

Statement of Basis

**Permit to Construct No. P-2012.0055
Project ID 61469**

**P4 Production, LLC
Soda Springs, Idaho**

Facility ID 029-00001

Final

**April 20, 2015
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Permit Writer**



The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01. et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

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ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
CFR	Code of Federal Regulations
CO	carbon monoxide
CO ₂	carbon dioxide
CO _{2e}	CO ₂ equivalent emissions
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
HAP	hazardous air pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM _{2.5}	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
<i>Rules</i>	<i>Rules for the Control of Air Pollution in Idaho</i>
SO ₂	sulfur dioxide
SO _x	sulfur oxides
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
VOC	volatile organic compounds

FACILITY INFORMATION

Description

P4 owns and operates an elemental phosphorous production facility near Soda Springs, Idaho. The facility processes phosphate ore to produce elemental phosphorus (P4) for sale. There are two primary departments at the facility - the Burden Preparation Department and the Furnace Department.

The Burden Preparation Department includes activities associated with handling and beneficiation of raw materials (coke, quartzite, and phosphate ore) to produce a suitable feedstock for processing by the Furnace Department to produce elemental phosphorus. Ore is received and stockpiled onsite. Ore is then conveyed to a nodulizing kiln for processing. The resulting nodules are cooled and stockpiled or sent directly to the nodule sizing and scale room from the cooler. In the scale room, the nodules are blended with coke and quartzite.

The coke and quartzite are received and stockpiled separately at the facility and are dried to a desired moisture content, if necessary, prior to blending with the nodules. This process is described in more detail in the next subsection.

The nodule-coke-quartzite blend (burden) is then sent to the Furnace Department for processing. Fuel used in the nodulizing kiln is primarily carbon monoxide (CO) off-gas from the furnace process which is supplemented with small quantities of natural gas and coal. The kiln off gas is treated with existing air pollution control equipment including a series of dust bins, a spray tower, and four parallel hydrosonic venturi scrubbers. The hydrosonic venturi scrubbers are fed with lime concentrated dual alkali (LCDA) solution to scrub acid gases, primarily SO₂, from the gas flow.

The Furnace Department operations utilize electric arc furnaces to melt the burden, chemically react the components, and create off-gases containing elemental phosphorus. The burden enters one of three electric furnaces (No.7, No.8, and No.9) that operate on a continuous basis at temperatures of 1,400 to 1,500°C (2,550 to 2732°F). The reducing environment in the furnaces reacts phosphate from the nodules to form phosphorus gas, carbon monoxide gas, and molten slag and ferrophosphorus.

The furnace gases, composed of mainly carbon monoxide and phosphorus, are drawn through electrostatic precipitator (ESP) dust collectors where particulate matter is removed. The cleaned gases are then sent through water spray condensers where the gases are cooled, condensing the phosphorus. The condensed phosphorus is pumped to settling/storage tanks for further solids removal and product storage. The stored phosphorus is loaded into water-blanketed railroad cars for shipment to market.

After the removal of phosphorus, the furnace off-gas is composed primarily of CO and water vapor. The CO is then sent to the nodulizing kiln as fuel. A thermal oxidizer (TO) unit is used to combust any excess CO gas.

The furnaces are periodically tapped to remove accumulated molten slag and ferrophosphorus. Slag taps occur about 45-48 times per day per furnace and last about 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.

The molten slag is tapped into cast steel ladles that are transported and poured onto the slag storage pile at the site. The ferrophosphorus is also collected in ladles, cooled, and stockpiled on-site.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

July 18, 1979 Monsanto was issued operating permit No, 13-0420-0001-00 for:

- Natural gas-fired boiler
- Phosphate ore-nodulizing kiln and cooler

- Crushing and screening with emissions controlled by a venturi scrubber
- Coke and quartzite handling and storage with emissions controlled by four baghouses
- Coke dryer and quartz dryer with emissions controlled by a scrubber
- Proportioning of phosphate ore
- Coke and quartzite and stocking area over furnaces
- Scale room transfer points controlled by a scrubber
- No. 7 electric arc furnace with emissions from the furnace tapping operations controlled by a scrubber
- No. 8 electric arc furnace with emissions from the furnace tapping operations controlled by a scrubber
- No. 9 electric arc furnace with emissions from the furnace tapping operations controlled by a scrubber (S)

- August 13, 1981 Part IV of the operating permit issued July 18, 1979, was amended to give Monsanto a compliance extension for installation of dust control equipment on its stocking system. (A)
- November 7, 1985 A permit to construct was issued to Monsanto for the coke fines electric furnace addition system. This permit, and other permits, were appealed on May 13, 1986. Additional information was submitted, and a draft permit was issued on August 26, 1986. The draft was revised and reissued on November 18, 1986 as another draft permit. This permit action was combined with others and was issued as Permit No. 0420-0001 on April 3, 1990. (S)
- November 19, 1985 Monsanto was issued the following modified pages of operating permit No. 420-0001 for a pot tapping emission reduction credit:
- Page 8 of 15, No.7 electric arc furnace, slag tapping to pots, pot hauling, pot dumping to the slag pile and ESP dust oxidation; with emissions from the tapping and ESP dust oxidation controlled by a venturi scrubber;
 - Page 9 of 15, No.8 electric arc furnace, slag tapping to pots, pot hauling, pot dumping to the slag pile and ESP dust oxidation; with emissions from the tapping and ESP dust oxidation controlled by a venturi scrubber;
 - Page 10 of 15, No, 9 electric arc furnace, slag tapping to pots, pot hauling, pot dumping to the slag pile and ESP dust oxidation; with emissions from the tapping and ESP dust oxidation controlled by a venturi scrubber; and
 - Page 10a of 15, fugitive emissions from slag piles and plant property and roads. (Voided on May 15, 1987)
- November 25, 1985 DEQ issued Monsanto a certificate for banked emission reduction credits of 780.0 tons per year for fugitive particulate emissions, The emissions reductions were the result of Monsanto's construction of a slag handling system (pot tapping) in 1980 which eliminated particulate-laden steam. (Voided May 15, 1987)
- November 25, 1985 DEQ issued Monsanto a certificate for banked emission reduction credits of 2.4 T/yr for fugitive particulate emissions, The emissions reductions were the result of Monsanto's paving of a 502-foot dirt road (Phos Avenue) in 1981. (Expired October 1, 1991)

April 15, 1986	A PTC was issued to Monsanto for the new coke and quartzite dryer. This permit, and other permits, were appealed on May 13, 1986. Additional information was submitted, and a draft permit was issued on August 26, 1986. The draft was revised and reissued on November 18, 1986 as another draft permit. This permit action was combined with others and issued as Permit No. 0420-0001 on April 3, 1990. (S)
May 15, 1987	The emission reduction credit for pot tapping, issued on November 25, 1985, was voided, Pages 8 through 10a of the operating permit issued November 19, 1985, which contained the enforceable limits on the emission reduction credit, were also voided. (Permit voided)
May 1, 1989	Monsanto was issued a PTC for the dust slurry system. (Permit canceled)
April 3, 1990	An operating permit was issued to Monsanto for emission reductions scaleroom scrubber shutdown. (S)
April 3, 1990	A PTC was issued to Monsanto for the new coke and quartzite dryer. (S)
September 12, 1991	DEQ canceled the dust slurry system PTC after receiving notification from Monsanto that the dust slurry system was permanently shut down. (Permit canceled)
November 25, 1997	On October 8, 1997, DEQ received a letter from P4 Production stating that Monsanto Company had entered into a joint venture with Solutia, Inc., to form a new company called P4 Production, LLC. The letter requested that the PTCs held by Monsanto for the Enoch Valley Mine and the Soda Springs facility be reissued to P4 Production. The permits were issued on the basis that no modifications or emissions increases resulted from the transition and were issued solely to reflect a change of ownership of the permitted emissions units. (S) The coke fines and electric furnace addition system permit was reissued to P4 Production. The new coke quartzite dryer permit was reissued to P4 Production.
October 19, 2000	The new coke quartzite dryer and coke fines and electric furnace addition system permits were amended to replace pound per hour fugitive emission limits with reasonable control requirements. The permit number also changed to 029-00001 on November 1, 2000, which superceded the permit issued on October 19, 2000, but the permit pages still contain the October 19, 2000 date on each page. (A)
October 23, 2000	The emission reductions-scaleroom scrubber shutdown operating permit was amended to replace pound per hour fugitive emission limits with reasonable control requirements. The permit number also changed to 029-00001 on November 1, 2000, which superceded the permit issued on October 23, 2000, but the permit pages still contain the October 23, 2000 date on each page. This permit expired on October 23, 2005. (S)
October 1, 2010	P-030316, Facility-wide permit to resolve past PSD issues, Permit status (S)
June 23, 2014	P-2012.0055 Project No. 61103, is for the modification at an existing Tier I facility. Applicant has proposed to install and operate a new screening system to replace the existing screening system. Permit status (A, but will become S upon issuance of this permit)

Application Scope

This PTC is a revision of an existing PTC. See the current Tier I permit statement of basis for the permitting history.

The applicant has proposed to:

- Increase the stated amount of 139 million pounds of CO to 160 million pounds per 12-consecutive months per year in permit condition 5.8.

- Revise permit condition 5.9 to set a time the temperature was to be measured to determine compliance.
- Delete permit condition 2.13 because the same requirement was stated in Permit Condition 2.10
- Incorporate permit P-2012.0055 project No. 61469 issued on June 23, 2014 into the present permitting action.

Application Chronology

January 13, 2015	DEQ received an application and an application fee.
February 12, 2015	DEQ determined that the application was complete.
March 30, 2015	DEQ made available the draft permit and statement of basis for peer and regional office review.
April 2, 2015	DEQ made available the draft permit and statement of basis for applicant review.
April 9, 2015	DEQ received the permit processing fee.
April 20, 2015	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

No changes to any emission units or control equipment listed in the Statement of Basis for Project No. 61103 issued June 23, 2014.

Emissions Inventories

No changes of any emission inventory listed in the Statement of Basis for Project No. 61103 issued June 23, 2014.

Comparison of the Project Emissions Increase to the PSD Significance Thresholds

No change in PSD applicability that was listed in the Statement of Basis for Project No. 61103 issued June 23, 2014.

Non-Carcinogenic TAP Emissions

No change in non-carcinogenic TAP emissions that was listed in the Statement of Basis for Project No. 61103 issued June 23, 2014.

Carcinogenic TAP Emissions

No change in carcinogenic TAP emissions that was listed in the Statement of Basis for Project No. 61103 issued June 23, 2014.

Ambient Air Quality Impact Analyses

No change in ambient air quality impact analyses that was listed in the Statement of Basis for Project No. 61103 issued June 23, 2014.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Caribou County, which is designated as attainment or unclassifiable for PM_{2.5}, PM₁₀, SO₂, NO₂, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

This facility is a major facility. This permitting action does not change that.

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the revisions to clarify the actual process and process quantities to the present operations. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility have a potential to emit greater than 100 tons per year for PM10, SO2, NOx, and CO. Therefore, this facility is classified as a major facility, as defined in IDAPA 58.01.01.008.10.

PSD Classification (40 CFR 52.21)

40 CFR 52.21Prevention of Significant Deterioration of Air Quality

The facility's applicability to PSD and the PSD analysis has remained unchanged from the Statement of Basis for Project No. 61103 issued June 23, 2014.

NSPS Applicability (40 CFR 60)

The facility's applicability to NSPS and the NSPS analysis has remained unchanged from the Statement of Basis for Project No. 61103 issued June 23, 2014

NESHAP Applicability (40 CFR 61)

The facility's applicability to NESHAP and the NESHAP analysis has remained unchanged from the Statement of Basis for Project No. 61103 issued June 23, 2014.

MACT Applicability (40 CFR 63)

The facility's applicability to MACT and the MACT analysis has remained unchanged from the Statement of Basis for Project No. 61103 issued June 23, 2014.

Permit Conditions Review

This section describes the permit conditions for **only** those permit conditions that have been revised, or deleted as a result of this permitting action.

Existing Permit Condition 2.7

The three-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 PM₁₀ emissions limits.

New Permit Condition 2.7

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 PM₁₀ emissions limits.

The three-hour average pressure drop across the venturi section of the scrubbing system was changed to a six-hour average pressure drop across the venture section of the scrubbing system in order to be consistent with 40 CFR 61.122.

Existing Permit Condition 2.10

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 same permit condition requirement appears in Existing Permit Condition 2.13

The permittee shall monitor and record the pH of the scrubbing solution measured in the recirculation tank at least once per hour when the system is operating.

The application requested the Existing Permit Condition 2.13 be deleted because the same requirement was indeed stated in Existing Permit Condition 2.10.

Thus Existing Permit Condition 2.13 was deleted with this permitting action.

Existing Permit Condition 5.8

All three units of the thermal oxidizer combined shall not combust more than 139 million pounds of CO gas per any 12-consecutive month period.

Revised Permit Condition 5.8

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.

This revised permit condition increased the pounds of CO from 139 million to 160 million. The prior permitting action involving the throughput of the CO to the thermal oxidizer was modeled at the maximum, which meant no CO from the furnaces was combusted in the kiln. Thus all CO produced in the furnaces was to be combusted in the thermal oxidizer. This allows the CO to increase to 160 million pounds per any 12-consecutive month period without any increase in the emission limits set by the prior permitting action.

Existing Permit Condition 5.9

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

Revised Permit Condition 5.9

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.

The Existing Permit Condition 5.9 did not establish a monitoring time to evaluate the 1600 degree F compliance. The revised Permit Condition 5.9 established at or above 1600 degrees F shall be determined over a one-hour average of time.

The General Provisions requirements for this permitting action remain unchanged from the prior permitting action of Project No. 61103 issued June 23, 2014.

PUBLIC REVIEW

Public Comment Opportunity

Because this permitting action does not authorize an increase in emissions, an opportunity for public comment period was not required or provided in accordance with IDAPA 58.01.01.209.04 or IDAPA 58.01.01.404.04.

APPENDIX A – EMISSIONS INVENTORIES

The were no changes to the emissions inventory with this permitting action.

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

There was no air quality Impact analysis required with this permitting action.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on April 8, 2015 via email with a follow up hard copy sent by mail :

Facility Comment: Permit Condition 1.3

As per your email on April 3, 2015, this should be revised to reflect the replacement of PTC No. P-2012.0055, issued on June 24, 2014.

DEQ Response: Permit Condition 1.3 was changed to correctly state the new PTC was indeed to replace PTC P-2012.0055, issued on June 24, 2014.

Facility Comment: Regarding Statement of Basis

Irrelevant references in the Table of Contents regarding Other Rules as Applicable, Visible emissions, Standards of New Sources, and Particulate Matter – New Process Wight Limitations should be eliminated.

DEQ Response:

The four mentioned topics in the facility comment were eliminated from the Table of Contents.

Facility Comment:

Under Table of Contents, Public Review, remove Public Comment Period, and Public Hearing

DEQ Response:

Public Comment Period and Public Hearing were removed from the Table of Contents.

Facility Comment:

Explain the revision to Permit Condition 2.7 to a six-hour average pressure drop to be consistent with 40 CFR 61.122.

DEQ Response: This explanation was added to the Statement of Basis.

Facility Comment:

In the explanation for the revision of Permit Condition 5.8, change the word “not” to “no” in the second sentence. It should read: “The prior permitting action involving the throughput of the CO in the thermal oxidizer was modeled at the maximum, which meant no CO from the furnaces was combusted in the kiln.”

DEQ Response:

The sentence was changed.

APPENDIX D – PROCESSING FEE