compliance with the flow rate limit. The readings shall be taken in evenly-spaced time increments.

[October 1, 2010]

2.11 Cooler Spray Tower Monitoring

The permittee shall monitor and record the scrubbing media flow rate, in gallons per minute, across the cooler spray tower once per hour. If more than one reading is taken each hour, the readings for that hour may be averaged to show compliance with the flow rate limit. The readings shall be taken in evenly-spaced time increments.

[October 1, 2010]

2.12 Throughput Monitoring

The permittee shall monitor and record the daily and monthly throughput of phosphate ore and other feed to the kiln when the system is operating.

[October 1, 2010]

Performance Testing Requirements

2.13 PM and PM_{10} Performance Tests for Kiln Hydro-Sonic Scrubbers and Cooler Spray Tower

The permittee shall conduct performance tests to measure PM and PM_{10} emissions from the kiln Hydro-Sonic scrubbers and the cooler spray tower according to the schedule in this permit condition. The performance testing will be conducted to demonstrate compliance with the emission rate limits.

The performance test shall be performed in accordance with IDAPA 58.01.01.157. The following information shall be recorded during each performance test:

- Amount of phosphate ore and other feed processed in the kiln, in tons per hour
- Pressure drop across each Hydro-Sonic scrubber when testing the Hydro-Sonic Scrubbers
- Scrubber solution flow rate for each scrubber
- When testing the Hydro-Sonic scrubbers, monitor and record the coal used in the kiln

After the initial performance test, which was done prior to the issuance of this permit, future testing shall be performed within one year of the issuance of the permit, or in accordance with the following schedule, whichever is later. If the PM or PM_{10} emission rate measured in the most recent test is less than or equal to 75% of the applicable emission standard, the next test shall be conducted within five years of the test date. If the PM or PM_{10} emission rate measured during the most recent performance test is greater than 75%, but less than or equal to 90%, of the emission standard, the next test shall be conducted within two years of the test date. If the PM or PM_{10} emission rate measured during the most recent performance test is greater than 90% of the emission standard, the next test shall be conducted within one year of the test date.

[October 1, 2010]

2.14 SO_2 Performance Tests for Kiln Hydro-Sonic Scrubbers

The permittee shall conduct performance tests to measure SO_2 emissions from the kiln Hydro-Sonics scrubber stacks according to the schedule in this permit condition. The performance testing will be conducted to demonstrate compliance with the emission rate limits.

Each performance test shall be performed in accordance with IDAPA 58.01.01.157. The following information shall be recorded during each performance test:

- Amount of kiln phosphate ore and other feed processed in the kiln, in tons per hour
- Pressure drop across each Hydro-Sonic scrubber
- Scrubber solution flow rate
- pH in the recirculation tank
- Coal burned in the kiln during the test

After the initial performance test, which was done prior to the issuance of this permit, future testing shall be performed within one year of the issuance of the permit, or in accordance with the following schedule, whichever is later. If the SO_2 emission rate measured in the most recent test is less than or equal to 75% of the applicable emission standard, the next test shall be conducted within five years of the test date. If the SO_2 emission rate measured during the most recent performance test is greater than 75%, but less than or equal to 90%, of the emission standard, the next test shall be conducted within two years of the test date. If the SO_2 emission rate measured during the most recent performance test is greater than 90% of the emission standard, the next test shall be conducted within one year of the test date.

[October 1, 2010]

2.15 SO_2 Performance Tests for Cooler Spray Tower

The permittee shall conduct performance tests to measure SO_2 emissions from the cooler spray tower according to the schedule in this permit condition. The performance testing will be conducted to demonstrate compliance with the emission rate limits.

The initial performance test shall be conducted within 180 days of issuance of PTC No. P-030316 to allow for the "worst case normal" sulfur ore to be used.

Each performance test shall be performed in accordance with IDAPA 58.01.01.157. The following information shall be recorded during each performance test:

- Amount of kiln phosphate ore and other feed processed in the kiln, in tons per hour
- The amount of sulfur in the ore that was processed in the kiln during each test run
- The percent SO_3 equivalent in the ore
- Scrubber solution flow rate

After the initial performance test, future testing shall be performed according to the following schedule. If the SO_2 emission rate measured in the most recent test is less than or equal to 75% of the applicable emission standard in, the next test shall be conducted within five years of the test date. If the SO_2 emission rate measured during the most recent performance test is greater than 75%, but less than or equal to 90%, of the emission standard, the next test shall be conducted within two years of the test date. If the SO_2 emission rate measured during the most recent performance test is greater than 90% of the emission standard, the next test shall be conducted within one year of the test date.

[October 1, 2010]

3 Material Handling and Drying

3.1 Process Description

Phosphate Ore Handling Operations

Phosphate ore and underflow solids (UFS) are reclaimed from the ore stockpile by loader and transported to the ore hopper by haul trucks and/or loaders. Separator discharge material (SDM) is also reclaimed from stockpiles and processed using a separate hopper. Phosphate ore, SDM, and UFS drop from the hoppers to belt 104 which transfers through a grizzly screen to belt 111. Belt 111 transfers material to belt 110. Belt 110 feeds a distributor in the Raw Ore Building which distributes the material to bins within the building. Phosphate ore feeders from the bins drop ore blends onto belt 115, which has a belt scale. Belt 115 transfers ore to belt 101 which transfers to belt 114. Material from belt 114 drops into the kiln feed pipe. The 104 Baghouse collects particulate matter (PM) from the tail and head-end of 104 belt, and tail-end of 111 belt.

Nodule Preparation

The blended phosphate ore, UFS and SDM are fed to the rotary kiln by a belt conveyor. Phosphate ore dust from the kiln's drop-out chamber is collected and recycled back to the kiln. Also, the UFS from the scrubber clarifier are dewatered and recycled to the kiln. The rotary kiln produces hardened nodules that allow for proper operation of the electric reduction furnaces. The rotary kiln raises the ore temperature to its point of incipient fusion and the tumbling action causes the ore to agglomerate into the desired nodular form. The rotary kiln is fueled with carbon monoxide (generated in the electric reduction furnace operation), natural gas, and supplemental coal. The hot nodules pass through a cooler and chunk breaker with a separate off-gas treatment system before being conveyed to the sizing/screening operation.

The raw nodules produced by the rotary kiln fall from the discharge end of the kiln onto a traveling-grate cooler. These nodules then fall from the cooler outlet onto a metal pan conveyor. Raw nodule production is split, with part going directly into the crushing and screening process and the rest is conveyed to the raw nodule stockpile by belt 300.

The nodule reclaim, crushing, and screening process combines fresh (hot) and reclaimed (cooler) nodules from the reclaim hopper, in the proportions necessary to achieve the desired temperature and quantity of coarse, medium, and fine-sized nodules. Nodule sizing is accomplished by using vibrating screens. The oversize material from these screens is routed to a crusher and then recycled for re-screening. The SDM is air conveyed into a storage tank and heavy mobile equipment is used to stockpile it for recycling through the kiln. The coarse, medium, and fine nodule size fractions are routed to scaleroom bins 2 through 7. The Nodule Reclaim Baghouse collects PM from the tail and head-end of belt 300, and the raw nodule dump to reclaim hopper. SDM Bin Vent collects PM from the SDM bin.

Coke Drying and Associated Handling

Coke is reclaimed from the coke stockpile by loader and dumped to the dryer feed hopper, which feeds the vibrating pan feeder. Coke falls from the vibrating pan feeder to belt 855, which feeds coke and quartzite to dryer 851. Dried coke falls from dryer 851 to belt 835 (coke and quartzite share this equipment to this point), and then to belt 105. Coke is fed from belt 105 to one of two coke screens. Sized coke falls from the coke screen to belt 106, and then fed to the coke distributor which fills scaleroom coke bin 8, coke bin 9, or coke bin 10. Sized coke can also be directed to belt 827, and then to scaleroom coke bin 11. Coke fines falls through the coke screen to a loadout bin. From the loadout bin, coke fines can be sent back through a bypass around the coke screens to belt 106 and fed to belt 827 which fills scaleroom coke bin 11, or feeds belt 828 which fills the bulk coke fines storage bin.

The Dryer Baghouse collects PM from the tail and head-end of the 855 belt, the dryer, and the tail-end of the 835 belt. The 105 Baghouse is described below.

[June 23, 2014]

Quartzite Drying and Associated Handling

Quartzite is reclaimed from the raw quartzite stockpile by loader and dumped to the dryer feed hopper, which feeds the vibrating pan feeder. Quartzite falls from the vibrating pan feeder to belt 855, which feeds coke and quartzite dryer 851. Dried quartzite falls from dryer 851 to belt 835 (coke and quartzite share this equipment to this point), and then to belt Q1. Quartzite transfers from belts Q1 to Q2, which feed either the north quartzite screen or the south quartzite screen. Fine quartzite falls through the north quartzite screen and/or south quartzite screen, through the silica mixers, and into the quartzite fines bunker. All other screened quartzite falls from the north quartzite screen and/or south quartzite screen into the scaleroom quartzite bin (Bin #1). The Dryer Baghouse collects PM from the tail and head-end of the 855 belt, the dryer, and the tail-end of the 835 belt. The 105 Baghouse collects PM from the head-end of the 835 belt, tail and head-end of the Q1 belt, and the tail-end of the Q2 belt.

Undried coke unloading from railroad cars or trucks

Coke brought in by railroad cars and trucks is unloaded at hopper 105. From hopper 105 the coke is fed to a truck loadout chute where it is then taken to the coke stockpile. Coke brought in by semi-trucks can be unloaded into the coke storage tent or deposited directly onto the coke stockpile. The Coke Bunker will be kept operational for infrequent events when a coke car has to be dumped and the 105 belt to truck loadout is unavailable. The Coke Bunker Baghouse will control emissions from unloading coke into the bunker.

[June 23, 2014]

Undried coke handling to screening and storage

Undried coke is unloaded from railroad cars or semi-trucks to hopper 105. Undried coke falls from the hopper to belt 105. Coke falls from belt 105 to one of two coke screens. Sized coke falls from the coke screen to the coke distributor which fills scaleroom coke bin 8, coke bin 9, or coke bin 10. Sized coke can also be directed to belt 827, and then to scaleroom coke bin 11. Coke fines fall through the coke screen to a loadout bin. From the loadout bin, coke fines can be sent back through a bypass around the coke screens to belt 106 and fed to belt 827 which fills scaleroom coke bin 11, or feeds belt 828 which fills the bulk coke fines storage bin. The 105 Baghouse collects PM from the head-end of the 835 belt, tail and head-end of the Q1 belt, the tail-end of the Q2 belt, and tail-end of the 105 belt. The Coke Handling Baghouse collects PM from the head-end of belt 105, tail and head-end of the bucket elevators, coke screens, tail and head-end of belt 106, bypass and fines loadout bin discharge spouts, the fines loadout bin vent, and tail and head-end of belt 827. The Scaleroom Baghouse collects PM from all scaleroom bins unloading to belt 416.

[June 23, 2014]

Undried quartzite handling to screening and storage

Quartzite is reclaimed from the raw quartzite stockpile by loader and dumped to the quartzite hopper. Quartzite falls from the hopper to belt Q2, and then feeds either the north quartzite screen or the south quartzite screen. Fine material falls through the north quartzite screen and/or the south quartzite screen into a silica fines mixer, and then to the quartzite fines bunker. All other screened quartzite falls from the north quartzite screen and/or south quartzite screen into the scaleroom quartzite bin (Bin #1). The Nodule Crushing and Screening Scrubber collects PM from the head-end of the Q2 belt and is regulated in another section of this permit.

The scaleroom process is a computer-controlled batch process. The scaleroom bins (containing nodules, quartzite, and coke) are positioned linearly above conveyor belt 416, also known as the long belt. When making a batch, the desired quantity of quartzite is automatically layered onto the moving long belt, followed by the nodules and then the coke.

Material is fed from 11 scaleroom bins (1 containing quartzite, 6 containing phosphate ore nodules, and 4 containing coke) to 11 weigh bins which proportion material onto belt 416 in the scaleroom. Material is carried by this belt to the top of (north) furnace building 7, and falls by way of rotary distributor 421 to one of three belts (belt 417 for furnace 7, belt 418 for furnace 8, and belt 419 for furnace 9). Material falls from belt 417 to rotary stock diverter 672 which feeds belt 713, feeds belt 714, or fills four stock bins. Belt 713 and belt 714 each fill one other stock bin. Material falls from belt 418 to furnace 8 stock diverter which feeds belt 12W or belt 12E. Belts 12W and 12E each fill six stock bins. Material falls from belt 419 to furnace 9 stock diverter which feeds belt 420W or 420E. Belts 420W and 420E each fill six stock bins. The material in each bin is gravity fed to the furnaces. Dust collection from all stock bins is controlled by #7, #8, and #9 CO dust collectors. Dust collection from all other transfer points in the furnace stocking area is controlled by the main furnace stocking baghouse. The Scaleroom Baghouse collects PM from the 11 scaleroom bins, and tail-end of the 416 belt. #7 CO Baghouse collects PM from the head and tail-end of belts 713 and 714, from rotary stock diverter 672 to the #7 Furnace stock bins, and the #7 Furnace stock bins. #8 CO Baghouse collects PM from the head and tail-end of belts 12W and 12E to the #8 Furnace stock bins, and the #8 Furnace stock bins. #9 CO Baghouse collects PM from head and tail-end of belts 420W and 420E to the #9 Furnace stock bins, and #9 Furnace stock bins. The Main Baghouse collects PM from the head-end of belt 416, head and tail-end of belts 713, 714, 12W, 12E, 420W, and 420E, and various points along belts 713, 714, 12W, 12E, 420W, and 420E. Dust from the #7, #8, #9 CO Baghouses is pneumatically conveyed to the Main Baghouse.

Coke fines handling from railcars to the stockpile

Coke fines are unloaded from railcars to hopper 105 and fed to belt 105. Belt 105 feeds coke fines to a truck loadout chute and the coke fines are then hauled to the coke fines stockpile. The Coke Bunker will be kept operational for infrequent events when a coke car has to be dumped and the 105 belt to truck loadout is unavailable. The Coke Bunker Baghouse will control emissions from unloading coke into the bunker.

[June 23, 2014]

Coke fines screening and handling from the stockpile or railcars to the bulk storage bin

Coke fines are reclaimed from the coke fines stockpile by loader and dumped to hopper 105. Coke fines are also unloaded from railcars directly to hopper 105. Coke fines fall from hopper 105 onto belt 105 and are fed to one of two coke screens. Coke fines fall through the coke screens to a loadout bin. From the loadout bin, coke fines can be sent back through a bypass around the coke screens to belt 106 and fed to belt 827 which fills coke bin 11 or feeds belt 828. Belt 828 fills the bulk coke fines storage bin.

[June 23, 2014]

Coke fines drying, screening, and handling from the stockpile to the bulk storage bin

Coke fines are reclaimed from the coke fines stockpile by loader and dumped to dryer feed hopper 853 which feeds vibrating pan feeder 854. Coke fines fall from vibrating pan feeder 854 to belt 855 which feeds coke and quartzite dryer 851. Dried coke fines fall from dryer 851 to belt 835 and then to belt 105 (coke, quartzite, and coke fines share this equipment to this point). Coke fines are fed from belt 105 to one of two coke screens. Sized coke in the fines falls from the coke screen to the mid-sized coke

distributor which fills either coke bin 8, bin 9, or bin 10. Sized coke can also be directed to belt 827, and then to scaleroom coke bin 11. Coke fines fall through the coke screen to a loadout bin. From the loadout bin, coke fines can be sent back through a bypass around the coke screens to belt 106 and fed to belt 827 which fills coke bin 11 or feeds belt 828. Belt 828 fills the bulk coke fines storage bin. The Coke Handling Baghouse collects from the tail and head-end of belt 827, tail and head-end of belt 828, bulk coke fines storage bin, and moving coke fines from the bulk storage bin to the first air conveyor.

[June 23, 2014]

Coke fines screening, crushing, and handling form the bulk storage bin to the furnace feed bins

Coke fines are transferred from the bulk storage bin to the coke-fines screen. Oversized coke fines fall through the screen to the over-sized coke surge pile. Contaminated or wet coke fines may be unloaded from the bulk coke fines storage bin through a reject chute to the ground. Under-sized coke fines are fed from the coke-fines screen to the second air conveyor, which pneumatically conveys the coke fines either to fines bins 304 or 305 (which feed furnace 7), to fines bins 306 or 307 (which feed furnace 8), or to fines bins 308 or 309 (which feed furnace 9). The 304, 305, 306, 307, 308, and 309 Furnace Feed Bin Vents collect dust from conveying coke fines from the second air conveyor to fines bins 304, 305, 306, 307, 308, and 309.

Maintenance Activities

Sandblasting of process equipment for reuse in the manufacturing process takes place in the Decon Building. The Decon Building Baghouse collects dust/particulate from the sandblasting process.

3.2 Control Device Descriptions

Table 3.1 Material Handling Descriptions

Emissions Unit(s) / Process(es)	Control Devices
Ore to belt 104	Baghouse 104
SDM to belt 104	
UFS to belt 104	
Belt 104 emissions to baghouse	
Belt 104 ore, SDM, UFS to grizzly	
Belt 111 ore, SDM, UFS	
Belt 300 nodules to raw nodule storage	Nodule reclaim baghouse
Raw nodule dump to reclaim hopper	
SDM blow to hopper	SDM vent filter
855 dryer feed belt – dried coke, quartzite, and coke fines	Dryer baghouse 836
Dryer – dried coke, quartzite, and coke fines	
Dryer – combustion	
835 dryer discharge belt loading - dried coke, quartzite, and coke fines	
835 dryer discharge belt unloading – dried coke, quartzite, and coke fines	Baghouse 105
Q2 belt loading – dried quartzite	
Q1 belt loading and unloading - dried quartzite	
105 belt loading – dried coke and coke fines	
105 vibrating pan feeder - undried coke, quartzite, and coke fines	
Coke railroad car unloading	Coke bunker baghouse (Coke baghouse)
Coke fines railroad car unloading	
Coal railroad car unloading	
Vactor truck station unloading	
Coke conveying	Coke handling baghouse
Coke screens – dried and undried coke	
Coke screens – dried and undried coke fines	
Bins 8, 9, and 10 loading – dried and undried coke	
Fine coke to belt 827 – dried and undried coke	
Fine coke to belt 827 – dried and undried coke fines	
Bin 11 (fine coke) loading – dried and undried coke	
Bin 11 (fine coke) loading – dried and undried coke fines	
Belt 827 to belt 828 – dried and undried coke fines	
Bin 1 weighing	Scaleroom baghouse
Bin 1 loading to belt 416	
Bins 2 and 3 weighing	
Bins 2 and 3 loading to belt 416	
Bins 4 and 5 weighing	
Bins 4 and 5 loading to belt 416	
Bins 6 and 7 weighing	
Bins 6 and 7 loading to belt 416	
Bins 8 and 9 weighing	
Bins 8 and 9 loading to belt 416	
Bin 10 weighing	
Bin 10 loading to belt 416	
Bin 11 weighing	
Bin 11 loading to belt 416	
Furnace No. 7 stock bins and transfer points	No. 7 CO baghouse
672 distributor to bins 701-704	
South twin belt to bin 705	
South twin belt to bin 706	
Bins 701-706	

Emissions Unit(s) / Process(es)	Control Devices
No. 8 furnace stock bins and transfer points	No. 8 CO baghouse
E/W pivot belt to bins 801-812	
Bins 801-812	
Furnace No. 9 stock bins and transfer points	No. 9 CO baghouse
E/W 420 pivot belt to bins 901-912	
Bins 901-912	
Transfer points and CO baghouses	Main furnace stocking system baghouse (Main stock baghouse)
Belt 416 burden to 421 distributor	
421 distributor to belt 417	
421 distributor to belt 418	
421 distributor to belt 419	
417 burden belt	
418 burden belt	
419 burden belt	
Belt 417 feed to 672 distributor	
672 distributor to south twin belt	
672 distributor to north twin belt	
Belt 418 Feed to E/W pivot belt	
E/W pivot belt	
Belt 419 to E/ 420 pivot belt	
E/W 420 pivot belt	
Fine coke storage bin from belt 828 – dried coke fines	Coke handling baghouse
Fine coke storage bin from belt 828 – undried coke fines	
Coke fines screens (2)	
Bulk storage bin	
Coke fines injection to feed bin 304	No. 304 coke fines bin vent filter
Coke fines injection to feed bin 305	No. 305 coke fines bin vent filter
Coke fines injection to feed bin 306	No. 306 coke fines bin vent filter
Coke fines injection to feed bin 307	No. 307 coke fines bin vent filter
Coke fines injection to feed bin 308	No. 308 coke fines bin vent filter
Coke fines injection to feed bin 309	No. 309 coke fines bin vent filter
Sandblasting of process equipment	Decon baghouse (Decon building baghouse)

Emission Limits

3.3 Emission Limits

The emissions from the Coke handling baghouse and the scaleroom baghouse stacks shall not exceed any corresponding emissions rate limits listed in Table 3.2.

Table 3.2. Baghouse emission limits.

Source Description	$PM_{2.5}$[b] lb/hr[d]	PM_{10}[c] lb/hr[d]
Coke handling baghouse	1.43	1.43
Scaleroom baghouse	0.90	0.90

a In absence of any other credible evidence, compliance is ensured by complying with permit operating, monitoring, and record keeping requirements.

b Particulate matter with an aerodynamic diameter less than or equal to a nominal two and a half (2.5) micrometers, including condensable particulate as defined in IDAPA 58.01.01.006.

c Particulate matter with an aerodynamic diameter less than or equal to a nominal ten (10) micrometers, including condensable particulate as defined in IDAPA 58.01.01.006.

d Pounds per hour, as determined by a test method prescribed by IDAPA 58.01.01.157, EPA reference test method, continuous emission monitoring system (CEMS) data, or DEQ-approved alternative.

[June 23, 2014]

Operating Requirements

3.4 Use of Baghouse and Bin Vent Filters Required

The baghouses and bin vent filters shall be used to control emissions from the corresponding processes listed in Table 3.1. Each baghouse and bin vent filter shall be operated at all times that material is handled within the corresponding process.

[October 1, 2010]

3.5 Pressure Drop

The permittee shall install instrumentation to accurately measure and indicate the pressure drop across Baghouse 104 and the Decon baghouse. The permittee shall operate, calibrate, and maintain instrumentation to accurately measure and indicate the pressure drop across each device required to be monitored.

[October 1, 2010]

3.6 Visible Emissions

The baghouses and filters listed in this permit section shall have no visible emissions, except for bag cleaning cycles, as determined by a see/no see evaluation.

[October 1, 2010]

3.7 Fuel Type

The permittee shall use natural gas exclusively as fuel for Dryer 851.

[October 1, 2010]

3.8 Coke Screen Operation

Only one of the two coke screens shall be used at a time.

[June 23, 2014]

Monitoring and Recordkeeping Requirements

3.9 Baghouse Pressure Drop Monitoring

Once each week, the permittee shall monitor and record the pressure drop across each baghouse listed in Table 3.1.

[October 1, 2010]

3.10 Coke Screen Operation Monitoring

The permittee shall monitor and record the date and time that each screen starts and finishes operation.

[June 23, 2014]

Performance Testing Requirements

3.11 Baghouse Testing

Within 180 days of installation of the coke screens permitted by this permit, the permittee shall conduct a performance test on each of the units listed below to demonstrate compliance with the $PM_{2.5}$ and with the PM_{10} emissions limits specified in this permit:

- Coke handling baghouse
- Scaleroom baghouse

[June 23, 2014]

3.12 Performance Test Schedule

For each of the sources that are listed in Table 3.2, after the initial performance test, future testing shall be performed according to the following schedule. If the pollutant emission rate measured in the most recent test is less than or equal to 75% of the corresponding emission standard in the baghouse emission limits table, the next test shall be conducted within five years of the test date. If the pollutant emission rate measured during the most recent performance test is greater than 75%, but less than or equal to 90%, of the corresponding emission standard in the Baghouse emission limits table, the next test shall be conducted within two years of the test date. If the pollutant emission rate measured during the most recent corresponding performance test is greater than 90% of the emission standard in the baghouse emission limits table, the next test shall be conducted within one year of the test date.

[June 23, 2014]

4 Nodule Crushing and Screening

4.1 Process Description

The nodule-crushing and screening scrubber, also known as the nodule scrubber, venturi scrubber, or nodule reclaim venturi scrubber, is used to control emissions from the transfers associated with moving quartzite from the Q2 belt to the quartzite screens and scaleroom quartzite bin, and emissions from the transfer points associated with nodule conveying, sizing, crushing, and screening.

4.2 Control Device Descriptions

Table 4.1 Nodule and Quartzite Transfer and Screening Description

Emissions Unit(s) / Process(es)	Emissions Control Device
North and south dried quartzite screens	Nodule crushing and screening scrubber
North and south undried quartzite screens	
Bin 1 dried quartzite Loading	
Bin 1 undried quartzite Loading	
Q2 belt unloading – dried quartzite	
Q2 belt unloading – undried quartzite	
Dried quartzite fines to conveyor belt loading	
Undried quartzite fines to conveyor belt loading	
Dried quartzite fines unloading to fines silo	
Undried quartzite fines unloading to fines silo	
Belt 265 nodules to distributor (300, 289)	
Reclaim hopper to belt 882	
Coarse gundlach crusher	
273 gundlach crusher	
Belt 888 pan discharge	
289, 882 and 881 (reclaim) elevator to top screen splitter	
East and west top sizing screens	
Nodules to 290 elevator	
Nodules to 291 elevator	
Nodules to splitters	
North and south quad deck screens	
North and south fine to belt 880	
North and south medium to belt 879	
North and south coarse to belt 878	
Fine nodules to bins 4 and 5	
Medium nodules to bins 2 and 3	
Coarse nodules to bins 6 and 7	
SDM to blow tank	
SDM silo unloading spout	
SDM overflow/bypass bunker	

Emission Limits

4.3 PM_{10} Emissions Limits

The PM_{10} emissions from the nodule crushing and screening scrubber shall not exceed 15 lb/hr or 65.7 tons per any consecutive 12-calendar-month period.

[October 1, 2010]

4.4 PM Process Weight Emission Limit

The PM emissions shall not exceed the emission limit set in IDAPA 58.01.01.702:

a. If PW is less than 17,000 lb/hr,

$E = 0.045(PW)^{0.60}$

b. If PW is equal to or greater than 17,000 lb/hr,

$E = 1.12(PW)^{0.27}$

[October 1, 2010][IDAPA 58.01.01.702, 4/5/00]

Operating Requirements

4.5 Pressure Drop and Media Flow Rate Instrumentation for Scrubber

The permittee shall install, operate, calibrate, and maintain instrumentation to accurately measure and indicate the pressure drop across the venturi section of the scrubber, and instrumentation to accurately measure and indicate the media flow rate to the scrubber.

[Operating Permit No. 029-00001, Section 4.2.1, 10/23/00]

4.6 Requirement to Operate Control Equipment

All equipment controlling emissions from the process shall be operated at all times that material is handled within the process.

[Operating Permit No. 029-00001, Section 3.1, 10/23/00]

4.7 Method to Determine Material Throughput

The permittee shall install and operate equipment to measure, or develop methods to determine, the pounds per hour and tons per year of material handled throughout the process.

[Operating Permit No. 029-00001, Section 4.1, 10/23/00]

4.8 Scrubber Maintenance

Maintenance shall be performed to the scrubber when visible emissions exceed 15% opacity.

[October 1, 2010] [Operating Permit No. 029-00001, Section 4.2.2, 10/23/00]

Monitoring and Recordkeeping Requirements

4.9 Maintain Calibration Specifications

Manufacturer specifications for calibration of the scrubbing media flow rate monitor shall be maintained on-site and shall be made available to DEQ representatives upon request. The permittee shall maintain records of the results of all calibrations in accordance with the recordkeeping general provision of this permit.

[October 1, 2010]

4.10 Inspect Inlet Distribution Assembly

The permittee shall inspect the scrubbing media delivery inlet distribution assembly each quarter. The inspection shall be to assure that the inlet distribution assembly is allowing complete flow and coverage across the venturi.

[October 1, 2010]

5 Furnaces No. 7, No. 8, and No. 9

5.1 Process Description

CO Flares

Feedstock is gravity fed from burden bins into three electric reduction furnaces (No. 7, No. 8, and No. 9). Electrical power is used to generate the heat required to drive the reduction of phosphate (from the nodules) to elemental phosphorus. This reaction results in the evolution of phosphorus gas, carbon monoxide gas, and molten calcium silicate and ferrophosphorus slag. The furnace gases, composed of mainly carbon monoxide and phosphorus, are drawn through electrostatic precipitator dust collectors where particulate matter is removed. The cleaned gases are then sent through water spray condensers which have an associated external cooling system where the gases are cooled, condensing the phosphorus. After removal of phosphorus, the furnace off gas, composed primarily of CO, water, and trace quantities of fluoride, phosphorus, phosphorus compounds, and particulate matter, is sent to the kiln where the CO is used as fuel for the kiln. During normal operations, the CO gas produced will be balanced by the kiln fuel demand and/or the thermal oxidizer. During periods of startup, shutdown, scheduled maintenance, safety measures, upset, and breakdown when the CO gas cannot be sent to either the kiln or the thermal oxidizer, the gas is sent to flares. Flaring is minimized by controlling the CO produced in the furnaces to match the amount of CO that the kiln is able to use as fuel and/or by using the thermal oxidizer when CO production exceeds the amount that can be used by the kiln.

Each furnace (No. 7, No. 8, and No. 9) has an electrostatic precipitator (treater) and spray tower to control particulate emissions. There are three furnaces, three electrostatic precipitators, and three spray towers.

No. 7, No. 8, and No. 9 Tap Hole Fume Collectors

These are also known as tap hole fume collectors (THFC) or Venturi Scrubbers. The furnaces are periodically tapped to remove accumulated molten slag and ferrophosphorus (FeP). Slag taps occur about 40-45 times per day per furnace and last about 10-15 minutes per tap. The ferrophosphorus is tapped once or twice per day per furnace. The tapping gases pass through a high-energy venturi scrubber equipped with a cyclonic separator before discharge to the atmosphere. This is the tap hole fume collector process and equipment.

The following requirements apply to emissions from slag tapping, PRV vent gases, and electrostatic precipitator dust oxidation from the No. 7, No. 8, and No. 9 furnaces, which are each controlled by a cyclonic separator pair and venturi scrubber known as the No. 7, No. 8, and No. 9 tap hole fume collectors (THFC). Normally, the No. 9 THFC also controls emissions from the seal pots. The No. 7 and No. 8 THFC may be used to control emissions from the seal pots when the No. 9 THFC is down.

Phosphorus Storage

Note: All emission limits, monitoring, and recordkeeping requirements are contained in the facility's Tier I operating permit.

Phosphorus storage and loading operations emissions are controlled by the No. 9 THFC with the No. 7 THFC as a backup.

5.2 PSD-Required BACT Emission Control

The following control measures are equivalent BACT for control of CO emissions from the furnaces. Either option, or both, shall be implemented as provided in Permit Condition 43.

- Balanced CO Gas Operation Method

  The Balanced CO Gas Operation Method is defined as operating the furnaces such that they produce no more CO gas than what the kiln can use as fuel.

- Thermal Oxidizer

  The thermal oxidizer may be used to thermally treat CO gas generated by the furnaces that is not used by the kiln.

Within 18 months of commencement of construction of the Balanced CO Gas Operation Method, the following procedures shall be followed for situations where the Balanced CO Gas Operation Method is the chosen method for BACT. Within 18 months of commencement of construction of the T. O., the following procedures shall be followed for situations where the T. O. is the chosen method for BACT.

For the furnaces, T.O., flares, and kiln from which excess emissions may occur during startup, shutdown, or scheduled maintenance, the facility owner or operator shall prepare, implement and file with the Department, Pocatello Regional Office, specific procedures which will be used to minimize excess emissions during such events. Specific information for each of the types of excess emissions events (i.e. startup, shutdown and scheduled maintenance) shall be established or documented for each piece of equipment or emissions unit and shall include all of the information listed in IDAPA 58.01.01.133.02.a through h (which may be based upon the facility owner or operator's knowledge of the process or emissions where measured data is unavailable).

For the furnaces, T.O., flares, and kiln, for process upsets and breakdowns and situations that require implementation of safety measures, which events can reasonably be anticipated to occur periodically but which cannot be reasonably avoided or predicted with certainty, the owner or operator shall prepare, implement, and file with the Department, Pocatello Regional Office, specific procedures which will be used to minimize such events and excess emissions during such events. To the extent possible and reasonably practicable (and based upon knowledge of the process or emissions where measured data is not available), specify the information for each type of anticipated upset/ breakdown/safety event listed in IDAPA 58.01.01.134.04.a through h.

Table 5.1 Furnace Description

Emissions Unit(s) / Process(es)	Emissions Control Device
Furnaces Nos. 7, 8, and 9	Electrostatic precipitators Spray towers CO flare for furnaces Nos. 7 and 8 CO flare for Furnaces Nos. 7, 8, and 9 Balanced CO Gas Operation method, or Thermal Oxidizer, or both
FeP Slag Tapping Calcium Silicate (CaSi) Slag Tapping No. 7 Treater doghouses PRV vent gases	No. 7 THFC
FeP slag tapping CaSi slag tapping No. 8 treater doghouses PRV vent gases	No. 8 THFC
FeP slag tapping CaSi slag tapping No. 9 treater doghouses PRV vent gases	No. 9 THFC
Acid water tank seal pot Wastewater tank seal pot Clarifier tank seal pot No. 7 collection tank seal pot No. 8 collection tank seal pot No. 9 collection tank seal pot East mud tank seal pot West mud tank seal pot	No. 9 THFC with No. 7 or No. 8 THFC backup
CO phos trap seal pot	Vented to atmosphere
554/508 mud tank seal pot	No. 9 THFC with No. 7 or No. 8 THFC backup
Phosphorus loading leg Phosphorus loading sump	Vented to atmosphere

[October 1, 2010]

Emission Limits

5.3 HCN Emissions

Emissions of hydrogen cyanide (HCN) resulting from the furnaces shall not cause the controlled ambient concentration of HCN to exceed the applicable acceptable ambient concentration listed in IDAPA 58.01.01.585. The emission rate of HCN may be estimated through the use of standard scientific and engineering principles and practices including, but not limited to, the use of emission factors and engineering judgment.

[October 1, 2010]

5.4 Thermal Oxidizer Emissions Limits

Emissions of PM10, SO2, NOx, and CO from the thermal oxidizer shall not exceed any of the corresponding limits specified in Table 5.2.

Table 5.2 Thermal Oxidizer Emission Limits

Emissions Unit	PM_{10}		SO_2		NO_x		CO	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Thermal Oxidizer	27	155	257	138	132	119	495	1,378

[a] Pounds per hour for each stack

[b] Tons per any consecutive 12-month period for three stacks combined

[October 1, 2010]

Operating Requirements

5.5 Throughput Limits

The throughput of nodules into the furnaces shall not exceed the limits in Table 5.3.

Table 5.3 Furnace Nodule Throughput Limits

Furnace	Nodule throughput
	T/day[a]
No. 7	5,425
No. 8	5,808
No. 9	6,068

[a] T/day = tons per calendar day

[October 1, 2010]

5.6 Implementation of the Balanced CO Gas Operation Method and/or Installation of the Thermal Oxidizer

Within eight months of issuance of PTC No. P-030316, the permittee shall commence construction of the thermal oxidizer or any modifications required for the Balanced CO Gas Operation Method or both commence construction of the thermal oxidizer and commence construction of any modifications required for the Balanced CO Gas Operation Method, and shall start up operation of the thermal oxidizer or the balanced CO gas operation method or both within 24 months of issuance of PTC No. P-030316, in accordance with Item No. 8 of the consent order signed on December 30, 2002. The Balanced CO Gas Operation Method shall match CO gas production from the furnaces with CO gas consumption of the kiln, or excess CO shall be thermally treated by the thermal oxidizer.

[October 1, 2010]

5.7 Operating Requirements

Upon implementation of the Balanced CO Gas Operation Method or installation of the thermal oxidizer or both as set forth by this permit, CO gas generated by the operating furnaces shall be controlled by the kiln, the thermal oxidizer, or the flares in accordance with the PSD-Required BACT Emission Control permit condition in this permit.

[October 1, 2010]

5.8 Thermal Oxidizer Throughput

All three units of the thermal oxidizer combined shall not combust more than 160 million pounds of CO gas per any 12-consecutive month period.

[April 20, 2015]

5.9 Thermal Oxidizer Operating Temperature

The primary combustion chamber of the thermal oxidizer shall be maintained at or above 1600 degrees F on a one-hour average when being used to control emissions from the furnaces.

[April 20, 2015]

5.10 Thermal Oxidizer Scrubber Operation

- When the thermal oxidizer is in use, one or more of the three scrubber units shall be operated to scrub emissions.
- For each scrubber unit in operation, the pressure drop across the venturi section of the scrubber shall be maintained at or above the pressure drop established by performance tests that showed compliance with the PM and PM_{10} emissions limits.
- For each scrubber unit in operation, the scrubbing media flow rate shall be maintained at or above the flow rate, in gallons per minute, established by performance tests that showed compliance with the PM and PM_{10} emissions limits.

[October 1, 2010]

5.11 Thermal Oxidizer Performance Testing

Within 180 days of commencement of operation of the thermal oxidizer, the permittee shall conduct a minimum of one performance test for each of the following pollutants: PM, PM10, SO2, NOx, and CO. These tests will be used to demonstrate compliance with the hourly limits for PM10, SO2, NOx, and CO. The permittee is encouraged to submit a source testing protocol for approval 30 days prior to conducting any of these performance tests. Of the three thermal oxidizer stacks, only the most commonly used stack is required to be tested and is considered representative of the other stacks.

The permittee shall test in accordance with IDAPA 58.01.01.157 and the conditions of this permit including the operating requirements for specify the unit to be tested and the performance testing requirements specified in the general provisions of this permit. The general provisions include notification requirements, testing procedures and reporting requirements.

The permittee shall monitor and record the following during each performance test:

- Temperature in the main combustion chamber in degrees Fahrenheit
- Quantity of gas treated from the furnace(s) in pounds
- Pressure drop across the scrubber for PM and PM_{10} tests
- Scrubbing media flow rate in gallons per minute for PM and PM_{10} tests

Each source test shall be conducted under "worst case normal" conditions as required by IDAPA 58.01.01.157 and the performance testing requirements specified in the general provisions of this permit. The performance test report shall contain documentation that the test was conducted under these conditions.

After the initial performance test, for each pollutant tested, future testing shall be performed according to the following schedule. If the pollutant emission rate measured in the most recent test is less than or equal to 75% of the applicable emission standard, the next test shall be conducted within five years of the test date. If the pollutant emission rate measured during the most recent performance test is greater than 75%, but less than or equal to 90%, of the applicable emission standard, the next test shall be conducted within two years of the test date. If the pollutant emission rate measured during the most recent performance test is greater than 90% of the applicable emission standard, the next test shall be conducted within one year of the test date.

[October 1, 2010]

5.12 Flare Operation

Balanced CO Gas Operation Method

When the Balanced CO Gas Operation Method is used to control emissions from the furnaces, the furnaces shall be operated such that they produce no more CO gas than what the kiln can use as fuel. Allowable operation of the flares is described in the documentation that is developed in accordance with the PSD-Required BACT Emission Control section of this permit.

Thermal Oxidizer

When the thermal oxidizer is used to control the emissions from the furnaces, any use of the flares is subject to IDAPA 58.01.01.130-136 and to the procedures developed in accordance with the PSD-required BACT emission control permit condition.

[October 1, 2010]

Monitoring and Recordkeeping Requirements

5.13 Nodule Throughput Monitoring

The permittee shall monitor the throughput of nodules in tons per day into the furnaces and record the amount once per calendar day.

[October 1, 2010]

5.14 Thermal Oxidizer Throughput Monitoring

The permittee shall monitor and record the quantity of CO gas sent to the thermal oxidizer at least once per month, when operating. The total quantity, in pounds, of CO gas sent to the thermal oxidizer each month shall be calculated. Records shall be maintained for that month and for every consecutive 12-calendar-month period.

[October 1, 2010]

5.15 Thermal Oxidizer Temperature Monitoring

The temperature in the primary combustion chamber of the thermal oxidizer shall be monitored an recorded once per hour when the thermal oxidizer is being used to treat CO emissions from the furnaces. If more than one reading is taken each hour, the readings for that hour may be averaged to show compliance with the temperature limit. The readings shall be taken in evenly-spaced time increments.

[October 1, 2010]

5.16 Thermal Oxidizer Scrubber Flow Rate and Pressure Drop Monitoring

- For each thermal oxidizer scrubber, the permittee shall monitor and record the average hourly pressure drop across the scrubber once per hour, when operating.
- The permittee shall monitor and record the average hourly scrubbing media flow rate, in gallons per minute, across the scrubber once per hour, when operating.

[October 1, 2010]

Reporting Requirements

5.17 Flare Usage

Any use of the flares is subject to the reporting provisions specified in IDAPA 58.01.01.130-136 and to the procedures developed in accordance with the PSD-required BACT emission control permit condition.

[October 1, 2010]

6 Natural Gas-Fired Boiler (A/U Boiler)

6.1 Process Description

The A/U boiler is used to provide steam to various processes at the facility. The primary steam source for the plant is the waste heat boiler on the kiln discharge and the A/U boiler is the secondary source. The A/U boiler is the primary source of steam when the kiln is down and/or maintenance is being performed on the waste heat boiler. The AU boiler is normally in a hot standby mode on minimum fire. It is rated for 50,000 lb/hr of steam. It was constructed prior to June 8, 1989.

6.2 Control Device Descriptions

Table 6.1. A/U boiler description.

Emissions Units / Processes	Control Devices
A/U boiler, 50,000 lb/hr steam	None

Operating Requirements

6.3 Fuel Throughput

The natural gas burned by the A/U boiler shall not exceed 140 million standard cubic feet per any consecutive 12-month period.

[October 1, 2010]

Monitoring and Recordkeeping Requirements

6.4 Fuel Monitoring and Recordkeeping

The permittee shall monitor and record the amount, in standard cubic feet, of natural gas burned in the A/U boiler each month and each consecutive 12-calendar-month period.

[October 1, 2010]

7 Optimization Projects

7.1 Process Description

There are several projects designed to improve the efficiency of operation which are allowed by this permit.

Furnace power control improvement

P4 will change the programming which controls the furnace power controls to reduce "peaks" and "valleys" associated with the power consumed by the furnaces. This will reduce variation in furnace power and result in a more constant flow of CO gas to be burned in the kiln and/or the thermal oxidizer. The effort will involve power control system logic improvements, possible automatic control of furnace power input voltage, and other possible equipment needed to reduce variations of furnace power. The project is intended to reduce variation in peak load while maintaining the same average furnace load.

Furnace feed variability reduction

The proposed improvement would better blend raw materials prior to "charging" the feed to the furnace. The benefits of a more stable chemical and physical furnace charge are in improved yields and recovery. This equates directly to a more stable and constant CO flow to the kiln and/or the thermal oxidizer (thereby improving its efficiency and reliability), as well as potentially reducing the loss of phosphorus to the slag. The effort will involve optimizing equipment and control systems, and the criteria and decision process used to make furnace charge adjustments.

Increase furnace tapping frequency

Increasing the frequency of tapping is expected to reduce furnace production variability. The benefits are a more stable furnace offgas flow that will reduce furnace temperature peaks and particulate entrainment. This will allow for more efficient electrostatic precipitator operation, which will reduce phossy mud and precipitator dust generation and result in safety improvements in the handling of recycle material. Additionally, a more stable offgas flow relates to a more stable CO flow to the kiln and/or the thermal oxidizer. Currently, one source of process variation occurs as the molten material accumulates inside the furnace between tapping operations. The effort would involve tapping (removing slag from the furnace) approximately twice the current frequency of four times per hour, thus reducing the slag accumulation in the furnace. The tapping would be of approximately half the duration so there would be no increase in emissions.

Kiln feed variation reduction

The proposed improvement would better blend ore prior to "charging" the feed to the nodulizing kiln. This project would upgrade the ore stacker itself to be able to move on a continuous basis, and related ore handling equipment to optimize blending. Additional blending of ore may reduce sulfur and carbon peaks to the kiln, resulting in more efficient SO2 scrubbing at the kiln discharge and more predictable CO consumption at the kiln.

Furnace vent gas pollution control improvements

P4 will complete a project to route the furnace PRV vent gases through the THFC scrubbers for scrubbing particulate from the vent gas stream.

8 General Provisions

General Compliance

8.1 The permittee has a continuing duty to comply with all terms and conditions of this permit. All emissions authorized herein shall be consistent with the terms and conditions of this permit and the "Rules for the Control of Air Pollution in Idaho." The emissions of any pollutant in excess of the limitations specified herein, or noncompliance with any other condition or limitation contained in this permit, shall constitute a violation of this permit, the "Rules for the Control of Air Pollution in Idaho," and the Environmental Protection and Health Act (Idaho Code §39-101, et seq.)

[Idaho Code §39-101, et seq.]

8.2 The permittee shall at all times (except as provided in the "Rules for the Control of Air Pollution in Idaho") maintain in good working order and operate as efficiently as practicable all treatment or control facilities or systems installed or used to achieve compliance with the terms and conditions of this permit and other applicable Idaho laws for the control of air pollution.

[IDAPA 58.01.01.211, 5/1/94]

8.3 Nothing in this permit is intended to relieve or exempt the permittee from the responsibility to comply with all applicable local, state, or federal statutes, rules, and regulations.

[IDAPA 58.01.01.212.01, 5/1/94]

Inspection and Entry

8.4 Upon presentation of credentials, the permittee shall allow DEQ or an authorized representative of DEQ to do the following:

- Enter upon the permittee's premises where an emissions source is located, emissions-related activity is conducted, or where records are kept under conditions of this permit;
- Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;
- Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under this permit; and
- As authorized by the Idaho Environmental Protection and Health Act, sample or monitor, at reasonable times, substances or parameters for the purpose of determining or ensuring compliance with this permit or applicable requirements.

[Idaho Code §39-108]

Construction and Operation Notification

8.5 This permit shall expire if construction has not begun within two years of its issue date, or if construction is suspended for one year.

[IDAPA 58.01.01.211.02, 5/1/94]

8.6 The permittee shall furnish DEQ written notifications as follows:

- A notification of the date of initiation of construction, within five working days after occurrence; except in the case where pre-permit construction approval has been granted then notification shall be made within five working days after occurrence or within five working days after permit issuance whichever is later;
- A notification of the date of any suspension of construction, if such suspension lasts for one year or more;

- A notification of the anticipated date of initial start-up of the stationary source or facility not more than sixty days or less than thirty days prior to such date; and
- A notification of the actual date of initial start-up of the stationary source or facility within fifteen days after such date; and
- A notification of the initial date of achieving the maximum production rate, within five working days after occurrence - production rate and date.

[IDAPA 58.01.01.211.03, 5/1/94]

Performance Testing

8.7 If performance testing (air emissions source test) is required by this permit, the permittee shall provide notice of intent to test to DEQ at least 15 days prior to the scheduled test date or shorter time period as approved by DEQ. DEQ may, at its option, have an observer present at any emissions tests conducted on a source. DEQ requests that such testing not be performed on weekends or state holidays.

8.8 All performance testing shall be conducted in accordance with the procedures in IDAPA 58.01.01.157. Without prior DEQ approval, any alternative testing is conducted solely at the permittee's risk. If the permittee fails to obtain prior written approval by DEQ for any testing deviations, DEQ may determine that the testing does not satisfy the testing requirements. Therefore, at least 30 days prior to conducting any performance test, the permittee is encouraged to submit a performance test protocol to DEQ for approval. The written protocol shall include a description of the test method(s) to be used, an explanation of any or unusual circumstances regarding the proposed test, and the proposed test schedule for conducting and reporting the test.

8.9 Within 30 days following the date in which a performance test required by this permit is concluded, the permittee shall submit to DEQ a performance test report. The written report shall include a description of the process, identification of the test method(s) used, equipment used, all process operating data collected during the test period, and test results, as well as raw test data and associated documentation, including any approved test protocol.

[IDAPA 58.01.01.157, 4/5/00]

Monitoring and Recordkeeping

8.10 The permittee shall maintain sufficient records to ensure compliance with all of the terms and conditions of this permit. Monitoring records shall include, but not be limited to, the following: (a) the date, place, and times of sampling or measurements; (b) the date analyses were performed; (c) the company or entity that performed the analyses; (d) the analytical techniques or methods used; (e) the results of such analyses; and (f) the operating conditions existing at the time of sampling or measurement. All monitoring records and support information shall be retained for a period of at least five years from the date of the monitoring sample, measurement, report, or application. Supporting information includes, but is not limited to, all calibration and maintenance records, all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. All records required to be maintained by this permit shall be made available in either hard copy or electronic format to DEQ representatives upon request.

[IDAPA 58.01.01.211, 5/1/94]

Excess Emissions

8.11 The permittee shall comply with the procedures and requirements of IDAPA 58.01.01.130–136 for excess emissions due to start-up, shut-down, scheduled maintenance, safety measures, upsets, and breakdowns.

[IDAPA 58.01.01.130–136, 4/5/00]

Certification

8.12 All documents submitted to DEQ—including, but not limited to, records, monitoring data, supporting information, requests for confidential treatment, testing reports, or compliance certification—shall contain a certification by a responsible official. The certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document(s) are true, accurate, and complete.

[IDAPA 58.01.01.123, 5/1/94]

False Statements

8.13 No person shall knowingly make any false statement, representation, or certification in any form, notice, or report required under this permit or any applicable rule or order in force pursuant thereto.

[IDAPA 58.01.01.125, 3/23/98]

Tampering

8.14 No person shall knowingly render inaccurate any monitoring device or method required under this permit or any applicable rule or order in force pursuant thereto.

[IDAPA 58.01.01.126, 3/23/98]

Transferability

8.15 This permit is transferable in accordance with procedures listed in IDAPA 58.01.01.209.06.

[IDAPA 58.01.01.209.06, 4/11/06]

Severability

8.16 The provisions of this permit are severable, and if any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

[IDAPA 58.01.01.211, 5/1/94]