Statement of Basis
Concrete Batch Plant General Permit

Permit to Construct No. P-2015.0005
Project ID 61471

Sunroc dba Clements Concrete - 00548
Boise, Idaho

Facility ID 777-00548

Final

July 30, 2020
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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

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BRC	below regulatory concern for criteria pollutants as provided in IDAPA 58.01.01.221.01 or for TAP as provided in IDAPA 58.01.01.223.01
Btu	British thermal units
CAA	Clean Air Act
CBP	concrete batch plant
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CMS	continuous monitoring systems
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
hr/yr	hours per consecutive 12-calendar-month period
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
lb/qtr	pound per quarter
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
PAH	polycyclic aromatic hydrocarbons
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
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
PW	process weight rate
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
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/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
TEQ	toxicity equivalent
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
yd^3/yr	cubic yards per consecutive 12-calendar-month period
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Sunroc dba Clements Concrete is a portable central mix concrete batch plant consisting of aggregate stockpiles, a cement storage silo, a cement supplement (flyash) storage silo, a weigh batcher, and conveyors. The facility combines aggregate, sand, fly ash and cement and then transfers the mixture into a central drum mixer along with water for stationary mixing of the concrete. When using a central mix drum, concrete is transferred to trucks for transport off-site. In addition, a water heater is used to heat the water in cold weather prior to use for the mixing of concrete.

The concrete batch plant will be fed a mixture of aggregates from a collocated crusher. The rock crusher will be permitted independently from the concrete batch plant. In the case of collocation of a concrete batch plant with an additional rock crushing plant (secondary to the one rock crushing plant allowed by the permit), the modeling completed by DEQ requires a minimum separation distance of 1,000 ft.

The process begins with materials being fed via front end loader to a compartment bin feeder system and then dispensed in metered proportions to a collecting conveyor. The material will pass over a scalping screen before being conveyed into the central drum mixer.

Particulate emissions will be controlled by maintaining the moisture content at 1.5% by weight for all ¼ in and smaller aggregate feed materials via water sprays. In addition, all particulate emissions from the central drum mixer will be collected and vented to a high efficiency baghouse with a minimum control efficiency of 99% as proposed by the applicant.

The applicant has proposed concrete production rate throughput limits of 366 cubic yards per hour (yd^3/hr), 2,500 cubic yards per day (yd^3/day), and 350,000 cubic yards per year (yd^3/year).

The applicant has proposed that line power from the local power grid will be used at the facility, and a backup PTC-exempt electrical emergency generator engine may be used on occasion only for emergency purposes. Therefore, no requirements for engines were included in the permit.

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).

June 4, 2015	P-2015.0005 Project 61471, initial general permit for concrete batch plant (CBP), permit status active (A), but will become superseded (S) upon issuance of this permit.

Application Scope

This PTC is for a minor modification at an existing minor facility. The applicant has proposed an increase in annual concrete production from 250,000 cubic yards (yd^3) to 350,000 yd^3, and to rely on the use of sprinkler system in lieu of spray bar control equipment. (Use of an emergency generator engine referenced in the application was addressed separately by Project 62442.)

Application Chronology

April 9, 2020	DEQ received an application and an application fee.
April 15 – 30, 2020	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
May 4, 2020	DEQ received the PTC processing fee.
May 8, 2020	DEQ determined that the application was complete.
June 12, 2020	DEQ made available the draft permit and statement of basis for peer and regional office review.

June 19, 2020	DEQ made available the draft permit and statement of basis for applicant review.
July 7, 2020	DEQ received comments from the applicant regarding the draft permit.
July 24, 2020	DEQ provided an updated draft permit to the applicant.
July 30, 2020	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Source	Control Equipment
Materials Handling	Material Transfer Points Materials handling Concrete aggregate transfers Truck unloading of aggregate Aggregate conveyor transfers Aggregate handling	Maintaining the moisture content in ¼" or smaller aggregate material at 1.5% by weight, from wash plant process supplemented by stockpile sprinklers, or other controls
Concrete Mixer	Concrete Batch Plant – Central Mix Manufacturer: Erie Strayer Model: MG - 11C Manufacture Date: 2009 Maximum capacity: 366 cy/hr Maximum production: 2,500 cy/day and 350,000 cy/yr	Cement Storage Silo Baghouse No. 1 [(a)] Manufacturer: R&S RAB - 1700 Model: RAB - 1700 Cement Supplement Storage Silo Flyash Baghouse No. 2 [(a)] Manufacturer: R&S RAB - 1700 Model: RAB - 1700 Weigh Batcher Baghouse Manufacturer: R&S RAB - 1700 Model: RAB - 1700 $PM_{10}/PM_{2.5}$ control efficiency: 99% Central Load-Out $PM_{10}/PM_{2.5}$ control efficiency: 99% routed to baghouse Material Transfer Point $PM_{10}/PM_{2.5}$ control efficiency: 75%
Water Heater	Water Heater Manufacturer: Kemco Direct Contact Model: RM99 Maximum Rating: 9.9 MMBtu/hr Fuel: LPG or natural gas Maximum Fuel Usage: 363,541 gal/yr Operating Hours: 24 hr/day, 2200 hr/yr	No control devices

a) The storage silo baghouses are process equipment, as they are part of the physical and operational design of the silos; therefore, the potential to emit does not have to be federally enforceable when calculating PTE from the silos. PM_{10} controlled emission factors were used when determining PTE and for modeling purposes.

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 concrete batch plant operations at the facility associated with this proposed project using the DEQ developed CBP EI spreadsheet (see Appendix A). Emissions estimates of criteria pollutant PTE were based on the following assumptions:

- Maximum concrete throughput does not exceed 2,500 yd^3/day and 350,000 yd^3/yr.
- Baghouse/cartridge filter control efficiencies were assumed to be 99.0%.
- Fugitive emissions of particulate matter (PM), PM_{10}, and $PM_{2.5}$ from the concrete batch plant material transfer points were assumed to be controlled by sprinklers or an equivalent method that reduce PM emissions by an estimated 75%. The assumed 75% control efficiency is based on the Western Regional Air Partnership Fugitive Dust Handbook. According to the Handbook, water suppressant of material handling can range from 50-90% control. Assuming the average of 70% and including another 5% due to Best Management Practices required by the permit allow for 75% control to be a conservative estimate.
- Aggregate is washed before delivery to the concrete batch plant site, and water is used on-site to control the temperature of the aggregate. Particulate matter and PM_{10} emissions from the weigh batcher transfer point are controlled by a baghouse/cartridge filter, and central mix load-out emissions are controlled by a baghouse. Capture efficiency of the truck mix load-out baghouse or equivalent was estimated at 99%.
- Controlled emissions of particulate toxic air pollutants (TAPs) were estimated based on the presence of bin vent filters/baghouse controlling emissions from the cement/cement supplement silos, a baghouse controlling emissions from the weigh batcher, and 99% control for truck load-out emissions. Hexavalent chromium content was estimated at 20% of total chromium for cement, and 30% of total chromium for the cement supplement/fly ash. The hexavalent chromium percentages were taken from a University of North Dakota study, by the Energy and Environmental Research Center, Center for Air Toxic Metals. Detailed emissions calculations can be found in Appendix A of this document.
- Determining emissions from a concrete batch plant also includes transfer emissions from the number of drop points throughout the process. The PM_{10} emissions from central-mix loading operations are defined by an equation which includes the wind speed at each drop point and the moisture content of cement and cement supplement and a number of exponents and constants defined by AP-42 Equation 11.12-2 (6/06). An average value of wind speed and moisture content are 7 mph, 4.17%, and 1.77%, respectively[1]. The following equation of particulate emissions is specific to PM_{10}. The resulting emissions were used to determine a factor to help evaluate wind speed variations in AERMOD modeling.

[1] 7 mph was the average wind speed obtained from an average of 19 Idaho airports throughout the state from 1996-2006. This data is from the Western Regional Climate Center (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#IDAHO). 4.17 % and 1.77% were the average percentages for sand and aggregate respectively. These values are based on EPA tests conducted at Cheney Enterprises. The percentages used in AP-42 are typical for most concrete batching operations.

- The second transfer emissions calculations were used to determine conveyor emissions. For both coarse and fine aggregate to a conveyor. It was assumed that 82%, which for this facility is 300 yd^3/hr (0.82 x 366 yd^3/hr), of the concrete produced was aggregate. This percentage was based on 1,865 lb coarse aggregate, 1,428 lb sand, 564 lb cement/supplement and 167 lb water for a total of 4,024 lb concrete as defined by AP-42 Table 11.12-5 (06/06). The fine and coarse aggregate contributions were separated into 36% and 46% of the total concrete production[2]. Employing emission factors from AP-42 Table 11.12-5 (6/06) for conveyor transfer and assuming 75% control efficiency as stated earlier for conveyor transfer PM_{10} emissions were calculated for each transfer point. For both fine and coarse aggregate, the facility has 2 transfer points.
- Emissions from a portable rock crusher were included in the emissions modeling analysis with the assumption that when the collocated rock crusher is operating, the concrete batch plant is operating at its maximum capacity.
- Any emissions unit outside a 1,000 ft radius from the concrete batch plant was not included in the emissions modeling analysis for this project.

Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined 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 **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

The uncontrolled Potential to Emit is used to determine if a facility is a "Synthetic Minor" source of emissions. Synthetic Minor sources are facilities that have an uncontrolled Potential to Emit for regulated air pollutants or HAP above the applicable Major Source threshold without permit limits.

The following table presents the uncontrolled Potential to Emit for regulated air pollutants from all emissions units at the facility as determined by DEQ staff using the DEQ Concrete Batch Plant EI spreadsheet. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this operation uncontrolled Potential to Emit is calculated with 0% control efficiency for the Concrete Batch Plant itself.

Table 2 UNCONTROLLED POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$	SO_2	NO_x	CO	VOC
	T/yr	T/yr	T/yr	T/yr	T/yr
Point Sources					
Concrete batch plant[(a)]	0.74	0.00	0.00	0.00	0.00
Boiler	0.15	0.27	2.73	1.53	0.20
Total, Point Sources	**0.89**	**0.27**	**2.73**	**1.53**	**0.20**

a) $PM_{10}/PM_{2.5}$ emissions from the concrete batch plant are considered "fugitive emissions" and therefore are not included in the Potential to Emit.

The following table presents the controlled Potential to Emit for HAP pollutants from all emissions units at the facility as determined by DEQ staff using the DEQ Concrete Batch Plant EI spreadsheet. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this operation uncontrolled Potential to Emit is calculated with 0% control efficiency for the Concrete Batch Plant itself.

[2] The percentages of coarse and fine aggregate are based on the AP-42 concrete composition. One cubic yard of concrete as defined by AP-42 is 4024 total pounds. Similarly, coarse aggregate is 1865 pounds or 46% of the total and sand (fine) aggregate is 1428 pounds or 36%.

Table 3 CONTROLLED POTENTIAL TO EMIT FOR HAZARDOUS AIR POLLUTANTS

IDAPA Listing	Hazardous Air Pollutants	PTE (lb/hr)	PTE (T/yr)
585	Chromium metal (II and III)	1.14E-04	0.000499
	Manganese as Mn (fume)	9.67E-05	0.000424
	Phosphorous	3.39E-04	0.001485
	Selenium	9.67E-07	0.000004
586	Arsenic	2.24E-05	0.000098
	Beryllium and compounds	1.25E-06	0.000005
	Cadmium and compounds	2.10E-05	0.000092
	Chromium (VI)	5.72E-06	0.000025
	Nickel	3.76E-05	0.000165
	Total	**0.0102**	**0.0096**

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.

This is an existing facility. However, since this is a general permit for facility-wide emissions, pre-project emissions were conservatively set to zero for all criteria pollutants.

Table 4 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Concrete batch plant	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boiler	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pre-Project Totals	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

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 as determined by DEQ staff using the DEQ Concrete Batch Plant EI spreadsheet. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 5 POST-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Concrete batch plant	0.271	0.053	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boiler	0.087	0.199	0.16	0.27	1.62	2.73	0.91	1.53	0.12	0.20
Post Project Totals	**0.36**	**0.25**	**0.16**	**0.27**	**1.62**	**2.73**	**0.91**	**1.53**	**0.12**	**0.20**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

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 6 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_x		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Post-Project Potential to Emit	0.36	0.25	0.16	0.27	1.62	2.73	0.91	1.53	0.12	0.20
Changes in Potential to Emit	**0.36**	**0.25**	**0.16**	**0.27**	**1.62**	**2.73**	**0.91**	**1.53**	**0.12**	**0.20**
BRC thresholds [a]		1.0		4.0		4.0		10.0		4.0

a) Potential emission rates are considered "below regulatory concern" (BRC) for criteria pollutants when less than 10% of significant emission rates as defined in IDAPA 58.01.01.006.

Non-Carcinogenic TAP Emissions

Because this project only authorizes an increase in annual emissions, and daily throughput limits remain the same, emissions of non-carcinogenic TAP are not expected to increase as a result of this project.

Carcinogenic TAP Emissions

Post-project and the change in carcinogenic TAP emissions are presented in the following table:

Table 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Post-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Arsenic	2.44E-06	1.5E-06	Yes
Beryllium and compounds	1.37E-07	2.8E-05	No
Cadmium and compounds	2.30E-06	3.7E-06	No
Chromium (VI)	6.25E-07	5.6E-07	Yes
Nickel	4.10E-6	2.7E-05	No

Some of the PTE for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling was required for arsenic and chromium (VI) because the annual average carcinogenic screening EL identified in IDAPA 58.01.01.586 were exceeded.

Post-Project HAP Emissions

The following table presents the post project potential to emit for HAP pollutants from all emissions units at the facility as submitted by the applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 8 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

IDAPA Listing	Hazardous Air Pollutants	PTE (lb/hr)	PTE (T/yr)
585	Chromium metal (II and III)	3.24E-05	0.000015
	Hexane	1.75E-02	0.029351
	Manganese as Mn (fume)	2.75E-05	0.000013
	Phosphorous	9.65E-05	0.000046
	Selenium	2.75E-07	0.000000
586	Arsenic	2.44E-06	0.000001
	Beryllium and compounds	1.37E-07	0.000000
	Cadmium and compounds	2.30E-06	0.000001
	Chromium (VI)	6.25E-07	0.000000
	Nickel	4.10E-6	0.000002
	Total	**0.02**	**0.03**

The estimated PTE for all federally listed HAPs combined is below 25 T/yr and no PTE for a federally listed HAP exceeds 10 T/yr. Therefore, this facility is not a Major Source for HAPs.

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of arsenic and chromium (VI) TAP from this project exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline.[3] Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix B.

An ambient air quality impact analysis 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).

As a result of the ambient air quality impact analysis, as well as information submitted by the applicant for specific operating scenarios, the following conditions (along with corresponding monitoring and record keeping requirements) were placed in the permit:

- the Emissions Limits permit condition,
- the Concrete Production Limits permit condition, and
- the Concrete Operation Setback Distance Requirements permit condition

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Ada County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

This modeling analysis for this facility demonstrates compliance with applicable standards in attainment areas. However, because a separate modeling analysis was not provided to demonstrate compliance with applicable standards in non-attainment areas, this portable facility is not permitted for operation in non-attainment areas. This requirement is assured by Permit Condition 2.6.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

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[3] Criteria pollutant thresholds in Table 1, State of Idaho Air Quality Modeling Guideline, Doc ID AQ-011, rev. 1, December 31, 2002.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 9 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	0.89	0.25	**100**	
PM_{10}	0.89	0.25	**100**	
$PM_{2.5}$	0.89	0.25	**100**	
SO_2	0.27	0.27	**100**	
NO_x	2.73	2.73	**100**	
CO	1.53	1.53	**100**	
VOC	0.20	0.20	**100**	
HAP (single)	0.0053	0.0015	**10**	
Total HAPs	0.0342	0.0096	**25**	

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 the proposed modified emissions source. 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.

Registration Procedures and Requirements for Portable Equipment (IDAPA 58.01.01.500)

IDAPA 58.01.01.500…….. Registration Procedures and Requirements for Portable Equipment

Section 01 requires that all existing portable equipment shall be registered within ninety (90) days after the original effective date of this Section 500 and at least ten (10) days prior to relocating, using forms provided by the Department, except that no registration is required for mobile internal combustion engines, marine installations and locomotives. This requirement is assured by Permit Condition 2.5.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625……Visible Emissions

The sources of PM_{10} emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 3.4.

Fugitive Emissions (IDAPA 58.01.01.650)

IDAPA 58.01.01.650…….. Rules for the Control of Fugitive Emissions

The sources of fugitive emissions at this facility are subject to the State of Idaho fugitive emissions standards. These requirements are assured by Permit Conditions 2.1, 2.2, and 2.8.

Standards for New Sources (IDAPA 58.01.01.677)

IDAPA 58.01.01.677……Standards for Minor and Existing Sources

The fuel burning equipment located at this facility, with a maximum rated input of less than ten (10) million BTU per hour, are subject to a particulate matter limitation of 0.015 gr/dscf of effluent gas corrected to 3% oxygen by volume when combusting gaseous fuels. Fuel-Burning Equipment is defined as any furnace, boiler, apparatus, stack and all appurtenances thereto, used in the process of burning fuel for the primary purpose of producing heat or power by indirect heat transfer. This requirement is assured by burning only LPG or natural gas in the water heater and is assured by Permit Conditions 3.5 and 3.12.

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 four 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; $E = 1.10 (PW)^{0.25}$

For equipment that commenced prior to October 1, 1979, the PM allowable emission rate is based on one of the following equations:

- IDAPA 58.01.01.702.01.a: If PW is < 17,000 lb/hr; $E = 0.045 (PW)^{0.60}$
- IDAPA 58.01.01.702.01.b: If PW is ≥ 17,000 lb/hr; $E = 1.12 (PW)^{0.27}$

As discussed previously in the Emissions Inventory Section, concrete has a density of 4,024 lb per cubic yard. Thus, for the new Concrete Batch Plant proposed to be installed as a result of this project with a proposed

throughput of 366 yd^3/hr, E is calculated as follows:

- Proposed throughput = 4,024 lb per cubic yard x 366 yd^3/hr = 1,472,784 lb/hr

Therefore, E is calculated as:

- $E = 1.10 \times PW^{0.25} = 1.10 \times (1{,}472{,}784)^{0.25} = 38.32$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 0.36 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 0.72 lb-PM/hr (0.36 lb-PM_{10}/hr ÷ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

Rules for Control of Odors (IDAPA 58.01.01.775)

IDAPA 58.01.01.750…… Rules for Control of Odors

Section 776.01 states that no person shall allow, suffer, cause, or permit the emission of odorous gases, liquids, or solids into the atmosphere in such quantities as to cause air pollution. These requirements are assured by Permit Conditions 2.7 and 2.10.

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 do not have a potential to emit greater than 100 tons per year for all criteria pollutants or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

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

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. In accordance with 40 CFR 52.21(a)(2), PSD requirements are therefore not applicable to this permitting action. The facility is/is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

New Source Performance Standards (NSPS) requirements from 40 CFR Part 60 have not been incorporated into the general permit. The permittee requested flexibility to bring a rental and/or portable emergency generator engine onsite, and sufficient information was not currently available to determine NSPS applicability for incorporation into the permit.

The PTC-exempt backup emergency generator engine may be subject to NSPS and/or NESHAP area source MACT. Although specific NSPS and/or NESHAP requirements have not been incorporated into this permit, compliance with all applicable NSPS and NESHAP requirements is still required. Although explicit requirements were not incorporated, NSPS and NESHAP incorporation by reference was included as Permit Condition 3.19.

Because the facility may have an emergency generator engine, this source may be subject to one or more of the following:

- 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)
- 40 CFR 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

NESHAP Applicability (40 CFR 61)

The facility is not subject to any National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements in 40 CFR 61.

MACT Applicability (40 CFR 63)

Maximum Available Control Technology (MACT) requirements from 40 CFR Part 63 have not been incorporated into the general permit. The permittee requested flexibility to bring a rental and/or portable emergency generator engine onsite, and sufficient information was not currently available to determine NESHAP MACT applicability for incorporation into the permit.

The PTC-exempt backup emergency generator engine may be subject to NSPS and/or NESHAP area source MACT. Although specific NSPS and/or NESHAP requirements have not been incorporated into this permit, compliance with all applicable NSPS and NESHAP requirements is still required. Although explicit requirements were not incorporated, NSPS and NESHAP incorporation by reference was included as Permit Condition 3.19.

Because the facility may have an emergency generator engine, this source may be subject to one or more of the following:

- 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)
- 40 CFR 63, Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Permit Conditions Review

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

Permit Conditions 1.1 through 1.4 establish the permit to construct scope, provide a description of the purpose of the permit and the regulated sources and control devices used at the facility.

FACILITY-WIDE CONDITIONS

As discussed previously, Permit Conditions 2.1 and 2.2 establish that the permittee shall take all reasonable precautions and use best management practices to prevent fugitive particulate matter (PM) from becoming airborne and provides examples of the controls in accordance with IDAPA 58.01.01.650-651.

As discussed previously, Permit Condition 2.3 establishes that the concrete batch plant shall employ efficient fugitive dust controls and provides examples of the controls in accordance with IDAPA 58.01.01.808.01 and 808.02.

Permit Condition 2.4 establishes that the concrete batch plant may collocate with one rock crushing plant and shall not locate with 1,000 ft. of another rock crushing plant or a concrete batch plant as requested by the Applicant.

As discussed previously, Permit Condition 2.5 establishes that the permittee notify DEQ when the permitted portable equipment is relocated. This requirement is based upon imposing reasonable permit conditions for portable concrete batch plants.

Permit Condition 2.6 establishes a restriction on locating the portable concrete batch plant to non-attainment areas. The location restrictions are based upon parameters used during the ambient air quality modeling analysis performed for this project.

As discussed previously, Permit Condition 2.7 establishes that there are to be no emissions of odorous gases, liquids, or solids from the permit equipment into the atmosphere in such quantities that cause air pollution.

As discussed previously, Permit Condition 2.8 establishes that the permittee shall monitor fugitive dust emissions on a daily basis to demonstrate compliance with the facility-wide permit requirements.

Permit Condition 2.9 establishes that the permittee measure and record the distances to equipment that will be collocated with the concrete batch plant to demonstrate compliance with the Collocation Restrictions permit condition.

As discussed previously, Permit Condition 2.10 establishes that the permittee monitor and record odor complaints to demonstrate compliance with the facility-wide permit requirements.

Permit Condition 2.11 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

CONCRETE BATCH PLANT EQUIPMENT

Permit Conditions 3.1 and 3.2 provide a description of the concrete production process equipment and control devices used at this facility.

Permit Condition 3.3 establishes hourly and annual emissions limits for $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, and VOC emissions from the concrete production operation at this facility.

As discussed previously, Permit Condition 3.4 establishes a 20% opacity limit for the concrete batch plant baghouse and the boiler stacks or functionally equivalent openings associated with the concrete production operation.

Permit Condition 3.5 incorporates PM limits for fuel-burning equipment in accordance with IDAPA 58.01.01.676.

Permit Condition 3.6 establishes a daily and annual concrete production limit for the concrete production operation as proposed by the applicant.

Permit Condition 3.7 establishes setback distance restrictions for the concrete production operation when the IC engines are operating and not operating. The setback distance restrictions are based upon the results of the Ambient Air Quality Modeling Analysis performed for this project.

Permit Condition 3.8 requires that the applicant employ a baghouse filter to control emissions from the weigh batcher loadout operation as proposed by the applicant.

Permit Condition 3.9 requires that the applicant employ a baghouse to control emissions from the central loadout operation as proposed by the applicant.

Permit Condition 3.10 requires that the applicant employ a baghouse to control emissions from the fly ash silo operation as proposed by the applicant.

Permit Condition 3.11 requires that the applicant employ industry-specific water sprays on material transfer points and an aggregate bin enclosure to control fugitive emissions as proposed by the applicant.

Permit Conditions 3.12 and 3.13 establish specifications for the type of fuel combusted in the water heater and an annual operational limit to limit emissions from the water heater.

Permit Condition 3.14 establishes that the permittee monitor and record hourly and daily concrete production to demonstrate compliance with the Concrete Production Limits permit condition.

Permit Condition 3.15 establishes that the permittee measure and record concrete production equipment setback distances to demonstrate compliance with operating permit requirements.

Permit Condition 3.16 establishes that the permittee shall establish procedures for operating the weigh batcher and central loadout baghouses. This is a DEQ imposed standard requirement for operations using baghouses to control particulate emissions.

Permit Condition 3.17 establishes that the permittee shall record hours of operation of the water heater to demonstrate compliance with the Water Heater Operation permit requirement.

Permit Condition 3.18 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Permit Condition 3.19 establishes that the federal requirements of NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines and NESHAP Subpart ZZZZ – National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines are incorporated by reference into this permit per current DEQ guidance. This language was included because a backup emergency generator engine subject to such requirements may be operated onsite (Project 62442). Explicit requirements were not incorporated because specific make and model information is not known (rental equipment may be used and applicable requirements could therefore change) and explicit permit requirements are not required for PTC-exempt sources.

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. During this time, there were no comments on the application and there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Final Concrete Batch Plant Emissions Inventory

Listed Below are the emissions estimates for the units selected.

Company:	**Sunroc dba Clements Concrete 00548**
Facility ID:	**777-00548**
Permit No.:	**P-2015.0005 Project 62428**
Source Type:	**Portable/Staionary Concrete Batch Plant**
Manufacturer/Model:	**Erie Strayer**

Production

Maximum Hourly Production Rate:	366	cy/hr
Proposed Daily Production Rate:	2500	cy/day
Proposed Maximum Annual Production Rate:	350000	cy/year

Tons/year

Emissions Units		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs	CO_2e
CBP Type:	**Central Mix**	0.015	0.05	NA	NA	NA	NA	3.47E-05		N/A
Water Heater #1:	**9.9 MMBtu/hr Propane Heater**	0.145	0.145	2.69E-01	2.727	1.527	0.200	0.00E+00		1745
Water Heater #2:	**No water heater**	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00		0
Small Diesel Engine(s) *:	**No Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA		0
Large Diesel Engine *:	**No Large Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA		0
	Annual Totals (T/yr)	**0.16**	**0.20**	**2.69E-01**	**2.73**	**1.53**	**0.20**	**3.47E-05**	**1.22E-04**	**1745**

Pounds/hour

		$PM_{2.5}$	PM_{10}	SO_2	NO_x	CO	VOC	Lead	THAPs
CBP Type:	**Central Mix**	0.034	0.08	NA	NA	NA	NA	8.32E-06	
Water Heater #1:	**9.9 MMBtu/hr Propane Heater**	0.087	0.087	1.60E-01	1.623	0.909	0.119	0.00E+00	
Water Heater #2:	**No water heater**	0.000	0.000	0.00E+00	0.000	0.000	0.000	0.00E+00	
Small Diesel Engine(s) *:	**No Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA	
Large Diesel Engine*:	**No Large Engine**	0.00	0.00	0.00E+00	0.00	0.00	0.00	NA	
	Daily Totals (lb/hr)	**0.12**	**0.16**	**1.60E-01**	**1.62**	**0.91**	**0.12**	**8.32E-06**	**1.66E-04**

* The Large engine may run : **There is no large engine.** hr/yr
* The Small engine(s) may run : **There is no small engine.** hr/yr

HAPS & TAPS Emissions Inventory

Metals	HAP	TAP	lb/hr	T/yr	Averaging Period	EL lb/hr	Exceeded?
Arsenic	X	X	**2.44E-06**	**1.07E-05**	Annual	1.50E-06	**Yes**
Barium		X	**0.00E+00**	**0.00E+00**	24-hour	3.30E-02	**No**
Beryllium	X	X	**1.37E-07**	**5.98E-07**	Annual	2.80E-05	**No**
Cadmium	X	X	**2.30E-06**	**1.01E-05**	Annual	3.70E-06	**No**
Cobalt	X	X	**0.00E+00**	**0.00E+00**	24-hour	3.30E-03	**No**
Copper		X	**0.00E+00**	**0.00E+00**	24-hour	1.30E-02	**No**
Chromium	X	X	**3.24E-05**	**9.74E-06**	24-hour	3.30E-02	**No**
Manganese	X	X	**2.75E-05**	**3.69E-05**	24-hour	3.33E-01	**No**
Mercury	X	X	**0.00E+00**	**0.00E+00**	24-hour	N/A	**No**
Molybdenum (soluble)		X	**0.00E+00**	**0.00E+00**	24-hour	3.33E-01	**No**
Nickel	X	X	**4.10E-06**	**1.80E-05**	Annual	2.70E-05	**No**
Phosphorus	X	X	**9.65E-05**	**3.26E-05**	24-hour	7.00E-03	**No**
Selenium	X	X	**2.75E-07**	**4.62E-07**	24-hour	1.30E-02	**No**
Vanadium		X	**0.00E+00**	**0.00E+00**	24-hour	3.00E-03	**No**
Zinc		X	**0.00E+00**	**0.00E+00**	24-hour	6.67E-01	**No**
Chromium VI	X	X	**6.25E-07**	**2.74E-06**	Annual	5.60E-07	**Yes**
Non PAH Organic Compunds							
Pentane		X	**0.00E+00**	**0.00E+00**	24-hour	118	**No**
Methyl Ethyl Ketone	X	X	**0.00E+00**	**0.00E+00**	24-hour	39.3	**No**
Non-PAH HAPs							
Acetaldehyde	X	X	**0.00E+00**	**0.00E+00**	Annual	3.00E-03	**No**
Acrolein	X	X	**0.00E+00**	**0.00E+00**	24-hour	1.70E-02	**No**
Benzene	X	X	**0.00E+00**	**0.00E+00**	Annual	8.00E-04	**No**
1,3 - Butadiene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.40E-05	**No**
Ethyl Benzene	X	X	**0.00E+00**	**0.00E+00**	24-hour	29	**No**
Formaldehyde	X	X	**0.00E+00**	**0.00E+00**	Annual	5.10E-04	**No**
Hexane	X	X	**0.00E+00**	**0.00E+00**	24-hour	12	**No**
Methyl Chloroform	X	X	**0.00E+00**	**0.00E+00**	24-hour	127	**No**
Propionaldehyde	X	X	**0.00E+00**	**0.00E+00**	24-hour	2.87E-02	**No**
Quinone	X	X	**0.00E+00**	**0.00E+00**	24-hour	2.70E-02	**No**
Toluene	X	X	**0.00E+00**	**0.00E+00**	24-hour	25	**No**
o-Xylene	X	X	**0.00E+00**	**0.00E+00**	24-hour	29	**No**
PAH HAPs							
2-Methylnaphthalene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
3-Methylcholanthrene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.50E-06	**No**
7,12-Dimethylbenz(a)anthracene	X		**0.00E+00**	**0.00E+00**	N/A	N/A	**N/A**
Acenaphthene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Acenaphthylene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Anthracene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Benzo(a)anthracene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Benzo(a)pyrene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**
Benzo(b)fluoranthene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**
Benzo(e)pyrene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**
Benzo(g,h,i)perylene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Benzo(k)fluoranthene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**
Chrysene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**
Dibenzo(a,h)anthracene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**
Dichlorobenzene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Fluoranthene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Fluorene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Indeno(1,2,3-cd)pyrene	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**
Naphthalene (24-hour)	X	X	**0.00E+00**	**0.00E+00**	24-hour	3.33	**No**
Naphthalene (Annual)	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Perylene	X		**0.00E+00**	**0.00E+00**	N/A	N/A	**N/A**
Phenanathrene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
Pyrene	X	X	**0.00E+00**	**0.00E+00**	Annual	9.10E-05	**No**
PAH HAPs Total	X	X	**0.00E+00**		Annual	2.00E-06	**No**
Polycyclic Organic Matter (POM)	X	X	**0.00E+00**	**0.00E+00**	Annual	2.00E-06	**No**

Total HAPs Emissions (lb/hr) and (T/yr): 1.66E-04 1.22E-04

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

M E M O R A N D U M

DATE: May 22, 2020

TO: Morrie Lewis, Permit Writer, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT: P-2015.0005 PROJ 62428, Permit to Construct (PTC) for Sunroc Corporation portable Concrete Batch Plant.

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
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
BPIP	Building Profile Input Program
BRC	below regulatory concern
CBP	Concrete Batch Plant
CFR	Code of Federal Regulations
CO	Carbon Monoxide
cy	cubic yards
DEQ	Idaho Department of Environmental Quality
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
hr	hours
IC	internal combustion
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
m	meters
m/sec	meters per second
NAAQS	National Ambient Air Quality Standards
NO	nitrogen oxide
NO_2	nitrogen dioxide
NOx	oxides of nitrogen
O_3	ozone
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 million
PRIME	Plume Rise Model Enhancement
PTC	Permit to Construct
PTE	potential to emit
SIL	significant impact level
SO_2	sulfur dioxide
SRC	Sunroc Corporation
TAP	toxic air pollutant
tpy	tons per year
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter of air

1.0 Summary

Sunroc Corporation (SRC) submitted a Permit to Construct (PTC) application to modify PTC P-2015.0005 for operations of their portable central mix concrete batch plant (CBP) plant in Idaho, currently located at 10988 Joplin Road, Boise. The proposed modification increases annual concrete production from 250,000 cubic yards per year (cy/year) to 350,000 cy/year. The application also proposes to change fugitive particulate control measures required by the existing permit.

Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03) requires that no permit be issued unless it is demonstrated that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment. This memorandum provides a summary of the applicable impact analysis requirements and a summary of those analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

DEQ review of submitted data and DEQ 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 facility 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.

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, in combination with DEQ's analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) 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) that predicted pollutant concentrations from emissions associated with the project as modeled, 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 emissions increases associated with the project will not result in increased emissions above ELs or 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 the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Summary of Submittals and Actions

- April 9, 2020: Application received by DEQ.
- April 15, 2020: Regulatory start date.
- May 8, 2020: Application determined complete by DEQ.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Setback from Ambient Air Boundary: A minimum 50-meter (164 feet) separation must be maintained between the baghouse exhaust release point and the nearest point of public access (generally the property boundary).	The applicable setback distance is necessary to assure compliance with applicable air quality standards at ambient air locations. Areas not under direct control of the permittee cannot be excluded from consideration as ambient air.
Allowable Production: Maximum concrete production does not exceed allowable rates of 366 cy/hour, 2,500 cy/day, and 350,000 cy/year. This project increased annual production	Pollutant impact analyses were performed using emissions based on these rates. These rates must not be exceeded.
Below Regulatory Concern for Criteria Pollutant Emissions: Maximum stationary, non-fugitive annual emissions of PM_{10}[a], $PM_{2.5}$[b], oxides of nitrogen (NOx), carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb) are below levels identified as below regulatory concern (BRC) as per Idaho Air Rules Section 221, and the project would be exempt from permitting if it were not for emissions of TAPs exceeding regulatory exemption criteria.	Idaho Air Rules Section 203.02, requiring air impact analyses demonstrating compliance with NAAQS, is not applicable to pollutants having a project-emissions increase that is less than BRC levels, provided the project would have qualified for a BRC permitting exemption except for the emissions levels of another criteria pollutant exceeding the ton/year BRC threshold.
Emission Controls: Impacts were calculated assuming that emissions from silo loading, the weigh batcher, and the central mixer were captured and vented through a baghouse.	Emission rates and modeled impacts would be substantially higher if any of these points are not controlled by a baghouse.
Release Parameters for Emission Points: Stack heights are no shorter than what is indicated in this memorandum. Other stack parameters of temperature, stack diameter, and flow rate were conservatively set to minimize dispersion.	Compliance with applicable air quality standards are not assured if the height of release is less than the modeled height of 73 feet.
Use of Generators to Power the Plant. The application did not include an option to operate the CBP with a generator powered by an internal combustion (IC) engine.	Including impacts from an IC engine in the analyses would likely increase required setback distances.

2.0 Background Information

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

2.1 Project Description, Proposed Location, and Area Classification

Permit P-2015.0005 is for operation of SRC's portable CBP. The proposed project is modification of SRC's PTC to increase allowable annual production from 250,000 cy/year to 350,000 cy/year. Proposed modifications also include changing required emission control measures for various fugitive particulate sources.

Pollutant-emitting processes conducted at the CBP include storage silo loading of cement and cement supplement, weigh batcher loading, mixer operations, operation of a propane boiler, and miscellaneous handling of aggregate materials.

2.2 Air Impact Analyses Required for All Permits to Construct

Criteria Pollutant and TAP Impact Analyses for a PTC are addressed in 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:

> ***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).*

2.3 Significant Impact Level and Cumulative NAAQS Impact Analyses

The 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 according to 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 emissions 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 facility-wide emissions, and emissions from any nearby co-contributing sources, 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.

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	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[r] (188 $\mu g/m^3$)	Mean of maximum 8th highest[s]
	Annual	1.0	100[t]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[t]	Maximum 1st highest[n]
	Quarterly	NA	1.5[t]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	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. 3-year mean of annual concentration. The NAAQS was revised from 15 $\mu g/m^3$ to12 $\mu g/m^3$ on December 14, 2012. However, this standard will not be applicable for permitting purposes in Idaho until it is incorporated by reference *sine die* into Idaho Air Rules (Spring 2014).
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 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.
r. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
s. 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.
t. Not to be exceeded in any calendar year.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

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. This evaluation is made specific to both time and space. As an example, consider a hypothetical case where the SIL analysis indicates the project (new source or modification) has impacts exceeding the SIL and the cumulative impact analysis indicates a violation of the NAAQS. If project-specific impacts are below the SIL at the specific receptors showing the violations during the times when modeled violations occurred, 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] (see Section 3.1.1 of this memorandum); 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.

2.4 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 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 emissions 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 emissions 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 analyses to demonstrate compliance with applicable air quality impact requirements.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the CBP were calculated by DEQ for various applicable averaging periods. DEQ's CBP emission calculation spreadsheet was used to calculate emissions for the facility, given the specified equipment and requested operational rates. DEQ air impact analyses assured that the estimated potential emissions rates were used properly in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

The proposed project only involves increasing the annual production rate. There are no physical modifications proposed for the CBP. DEQ performed the air impact analyses based on facility-wide emissions rather than the increment of impact resulting from the relaxation of the annual production restriction.

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

3.1.1 Criteria Pollutant Emissions Rates and Modeling Applicability

Exclusion of BRC Sources from NAAQS Compliance Demonstration Requirements

A criteria pollutant-specific NAAQS compliance demonstration may not be required where facility-wide potential to emit (PTE) values for that criteria pollutant would qualify for a BRC permit exemption as per Idaho Air Rules Section 221 (equal to 10 percent of the emissions defined as significant) if it were not for potential emissions of other criteria pollutants or TAPs. 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.[1]" The interpretation policy also states that the exemption criteria of uncontrolled 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 DEQ emission inventory asserts that facility-wide controlled PTE emissions of criteria pollutants are below BRC levels, as listed in Table 3. The only emissions considered in this calculation are non-fugitive emissions from the CBP plant, including: baghouse vent emissions from material storage silo loading, weigh batcher loading, and mixer operations and emissions from propane combustion in the boiler. Emissions from material handling of sand and aggregate are considered fugitive, and as such were excluded from permit-applicability PTE.

3.1.2 Toxic Air Pollutant Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed after July 1, 1995. Table 4 lists emission rates used in the TAP impact analyses performed for those TAPs with potential emissions exceeding the TAP-specific ELs.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY			
Criteria Pollutant	**BRC Level (ton/year)**	**Applicable Facility Wide PTE Emissions (ton/year)**	**Air Impact Analyses Required?**
PM_{10}[a]	1.5	0.3	No
$PM_{2.5}$[b]	1.0	0.2	No
Carbon Monoxide (CO)	10.0	1.5	No
Sulfur Dioxide (SO_2)	4.0	0.3	No
Nitrogen Oxides (NOx)	4.0	2.7	No
Lead (Pb)	0.06	3.3E-6	No
Ozone (as VOC)	4.0	0.2	No

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.

Table 4. TAP EMISSIONS USED IN DEQ ANALYSES		
Source	**TAP Emissions (lb/hr)[a]**	
	Arsenic[b]	**Chromium 6+[b]**
Cement silo filling[c]	4.16E-8	5.69E-8
Cement supplement silo filling[c]	1.46E-6	5.34E-7
Central mixing[c]	9.44E-7	3.41E-8
Total from baghouse silo vent[d]	2.44E-6	6.25E-7

a. Maximum annual emissions are used for carcinogenic TAPs listed in Idaho Air Rules Section 586, and maximum 24-hour emissions are used for noncarcinogenic TAPs listed in Idaho Air Rules Section 585.
b. Carcinogenic TAP. Pound/hour rates for annual averages were calculated by dividing the annual emissions by 8,760 hour/year of operation.
c. Emissions are collected from the source and vented through the silo baghouse vent.
d. Total emissions are the sum of emissions from cement silo filling, supplement silo filling, and central cement mixing.

3.1.3 Emissions Release Parameters

Table 5 provides emission release parameters used in the analyses for the CBP, including stack height, stack diameter, exhaust temperature, and exhaust velocity. Release parameters provided in the application were not well supported. The application indicated the emissions from silo filling, the weigh-batcher, and central mixing are completely captured, and vented through a single baghouse of the cement storage silo. To assure modeled impacts were reasonably conservative, DEQ modeled the silo baghouse vent as a capped release with an exhaust temperature equal to that of ambient air (as indicated for the specific hour modeled in the meteorological input data file). By modeling the source as a capped release at ambient temperature, both plume buoyancy and momentum are eliminated, thereby negating any plume rise effect of exhaust flow.

Table 5. HMA PLANT EMISSION RELEASE PARAMETERS						
Release Point/ Location	**Source Type**	**Release Orientation**	**Stack Height (m)[a]**	**Modeled Diameter (m)[a]**	**Stack Gas Temp. (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
SILO	Point	capped	22.3 (73 ft)	0.34 (1.13 ft)	0[d] (-460 ^oF)	32.9 (108 fps)

a. Meters. Values in parentheses are in feet.
b. Kelvin. Values in parentheses are in degrees Fahrenheit.
c. Meters per second. Values in parentheses are in feet/second.
d. Setting the temperature to 0 Kelvin triggers the model to set the exhaust temperature to the ambient air value in the meteorological data file for the specific hour modeled.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. Since a NAAQS compliance demonstration was not required for this project, with applicable facility-wide emissions below BRC levels, evaluating background concentrations was not necessary.

3.3 Impact Modeling Methodology

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

3.3.1 General Overview of Analyses

DEQ performed the project-specific air pollutant emissions inventory and air impact analyses based on information submitted from SRC and general knowledge of CBPs. The submitted information, 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.

The SRC CBP is a portable facility that may locate anywhere within Idaho. Therefore, site-specific data/characteristics used in air impact analyses, such as meteorological data, site layout, and terrain, cannot be represented as accurately as can be achieved for one fixed site. This increases the uncertainty in analytical results. DEQ used several methods to account for and offset this increased uncertainty, and these methods are described in subsequent sections of this memorandum. The general method used for portable sources was the following:

1. Use a polar receptor grid with the emission points located at the center in a conservatively tight grouping.

2. Run the model for numerous meteorological datasets, collected throughout Idaho.

3. For each model run and pollutant, identify the controlling receptor. The controlling receptor is the one just beyond (further from the emission points) the most distant receptor showing a concentration value over the applicable standard.

4. Determine the distance between the controlling receptor and the emission points for each model run.

5. The minimum setback requirement distance is the furthest distance between the controlling receptor and key emission points (the silo baghouse vent), considering all model runs.

6. Compliance with identified applicable standards is assured provided the CBP operates as described and the minimum setback between emission sources and the nearest point of ambient air is maintained.

Table 6 provides a brief description of parameters used in the modeling analyses.

Table 6. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Portable in Idaho	Air impact modeling was performed to determine a setback distance needed between emission sources and the nearest point of ambient air for any location where the CBP may locate.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	Multiple Areas	See Section 3.3.4 of this memorandum for additional details of the meteorological data.
Terrain	Not Considered	Flat terrain was assumed in the analyses.
Building Downwash	Considered	BPIP-PRIME was used to evaluate building/structure dimensions for consideration of downwash effects in AERMOD.
Receptor Grid	Polar Grid	Adequate to resolve maximum modeled impacts.

3.3.2 Modeling protocol and Methodology

A modeling protocol was not submitted to DEQ prior to the application because DEQ performed the required air impact analyses. Non-site-specific modeling was generally conducted using data and methods described in the *State of Idaho Air Quality Modeling Guideline*.[2]

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 40 CFR 51, Appendix W (Guideline on Air Quality Models). 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 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 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.

3.3.4 Meteorological Data

DEQ air impact analyses used processed meteorological data from numerous locations throughout Idaho. DEQ determined that NAAQS and TAP increment compliance is reasonably assured for all areas of Idaho when compliance is demonstrated by multiple analyses using the following 20 meteorological datasets: Boise, Coeur d'Alene, Grangeville, Twin Falls, Pocatello (DEQ tower in the downtown area), Pocatello airport, Idaho Falls, Rexburg, Burley, Lewiston, McCall, Spokane, Challis, Pullman/Moscow, Jerome, INL, Mountain Home, Soda Springs, Bonners Ferry, and Sandpoint. All data were processed using the option in AERMET to adjust the surface friction velocity (u*) to address AERMOD's tendency to over-predict concentrations from some sources under stable, low wind speed conditions.

3.3.5 Effects of Terrain on Modeled Impacts

Terrain effects on dispersion were not considered in the non-site-specific analyses. DEQ contends that assuming flat terrain is not a critical limitation of the analyses because most emission points associated with CBPs are near ground-level and the immediate surrounding area is typically flat for dispersion modeling purposes. Emissions sources near ground-level typically have maximum pollutant impacts near the source, minimizing the potential effect of surrounding terrain to influence the magnitude of maximum modeled impacts. Also, other conservative assumptions and data used in the analyses will offset the potential underestimation of impacts to elevated terrain.

3.3.6 Facility Layout

DEQ's analyses for portable CBPs use a conservative generic facility layout. This is done because the specific layout will vary depending on product needs and specific characteristics of the site and equipment. To provide conservative results, DEQ uses a tight grouping of emissions sources. Source positioning was not a consideration for this project because all TAP emissions were collected and released through the single silo baghouse vent.

3.3.7 Effects of Building Downwash on Modeled Impacts

Downwash was considered in a generic manner by centering the release point on a 10-meter square building 10 meters tall. The silo was included as a 3.0-meter diameter structure extending to the 73-foot release point. Downwash effects from equipment or other minor structures at the site were not accounted for because much of the equipment is porous to wind, thereby minimizing downwash effects.

3.3.8 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." Ambient air is typically considered areas external to the identified property boundary where the facility is located, assuming that reasonable measures will be taken to preclude public access.

DEQ's non-site-specific analysis methods, using a generic facility layout, were used to generate minimum required setback distances between key emissions points and the property boundary or the established boundary to ambient air (if not the same as the property boundary). Setback distances were specified as the distance between the release point of the baghouse vent and the closest point of potential public access. Compliance with applicable air quality standards and increments is not demonstrated unless setback distances are maintained.

3.3.9 Receptor Network

The polar grid included a total of over 550 receptors, provided good resolution of the maximum design value concentrations for the project, and provided extensive coverage. The initial ring of receptors was established 50 meters from the silo baghouse vent release point with a 5-degree spacing. Another ring of receptors was established every 5 meters from the source, out to 150 meters. Beyond that, receptor rings were placed every 10 meters out to 250 meters, every 25 meters out to 400 meters, and then every 50 meters out to 700 meters. DEQ determined that the receptor grid used in the analyses was adequate to reasonably resolve maximum modeled impacts.

The receptor grid used in the impact modeling analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2], and DEQ determined that the receptor network was effective in determining setback distances needed to reasonably assure compliance with applicable air quality standards at all ambient air locations.

3.3.10 Crucial CBP Characteristics Affecting Air Quality Impacts

Table 7 lists characteristics of the CBP that are critical to the TAPs compliance demonstrations (non-fugitive potential emissions of criteria pollutants were below levels identified as BRC; therefore, NAAQS compliance demonstrations were not required for permit issuance).

Table 7. IMPORTANT CHARACTERISTIC OF CBP USED IN DEQ ANALYSES	
Parameter	**Value or Description**
CBP Production Rates	366 cy/hour, 2,500 cy/day, 350,000 cy/year
Co-Contributing Sources	Co-contributing sources are not a concern for the project since non-fugitive facility-wide emissions of criteria pollutants are blow BRC levels, thereby excluding the requirement of a NAAQS compliance demonstration. TAP emissions are only regulated on a project-by-project basis and do not consider any existing emissions.
Emission Capture and Controls	Emissions from cement silo filling, cement supplement silo filling, weigh batcher loading, and central mixing are captured and routed through a baghouse.
Height of Emission Release Point	The baghouse vent point must be no shorter than 73 feet from groundlevel.
Operation of Generators	IC engine-powered generators will not be used to provide electrical power to the CBP.
Operation Locations	The CBP may operate anywhere within Idaho.

4.0 Impact Modeling Results

DEQ determined required setback distances from the non-site-specific modeling results for each applicable TAP and meteorological dataset. Table 8 lists controlling setback distances for each TAP. Setback distances are the closest allowable distance between the property boundary and the center of the facility, which is taken to be the cement silo baghouse vent location. All modeled impacts were below the AACCs of Arsenic and Chromium 6+; therefore, the required setback was set at 50 meters (164 feet), the closest modeled distance between the source and receptors.

Table 8. SETBACK DISTANCES AS A FUNCTION OF METEOROLOGICAL DATA USED IN THE ANALYSIS		
Meteorological Dataset used in Analysis	**Setback Distance Required to Meet TAP AACC**	
	Arsenic AACC = 2.3 E-4 µg/m^3	**Chromium 6+ AACC = 8.3 E-4 µg/m^3**
Rexburg	<50 meters (max = 3.1E-5 µg/m^3)	<50 meters (max = 8.0E-6 µg/m^3)
Burley	<50 meters (max = 1.6E-5 µg/m^3)	<50 meters (max = 4.0E-6 µg/m^3)
Sandpoint	<50 meters (max = 4.8E-5 µg/m^3)	<50 meters (max = 1.24E-5 µg/m^3)
McCall	<50 meters (max = 2.5E-5 µg/m^3)	<50 meters (max = 6.5E-6 µg/m^3)
Boise	<50 meters (max = 2.6E-5 µg/m^3)	<50 meters (max = 6.7E-6 µg/m^3)
Mountain Home	<50 meters (max = 1.6E-5 µg/m^3)	<50 meters (max = 4.0E-6 µg/m^3)
Jerome	<50 meters (max = 1.2E-5 µg/m^3)	<50 meters (max = 3.0E-6 µg/m^3)
Spokane	<50 meters (max = 1.7E-5 µg/m^3)	<50 meters (max = 4.3E-6 µg/m^3)
Twin Falls	<50 meters (max = 1.6E-5 µg/m^3)	<50 meters (max = 4.0E-6 µg/m^3)
Coeur d'Alene	<50 meters (max = 1.4E-5 µg/m^3)	<50 meters (max = 3.5E-6 µg/m^3)
Pocatello (DEQ tower)	<50 meters (max = 2.9E-5 µg/m^3)	<50 meters (max = 7.4E-6 µg/m^3)
Pocatello (airport)	<50 meters (max = 1.2E-5 µg/m^3)	<50 meters (max = 3.1E-6 µg/m^3)
Soda Springs (P4 facility Rambol data)	<50 meters (max = 3.7E-5 µg/m^3)	<50 meters (max = 9.4E-6 µg/m^3)
Bonners Ferry	<50 meters (max = 2.1E-5 µg/m^3)	<50 meters (max = 5.4E-6 µg/m^3)
Idaho Falls	<50 meters (max = 2.5E-5 µg/m^3)	<50 meters (max = 6.4E-6 µg/m^3)
Lewiston	<50 meters (max = 1.5E-5 µg/m^3)	<50 meters (max = 3.9E-6 µg/m^3)
Grangeville	<50 meters (max = 2.2E-5 µg/m^3)	<50 meters (max = 5.6E-6 µg/m^3)
Moscow	<50 meters (max = 3.1E-5 µg/m^3)	<50 meters (max = 8.0E-6 µg/m^3)
Challis	<50 meters (max = 1.8E-5 µg/m^3)	<50 meters (max = 4.7E-6 µg/m^3)
INL	<50 meters (max = 1.7E-5 µg/m^3)	<50 meters (max = 4.3E-6 µg/m^3)

[a.] Maximum modeled impacts are listed in parentheses.

5.0 Conclusions

The ambient air impact analyses and other air quality analyses performed in support of the PTC application demonstrated to DEQ's satisfaction that emissions from the SRC CBP as described in this memorandum will not cause or significantly contribute to a violation of any ambient air quality standard.

References

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

2. *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 http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.