Statement of Basis

Permit to Construct No. P-2017.0011
Project ID 62449

Blackfoot Facility of Basic American Foods
Blackfoot, Idaho

Facility ID 011-00012

Final

April 16, 2021

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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

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BAF	Blackfoot Facility of Basic American Foods
BAPCI	Basic American Potato Company, Inc.
BMP	best management practices
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
iwg	inches of water gauge
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
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

O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
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
POM	polycyclic organic matter
ppm	parts per million
ppmvd	parts per million by volume, dry
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIC	Standard Industrial Classification
SIL	Significant Impact Level
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Blackfoot Facility of Basic American Foods (BAF), a division of Basic American, Inc., is a manufacturer of dried food products and is located at 415 West Collins Road, Blackfoot, Idaho. Basic American Potato Company, Inc. (BAPCI) is a potato processing company and is located at 409 West Collins Road, Blackfoot, Idaho. Because BAPCI and BAF have the same owner, are adjacent, and have same first two digits of Standard Industrial Classification (SIC) code, the two plants are considered as one Tier I source or Tier I facility. The facility is classified as an existing major stationary source, as defined in 40 CFR 52.21(b)(1), because the facility is a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a) and because the estimated emissions of $PM_{2.5}$/PM_{10}, SO_2, NO_X, and CO have the potential to exceed major stationary source thresholds of 100 tons per year.

The production line C-8 at BAF prepares dried vegetable product from a combination of fresh vegetables and previously dried vegetables. Detailed process description of the production line can be found in the permit.

Permitting History

The following information was derived from a review of the permit files available to DEQ for production line C-8 at BAF. For the rest of the facility, the permitting history can be found in the statement of basis of the current Tier I operating permit.

Permit status is noted as active and in effect (A) or superseded (S).

January 18, 2019	P-2017.0011 PROJ 62167, PTC revision to remove non-applicable permit conditions. (A, but will become S upon issuance of this permit)
July 31, 2017	P-2017.0011, initial PTC for installing a new production line C-8 (line C-8), Permit status (S)

Application Scope

Installation of line C-8 was authorized by DEQ Permit to Construct (PTC) No. P-2017.0011 issued July 31, 2017. Line C-8 emissions units include a pre-dryer and a main dryer, with vertical stack release points NND and NNG, respectively. Emissions from the main dryer are routed through a Venturi scrubber for particulate control. Stack NNG is the scrubber exhaust. Emissions from the pre-dryer stack are uncontrolled.

Stack testing for pre-dryer stack (NND stack) conducted since the permit was issued has indicated higher particulate matter emission rates than anticipated during project design, which has led to limitations in production rate. To enable the line C-8 to attain desired rates of operation, BAF has increased the height of stack NND to 86 feet to increase dispersion of pollutants emitted from this stack.

This application requests an increase in PM emissions limits for stack NND based on the increased stack height. This application also requests that the method of demonstrating compliance with the $PM_{2.5}$ limits of the pre-dryer and dryer be based on limiting daily and annual production of line C-8 (i.e., 70,000 lb/day and 21.7 million lb/yr, finished product.)

There are no physical changes to the emissions units associated with this project, nor are there any changes in process flows associated with this project.

Application Chronology

May 13, 2020	DEQ received an application.
May 19, 2020	DEQ received an application fee.
June 5, 2020	DEQ determined that the application was incomplete.
October 30, 2020	DEQ received supplemental information from the applicant.

December 8, 2020	DEQ determined that the application was complete.
December 18, 2020	DEQ received a revised application.
January 19, 2021	DEQ made available the draft permit and statement of basis for peer and regional office review.
January 28, 2021	DEQ made available the draft permit and statement of basis for applicant review.
February 24 – March 26, 2021	DEQ provided a public comment period on the proposed action, with EPA's 45-day concurrent review till April 10, 2021.
March 2, 2021	DEQ received the permit processing fee.
April 16, 2021	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION[1]

Source ID No.	Sources	Control Equipment
PREDRYER	Predryer Manufacturer: Industrial Metal Enterprises Model: custom First stage burner model: Low NOx burner, 25 ppmvd @ 3% O_2 Manufacturer: Winnox Eclipse Model: CROSSFIRE Heat input rating: 6.0 MMBtu/hr Second stage burner model: Low NOx burner, 20 ppmvd @ 3% O_2 Manufacturer: Winnox Eclipse Model: WX0200 Heat input rating: 2.0 MMBtu/hr Manufacture date: 4/1/2017 Max. production: 70,000 lb/day finished product Fuel: natural gas	None
DRYER	Dryer Manufacturer: Buhler Aeroglide Model: C1 144-132 RGX Burner model: Low-NOx burner, 10 ppmvd @ 3% O_2 Manufacturer: Winnox Eclipse Model: WX0200 Heat input rating: 5.0 MMBtu/hr Manufacture date: 4/1/2017 Max. production: 70,000 lb/day finished product Fuel: natural gas	Wet Venturi Scrubber Manufacturer: EnviroCare Model: MicroMist Pressure drop across throat: 17.5 inch H_2O Operating pressure range: 17 to 25 inch H_2O Recirculation rate: 265 gpm Gas flow: 19,300 ACFM $PM_{10}/PM_{2.5}$ control efficiency: 75.0%

Source ID No.	Sources	Control Equipment
AMU	Air Makeup Unit Manufacturer: Reyco Model: Ventpac 60 Burner Model: Low NOx burner, 25 ppmvd @ 3% O_2 Burner Manufacturer: Winnox Eclipse Model: CROSSFIRE Manufacture Date: 4/1/2017 Heat input rating: 5.0 MMBtu/hr Fuel: natural gas	None

[1] Refer to modeling memo for the stack parameters.

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit, an emission inventory was developed for the C-8 production line at the facility. This project only involves the EI for the pre-dryer particulate emissions. The PM PTE from the pre-dryer stack NND is estimated based on the production levels of 70,000 lb/day and 21.7 million lb/yr, finished product and an emission factor developed based on the particulate performance testing completed on May 30, 2019.

Annual production of 21.7 million lb/yr is based on the pre-dryer operating at 70,000 lb/day and 85% of 8,760 hr/yr while the previous permitting action assumed the pre-dryer operating at 8,760 hr/yr. For PTE of other emissions units and other criteria pollutants of Line C-8, refer to the SOB for PTC No. P-2017.0011 issued on 7/31/2017.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants at the facility (i.e., BAPCI and BAF.)

Table 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS (T/yr)

	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	Lead
Basic American Potato Company, Inc.[1]	78.1	ND[4]	0.4	49.9	58.8	3.9	3.46E-04
Blackfoot Facility of Basic American Foods [2]	94.2	ND[4]	18.2	77.6	240.6	7.7	9.39E-04
Facility-Wide PTE (T/yr) [3]	172.3	172.3[4]	18.6	127.5	299.4	11.6	1.29E-03

[1] Taken from the statement of basis for Tier I Operating Permit No. T1-2018.0013 Project 62002 issued on March 22, 2019.
[2] Taken from statement of basis for Tier I Operating Permit No. T1-2018.0010 Project 62001 issued on March 22, 2018.
[3] Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
[4] No data were provided in the Tier I SOBs. Assume that $PM_{2.5}$ emissions equal to PM_{10} emissions.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility. The PTE from the pre-dryer of production line C-8 is provided by the applicant and verified by DEQ staff. The PTE from the existing emissions units are taken from the existing permits. See Appendix A for a detailed presentation of the calculations of the pre-dryer PM emissions.

Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS (T/yr)

	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	Lead
Basic American Potato Company, Inc.[1]	78.1	ND[4]	0.4	49.9	58.8	3.9	3.46E-04
Blackfoot Facility of Basic American Foods [2]	94.2	ND[4]	18.2	77.6	240.6	7.7	9.39E-04
Pre-dryer of Production Line C-8 PTE Increase	0.91[(11.48 -5.59) lb/day*365 day/yr*85% / 2000 lb/T]	0.31 (1.26 T/yr -0.95 T/yr)	0.00	0.00	0.00	0.00	0.00
Facility-Wide PTE (T/yr) [3]	173.2	173.2 [4]	18.6	127.5	299.4	11.6	1.29E-03

[1] Taken from the statement of basis for Tier I Operating Permit No. T1-2018.0013 Project 62002 issued on March 22, 2019.
[2] Taken from statement of basis for Tier I Operating Permit No. T1-2018.0010 Project 62001 issued on March 22, 2018.
[3] Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
[4] No data were provided in the Tier I SOBs. Assume that $PM_{2.5}$ emissions equal to PM_{10} emissions.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Changes in Potential to Emit (T/yr)	PM_{10}	$PM_{2.5}$	SO_2	NO_X	CO	VOC	Lead
Pre-dryer of Production Line C-8 PTE Increase	0.91	0.31	0.00	0.00	0.00	0.00	0.00

TAP Emissions

This permitting action does not change TAP emissions.

HAP Emissions

This permitting action does not change HAP emissions.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this project will not significantly contribute to a violation of any ambient air quality standard.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The Basic American Foods facility is located in Bingham County, which is designated as unclassifiable/attainment for $PM_{2.5}$, PM_{10}, SO_2, NO_X, CO, and Ozone. Reference to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For THAPs (Total Hazardous Air Pollutants) Only:

A = Use when any one HAP has actual or potential emissions $\geq$ 10 T/yr or if the aggregate of all HAPS

(Total HAPs) has actual or potential emissions ≥ 25 T/yr.

SM80 = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the permit sets limits ≥ 8 T/yr of a single HAP or ≥ 20 T/yr of THAP.

SM = Use if a synthetic minor (potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable limitations) and the potential HAP emissions are limited to < 8 T/yr of a single HAP and/or < 20 T/yr of THAP.

B = Use when the potential to emit without permit restrictions is below the 10 and 25 T/yr major source threshold

UNK = Class is unknown.

For All Other Pollutants:

A = Actual or potential emissions of a pollutant are ≥ 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (potential emissions fall below 100 T/yr if and only if the source complies with federally enforceable limitations) and potential emissions of the pollutant are < 80 T/yr.

B = Actual and potential emissions are < 100 T/yr without permit restrictions.

UNK = Class is unknown.

Table 5 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	>100	>100	**100**	A
PM_{10}	>100	>100	**100**	A
$PM_{2.5}$	>100	>100	**100**	A
SO_2	>100	>100	**100**	A
NO_X	>100	>100	**100**	A
CO	>100	>100	**100**	A
VOC	<100	<100	**100**	B
HAP (single)	<10	<10	**10**	B
HAP (total)	<25	<25	**25**	B
Pb	<100	<100	**100**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for increasing particulate emissions limits of the pre-dyer of Line C-8. 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 58.01.01.401..... Tier 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.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 ..... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions in the current Tier I operating permit.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701..... Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979 and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced operation on or after October 1, 1979, the PM allowable emission rate (E) is based on one of the following equations:

- IDAPA 58.01.01.701.01.a: If PW is < 9,250 lb/hr; $E = 0.045 (PW)^{0.60}$
- IDAPA 58.01.01.701.01.b: If PW is ≥ 9,250 lb/hr; $E = 1.10 (PW)^{0.25}$

The proposed throughput of the new production line is 70,000 lb/day. The hourly process weight is calculated as follows:

- PW= (70,000 lb/day) / (24 hr/day) = 2,917 lb/hr

Therefore, the allowable PM emission rate is calculated as:

- $E = 0.045 \times PW^{0.60} = 0.045 \times (2{,}917)^{0.60} = 5.4$ lb/hr

As presented in Table 7 of the application, the estimated PM PTE for the new production line is 0.64 lb/hr. Therefore, compliance with the process weight rate requirement has been demonstrated.

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

IDAPA 58.01.01.301..... Requirement 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 $PM_{2.5}/PM_{10}$, NO_X, and CO as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, this facility is classified as a major facility, as defined in IDAPA 58.01.01.008.10. The facility currently has a Tier I operating permit. Per IDAPA 58.01.01.209.05, the facility will have to apply to modify their Tier I permit to incorporate the requirements of this PTC.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 ..... Prevention of Significant Deterioration of Air Quality

The facility is classified as an existing major stationary source because the facility is a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a) and because the estimated emissions of $PM_{2.5}/PM_{10}$, NO_X, and CO have the potential to exceed major stationary source thresholds of 100 tons per year.

NSPS Applicability (40 CFR 60)

Refer to the BAF's current Tier I operating permit for NSPS applicability determinations and discussions. This permitting action does not alter applicable NSPS requirements.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT Applicability (40 CFR 63)

Refer to BAF's current Tier I operating permit for MACT applicability determinations and discussions. This permitting action does not alter applicable MACT requirements.

Permit Conditions Review

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

Permit Conditions 1.1 and 1.3

Permit Condition 1.1 states the purpose of this permitting action. Permit Condition 1.3 states that this PTC replaces PTC No. P-2017.0011, issued on January 18, 2019.

Table 1.1

The operating parameters of the wet Venturi scrubber are removed as they are specified elsewhere in the permit. The gas flowrate is updated from 39,700 to 19,300 acfm using the information obtained from the May 30, 2019 source test.

Permit Condition 2.1

Permit Condition 2.1 is updated to include ", and the permitted annual production rate is 21.7 million pounds of finished product per year" as requested by the applicant. The modeled annual emissions rate of 1.26 T/yr for the pre-dryer stack was based on the pre-dryer operating at 85% of 365 day/yr. The annual production limit is calculated as 85% x 365 day/yr x 70,000 lb/day = 21.7 x 10^6 lb/yr.

Table 2.1

Emissions limits of $PM_{2.5}$ for the pre-dryer stack increase from 5.18 to 8.10 lb/day and from 0.95 to 1.26 T/yr and emissions limit of PM_{10} increases from 5.59 to 11.48 lb/day as they are the modeled rates and are requested to be changed by the applicant. The modeled ambient impact is below significant impact level (SIL) at the production design rate of 70,000 lb/day and 21.7 million pound/yr and with the use of the Venturi scrubber to control particulate emissions from the dryer. The impact levels are about 98% SIL for 24-hr $PM_{2.5}$, 96% SIL for annual $PM_{2.5}$, 33% SIL for 24-hr PM_{10}.

"of two point five (2.5) and" is added to footnote b) of Table 2.1. It was missed in the existing permit.

Permit Condition 2.7

As explained under Permit Condition 2.1, "and 21.7 million pounds per year, based on any consecutive 12-calendar month period" is added to Permit Condition (PC) 2.7.

Old PC 2.7.2 is removed as a result of using throughput limit as a compliance method in lieu of source testing and their respective new emissions factors.

Permit Condition 2.9.2

The operating parameters of the wet Venturi scrubber are updated using the information obtained from the May 30, 2019 source test. The following are added to PC 2.9.2:

"At the time of this permit issuance, the pressure drop obtained during the most recent performance test demonstrating compliance with the emissions limits was 17.5 inches of water (tested on 5/30/2019)."

"At the time of this permit issuance, the recirculation rate obtained during the most recent performance test demonstrating compliance with the emissions limits was 265 gallons per minute (tested on 5/30/2019)."

Permit Condition 2.11.1

"Prior to the new emission factors based on source test on each stack are approved by DEQ," is no longer needed and is removed from PC 2.11.1 as a result of using throughput limit as a compliance method in lieu of source testing and their respective new emissions factors.

Old Permit Conditions 2.11.3, 2.11.5, 2.11.6, and 2.11.7

Old PCs 2.11.3, 2.11.5, 2.11.6, and 2.11.7 are no longer needed and are removed as a result of using throughput limit as a compliance method in lieu of source testing and the respective new emissions factors.

New Permit Condition 2.11.3

To demonstrate compliance with the new annual production limit in PC 2.7, the following is added to PC 2.11.3:

"2.11.3 Every month, the permittee shall record the monthly and annual finished product produced from production line C-8 to demonstrate compliance with the annual finished product limit in Permit Condition 2.7. The annual finished product shall be calculated by summing the monthly finished product from the previous consecutive 12-month period."

Permit Condition 2.14

Permit condition 2.14 is revised because the applicant has fulfilled initial source test requirement. "Within 180 days…" is replaced with "If additional source testing is performed".

Permit Condition 2.14 specifies that if a source test is required, both the pre-dryer and dryer will be required to be tested approximately the same time, such as in two consecutive days. Permit Condition 2.14 also specifies what needs to be monitored during a source test. The following explains why:

During the virtual meeting with the facility on October 6, 2020, the facility's consultant mentioned that during the first time initial source testing, the pre-dryer was OK, but the dryer exceeded the limit at 70,000 lb/day; after the adjustment to the scrubber, the dryer met the limit, but the pre-dryer exceeded the limit at the 70,000 lb/day. It appears that how to operate the scrubber (i.e., pressure change) affects the dryer and pre-dryer emissions at the same time. Therefore, when a source test is required, we may consider source testing both emissions points at approximate the same time, such as in two consecutive days.

Permit Condition 2.15

After considering the input from DEQ's compliance group (12/6/2020 email) and after reviewing the permit conditions for other dryers at the facility, a future mandatory source test within five years will not be required and, PC 2.15 is removed.

The $PM_{2.5}$ emissions from the dryer with the scrubber of 75% control efficiency are 0.57 T/yr; the uncontrolled emissions are 2.3 T/yr. If the facility operates the scrubber and the production line the same as when the production line was tested that demonstrated compliance, a future mandatory source test within five years is not required.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c in concurrent with EPA's 45-day review in accordance with IDAPA 58.01.01.209.05.c. Comments were not submitted in response to DEQ's proposed action. EPA did not review the permit, but allowed DEQ to issue the final PTC. Refer to the chronology for public comment period dates.

APPENDIX A – EMISSIONS INVENTORIES

Parameter	Value	Units	Basis
PM Emission Factors			
Predryer - NND			
Filterable PM2.5	0.0483	lb/1000 lbs	May 2019 source test.
Condensible PM2.5	0.0674	lb/1000 lbs	May 2019 source test.
Total PM2.5	0.1157	lb/1000 lbs	May 2019 source test.
Scrubber - NNG			
Scrubber PM2.5 emission factor	0.0349	lb PM2.5/1000 lbs product	May 2019 source test. All measured PM considered to be PM2.5
Scrubber PM10 emission factor	0.0349	lb PM2.5/1000 lbs product	May 2019 source test. All measured PM considered to be PM10
Operating Information			
Daily Production Rate	70,000	lb/day	production goal
annual duty factur	85%		
Process C-8 prep area steam demand	920	lb/hr	Permit limit. PTC P-2017.0011
Existing PM PTE			
Pre-dryer - NND			
PM2.5 24-hour	5.18	lb/day	Emission limit from PTC No. P-2017.0011 (1/28/2019)
PM2.5 annual	0.95	ton/yr	Emission limit from PTC No. P-2017.0011 (1/28/2019)
PM10 24-hour	5.59	lb/day	Emission limit from PTC No. P-2017.0011 (1/28/2019)
PM10 annual	0.95		from Statement of Basis, Tier I Operating No. T1-2018.0011, Project ID 62001 (March 22, 2018), Appendix A
Pre-dryer - NND			
PM2.5 24-hour	3.10	lb/day	Emission limit from PTC No. P-2017.0011 (1/28/2019)
PM2.5 annual	0.57	ton/yr	Emission limit from PTC No. P-2017.0011 (1/28/2019)
PM10 24-hour	3.91	lb/day	Emission limit from PTC No. P-2017.0011 (1/28/2019)
PM10 annual	0.57		from Statement of Basis, Tier I Operating No. T1-2018.0011, Project ID 62001 (March 22, 2018), Appendix A
Measured Stack Parameters- Predryer			
Temperature			
May 2018	154	°F	June 2018 stack test report
June 2019	152	°F	May 2019 stack test report
air flow rate			
May 2018	16,000	acfm	June 2018 stack test report
June 2019	16,500	acfm	May 2019 stack test report
Measured Stack Parameters- Scrubber			
Temperature			
June 2018	108	°F	June 2018 stack test report
May 2019	105	°F	May 2019 stack test report
air flow rate			
June 2018	22,000	acfm	June 2018 stack test report
May 2019	19,300	acfm	May 2019 stack test report
Boiler 2A Data			
PM2.5 and PM10 PTE			
hourly	0.682	lb/hr	max fire. From PTC P-2017.0031 amd Boiler 2A PTC application
annual	2.990	ton/yr	max fire. From PTC P-2017.0031 amd Boiler 2A PTC application
full fire steam rate	76,000	lb/hr	max fire. From Boiler 2A PTC application
Stack height	100	feet	from Boiler 2A PTC application
Stack diameter	42	inches	October 2018 stack test
stack temperature	248	°F	October 2018 stack test
Flue gas - in-stack	25,000	acfm	October 2018 stack test
SIL Values			
PM2.5 24-hour	1.2	µg/m^3	State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc. ID AQ-011 (September 2013). Table 3, Significant Impact Levels
PM2.5 annual	0.3	µg/m^4	
PM10 24-hour	5.0	µg/m^5	

PM Emission Factors			
Pre-Dryer PM2.5 Emission Factor			
filterable PM2.5	0.048	lb/1000 lbs	
consdensible PM	0.067	lb/1000 lbs	
Total PM10	0.116	lb/1000 lbs	
Pre-Dryer PM10 Emission Factor			
filterable PM10	0.097	lb/1000 lbs	
consdensible PM	0.067	lb/1000 lbs	
Total PM10	0.164	lb/1000 lbs	
Boiler 2A PM Emission			
steam based emission rate	0.0090	lb PM/Mlb steam	All PM asssumed to be PM2.5 and PM10
max emissions to support line C-8	0.0083	lb PM/hr	

	PM2.5			PM10		
	lb/hr	lb/day	ton/yr	lb/hr	lb/day	ton/yr
Predryer - Stack NND	0.337	8.10	1.26*	0.478	11.48	1.78*
Dryer/Scrubber - Stack NNG	0.129	3.10	0.57	0.163	3.91	0.57
Boiler 2A - 920 lb/steam/hr	0.0083	0.198	0.03	0.0083	0.198	0.03
*Based on 85% Annual duty						

		CO	NOx	SO2	PM-10	VOC	Lead	
	Pre-Project PTE[a]							
	Point Sources	240.6	77.6	18.2	94.2	7.8	0.0	
	Fugitive Sources	14.0	16.7	0.4	4.3	0.9	0.0	
	Total Pre-Project PTE	254.6	94.3	18.6	98.5	8.7	0.0	
	Project Emissions Changes							
	Point Sources	0.0	0.0	0.0	0.8	0.0	0.0	
	Fugitive Sources	0.0	0.0	0.0	0.0	0.0	0.0	
	Total Project Emission Changes	0.0	0.0	0.0	0.8	0.0	0.0	
	Post-Project PTE							
	Point Sources	240.6	77.6	18.2	95.0	7.8	0.0	
	Fugitive Sources	14.0	16.7	0.4	4.3	0.9	0.0	
	Total Post-Project PTE	254.6	94.3	18.6	99.3	8.7	0.0	
	[a] From Statement of Basis, Tier I Operating No. T1-2018.0011, Project ID 62001 (March 22, 2018), Appendix A							

					Result	
		Pollutant	Averaging Time	SIL, µg/m^3	µg/m^3	% of SIL
		$PM_{2.5}$	24-hour	1.2	1.18	98%
			Annual	0.3	0.29	96%
		PM_{10}	24-hour	5	1.65	33%

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

M E M O R A N D U M

DATE: April 14, 2021

TO: Shawnee Chen, Permit Writer, Air Program

FROM: Kevin Schilling, Modeling Review Analyst, Air Program

PROJECT: P-2017.0011 PROJ 62449, Relaxation of Emission Limits for Production Line C-8 at the Basic American Foods Facility located in Blackfoot, Idaho.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

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Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
acfm	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ASOS	Automated Surface Observing System
AWMA	Air and Waste Management Association
BAF	Basic American Foods
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
Coal Creek	Coal Creek Environmental Associates, LLC
DEM	Digital Elevation Map
DEQ	Idaho Department of Environmental Quality
DV	Design Values
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GEP	Good Engineering Practice
hr	hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
lb/hr	Pounds per hour
Line C-8	Production line C-8 at the Blackfoot facility of Basic American Foods
m	Meters
m/sec	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum of 1983
NED	National Elevation Dataset
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NWS	National Weather Service
O_3	Ozone
OLM	Ozone Limiting Method
ORD	EPA Office of Research and Development
Pb	Lead

PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion
PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
PVMRM	Plume Volume Molar Ratio Method
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
tpy	Tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
ºF	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

Basic American Foods (BAF) submitted a Permit to Construct (PTC) application to relax the permitted emission limits for Production Line C-8 (Line C-8) at their facility located in Blackfoot, Idaho. Project-specific air pollutant impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the modification were submitted to DEQ to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increments as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03). This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

Coal Creek Environmental Associates, LLC (Coal Creek), on behalf of BAF, prepared the PTC application and performed ambient air impact analyses for this project. DEQ review of submitted data and analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the described project will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was primarily the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models, as agreed on by DEQ and Coal Creek; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) generally adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either: a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) implementation of the proposed changes will result in predicted pollutant concentrations from emissions associated with the project that, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Summary of Submittals and Actions

- May 3, 2020: Regulatory Start Date.
- June 5, 2020: Application determined incomplete for use of an alternate Significant Impact Level (SIL) that was not substantiated.
- November 2, 2020: An alternate NAAQS compliance approach was agreed on between BAF and DEQ, and BAF submitted *Request for Reconsideration of Incompleteness Determination – PTC Application for Increase in $PM_{2.5}$ and PM_{10} Emission Limits for Production Line C-8 at Blackfoot Facility of Basic American Foods* (Reconsideration Request).
- December 8, 2020: Application determined complete.
- December 18, 2020: An updated application is submitted to DEQ.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
General Emission Rates. Emission rates used in the air impact analyses, as listed in this memorandum, must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses. Modeled emission rates from Line C-8 were as follows: PM_{10}[a] 24-hour: Pre-Dryer NND = 11.48 pound/day Scrubber NNG = 3.91 pound/day $PM_{2.5}$[b] 24-hour: Pre-Dryer NND = 8.10 pound/day Scrubber NNG = 3.10 pound/day $PM_{2.5}$ annual: Pre-Dryer NND = 1.26 ton/year Scrubber NNG = 0.57 ton/year
Air Impact Analyses for Criteria Pollutant Emissions. This project revision only affects emissions of PM_{10} and $PM_{2.5}$.	Emissions of other criteria pollutants associated with the Line C-8 project were addressed in the previous permitting project and were unchanged by the proposed permit revision.
Air Impact Analyses for TAP Emissions. TAPs modeling was not required for this project.	The requested revisions for this project did not result in any changes in TAP emissions.

[a.] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
[b.] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

2.0 Background Information

This section provides background information applicable to the project and the site proposed for the facility. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

This permit revision project is to increase allowable $PM_{2.5}$ and PM_{10} emissions from stack NND, which is associated with pre-dryer emissions in production Line C-8 at the BAF Blackfoot potato processing facility. Construction of Line C-8 was initially authorized by PTC P-2017.0011 Project ID 61851, issued on July 31, 2017, and minimally revised on January 18, 2019. The issued permit established emission limits and production limits that vary according to most-recent source test results. The applicable production rate limit is determined by back-calculating from the allowable emission rate, using the most-recent source test results to establish an emission factor.

This project requests a relaxation of the allowable emission rates for PM_{10} and $PM_{2.5}$. The permit also establishes a production limit of 70,000 pound/day and 21.7 million pound/year. There are no other proposed emission-affecting physical or operational changes; because of this, the project is evaluated as a revision of the initial permitting project for air impact purposes. The acceptable impacts are evaluated as if the entire project was not previously permitted. Since the proposed changes only affect PM_{10} and $PM_{2.5}$ emissions, impact analyses of other pollutants are not required.

2.2 Proposed Location and Area Classification

The facility is located Blackfoot, within Bingham County (Northing: 4,784 km; Easting: 388 km; UTM Zone 12). This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS**. The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.** Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

> ***02. Estimates of Ambient Concentrations**. All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

2.4.1 General Approach for Analyses

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emission sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

If the cumulative NAAQS impact analysis indicates a violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

Table 2. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] ($\mu g/m^3$)[b]**	**Regulatory Limit[c] ($\mu g/m^3$)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2 (0.3)[k]	12[l]	Mean of maximum 1st highest[m]
Carbon monoxide (CO)	1-hour	2,000	40,000[n]	Maximum 2nd highest[o]
	8-hour	500	10,000[n]	Maximum 2nd highest[o]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[p] (7.8 $\mu g/m^3$)	75 ppb[q] (196 $\mu g/m^3$)	Mean of maximum 4th highest[r]
	3-hour	25	1,300[n]	Maximum 2nd highest[o]
	24-hour	5	365[n]	Maximum 2nd highest[o]
	Annual	1.0	80[s]	Maximum 1st highest[o]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[t] (188 $\mu g/m^3$)	Mean of maximum 8th highest[u]
	Annual	1.0	100[s]	Maximum 1st highest[o]
Lead (Pb)	3-month[v]	NA	0.15[s]	Maximum 1st highest[o]
	Quarterly	NA	1.5[s]	Maximum 1st highest[o]
Ozone (O_3)	8-hour	40 TPY VOC[w]	70 ppb[x]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 0.3 $\mu g/m^3$ was the SIL in affect at the time of the initial permit, and is the upper limit of any justified case-by-case SIL determination.
l. 3-year mean of annual concentration.
m. 5-year mean of annual averages at the modeled receptor.
n. Not to be exceeded more than once per year.
o. Concentration at any modeled receptor.
p. Interim SIL established by EPA policy memorandum.
q. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
r. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
s. Not to be exceeded in any calendar year.
t. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
u. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
v. 3-month rolling average.
w. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
x. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

2.4.2 Annual $PM_{2.5}$ SIL

The 0.2 $\mu g/m^3$ annual $PM_{2.5}$ SIL was established through EPA guidance[1] on April 17, 2018. The guidance also states that EPA has "recognized that permitting authorities have the discretion to apply SILs on a case-by-case basis in the review of individual permit applications, provided such use is justified in the permitting record."

In 2010, EPA attempted to reduce the need for case-by-case justification and established SIL values for $PM_{2.5}$ in paragraph (k)(2) of 40 CFR 51.166 and 52.21, with the 24-hour SIL at 1.2 $\mu g/m^3$ and the annual SIL at 0.3 $\mu g/m^3$. The regulatory language (unlike that used for previous SILs) effectively stated that impacts below the SIL could be considered as inconsequential to NAAQS compliance. Idaho adopted and used these values for permitting shortly after EPA's promulgation. During subsequent litigation over the 2010 rule, EPA conceded the regulation was flawed because it "did not preserve the discretion of permitting authorities to require additional analysis in certain circumstances, and the court granted EPA's request to vacate and remand the rule so that the EPA could address the flaw." The court left the $PM_{2.5}$ NAAQS significance levels separately promulgated in 40 CFR 51.165(b)(2), "because the regulatory text in that section did not say that a proposed source that has an impact less than the significance level is always deemed to not cause or contribute to a violation." It merely stated that an impact greater than those listed at any location not meeting NAAQS would be considered to cause or contribute to the violation.

DEQ continued to use the EPA SILs established in 2010 for minor source permitting, even though EPA had vacated the SILs and remanded the rule. DEQ determined it would not be reasonable to require comprehensive cumulative impact analyses for projects shown to have minimal impact to air quality. Air impact analyses performed to support the initial permitting of the BAF Line C-8 used the DEQ-established annual $PM_{2.5}$ SIL of 0.3 $\mu g/m^3$.

EPA then developed a revised set of SIL values based on further technical and legal analyses, seeking to provide a stronger analytical foundation for the SILs. These values of 1.2 $\mu g/m^3$ for the 24-hour SIL and 0.2 $\mu g/m^3$ for the annual SIL were provided in the EPA 2018 $PM_{2.5}$ SIL Guidance[1] in a "non-binding" manner to still allow permitting authorities to use their discretion. The guidance concludes, "The EPA believes that the application of these SILs in a manner described below would be sufficient in most situations for a permitting authority to conclude that a proposed source will not cause or contribute to a violation of an ozone or $PM_{2.5}$ NAAQS or $PM_{2.5}$ PSD increment."

The annual 0.2 $\mu g/m^3$ SIL is lower than the 0.3 value still listed in 40 CFR 51.165(b)(2). Regarding this, the EPA 2018 $PM_{2.5}$ SIL Guidance states, "This value is lower than the value of 0.3 $\mu g/m^3$ listed in 40 CFR 51.165(b)(2). Since 40 CFR 51.165(b)(2) does not address whether an impact below 0.3 $\mu g/m^3$ causes or contributes to a violation of the NAAQS, the EPA and other permitting authorities retain the discretion under this provision to determine on a case-by-case basis whether an impact between 0.2 $\mu g/m^3$ and 0.3 $\mu g/m^3$ will cause or contribute to a violation of the annual $PM_{2.5}$ NAAQS."

Coal Creek's initial application submitted for this Line C-8 emission limit relaxation project used an annual SIL value of 0.3 $\mu g/m^3$, and there was a small area immediately north of the facility where project impacts were between 0.2 $\mu g/m^3$ and 0.3 $\mu g/m^3$. The application was determined incomplete because there was no technical justification for using 0.3 $\mu g/m^3$ rather than the 0.2 $\mu g/m^3$ value established in the 2018 guidance. BAF, Coal Creek, and DEQ discussed options for moving forward. It was agreed that Coal Creek would provide weight-of-evidence analyses demonstrating that use of 0.3 $\mu g/m^3$ as the annual $PM_{2.5}$ SIL is appropriate for the small area north of the facility. The analyses would also provide evidence that operation of Line C-8 would be very unlikely to cause impacts exceeding 0.2 $\mu g/m^3$, even in the area north of the facility where modeled maximum impacts were between 0.2 and 0.3 $\mu g/m^3$. Descriptions of the weight-of-evidence analyses and the conclusions are provided in Section 3.4 and 4.2 of this memorandum.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emission increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emission increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants resulting from operation of the revised project were calculated by Coal Creek for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Modeling Applicability and Modeled Criteria Pollutant Emission Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.[2]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in most cases where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[3]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If total project-specific emission rate increases of a pollutant are below Level I Modeling Applicability Thresholds, then project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Applicability Thresholds are conditional, requiring DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emission sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource-intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting. Addressing secondary formation of O_3 within the context of permitting a new stationary source has been

somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

This project involves relaxation of PM_{10} and $PM_{2.5}$ emission limits established by a previous permitting project. Other criteria pollutant emissions are unaffected by the proposed revision, and NAAQS compliance for those pollutants was demonstrated in the previous permitting project through air impact modeling analyses. Since this project is a revision of PM_{10} (24-hour) and $PM_{2.5}$ (24-hour and annual) allowable emissions, air impact analyses for those pollutants will be reperformed. Table 3 provides both the existing emission limits and the proposed emission limits.

Table 3. Existing and Proposed Emissions

Permitted Limits	Pollutant/ Averaging Period	Emission Rates (pound/hour)[a]		
		Pre-Dryer - NND	Scrubber - NNG	Boiler 2A – BLR2A
Existing Limits	24-hour PM_{10}[b]	0.233	0.163	0.00830
	24-hour $PM_{2.5}$[c]	0.216	0.129	0.00830
	Annual $PM_{2.5}$	0.216	0.130	0.00700
Proposed Limits	24-hour PM_{10}	0.478	0.163[d]	0.00830
	24-hour $PM_{2.5}$	0.337	0.129	0.00830
	Annual $PM_{2.5}$	0.287	0.130	0.00700

a. Maximum emission rate over specified averaging period, expressed as a pound/hour rate averaged evenly over the period.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Coal Creek correctly identified 0.163 pound/hour as the 24-hour averaged PM_{10} emission rate from Scrubber NNG; however, a value of 0.129 pound/hour was used in the modeling file submitted. DEQ verified that impacts were below the 5.0 $\mu g/m^3$ SIL for modeling of the correct emission rate.

3.1.2 TAPs Modeling Applicability

TAP emission regulations under Idaho Air Rules Section 210 are only applicable for new or modified sources constructed after July 1, 1995. TAPs were evaluated in the previous permitting project, and the propose relaxation of the allowable emission rates does affect TAP emission rates.

3.1.3 Emission Release Parameters

Table 4 lists emission release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for emission sources modeled in the air impact analyses. Documentation and justification of emission point release parameters were provided in the submitted application. Stack heights were based on field measurements. Stack diameter, exhaust temperature, and exhaust flow were based on a May 2019 stack test for the pre-dryer (NND) and scrubber (NNG) stack and an October 2018

stack test for Boiler 2A (BLR2A). Values appeared reasonable and DEQ did not independently very the values.

Table 4. POINT SOURCE STACK PARAMETERS								
Release Point	Description	UTM[a] Coordinates		Stack Height (m(ft))[b]	Stack Gas Flow Temp. (K (^{o}F))[c]	Stack Gas Flow Velocity (m/sec)[d]	Modeled Stack Diameter (m(ft))	Orient. Of Release[e]
		Easting-X (meters)	Northing-Y (meters)					
NND	Pre-Dryer	387746.3	4784026.8	26.2 (86)	340 (152)	8.71	1.07 (3.5)	Vertical
NNG	Scrubber	387722.4	4784018.5	21.3 (70)	314 (105)	7.80	1.22 (4.0)	Vertical
BLR2A	Boiler 2A	387767.3	4784172.2	30.5 (100)	393 (248)	13.2	1.07 (3.5)	Vertical

a. Universal Transverse Mercator.
b. Meters with feet in parentheses.
c. Kelvin with degrees Fahrenheit in parentheses.
d. Meters per second.
e. Vertical orientation with an uninterrupted release point.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. Coal Creek demonstrated that the project would not cause a significant impact to air quality; therefore, cumulative NAAQS analyses, with background pollutant concentrations, were not required.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate compliance with applicable air quality standards.

3.3.1 General Overview of Impact Analyses

Coal Creek generated the project-specific air pollutant emission inventory and performed air impact analyses that were submitted with the application. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 5 provides a brief description of parameters used in the modeling analyses.

3.3.2 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline*[3].

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. The refined, steady-state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 19191 was used by DEQ for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

Table 5. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Blackfoot, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	2002-2006	Site specific data from the Blackfoot INL meteorological monitoring tower, with missing data filled with Pocatello airport ASOS data. Upper air data from Boise airport. See Section 3.3.4 of this memorandum for additional details of the meteorological data.
Terrain	Considered	1 arc second National Elevation Dataset (NED) was acquired from the USGS for the surrounding area. AERMAP version 18081 was used to process terrain elevation data for all buildings and receptors. See Section 3.3.5 for more details.
Building Downwash	Considered	Considered in a generic method. See Section 3.3.6.
Receptor Grid	**SIL Analysis** The selection of receptors for use in the SIL Analyses is as follows (see Section 3.3.9):	
	Grid 1	25-meter spacing along the ambient air boundary, extending to 250 meters.
	Grid 2	100-meter spacing extending out to 1,000 meters
	Grid 3	10-meter spacing for a localized grid in the area of maximum impact, to assure project impacts are below the applicable SIL.

3.3.4 Meteorological Data

The meteorological data used for the project were also used several previous BAF Blackfoot permitting projects. Site-specific meteorological data were collected from 2002 through 2006 at the INL meteorological monitoring tower at Mountain View Middle School in Blackfoot. This station is 2.5 miles east of the BAF facility. Missing data were filled using ASOS data from Pocatello. Figure 1 shows wind rose of surface winds. Upper air data were obtained from the Boise Airport. More details of the meteorological data and its processing for model input are provided in the submitted application. DEQ determined the data are reasonably representative for the application site and have been properly processed and used in the model.

3.3.5 Effects of Terrain on Modeled Impacts

Submitted ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files.

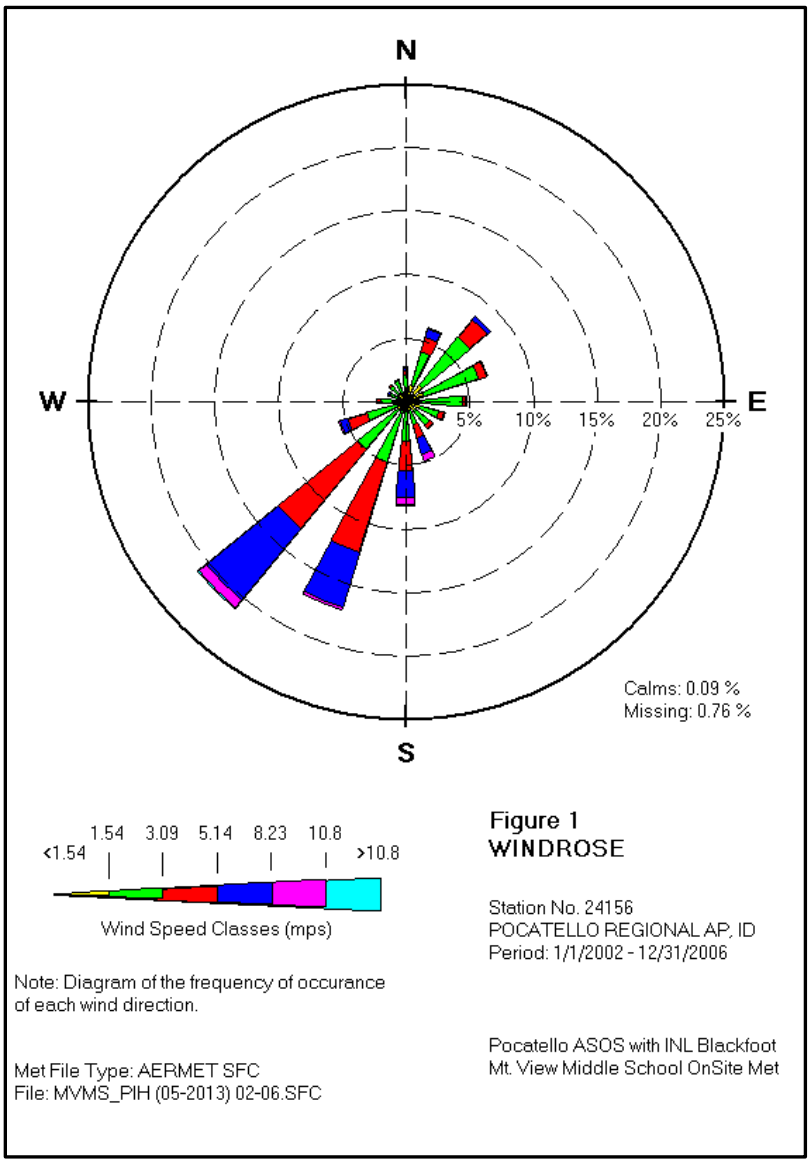
The terrain preprocessor AERMAP version 18081 was used by Coal Creek to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

3.3.6 Facility Layout and Downwash

DEQ verified proper identification of the site location, equipment and building locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to plot plans submitted in the application. Aerial photographs on Google Earth (available at https://www.google.com/earth) were also used to assure that horizontal coordinates were accurate as described in the application.

Potential downwash effects on emission plumes were accounted for in the model by using building dimensions and locations (locations of building corners, base elevation, and building heights). Dimensions and orientation of proposed buildings were used as input to the Building Profile Input Program for the Plume Rise Model Enhancements downwash algorithm (BPIP-PRIME version 04274) to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information for input to AERMOD.

Figure 1. Wind rose for hourly meteorological data from Blackfoot, Idaho.



3.3.7 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." To exclude areas of the site from consideration as ambient air, the permittee must have the legal and practical ability to control access to such areas of the

site. Fence-lines on BAF's property were used to establish the ambient air boundary. Where buildings were located along property boundaries and a fence was not present, ambient air was established immediately exterior to the structures. DEQ review concluded that the ambient air boundary precluded public access based on the methods described in the modeling report according to the criteria described in DEQ's *Modeling Guideline*[3].

3.3.9 Receptor Network

The receptor grid used in the submitted analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[3] and DEQ determined that it was adequate to resolve maximum modeled impacts.

Table 5 describes the receptor network used in the submitted modeling analyses. The receptor grids used in the model provided good resolution of the maximum design concentrations for the project and provided extensive coverage. DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.10 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

H = S + 1.5L, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

All sources from the BAF facility are below GEP stack height. Therefore, consideration of downwash caused by nearby buildings was required.

3.4 Weight-of-Evidence Considerations and Analyses

Supplementary analyses were performed for the area north of the facility where project impacts exceeded the 0.2 $\mu g/m^3$ EPA-recommended SIL but were less that the 0.3 $\mu g/m^3$ upper limit for case-by-case SIL approvals. Coal Creek provided a weight-of-evidence review to help assure that the project will not cause or significantly contribute to a violation of an ambient air quality standard.

The SIL analysis for annual $PM_{2.5}$ showed that impacts exceeded the 0.2 $\mu g/m^3$ SIL (see Section 4 of this memorandum), which would trigger a facility-wide cumulative impact analysis to demonstrate compliance with the 12 $\mu g/m^3$ NAAQS. Although project impacts did not exceed the 0.3 $\mu g/m^3$ value identified as an upper limit for case-by-case SIL determinations, Coal Creek did not submit a statistical analysis of applicable monitoring data to justify that 0.3 $\mu g/m^3$ represents a value of de minimis impact. Alternatively, Coal Creek performed analyses to demonstrate that use of 0.3 $\mu g/m^3$ as a SIL is appropriate for this project, given unique considerations of the facility and the project. These analyses were intended to accomplish the following:

1. Show that realized impacts from the project are likely to be below the 0.2 µg/m^3 SIL. This involves examining the conservatism of annual emission rates and potential overestimation of modeled impacts because of building downwash algorithms used in the modeling analyses.

2. Show that if impacts could exceed the SIL, those impacts are not in areas where there is a high probability of public exposure.

3. Demonstrate that in areas where modeled impacts exceed the 0.2 µg/m^3 SIL, impacts from this revised project (increased allowable emissions and an increase in the Pre-Dryer stack) are no greater than impacts for the pre-revised project.

Section 4.2 provides results/conclusions from the weight-of-evidence analysis.

4.0 NAAQS and TAPs Impact Modeling Results

4.1 Results for NAAQS Analyses

Idaho Air Rules Section 203.02 require that no permit be issued unless it is demonstrated to the satisfaction of the Department that the project would not cause or significantly contribute to a violation of an applicable air quality standards. The project only affects emissions of PM_{10} and $PM_{2.5}$, so only those pollutants required assessment.

Table 6 provides results for the significant impact level (SIL) analyses. Maximum predicted impacts from the C-8 Line are below the SIL for 24-hour averaged $PM_{2.5}$ and PM_{10}. Annual $PM_{2.5}$ impacts were below the 0.2 µg/m^3 SIL at all locations except for a small area north of the facility (see Figure 2) where impacts were between 0.2 µg/m^3 and the 0.3 µg/m^3 upper limit on what may be used for a SIL with justification. Section 4.2 explains through a weight-of-evidence assessment how permit issuance for the proposed revised project is supported without a cumulative NAAQS impact analysis.

Table 6. RESULTS FOR SIGNIFICANT IMPACT LEVEL ANALYSES

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m^3)[a]	Significant Contribution Level (µg/m^3)	Impact Percentage of Significant Contribution Level	Cumulative NAAQS Analysis Required?	UTM[b,c] Easting (m)	UTM[c] Northing (m)
$PM_{2.5}$[d]	24-hour	1.18	1.2	98%	No	387890	4784310
	Annual	0.29	0.2 (0.3)	145% (96%)	Yes (No)[g]	387890	4784310
PM_{10}[e]	24-hour	1.65 (1.79)[f]	5.0	33%	No	387890	4784310

a. Micrograms per cubic meter.
b. Universal Transverse Mercator, NAD83, Zone 12.
c. Location of maximum modeled impacts.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Value in parentheses is from DEQ verification analyses, correcting for the wrong emission rate entered for the Scrubber stack NNG.
g. Through a weight-of-evidence assessment (described in Section 4.2 below), DEQ determined there is reasonable evidence that the project will not cause a significant contribution to a NAAQS violation.

Figure 2. Receptor locations where the Line C-8 BAF Blackfoot project has annual $PM_{2.5}$ impacts between the 0.2 µg/m^3 SIL recommended by EPA guidance and the 0.3 µg/m^3 SIL upper limit specified in federal regulation.



4.2 Weight of Evidence Analyses

This Section provides weight-of-evidence considerations to evaluate whether there is satisfactory confidence that the impacts from BAF Line C-8, as revised by this project, will not significantly contribute to a violation of the annual $PM_{2.5}$ NAAQS.

4.2.1 Appropriate SIL Value and Modeled Impacts

All modeled impacts of Line C-8 are below the previously used 0.3 µg/m^3 SIL. Current EPA SIL guidance[1] establishes a default annual $PM_{2.5}$ SIL of 0.2 µg/m^3 SIL, as described in Section 2.4.2 of this memorandum. A SIL upper limit of 0.3 µg/m^3 is listed in 40CFR51.165(b)(2), but the EPA SIL guidance explains that use of a SIL value other than 0.2 µg/m^3 must be justified as a de minimis impact through analysis of representative ambient air monitoring data. Although Coal Creek did not perform a technical evaluation to generate an alternative SIL value, 0.3 µg/m^3 is within the realm of acceptable values and

modeled impacts exceeding the default 0.2 µg/m^3 SIL were limited to a 150-meter area along the northern facility boundary, extending out to a maximum of about 100 meters to U.S. Highway 26.

4.2.2 Conservatism of Annual $PM_{2.5}$ Emission Estimates

Modeled emission rates are likely an overestimation of annual rates. The modeled annual $PM_{2.5}$ rate from the Pre-Dryer Stack NND was representative of 2019 source test results (0.1157 pounds $PM_{2.5}$/1,000 pounds produced). Subsequent source test results in July 2020 were lower (0.0843 pounds $PM_{2.5}$/1,000 pounds produced). Although emission fluctuation is anticipated, using high values from short-term tests for annual impacts is highly conservative. If modeling results are adjusted for the difference in source testing results, then only nine receptors would have impacts exceeding 0.2 µg/m^3, with the maximum impact at only 0.21 µg/m^3.

4.2.3 Overestimation of Impacts Caused by Modeled Building Downwash Affects

Downwash effects from buildings at the Blackfoot BAF facility are likely overstated by the existing regulatory modeling platform. Wind tunnel studies of the BAF facility have been performed for prior permitting projects (before construction of Line C-8). Results from those studies indicated that the use of BPIP-PRIME and the PRIME algorithm in AERMOD to account for downwash effects results in a substantial over-prediction of impacts resulting from many emission sources at the facility. Wind tunnel evaluation was not performed for the Line C-8 project; however, Coal Creek described in the Reconsideration Request the preliminary results from an on-line BPIP diagnostic tool[5], developed by CPP Wind, for identification of possible downwash over-predications. Coal Creek indicated that the diagnostic tool estimated that BPIP-PRIME would result in over-predications of 3x to 5x in the direction of maximum project impacts.

Over-predication of impacts as caused by BPIP-PRIME and AERMOD algorithms is a recognized problem within the permit modeling community and work is ongoing to revise BPIP-PRIME and AERMOD (referred to as PRIME2). Two PRIME2 downwash methods have been incorporated into AERMOD as alpha methods: 1) a method developed by EPA Office of Research and Development (ORD) that is identified as ORD_DWNW; a method developed by the Air and Waste Management Association (AWMA) group that is identified as AWMADWNW.

Alpha methods are intended for experimental purposes and are not to be used for regulatory modeling. However, DEQ believes use of the alpha method can provide valuable supplemental information for consideration in a weight-of-evidence analysis. Coal Creek used AWMADWNW to evaluate project impacts and gain insight into potential overestimation of impacts cause by current regulatory downwash algorithms in AERMOD. The options AWMAUEFF and AWMATURB were selected under AWMADWNW. AWMAUEFF redefines the height at which the wind speed is taken from the profile wind speed used in the calculation of concentrations from the primary plume. The current PRIME algorithm uses the wind speed at stack height, and AWMAUEFF uses the windspeed at the height of plume centerline. AWMATURB redefines lower and upper bounds for calculating effective parameters (ueff [wind speed], sweff [sigma W], sveff [sigma V], and tgeff [potential temperature gradient]). Coal Creek also used the modified version of BPIP, BpipPrm19191, which is available from the EPA SCRAM website.

Impact results showed only 13 receptors exceeded the 0.2 µg/m^3 SIL, in a limited area of about 50 meters along the ambient air boundary and extending out less than 20 meters. The maximum impact was only 0.21 µg/m^3, substantially less than the 0.29 µg/m^3 impact estimated by the regulatory version of AERMOD with the PRIME downwash algorithm.

The Reconsideration Request submitted by Coal Creek and BAF also presented results from what was described as an updated version of PRIME2, submitted to EPA in July 2020 and currently still under review as an updated alpha method. Coal Creek indicated that maximum project impacts were only 0.19 $\mu g/m^3$ when using the updated PRIME2 algorithm, which is below the 0.2 $\mu g/m^3$ SIL. DEQ did not verify results from use of the updated PRIME2 algorithm.

4.2.4 Comparison with Pre-Revision Impacts

The proposed revision of the Line C-8 project involved an increase in allowable emissions from the Pre-Dryer and an increase in the Pre-Dryer stack NND from 60 feet to 86 feet. Table 7 compares the pre-revision analyses to the post-revision analyses for those receptors showing an impact over the 0.2 $\mu g/m^3$ SIL in the revised project analysis. Release parameters and horizontal coordinates of the release point for both the pre- and post-revision case were based on recent data from source testing and as-built coordinates. Pre-revision emissions were modeled as negative values and post-revision emissions were modeled as positive values; therefore, negative results indicate a net reduction in impacts.

Results indicate a net air quality benefit in the area where regulatory modeled project annual $PM_{2.5}$ impacts exceeded the SIL. The smallest net reduction in impact was 0.00051 $\mu g/m^3$; and this value was at a receptor that had a total project impact below the SIL, but it was conservatively included in the comparison analysis.

Table 10. COMPARISON OF PRE- AND POST-REVISION PARAMETERS AND RESULTS

Parameter	Pre-Revision Value	Post-Revision Value
Pre-Dryer NND horizontal coordinates (meters)	387746 E, 4784027 N	
Scrubber NNG horizontal coordinates (meters)	387722 E, 4784018 N	
Pre-Dryer NND stack height (meters [feet])	18.3 (60)	26.2 (86)
Receptors showing a net increase in impacts resulting from revisions	zero	

4.2.4 Potential for Public Exposure

The area where modeled project impacts exceed the 0.2 $\mu g/m^3$ SIL is a small strip of land between the facility ambient air boundary and U.S. Highway 26. There is little potential for public exposure to unacceptably high annual $PM_{2.5}$ impacts since there are no businesses or residences in this area, although there is a residential area immediately west of this area.

4.2.5 Conclusion to Weight-of-Evidence Analysis

Considering the supplemental considerations put forth in a weight-of-evidence analysis, DEQ determined that Coal Creek and BAF have adequately demonstrated that the revised BAF Line C-8 project will not cause or significantly contribute to a violation of a NAAQS. This is based on the following:

1. All impacts are below the 0.3 $\mu g/m^3$ upper limit of the annual $PM_{2.5}$ SIL; however, there is a small area where impacts exceed the 0.2 $\mu g/m^3$ SIL value recommended in EPA guidance.

2. Conservative emission estimates were used in the regulatory modeling, using allowable production rates and an emission factor generated from the maximum of three source tests. When emissions area based on the most-recent source test, the emission rate is only about 73 percent of the value used in the regulatory modeling.

3. Wind tunnel analyses of the facility have shown that downwash algorithms in the current regulatory modeling platform likely result in substantial overestimation of impacts. Alpha methods to better account for downwash effects also show substantially lower impacts than the regulatory option method.

4. The revised project, with an increased stack height, shows lower impacts than the original project at those receptors where impacts exceed the 0.2 $\mu g/m^3$ SIL.

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ air impact analyses, demonstrated to DEQ's satisfaction that emissions from the will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

References

1. *Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program*. U.S. EPA. Office of Air Quality Planning and Standards. Guidance memorandum from Peter Tsirigotis, Director, to Regional Air Division Directors, Regions 1-10. April 17, 2018.

2. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

3. *State of Idaho Guideline for Performing Air Quality Impact Analyses*. Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at https://www.deq.idaho.gov/permits/air-quality-permitting.

4. *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard*. Office of Air Quality Planning and Standards. Air Quality Modeling Group. Research Triangle Park, NC. Guidance memorandum from R. Chris Owen and Roger Brode to Regional Dispersion Modeling Contacts. September 30, 2014.

5. https://www.cppwind.com/bpip-diagnostic-tool/#/

APPENDIX C – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company:	**Blackfoot Facility of Basic American Foods**
Address:	**415 West Collins Road**
City:	**Blackfoot**
State:	**ID**
Zip Code:	**83221**
Facility Contact:	**Steve Brokett**
Title:	**Idaho Campus Environmental Manager**
AIRS No.:	**011-00012**

N	Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
Y	Did this permit require engineering analysis? Y/N
N	Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM10	0.9	0	0.9
VOC	0.0	0	0.0
Total:	0.0	0	**0.9**
Fee Due	**$ 1,000.00**		

Comments: