Statement of Basis

Permit to Construct No. P-2011.0141
Project ID 60966

JR Simplot Co. - Caldwell Facility
Caldwell, Idaho

Facility ID 027-00131

Final

April 4, 2012
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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.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
Btu	British thermal units
CEMS	continuous emission monitoring systems
CFR	Code of Federal Regulations
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gases
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometers
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
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
PAH	polyaromatic hydrocarbons
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
RICE	reciprocating internal combustion engines
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/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period

TAP	toxic air pollutants
U.S.C.	United States Code
VOC	volatile organic compounds
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

J.R. Simplot Company (Simplot) owns and operates a potato processing plant in Caldwell, Idaho. Simplot is proposing to replace the existing Caldwell potato plant with a new building and state-of-the-art processing equipment that will increase production while improving energy efficiency. To support the process equipment, Simplot proposes to install three new boilers capable of firing natural gas. Two of the three boilers will be capable of burning a mixture of natural gas and biogas from the existing anaerobic digester which treats wastewater from the facility.

The facility will produce par-fried French fries that will include both battered and unbatttered products, par-fried preformed potato products, and shredded potatoes using the same general process as the existing plant uses.

Trucks will transport raw potatoes to the facility where the potatoes will be unloaded inside the enclosed receiving area within the new processing building. The potatoes are mechanically sorted by size and, during harvest season, randomly inspected. After sorting and inspection, the potatoes will be transported to one of the facility's five production lines. Steam peelers will remove the potato peels for most product cuts prior to being sliced into various shapes and lengths. After the potatoes are cut and sorted into different lengths, they will be dipped into hot water blancher tanks to remove the excess sugars. After leaving the blancher, potatoes in Line 5 will be shredded and frozen for packaging. Potatoes in Line 5 will not be dried or fried and emissions from the process will be negligible.

The potato products for Lines 1, 2, 3, and 4 will be conveyed to steam-heated dryers to remove surface moisture. Once the surface moisture is removed, the potatoes in Line 1 and Line 4 will be conveyed to the Line 1 and Line 4 fryers. Line 2 and Line 3 potatoes will be formed into preformed potato products before being conveyed to the Line 2 and Line 3 fryers. Following the frying process, the final potato products will be frozen and packaged for shipping. All of the proposed dryers (Line 1-4) and fryers (Lines 1-4) will be heated using steam from the boilers. Process emissions from the fryers and dryers will be routed to the RTO to minimize particulate matter and volatile organic compounds emitted to the atmosphere.

The facility will continue to use the existing anaerobic digester to biologically treat process wastewater prior to application on the facility's agricultural lands. An existing flare is used to combust biogas generated by the anaerobic digester before it is vented to atmosphere. With this project Simplot proposes to combust the digester biogas in two of the new boilers or in the existing flare. However, Simplot will install a sulfur removal technology to remove 98 percent of the hydrogen sulfide in the biogas prior to combustion in the new boilers. The permit does not include any specific requirements for the treatment system, though the permit does include emissions monitoring requirements to assure that the treatment system is working. The treatment system may operate with varying operating parameters provided the emissions are in compliance with emission limits. It was determined that monitoring emission rates is sufficient without a need to limit operational parameters of the treatment system. Compliance is determined by either directly monitoring SO_2 emission rates or indirectly determining emission rates through biogas flow rate and H_2S monitoring.

Permitting History

The following information is the comprehensive permitting history of all underlying applicable permits issued to this Tier I facility. This 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).

December 17, 1997	PTC No. 027-00009, PTC for anaerobic digester biogas flare, Permit Status (S)
December 31, 1997	PTC No. 027-00009, PTC modification to line 5 fryer, Permit Status (S)
December 10, 2001	PTC No. 027-00009, PTC for ADI-BVF anaerobic digester with biogas flare, Permit Status (S)

October 4, 2002	Tier I Operating Permit No. 027-00009, Initial Tier I operating permit, Permit Status (S)
October 17, 2003	PTC No. P-030013, PTC for an ethanol production plant, Permit Status (Cancelled)
October 17, 2003	PTC No. P-030014, PTC revision for PTC No. 027-00009, Permit Status (S)
June 21, 2004	T1-030015, Tier I operating permit incorporating PTC No. 027-00009, PTC No. P-030013, PTC No. P-030014, and a consent order issued in 1999, Permit Status (S)
December 22, 2005	PTC No. P-050016, PTC revision to replace the wet scrubber at the Line 1 fryer with wet ESP, Permit Status (A)
June 14, 2006	PTC No. P-060025, Mandates the two Cleaver-Brooks boilers to operate using natural gas exclusively, Permit Status (S)
September 6, 2007	PTC No. P-2007.0073, PTC modification to change Line 4 fryer from processing French fries to pre-formed potato product and removal of Line 4 dryer, Permit Status (A)
January 17, 2007	T1-050013, Renewal of Tier I permit, Permit Status (S)
March 8, 2007	T1-2007.0010, Administrative amendment, Permit Status (S)
April 25, 2007	T1-2007.0042, Administrative amendment, Permit Status (S)
December 7, 2007	PTC No. P-2007.0222, PTC revision of PTC No. P-060025 for the replacement of an existing natural gas fired boiler, Permit Status (S)
July 11, 2008	PTC No. P-2008.0091, PTC modification to replace Boiler No. 10 with Boiler No. 1, Permit Status (S)
October 26, 2009	T1-2009.0119, Administrative amendment, Permit Status (S)
January 29, 2010	PTC No. P-2009.0136, PTC revision to operate an additional burner in Boiler No. 1 and remove temporary Boiler No. 11, Permit Status (A)
February 4, 2011	T1-2009.0119, Administrative amendment, Permit Status (S)
February 13, 2012	T1-2011.0117 Tier I permit renewal (A)

Application Scope

This PTC is for a modification at an existing PSD minor facility.

The applicant has proposed to:

- Install and operate 5 new potato processing lines. Lines 1 – 4 include dryers and fryers will be controlled by an regenerative thermal oxidizer
- Install 3 new boilers. Two will be capable of burning biogas from the existing anaerobic digester.
- Remove existing potato processing lines after a period of commissioning the new plant.
- Remove the existing boilers after a period of commissioning the new plant.

Application Chronology

December 6, 2011	DEQ received an application and an application fee.
Dec. 19, 2011 – Jan. 13, 2012	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
December 30, 2011	DEQ determined that the application was complete.
February 23, 2012	DEQ made available the draft permit and statement of basis for peer and regional office review.
February 28, 2012	DEQ made available the draft permit and statement of basis for applicant review.

March 8, 2012	DEQ received the applicant's comments on the draft permit including adding an operating scenario that was not included in the original model.
March 19, 2012	DEQ received the permit processing fee.
March 22, 2012	DEQ received updated modeling in support of the new operating scenario.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment
Emissions Unit Name: Line 1-4 Dryers Line 1-4 Fryers	RTO (Maximum Heat input 25.2 MMBtu/hr - NG)
Line 5	None
Boiler A Manufacturer: To be determined 98 MMBtu/hr Fuel: Natural Gas	Low NO_x Burner
Boiler B & C Manufacturer: To be determined 98 MMBtu/hr (each boiler) Fuel: Natural Gas & Biogas	Low NO_x Burner Biogas Pretreatment – H_2S Removal
Anaerobic Digester Biogas	Biogas is treated as described above prior to combustion in the boilers. Biogas is untreated when flared.
Generator (unit 4) – Emergency, Warehouse A Manufacturer: Onan 55 hp Fuel: Natural Gas	None
Generator (unit 5)– Emergency, Greenhouse Manufacturer: Olympian 68 hp Fuel: Natural Gas	None
Generator (unit 1) – Emergency, Wastewater Treatment Manufacturer: Onan 166 hp Fuel: Diesel	None
Generator (unit 3) – Emergency, Tech Center Manufacturer: Dayton 14.8 hp Fuel: Natural Gas	None
Fire Water Pump Engine (unit 2) Manufacturer: Cummins 287hp Fuel: Diesel	None

Emissions Inventories

Existing Facility Potential to Emit

Potential to Emit is 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 only be considered in determining potential emissions if the limitation state or federally enforceable.

Fugitive emissions do not count towards the existing facility's potential to emit because is it not an existing listed[1] source category which must include fugitive emissions. On July 20, 2011 EPA published a final regulation that specifies that CO_2 emissions from biogenic sources do not count towards the potential to emit of a facility for a period of 3 years. According to this rule "...the mass of the greenhouse gas carbon dioxide shall not include carbon dioxide emissions resulting from the combustion... of nonfossilized ..." fuels[2] or from fermentation processes. Therefore carbon dioxide emissions that result from the combustion of biogas from the anaerobic digesters, and CO_2 emissions from the fermentation process are not included in the potential to emit.

Table 2 EXISTING POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

	PM/PM_{10}[a]/$PM_{2.5}$	SO_2[a]	NOx[a]	CO[a]	VOC[a]	CO_2e[b]
Source	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**
Boiler 1 (Biogas)	3.2	90.2	21.1	35.4	2.3	
Boiler 8	2.6	0.2	34.7	29.1	1.9	
Dryer 1	26.3	0.01	2.0	1.7	0.1	
Dryer 6	45.6	0.06	5.2	8.7	0.6	
WESP (fryer emissions)	47.7	0.00	0.00	0.00	0.00	
Air Make-up units	1.8	0.1	24.2	20.3	1.3	
Solvent Use					2.8	
Total, Point Sources	**127.2**	**90.6**	**87.2**	**95.2**	**9.0**	**63,718**

a) From JR Simplot's July 2011 Tier I Operating Permit renewal application.
b) From JR Simplot, received December 30, 2011
c) PTC No. P-030013 issued 10/17/03

Post Project Potential to Emit

The following table presents the post project Potential to Emit for criteria and GHG pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

1 Source listed is at 40 CFR 52.21(b)(1)(iii) – definition of a major source

2 The regulation specifies that greenhouse gases other than CO_2 from biogenic sources are to be included for biogenic sources. However, other greenhouse gas emissions from the combustion of biogas (i.e.CH_4, N_2O) are negligible when compared to the amount of emissions required to make a difference in the facility's classification as a major facility or not and are not quantified in this statement of basis.

Table 3 POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

	$PM/PM_{10}/PM_{2.5}$	SO_2	NOx	CO	VOC	CO_2e
Source	T/yr	T/yr	T/yr	T/yr	T/yr	T/yr
Boiler A	3.2	0.25	7.8	15.9	2.3	
Boiler B	3.2	1.2	7.8	15.9	2.3	
Boiler C	3.2	1.2	7.8	15.9	2.3	
Flare	0.4	90.0	4.0	22.0	8.3	
RTO (Dryer 1-4 & Fryer 1-4)	29.4	0.06	11.0	9.1	21.0	
Emergency Engines	0.1	2.8E-4	0.8	0.2	0.1	
Solvent Use					2.8	
Total, Point Sources	**39.5**	**92.6**	**39.3**	**78.9**	**39.1**	**99,000**

a) PTC No. P-030013 issued 10/17/03

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

	$PM/PM_{10}/PM_{2.5}$	SO_2	NOx	CO	VOC	CO_2e
	T/yr	**T/yr**	**T/yr**	**T/yr**	**T/yr**	**T/yr**
Existing PTE	127.2	90.6	87.2	95.2	9.0	63,718
Post Project PTE	39.5	92.6	39.3	78.9	39.1	99,000
Change in PTE	**-87.7**	**2.0**	**-47.9**	**-16.3**	**30.1**	**35,282**

Post Project HAP Emissions

Total HAP emissions are 2.6 tons per year, the highest individual HAP is hexane at 2.5 tons per year. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

TAP Emissions

A summary of the estimated PTE for emissions increase of toxic air pollutants (TAP) is provided in the following table for those TAPs that exceed the screening emissions level. All other TAPs are emitted below the screening emissions level.

Table 5 POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Non-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)
Formaldehyde	2.3E-02	5.1E-04	Yes
Naphthalene (PAH)	1.9E-04	9.1E-05	Yes
Arsenic	6.3E-05	1.5E-06	Yes
Cadmium	3.4E-04	3.7E-06	Yes
Chromium VI	1.8E-05	5.6E-07	Yes
Nickel	6.6E-04	2.7E-05	Yes

TAPs listed in Table 5 exceeded the screening emission levels. The applicant chose to model these emission increases in order to demonstrate preconstruction compliance for toxic air pollutants. The modeling results show that ambient impacts are below the acceptable ambient concentration increment and preconstruction compliance has been demonstrated.

Ambient Air Quality Impact Analyses

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 A.

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

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

Facility Classification

The AIRS/AFS facility classification codes are as follows:

A Actual or potential emissions of a pollutant are greater than or equal to the applicable major source threshold.

SM Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

SM80 Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations and permitted emissions are 80% of the major source threshold.

B Uncontrolled potential to emit is less than major facility thresholds.

C Class is unknown.

Table 6 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	> 100	29.4	100	SM
$PM_{10}/PM_{2.5}$	> 100	29.4	100	SM
SO_2	>100	92.6	100	SM80
NO_x	<100	39.3	100	B
CO	<100	78.9	100	B
VOC	>100	39.1	100	SM
CO_2e	>100,000	99,000	100,000	SM80
HAP (single)	<10	2.5	10	B
HAP (Total)	<25	2.6	25	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 the modified facility. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.200. 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 facility is not subject to IDAPA 58.01.01.300-399, and the applicant did not apply for a Tier II operating permit in accordance with IDAPA 58.01.01.401. This permitting action was not processed in accordance with the procedures of IDAPA 58.01.01.400-410.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625.....Visible Emissions

The sources of visible emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. Standards for New Sources (IDAPA 58.01.01.676).

Fuel Burning Equipment (IDAPA 58.01.01.675)

IDAPA 58.01.01.676.....Standards for New Sources

The fuel burning equipment located at this facility, with a maximum rated input of ten (10) million BTU per hour or more, 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. Burning gaseous fuels as the permittee has proposed assures compliance with the grain loading standard; burning natural gas and biogas in the boilers is inherently in compliance with the grain loading standard.

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 PM10, SO2, NOx, CO, VOC
- 10 tons per year for any one HAP or 25 tons per year for all HAP combined
- 100,000 tons per year of CO_2e

Therefore, after the transition from operating the existing potato processing lines to the new lines the facility will not be a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 will not apply.

Simplot anticipates commissioning the new process equipment and boilers by August 2013. During the commissioning period the existing process equipment will be brought off line as the new equipment becomes operational. The facility will remain an existing Tier I major facility operating under the existing Tier I Operating permit until the commissioning period of the new plant ends. As detailed in the permit to construct, the commissioning of the new equipment ends when the existing permits are canceled. At the time that the existing permits are canceled the facility will become a Tier I minor facility and will not be subject to the existing Tier I operating permit, it will be regulated by this permit which limits the facility to below Tier I major facility thresholds.

PSD Classification (40 CFR 52.21)

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

The existing facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action.

The primary activity of the facility is potato products (SIC Code 2037) and is not a listed facility category that is subject to the 100 ton per year threshold in accordance with 40 CFR 52.21(b)(1)(i)(a). The facility is subject to the 250 ton per year major facility threshold. However, the facility does include a listed source category[3] that is itself subject to the 100 ton per year threshold[4]. In accordance with 40 CFR 52.21(b)(1)(iii) fugitive emissions are to be included for listed source categories. In this case the listed source category is boiler(s) greater than 250 MMBtu heat input; negligible fugitive emissions are associated with this category. In summary PSD is not triggered because facility wide emissions do not exceed 250 tons per year, and emissions from the listed source category (boilers) do not exceed 100 tons per year.

Potential greenhouse gas emissions from the existing plant are less than 100,000 tons per year and are limited to less than 99,000 tons per year from the modified plant, therefore in accordance with 40 CFR 52.21(b)(49)(v) greenhouse gases are not subject to regulation.

NSPS Applicability (40 CFR 60)

40 CFR 60, Subpart Dc ..... Standards of Performance for Small Industrial–Commercial–Institutional Steam Generating Units

§ 60.40c ..... Applicability and Delegation of Authority

> *(a)Except as provided in paragraphs (d), (e), (f), and (g) of this section, the affected facility to which this subpart applies is each steam generating unit for which construction, modification, or reconstruction is commenced after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr).*

The proposed steam generating units at the Simplot facility are constructed after June 9, 1989 have input capacities between 10-100 MMBtu and do not qualify for any of the exceptions provided in (d), (e), (f), and (g) of this section. Therefore they are affected emission units and must comply with this Subpart. However, all three new boilers at this facility combust gaseous fuel for which there are no emissions standards in this Subpart. Therefore, the only Sections of this subpart that are applicable to the boilers at this facility are the Applicability and Delegation of Authority specified in § CFR 60.40c(a), the Recordkeeping requirements of § CFR 60.48c(g) and (i), and the Reporting requirements of § CFR 60.48c(a), (a)(1), and (a)(3).

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3 The Facility has fossil-fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input.
4 July 6, 1992 letter from Edwin B. Erickson, EPA Regional Administrator to George Clemon Freeman, Jr., Counsel for Reserve Coal Properties. (EPA's policy on handling listed source categories at sources where the primary activity is not listed.)

60.48c(g)(1) Except as provided under paragraphs (g)(2) and (g)(3) of this section, the owner or operator of each affected facility shall record and maintain records of the amount of each fuel combusted during each operating day.

(2) As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility that combusts only natural gas, wood, fuels using fuel certification in §60.48c(f) to demonstrate compliance with the SO2standard, fuels not subject to an emissions standard (excluding opacity), or a mixture of these fuels may elect to record and maintain records of the amount of each fuel combusted during each calendar month.

(3) As an alternative to meeting the requirements of paragraph (g)(1) of this section, the owner or operator of an affected facility or multiple affected facilities located on a contiguous property unit where the only fuels combusted in any steam generating unit (including steam generating units not subject to this subpart) at that property are natural gas, wood, distillate oil meeting the most current requirements in §60.42C to use fuel certification to demonstrate compliance with the SO2standard, and/or fuels, excluding coal and residual oil, not subject to an emissions standard (excluding opacity) may elect to record and maintain records of the total amount of each steam generating unit fuel delivered to that property during each calendar month.

60.48c (i) All records required under this section shall be maintained by the owner or operator of the affected facility for a period of two years following the date of such record.

60.48c (a) The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction and actual startup, as provided by §60.7 of this part. This notification shall include:

(1) The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.

(2) If applicable, a copy of any federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under §60.42c, or §60.43c.

(3) The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.

NESHAP Applicability (40 CFR 61)

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

MACT Applicability (40 CFR 63)

The facility is not proposing to add any emissions units that are subject to MACT standards in 40 CFR Part 63.

On March 21, 2011 EPA promulgated NESHAPs for boilers at area sources of HAP emissions (40 CFR 63 Subpart JJJJJJ). Area sources are source that are not major for HAP. Simplot is an area source of HAP. However, Simplot only combusts gaseous fuels in the boilers and therefore is not affected by this NESHAP. In accordance with 40 CFR 63.11194 (What is the affected source of this subpart?) a boiler must combust coal, biomass (solid) or oil to be an affected emissions unit.

Simplot will continue to use the existing internal combustion engines with the new potato processing equipment. The applicable requirements for the existing engines are included in the existing Tier I operating permit. These requirements have been copied into this permit because the facility will be requesting to cancel the existing Tier I operating permit after the new plant has been commissioned.

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- 4

Describes the purpose and scope of the permit. This permit allows the construction, commissioning and operation of 3 new boilers and 5 new potato processing lines. The commissioning period includes operating some existing equipment while some of the new equipment is brought online.

Permit Condition 5

This is the process description for the commissioning period of the new equipment. The existing equipment will continue to operate under the provisions of existing Tier I operating permit No. T1-2011.0117 issued February 13, 2012 until that permit is canceled. The permittee shall also comply with the provisions of this permit section which will regulate facility-wide operations during the commissioning period.

Permit Condition 6

Lists the new equipment that will be added to the facility as well as the control devices for each piece of equipment.

Permit Condition 7

Describes when this section of the permit for the *Potato Processing - New Plant Commissioning* is effective. The facility has proposed to bring some new equipment online while some existing equipment remains operational. This section of the permit regulates during that commissioning period.

Permit Condition 8

This permit condition lists operational constraints necessary to assure compliance with NAAQS during the commissioning period. These limitations assure emissions are consistent with the emission rates that were modeled to demonstrate compliance with the NAAQS during the commissioning period of the new equipment which will include operating some of the existing equipment.

- Cease operating existing Boiler No. 8.

  Emissions from Boiler No 8. are not included in the model that shows compliance with the NAAQS during the commissioning period. NO_2 ambient impacts during the commissioning period were estimated to be within 88% of ambient standards without Boiler No. 8 operating.

- Shall operate only one new boiler.

  This operating scenario showed compliance with the NAAQS. The facility did not model all existing and new boilers operating at the same time.

- Not test the wastewater, warehouse and greenhouse generators for the purpose of testing. The warehouse generator and and firewater pump engine shall only be tested for 30 minutes per hour between 11 am and 6 pm.

  This is consistent with ambient impact analysis provided in the application.

  For purposes of clarification the permit also lists the equipment that may be operated during the commissioning period.

The commissioning period is defined by this permit condition. It begins when any of the new equipment listed in Table 2 becomes operational and ends when the existing potato processing lines and boilers permanently cease operation and the permits to construct for the existing potato processing lines and for the existing boilers have been canceled. The permit condition lists all existing permits which must be canceled in order to end the commissioning period.

Permit Condition 9

Requires monitoring the operational status of the new and existing dryers and fryers to determine compliance with operational restrictions.

Permit Condition 10

This permit condition requires notifying DEQ in writing when any of the new equipment listed in Table 2 becomes operational. This initiates the commissioning period and DEQ must be notified of the occurrence.

Permit Condition 11 & 12

These conditions provide the process description for the new potato processing lines and provide a description of the air pollution control equipment used.

Permit Condition 13

The *New Potato Processing Lines* section of the permit becomes applicable at the time of permit issuance. The *Potato Processing – New Plant Commissioning* section of the permit is only applicable during a specific time period as detailed by that section of the permit. In order to avoid any potential confusion of when other sections of the permit become applicable the permit has been written to include when each section becomes applicable.

Permit Condition 14

Emission limits are established for $PM_{2.5}$ and NO_x from the RTO. These emission limits are established consistent with the modeled emission rates that demonstrate compliance with ambient standards. An increase of emissions may not assure compliance.

Permit Condition 15

Requires all emissions from the fryers and dryers to be ducted to an RTO.

Permit Condition 16

Limits daily production consistent with the emission inventory provided in the application. Particulate matter emissions from the RTO are expected to be correlated to production rate. Limiting production rates provides a reasonable assurance of compliance with ambient standards. Daily production is limited consistent with the 24-hr ambient standards for particulate matter.

Permit Condition 17

The RTO combustion chamber shall be equipped with a temperature monitoring and recording device. The operating temperature of the RTO is expected to correlate to VOC destruction efficiencies and particulate matter emissions.

Permit Condition 18

The minimum operating temperature of the RTO combustion chamber is limited to a temperature of 1,550 degrees Fahrenheit. This is a manufacturer specified minimum operating temperature.

Permit Condition 19

Requires monitoring of daily production in Lines 1-4 to determine compliance with daily production limitations.

Permit Condition 20

Monitoring of the RTO combustion furnace each 15 minutes is required to assure compliance with the minimum operating temperature of 1,550 degrees Fahrenheit.

Permit Condition 21

Requires periodic NO_x and $PM_{2.5}$ emission testing on the RTO. It is reasonable to require periodic emission testing to assure the RTO will perform as portrayed. Simplot has not provided documentation that assures the RTO will continuously emit at less than the emission limits. Also the flame characteristics of the RTO combustion device may change over time which may affect NO_2 emission rates. Simplot estimated the RTO would reduce particulate matter emissions by 90% without documenting this efficiency. It is reasonable to require periodic testing to assure the RTO will perform as portrayed.

Testing is required within 180 days of startup. Then testing is required depending on how close each pollutant was emitted to the emission rate limit. If the pollutant was emitted at less than or equal to 75% of the standard then testing is required again in 5 years. If the test results for the pollutant were greater than 75% but less than or equal to 90% the next test for that pollutant is required within 2 years. If the test results for the pollutant are greater than 90% then testing is required within a year.

Permit Condition 22 & 23

Provide a brief process description of the 3 gas fired boilers and the control equipment.

Permit Condition 24

The *New Boilers* section of the permit becomes applicable at the time of startup of any of the new boilers. The *Potato Processing – New Plant Commissioning* section of the permit is only applicable during a specific time period as detailed by that section of the permit. In order to avoid any potential confusion of when other sections of the permit become applicable the permit has been written to include when each section becomes applicable.

Permit Condition 25

Limits emissions of CO and NO_x from each boiler. Carbon monoxide emissions are limited so that the boilers in conjunction with all other sources of CO will not emit at the Tier I permit major source threshold of 100 tons per year. NO_x emissions are limited to those rates that were modeled to show compliance with the NO_2 ambient standards.

Permit Condition 26

Sulfur Boiler B and C are limited to 0.7 pounds per hour each. These emission rate limits are consistent the emission rates modeled to assure compliance with the SO_2 ambient air quality standards.

Permit Condition 27

Limits each of the boilers rated input capacity to less than or equal to 98 MMBtu/hr. The permittee has indicated that the supplier of the boilers is yet to be determined. This Btu restriction assures that the size of each boiler will be consistent with the emission inventories that were provided.

Permit Condition 28

Limits the fuel types for each boiler consistent with the emission inventories that were provided.

Permit Condition 29

This permit condition was developed during negotiations with Simplot. It requires:

- that a biogas flow rate monitor be installed in accordance with manufacturer specifications to monitor the amount of biogas combusted in the boilers
- that the monitor be accurate within plus or minus 5% of the flow being monitored
- that the monitor be calibrated in accordance with manufacturer specifications

Permit Condition 30

Section 30.1 specifies frequency of monitoring of sulfur dioxide emissions. The standard that is being protected is a 1-hour ambient standard. The facility is required to periodically determine hourly emission rates. Initially the frequency of monitoring is once each 8 hours. If three months of monitoring once each 8 hours gives values that are less than or equal to 90% of the allowable emission rate then monitoring may occur once each day. If any daily value is determined to be greater than 90% of the standard monitoring shall revert to once each 8 hours, then the cycle begins again.

The facility has proposed to install a device to reduce H_2S concentrations in the biogas that is combusted in the boilers, ultimately reducing SO_2 emission rates. The device is assumed to have 98% removal efficiency though details of the operation of the control device to achieve the guaranteed control efficiency such as scrubbing media PH and flow rate requirements were not provided in the application. In absence of a manufacturer guarantee that includes operating constraints associated with guarantee, and considering that the H_2S emissions are coming from a biological process that may have fluctuations of H_2S concentrations, frequent monitoring is required to assure compliance with the hourly SO_2 emission rate limit. This monitoring is also consistent with monitoring requirements for other permitted biological processes that produce biogas containing H_2S.

Section 30.2 specifies that the permittee is required to periodically determine hourly SO_2 emission rates from the boilers. The permit allows the use of H_2S monitoring to gather data to predict SO_2 emission rates or directly monitoring SO_2 emissions from the boiler stacks.

Section 30.3 specifies requirements if the permittee elects to use a H_2S or SO_2 CEM, or an inline H_2S monitor to determine pound per hour SO_2 emission rates. Also specifies that monitoring is required to occur in accordance with a DEQ approved monitoring protocol.

Section 30.4 specifies requirements if the permittee elects to use a handheld H_2S monitor.

All of the requirements specified in Permit Condition 31 and its subsections are similar to those of similar sources that are permitted to operate in Idaho.

Permit Condition 31

Requires periodic NO_x and CO emission testing on all boilers. Carbon monoxide and NO_x emissions are directly related to the tune of the boilers and may widely fluctuate, CO emission greater than 5 pounds per hour will cause the facility to trigger PSD and Tier I permitting requirements. The manufacturer of the boiler, and any accompanying emission guarantees have not been determined; it is reasonable to require periodic source testing to assure compliance with ambient standards and to assure PSD and Tier I permitting requirements are not triggered. The testing schedule was developed during negotiations with the applicant.

Permit Conditions 32 & 33

These permit conditions include the New Source Performance Standards that are applicable to the new boilers.

Permit Condition 34

Provides the process description for the *Natural Gas Usage* section of the permit; which is simply all natural gas combustion sources at the facility.

Permit Condition 35

The *Natural Gas Usage* section of the permit becomes applicable at the time of permit issuance. The *Potato Processing – New Plant Commissioning* section of the permit is only applicable during a specific time period as detailed by that section of the permit. In order to avoid any potential confusion of when other sections of the permit become applicable the permit has been written to include when each section becomes applicable.

Permit Condition 36

Facility-wide natural gas usage is limited to 1,646 MM scf/yr. This limitation on natural gas usage, in combination of the other combustion sources at the facility, serves to limit greenhouse gas (CO_2e) emission to 99,000 tons per year to avoid triggering PSD and Tier I permitting requirements. Following is how this limitation was derived:

CO_2e (T/yr.)	
99,000	(Facility Wide Limit – biogenic sources not included)
- 8	(emergency engines – diesel fuel)
-10	(fire water pump engine – diesel fuel)
-767	(RTO – VOC combustion component) (CO_2 175 lb/hr & assumes VOC is all carbon which is converted to CO_2)
98,215	(allowable for natural gas combustion sources)

$$\frac{98{,}215 \text{ T/yr}}{0.0585 \text{ T/MMBtu NG}} = 1{,}678{,}888 \text{ MMBtu/yr}$$

$$\frac{1{,}678{,}888 \text{ MMBtu/yr}}{1{,}020 \text{ Btu/scf}} = 1{,}646 \text{ MMscf/yr}$$

Permit Condition 37

Requires monitoring facility-wide natural gas consumption to assure compliance with the usage limitation.

Permit Condition 38 &39

Provides a process description for the Biogas Unit and a control equipment description.

Permit Condition 40

The *Biogas Unit* section of the permit becomes applicable upon cancelation of Permit to Construct No. P-2009.0136 issued January 29, 2010. The *Potato Processing – New Plant Commissioning* section of the permit is only applicable during a specific time period as detailed by that section of the permit. In order to avoid any potential confusion of when other sections of the permit become applicable the permit has been written to include when each section becomes applicable.

Permit Condition 41

Limits SO_2 emissions to 28.9 pounds per hour to protect the one hour NAAQS for SO_2. Also limits SO_2 emissions to 90 tons per year consistent with the existing permit and to prevent the facility from becoming a Tier I major facility.

Permit Condition 42

Includes the odor rule from IDAPA 58.01.01.775-776.

Permit Condition 43& 44

Requires that all biogas be combusted, also requires that the flare have a flame present anytime biogas is sent to the flare.

Permit Condition 45

Requires an O&M manual to be developed for the operation of the flare. This is an existing permit condition.

Permit Condition 46

Requires monitoring the amount biogas produced each hour and each consecutive 12-months to gather the necessary data to calculate emissions to determine compliance with emission limitations.

Permit Condition 47

Requires periodically calculating the SO_2 emission rates from the flare. This requirement is similar to the boiler monitoring requirements with the exception that it also includes determining emissions during any consecutive 12 calendar month period.

Permit Condition 48

This is an existing permit condition that requires monitoring for the presence of a flame at the flare anytime the biogas is diverted to it.

Permit Condition 49

Lists the internal combustion engines at the facility.

Permit Condition 50

Specifies the effective date of this section of the permit. The engines are currently regulated by the facility's Tier I operating permit. The Tier I operating permit will eventually be cancelled then this section of the permit will become effective.

Permit Conditions 51-54, 56, 58-65 incorporate the MACT requirements that apply to the engines at the facility. These requirements are currently in the Tier I operating permit.

Permit Condition 55

Limits the hours of operation of emergency engines to those used in the model that demonstrated compliance with the NAAQS.

Permit Condition 57

Requires monitoring operations of the emergency engines to be able to determine compliance with the hours of operation restrictions.

Permit Condition 67

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Permit Condition 68

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Permit Condition 69

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Permit Condition 70

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Permit Condition 71

The permit expiration construction and operation provision specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Permit Condition 72

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.03.

Permit Condition 73

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Permit Condition 74

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Permit Condition 75

The performance test report provision requires that the permittee report any performance test results to DEQ within 60 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Permit Condition 76

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Permit Condition 77

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Permit Condition 78

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Permit Condition 79

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Permit Condition 80

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Permit Condition 81

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Permit Condition 82

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

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

J.R. Simplot Company - Project Idaho

Boiler A

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	98.00 MMBtu/hr	HHV
Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	14,226 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	16,511 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	140 F	Estimate - inline condensing economizer creates lower exhaust temp
Exhaust Oxygen	4 % O2	Estimate
Exhaust Moisture	17 % Moisture	Estimate
Exhaust gas volume - estimated actual	24,088 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor ppmvd	Emission Factor lb/MMBtu	Emission Rate [b] lb/hr	Emission Rate [b] tpy	MW
NOx [a]	15 (3% O2)	0.0182	1.79	7.82	46
CO [a]	50 (3% O2)	0.0370	3.62	15.87	28
SO2 [a]	--	0.0006	0.058	0.25	64
PM10 (Filt. & Cond.) [a]	--	0.0075	0.730	3.20	--
PM2.5 (Filt.& Cond.) [a]	--	0.0075	0.730	3.20	--
VOC [a]	--	0.0054	0.528	2.31	16
Lead [a]	--	4.9E-07	4.8E-05	2.1E-04	

PVM=mRuT --> V=mRuT/PM --> m=PVM/RuT
Ideal Gas Law
T = 293.15 K
P = 1 atm
Ru= 1.314 ft^3*atm/(K*lb-mol)

notes:
a - Proposed NOx and CO ppmvd limits are based on 3% Oxygen.
b - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).
c - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	Emission Rate [b] tpy
CO2	117	11,465	50,174
CH4	2.2E-03	2.2E-01	9.4E-01
N2O	2.2E-04	2.2E-02	9.4E-02
CO2e [c]		11,466	50,223

notes:
a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.
b - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.
c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	Emission Factor [a] lb/mmBtu	Emission Rate [e] lb/hr	Emission Rate [e] lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	1.9E-05	0.2
7440-39-3	Barium	4.4E-03	4.3E-06	4.2E-04	4
71-43-2	Benzene	2.1E-03	2.1E-06	2.0E-04	2
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.2E-06	0.010
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.1E-04	0.9
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-04	1.2
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.3E-04	1.1
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	5.4E-06	0.05
7440-48-4	Cobalt	8.4E-05	8.2E-08	8.1E-06	0.07
7440-50-8	Copper	8.5E-04	8.3E-07	8.2E-05	1
50-00-0	Formaldehyde	7.5E-02	7.4E-05	7.2E-03	63
110-54-3	Hexane	1.8E+00	1.8E-03	1.7E-01	1,616
7439-96-5	Manganese	3.8E-04	3.7E-07	3.7E-05	0.32
7439-97-6	Mercury	2.6E-04	2.5E-07	2.5E-05	0.22
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.1E-04	0.9
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.9E-05	0.5
7440-02-0	Nickel	2.1E-03	2.1E-06	2.0E-04	1.8
109-66-0	Pentane	2.6E+00	2.5E-03	2.5E-01	2,186
7782-49-2	Selenium	2.4E-05	2.4E-08	2.3E-06	0.02
108-88-3	Toluene	3.4E-03	3.3E-06	3.3E-04	2.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.1E-01	1,852
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.7E-07	0.002
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.2E-07	0.001
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
218-01-9	Chrysene	1.8E-06	1.8E-09	1.7E-07	0.002
53-70-3	Dibenzo(a,h)anthracene	1.2E-06	1.2E-09	1.2E-07	0.001
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.7E-07	0.002
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	1.7E-07	0.002
25321-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.2E-04	1.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.8E-03	24
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	3.1E-01	2,693
PAH	PAH (total) [d]	-	-	1.10E-06	0.010

notes:
a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).
b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.
c - Ammonia emission factor from EPA's WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)
d - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, Indeno(1,2,3,-cd)pyrene, benzo(a)pyrene.
e - Hourly emissions based on 98.0 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

J.R. Simplot Company - Project Idaho

Boiler B

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	98.00 MMBtu/hr	HHV
Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	14,228 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	16,611 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	140 F	Estimate - inline condensing economizer creates lower exhaust temp
Exhaust Oxygen	4 % O2	Estimate
Exhaust Moisture	17 % Moisture	Estimate
Exhaust gas volume - estimated actual	24,068 acfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor ppmvd	Emission Factor lb/MMBtu	Emission Rate [a] lb/hr	Emission Rate [a] tpy	MW
NOx [a]	15 (3% O2)	0.0182	1.79	7.82	46
CO [a]	50 (3% O2)	0.0370	3.62	15.87	28
SO2 [b]	--	0.0035	0.35	1.15	64
PM10 (Filt. & Cond.) [b]	--	0.0075	0.730	3.20	--
PM2.5 (Filt.& Cond.) [b]	--	0.0075	0.730	3.20	--
VOC [b]	--	0.0054	0.528	2.31	16
Lead [b]	--	4.9E-07	4.8E-05	2.1E-04	

PVM=mRuT --> V=mRuT/PM --> m=PVM/RuT
Ideal Gas Law

T =	293.15	K
P =	1	atm
Ru=	1.314	ft^3*atm/(K*lb-mol)

notes:

a - Proposed NOx and CO ppmvd limits are based on 3% Oxygen.

b - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf). Boiler also capable of burning biogas from anaerobic digester: Sulfur scrubber will remove 98 percent of sulfur in biogas, and assume half of biogas will go to Boiler B and half to Boiler C.

c - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	117	11,455	50,174
CH4	2.2E-03	2.2E-01	9.4E-01
N2O	2.2E-04	2.2E-02	9.4E-02
CO2e [c]		11,466	50,223

notes:

a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	lb/mmBtu	Emission Rate [a] lb/hr	lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	1.9E-05	0.2
7440-39-3	Barium	4.4E-03	4.3E-06	4.2E-04	4
71-43-2	Benzene	2.1E-03	2.1E-06	2.0E-04	2
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.2E-06	0.010
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.1E-04	0.9
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-04	1.2
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.3E-04	1.1
7440-47-3_CrVI	Chromium VI	5.6E-05	5.5E-08	5.4E-06	0.05
7440-48-4	Cobalt	8.4E-05	8.2E-08	8.1E-06	0.07
7440-50-8	Copper	8.5E-04	8.3E-07	8.2E-05	1
50-00-0	Formaldehyde	7.5E-02	7.4E-05	7.2E-03	63
110-54-3	Hexane	1.8E+00	1.8E-03	1.7E-01	1,515
7439-96-5	Manganese	3.8E-04	3.7E-07	3.7E-05	0.32
7439-97-6	Mercury	2.6E-04	2.5E-07	2.5E-05	0.22
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.1E-04	0.9
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.9E-05	0.5
7440-02-0	Nickel	2.1E-03	2.1E-06	2.0E-04	1.8
109-66-0	Pentane	2.5E+00	2.5E-03	2.5E-01	2,188
7782-49-2	Selenium	2.4E-05	2.4E-08	2.3E-06	0.02
108-88-3	Toluene	3.4E-03	3.3E-06	3.3E-04	2.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.1E-01	1,892
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.7E-07	0.002
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.2E-07	0.001
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
218-01-9	Chrysene	1.8E-06	1.8E-09	1.7E-07	0.002
53-70-3	Dibenzo(a,h)anthracene	1.2E-06	1.2E-09	1.2E-07	0.001
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.7E-07	0.002
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	1.7E-07	0.002
25321-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.2E-04	1.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.8E-03	24
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	3.1E-01	2,693
PAH	PAH (total) [d]	-	-	1.1E-06	0.010

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - Ammonia emission factor from EPA's WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene.

e - Hourly emissions based on 98.0 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

J.R. Simplot Company - Project Idaho

Boiler C

	Boiler Specifications	
Operating hours	8,760 hours/year	
Firing rate	98.00 MMBtu/hr	HHV
Stack Exhaust Flow Information		
F Factor (Natural Gas)	8,710 dscf/MMBtu	Source: EPA Method 19
Exhaust gas volume flow	14,226 dscfm @ 0%O2	
Exhaust gas volume flow - corrected	16,611 dscfm @ 3%O2	Corrected to 3% O2
Exhaust Temperature	140 F	Estimate - inline condensing economizer creates lower exhaust temp
Exhaust Oxygen	4 % O2	Estimate
Exhaust Moisture	17 % Moisture	Estimate
Exhaust gas volume - estimated actual	24,088 scfm	based on expected operating conditions

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor ppmvd	Emission Factor lb/MMBtu	Emission Rate [a] lb/hr	Emission Rate [a] tpy	MW
NOx [a]	15 (3% O2)	0.0182	1.79	7.82	46
CO [a]	50 (3% O2)	0.0370	3.62	15.87	28
SO2 [b]	–	0.0035	0.35	1.15	64
PM10 (Filt. & Cond.) [b]	–	0.0075	0.730	3.20	–
PM2.5 (Filt.& Cond.) [b]	–	0.0075	0.730	3.20	–
VOC [b]	–	0.0054	0.528	2.31	16
Lead [b]	–	4.9E-07	4.8E-05	2.1E-04	

PVM=mRuT --> V=mRuT/PM --> m=PVM/RuT
Ideal Gas Law
T = 293.15 K
P = 1 atm
Ru = 1.314 ft^3*atm/(K*lb-mol)

notes:

a - Proposed NOx and CO ppmvd limits are based on 3% Oxygen.

b - Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf). Boiler also capable of burning biogas from anaerobic digester. Sulfur scrubber will remove 98 percent of sulfur in biogas, and assume half of biogas will go to Boiler B and half to Boiler C.

c - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	117	11,466	50,174
CH4	2.2E-03	2.2E-01	9.4E-01
N2O	2.2E-04	2.2E-02	9.4E-02
CO2e [c]		11,466	50,223

notes:

a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly emissions based on 98.0 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	Emission Factor [a] lb/mmBtu	Emission Rate [b] lb/hr	Emission Rate [b] lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	1.9E-05	0.2
7440-39-3	Barium	4.4E-03	4.3E-06	4.2E-04	4
71-43-2	Benzene	2.1E-03	2.1E-06	2.0E-04	2
7440-41-7	Beryllium	1.2E-05	1.2E-08	1.2E-06	0.010
7440-43-9	Cadmium	1.1E-03	1.1E-06	1.1E-04	0.9
7440-47-3 Cr	Chromium-Total [b]	1.4E-03	1.4E-06	1.3E-04	1.2
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	1.3E-04	1.1
7440-47-3_CrVI	Chromium VI	5.5E-05	5.5E-08	5.4E-06	0.05
7440-48-4	Cobalt	8.4E-05	8.2E-08	8.1E-06	0.07
7440-50-8	Copper	8.5E-04	8.3E-07	8.2E-05	1
50-00-0	Formaldehyde	7.5E-02	7.4E-05	7.2E-03	63
110-54-3	Hexane	1.8E+00	1.8E-03	1.7E-01	1,515
7439-96-5	Manganese	3.8E-04	3.7E-07	3.7E-05	0.32
7439-97-6	Mercury	2.6E-04	2.5E-07	2.5E-05	0.22
7439-98-7	Molybdenum	1.1E-03	1.1E-06	1.1E-04	0.9
91-20-3	Naphthalene	6.1E-04	6.0E-07	5.9E-06	0.5
7440-02-0	Nickel	2.1E-03	2.1E-06	2.0E-04	1.8
109-66-0	Pentane	2.6E+00	2.5E-03	2.5E-01	2,188
7782-49-2	Selenium	2.4E-05	2.4E-08	2.3E-06	0.02
108-88-3	Toluene	3.4E-03	3.3E-06	3.3E-04	2.9
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	2.1E-01	1,892
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	1.7E-07	0.002
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	1.2E-07	0.001
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	1.7E-07	0.002
218-01-9	Chrysene	1.8E-06	1.8E-09	1.7E-07	0.002
53-70-3	Dibenzo(a,h)anthracene	1.2E-06	1.2E-09	1.2E-07	0.001
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	1.7E-07	0.002
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	1.7E-07	0.002
25321-22-6	Dichlorobenzene	1.2E-03	1.2E-06	1.2E-04	1.0
7440-66-6	Zinc	2.9E-02	2.8E-05	2.8E-03	24
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	3.1E-01	2,693
PAH	PAH (total) [d]	-	-	1.10E-06	0.010

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - Ammonia emission factor from EPA's WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3,-cd)pyrene, benzo(a)pyrene.

e - Hourly emissions based on 98.0 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

Project Idaho

Fryer and dryer uncontrolled emissions

Simplot source tests

	Source Test Date	PM Front-half emissions Method 5 lbs/hr	PM Back-half emissions Method 202 lbs/hr	PM Total emissions lbs/hr	Production rate finished lbs/hr	VOC Method 25A lbs/hr	Emission Factor EF PM-Total lbs/M lbs	Emission Factor EF VOC lbs/M lbs
Aberdeen Line 1 batter french fry - fryer uncontrolled	4/29/1998	0.59	2.94	3.53	17,550		0.201	
Aberdeen Line 2 preform fryer - fryer uncontrolled	6/7/1999	0.52	2.4	2.92	2,408		1.217	
Nampa Main Line batter french fry - Fryerafter heat exchanger	9/15/2005	2.68	3.21	5.87	23,630		0.248	
Caldwell Line 1 preform fryer - fryer uncontrolled	5/28/1999	1.66	1.4	3.06	6,480		0.472	
Heyburn Line 2 french fry, Fryer Reyco air washed controlled	2/22/2000 fryer, 10/28/2000 dryer	2.9	3.66	6.56	21,690	2.2	0.303	0.101
Heyburn Line 3, preform fryer, fryer Rotocione controlled	2/16/2000 fryer, 9/21/2000 dryer	0.42	0.71	1.13	2,378	1.12	0.475	0.471
Caldwell Line 1 preform line dryer	10/16/2000	0.38	0.68	0.85	8,331		0.114	
Caldwell Line 4 french fry line dryer	10/18/2000	3.14	3.11	6.25	34,085		0.183	
Caldwell Line 6 french fry line dryer	10/14/2000	3.03	4.15	7.18	36,211		0.198	
Nampa Main Line dryer	4/16/1995				35,435	7.07		0.200
							Average	

Project Idaho

	Line 1 fryer 55,000 lbs/hr		Line 1 dryer 55,000 lbs/hr	
	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr
	11.08			
	13.55			
	16.09	5.58		
			10.08	
			10.91	
				10.97
Average	13.77	5.58	10.49	10.97

	Line 2 fryer 55,000 lbs/hr		Line 2 Dryer 55,000 lbs/hr	
	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr
	11.08			
	13.55			
	16.09	5.58		
			10.08	
			10.91	
				10.97
Average	13.77	5.58	10.49	10.97

	Line 3 fryer 11,000 lbs/hr		Line 3 dryer 11,000 lbs/hr	
	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr
	13.38			
	5.19			
	5.23	5.19		
			1.25	
				2.19
Average	7.93	5.19	1.25	2.19

	Line 4 fryer 11,000 lbs/hr		Line 4 dryer 11,000 lbs/hr	
	PM Total lbs/hr	VOC Total lbs/hr	PM Total lbs/hr	VOC Total lbs/hr
	13.38			
	5.19			
	5.23	5.19		
			1.25	
				2.19
Average	7.93	5.19	1.25	2.19

Notes:

1. lbs/M lbs for emission factor is lbs of emissions (either PM or VOC) per thousand lbs of finished potato product
2. In the Simplot source tests, all Production rates are the actual measured finished potato product rates during the one-hour source test
3. Even though PM and VOC are distinctly different tests, because of the nature of our emissions, they are not additive for total emissions to a control device.
4. Use the Average for the input to an RTO unit. The database for uncontrolled emissions from fryers and dryers is very limited.
5. Even though there is data for Heyburn Lines 2 & 3 with Reyco air wash and Rotocione control, it has always been considered that this control for emissions is minor, the control was meant for large particles
6. There is no source test data for pre-fryer dryer VOC, so the french fry dryer VOC emission factor was used as a default value

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Regenerator Thermal Oxidizer

- Controls all dryer and fryer emissions.

Operating hours	8,760 hours/year	
Maximum heat input rate (startup)	25.20 MMBtu/hr	Angull email 10/12/2011
Annual average heat input (SFI Mode)	12.60 MMBtu/hr	Angull email 10/12/2011
Fryer & Dryer Emissions with Control Efficiencies		
Maximum PM Emissions - Fryers and Dryers	66.9 lb PM/hr	
Maximum VOC Emissions - Fryers and Dryers	47.9 lb VOC/hr	
PM Destruction Efficiency	90% Control	
VOC Destruction Efficiency	90% Control	
Stack Exhaust Flow Information		
Exhaust Temperature	111 degree F	Burns McDonnell Option 1 - 10/10/2011
Exhaust gas volume	100,000 acfm	Burns McDonnell Option 1 - 10/10/2011
Exhaust gas volume - calculated	163,235 acfm	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor [a] lb/MMBtu	RTO Burner Emission Rate [b] lb/hr	tpy	RTO Exhaust Emission Rate [c] lb/hr	tpy
NOx	0.1000	2.52	11.04	2.52	11.04
CO	0.0824	2.08	9.09	2.08	9.09
SO2	0.0006	0.015	0.06	1.5E-02	0.06
PM10 (Filt. & Cond.)	0.0075	0.188	0.82	6.71	29.38
PM2.5 (Filt.& Cond.)	0.0075	0.188	0.82	6.71	29.38
VOC	0.0054	0.136	0.60	4.80	21.02
Lead	4.9E-07	1.2E-05	5.4E-05	1.2E-05	5.4E-05

notes:

a - NOx emission factor for Maxon Kinemax burners. All other criteria pollutant emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf)

b - RTO Burner emissions based on 25.2 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

c - RTO exhaust emissions include RTO burner, Dryer Lines 1 - 4, and Fryer Lines 1 - 4. Particulate matter and VOC emissions include 90% control (Vendor Guarantee).

Greenhouse Gas Emissions

Greenhouse Gas	Fryer & Dryer Gas [a] lb/hr	NG Emission Factor [b] lb/MMBtu	RTO Burner Emission Rate [c] lb/hr	tpy
CO2	176	117	3,121	13,670
CH4	--	2.2E-03	5.5E-02	2.4E-01
N2O	--	2.2E-04	5.5E-03	2.4E-02
CO2e [d]			3,124	13,683

notes:

a - Greenhouse Gas emissions from converting VOC in fryer and dryer exhaust to CO2. VOC emissions assumed to be as carbon basis and conservatively assume 100 percent conversion to CO2.

b - Greenhouse Gas emission factors for natural gas combustion from 40 CFR 98, Subpart C, Table C-1.

c - Hourly emissions based on 25.2 MMBtu/hr, and annual emissions based on 8,760 hrs/yr.

d - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

Toxic Air Pollutant Emissions

CAS	Compound	Emission Factor [a] lb/mmscf	lb/mmBtu	RTO Burner Emission Rate [e] lb/hr	lb/yr
7440-38-2	Arsenic	2.0E-04	2.0E-07	4.9E-06	4.3E-02
7440-39-3	Barium	4.4E-03	4.3E-06	1.1E-04	9.5E-01
71-43-2	Benzene	2.1E-03	2.1E-06	5.2E-05	4.5E-01
7440-41-7	Beryllium	1.2E-05	1.2E-08	3.0E-07	2.6E-03
7440-43-9	Cadmium	1.1E-03	1.1E-06	2.7E-05	2.4E-01
7440-47-3_Cr	Chromium-Total [b]	1.4E-03	1.4E-06	3.5E-05	3.0E-01
7440-47-3_CrIII	Chromium III	1.3E-03	1.3E-06	3.3E-05	2.9E-01
7440-47-3_Cr(VI)	Chromium VI	5.6E-05	5.5E-08	1.4E-06	1.2E-02
7440-48-4	Cobalt	8.4E-05	8.2E-08	2.1E-06	1.8E-02
7440-50-8	Copper	8.5E-04	8.3E-07	2.1E-05	1.8E-01
50-00-0	Formaldehyde	7.5E-02	7.4E-05	1.9E-03	1.6E+01
110-54-3	Hexane	1.8E+00	1.8E-03	4.4E-02	3.9E+02
7439-96-5	Manganese	3.8E-04	3.7E-07	9.4E-06	0.08
7439-97-6	Mercury	2.6E-04	2.5E-07	6.4E-06	0.06
7439-98-7	Molybdenum	1.1E-03	1.1E-06	2.7E-05	2.4E-01
91-20-3	Naphthalene	6.1E-04	6.0E-07	1.5E-05	1.3E-01
7440-02-0	Nickel	2.1E-03	2.1E-06	5.2E-05	4.5E-01
109-66-0	Pentane	2.6E+00	2.5E-03	6.4E-02	5.6E+02
7782-49-2	Selenium	2.4E-05	2.4E-08	5.9E-07	5.2E-03
108-88-3	Toluene	3.4E-03	3.3E-06	8.4E-05	7.4E-01
10024-97-2	Nitrous Oxide	2.2E+00	2.2E-03	5.4E-02	4.8E+02
56-55-3	Benz(a)anthracene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
50-32-8	Benzo(a)pyrene	1.2E-06	1.2E-09	3.0E-08	2.6E-04
205-99-2	Benzo(b)fluoranthene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
207-08-9	Benzo(k)fluoranthene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
218-01-9	Chrysene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
53-70-3	Dibenzo(a,h)anthracene	1.2E-06	1.2E-09	3.0E-08	2.6E-04
193-39-5	Indeno(1,2,3-cd)pyrene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
91-57-6	3-Methylchloranthrene	1.8E-06	1.8E-09	4.4E-08	3.9E-04
23321-22-6	Dichlorobenzene	1.2E-03	1.2E-06	3.0E-05	2.6E-01
7440-66-6	Zinc	2.9E-02	2.8E-05	7.2E-04	6.3E+00
7664-41-7	Ammonia [c]	3.2E+00	3.1E-03	7.9E-02	6.9E+02
PAH	PAH (total) [d]	-	-	2.82E-07	2.47E-03

notes:

a - All other HAP and TAP emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf).

b - AP-42 provides a chromium emission factor for natural gas fired external combustion, but does not include guidance for partitioning emissions between the carcinogenic chromium VI (hexavalent chromium) and the chromium III (trivalent chromium). EPA's 2002 National-Scale Air Toxics Assessment (NATA) released June 2009 includes a chromium speciation profile for natural gas-fired boilers, which indicates 4 percent of total chromium is chromium VI and 96 percent is chromium III. ENVIRON assumed 4 percent of total chromium emissions were emitted as chromium VI.

c - Ammonia emission factor from EPA's WebFIRE database (http://cfpub.epa.gov/oarweb/index.cfm?action=fire.main)

d - (Polycyclic Organic Matter) For emissions of PAH mixtures, the following PAHs and shall be considered together as one TAP, equivalent in potency to benzo(a)pyrene: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3,-cd)pyrene, benzo(a)pyrene.

e - Hourly emissions based on 25.2 MMBtu/hr and annual emissions based on 8,760 hrs/yr.

BIOGAS FLARE

Pollutant	Emission Factor (lb/MMscf)	Emission Factor (lb/MMBtu)[a]	Potential to Emit lb/hr	Potential to Emit TPY
NOx	-	0.068	1.3	4.0
CO	-	0.37	7.0	22.0
SO2[a]	908.7	-	28.8	90.0
PM-10 [b]	-	7.5E-03	0.14	0.4
PM-2.5 [b]	-	7.5E-03	0.14	0.4
VOC	-	0.14	2.7	8.3
Lead [b]	-	4.9E-07	9.3E-06	2.9E-05

Biogas Flow Rate - Hrly	0.03174	MMscf/hr
Biogas Flow Rate - Ann.	198.1	MMscf/yr
Biogas Heat Content	600	btu/scf
Flare Heat Capacity - ST	19.0	MMBtu/hr
Flare Heat Capacity - LT	118,856	MMBtu/yr

Notes:
(a) The SO2 emission factor based on permit limit of H2S in the biogas (5,391 ppmv H2S).
(b) Emission factors based on AP-42, Section 1.4 (Natural Gas Combustion) corrected to lb/mmBtu using natural gas heat content (1,020 btu/cf). Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.
(c) Emission factors from AP-42 Section 13.5, Industrial Flares, September 1991. This Section contained emission factors for only NOx, CO and VOCs.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMscf	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	Emission Rate [b] tpy
CO2	119,256	--	3,785	11,812
CH4	--	2.2E-03	4.2E-02	1.3E-01
N2O	--	2.2E-04	4.2E-03	1.3E-02
CO2e [c]			3,787	11,819

notes:
a - CO2 emission factor based on biogas composition, CH4 and N2O emission factors from 40 CFR 98, Subpart C, Table C-1.
b - Hourly emissions based on 19.0 MMBtu/hr and 0.032 MMscf/hr, and annual emissions based on 118,856 MMBtu/yr and 198 MMscf/yr.
c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

Flare Stack Parameter Calculations [a]		short-term	long-term
Total Heat release	cal/s	1,333,950	950,380
Radiative Heat Loss	%	65.0	65.0
Net Heat Release	cal/s	466,882	332,633
Effective Stack Diameter	m	0.68	0.57
Physical Stack Height	m	6.1	6.1
Effective Stack Height	m	10.0	9.4
notes:			

a - Flare release parameters calculated using EPA Guidance Document: EPA-450/4-88-010 (Screening Procedures for Estimating the Air Quality Impact of Stationary Sources).

Sulfur Dioxide Calculations - Maximum Day Emissions

Basis:	31,740	scf/hr	Biogas (based on maximum blower throughput of 500 scfm with 29 scfm safety factor)
	19,044	scf/hr	Methane @ 60% methane (PTC analysis)
	5391	ppmv	Hydrogen Sulfide in Biogas (Digester Permit Limit)

Calculation: at 5391 ppmv H2S in Biogas = 0.005391 volume fraction of total Biogas
171.11034 scf H2S/hr
(31,740 scf/hr) x (0.005391) = 171 scf H2S/hr

PV = nRT
1 P = pressure, atmospheres
171.11034 V = volume, cubic feet
n = lbmoles
0.7302 R = gas constant, atm-cf/lbmoles-deg. R
520 T = temperature, deg. R

For standard pressure and temperature (STP)
T = 32 deg. F, 0 deg. C, 492 deg. R
P = 1 atm.

$$n = \frac{PV}{RT} = \frac{(1\ \text{atm})(171.1\ \text{scf H2S/hr})}{(0.7302\ \text{atm-cf/lbmoles-deg. R})(460+60\ \text{deg. R})}$$

= 0.45064139 lbmoles H2S/hr

	H_2S	+	$1\frac{1}{2}O_2$	g	SO_2	+	H_2O
MW	34				64		
lbmoles/hr	0.45				0.45		
lbs/hr	15.32				28.84		

Emission Factor for sulfur dioxide

$$\frac{(28.8\ \text{lbs SO2/hr})*(0.6\ \text{scf CH4})*(1,000,000\ \text{scf})}{(19,044\ \text{scf CH4/hr})*(1\ \text{scf biogas})*(1\ \text{MMscf})} = 908.7\ \text{lbs SO2/MM scf Biogas}$$

18.2 lbs SO2/MM scf Biogas (controlled, 98% sulfur removal)

Sulfur Dioxide Calculations - Average Day/Annual Emissions

Basis:	23,771,141	lb COD reduced/yr	Biogas PTC Application (1999)
	542,720	scf biogas/day	Biogas (based on COD reduction, 5.0 cf methane/lb COD reduced) - average annual flow rate from 1997 flare PTC Application
	325,632	scf CH4/day	Methane @ 60% methane (PTC analysis)
	5	cf CH4/lb COD reduc	PTC analysis
Digester and Flare Permit Limits:	2000000	lb COD/month	
	90	tons SO2/year	
	5391	ppmv	Hydrogen Sulfide in Biogas (Digester Permit Limit)

Calculation:

at 5391 ppmv H2S in Biogas = 0.005391 volume fraction of total Biogas
(542,720 scf/day) x (0.005391) = 2,926 scf H2S/day
2926 scf H2S/day

PV = nRT
1 P = pressure, atmospheres
2925.8 V = volume, cubic feet
n = lbmoles
0.7302 R = gas constant, atm-cf/lbmoles-deg. R
520 T = temperature, deg. R

For standard pressure and temperature (STP)
T = 32 deg. F, 0 deg. C, 492 deg. R
P = 1 atm.

$$n = \frac{PV}{RT} = \frac{(1\ \text{atm})(2{,}925.8\ \text{scf H2S/day})}{(0.7302\ \text{atm-cf/lbmoles-deg. R})(460+60\ \text{deg. R})}$$

= 7.71 lbmoles H2S/day

	H_2S	+	$1\frac{1}{2}O_2$	g	SO_2	+	H_2O
MW	34				64		
lbmoles/d	7.7				7.7		
lbs/day	262.0				493.2		

493.2 lbs/day x 365 days = 180,000 lbs/yr SO_2

= 90.0 tons/yr SO_2

Emission Factor for sulfur dioxide

$$\frac{(493.2\ \text{lbs SO2/d})*(0.6\ \text{scf CH4})*(1{,}000{,}000\ \text{scf})}{(325{,}632\ \text{scf CH4/d})*(1\ \text{scf biogas})*(1\ \text{MMscf})} = 908.7\ \text{lbs SO2/MM scf Biogas}$$

J.R. Simplot Company - Project Idaho

EG1 - Natural Gas Generator

- 25kW Onan #30.0SR-15R/2160A, at Warehouse A (palletizer area)

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	0.46 MMBtu/hr	Generator Spec. Sheet
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	0.85	0.2	–	0.02
CO	0.557	0.1	–	0.01
SO2	0.000588	1.4E-04	–	1.4E-05
PM-10	0.010	0.002	9.6E-05	2.3E-04
PM-2.5	0.010	0.002	9.6E-05	2.3E-04
VOC	0.12	0.03	–	2.7E-03

a - Emission factors from AP-42 Section 3.2 for 4-Stroke Lean Burn Engines. NOx and CO emission factors based on <90% load during planned testing. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hour emissions based on 0.5 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	117	27	3
CH4	2.2E-03	5.1E-04	5.1E-05
N2O	2.2E-04	5.1E-05	5.1E-06
CO2e [c]		27	3

notes:

a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly and 24-hour emissions based on 0.5 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

J.R. Simplot Company - Project Idaho

EG2 - Natural Gas Generator

- 7kW Olympian G3OF3, Emergency Generator at Greenhouse

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	0.12 MMBtu/hr	Based on scaling EG1 to 7kW
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	0.85	0.05	–	0.005
CO	0.557	0.03	–	0.003
SO2	0.000588	3.5E-05	–	3.5E-06
PM-10	0.010	0.001	2.5E-05	6.0E-05
PM-2.5	0.010	0.001	2.5E-05	6.0E-05
VOC	0.12	0.01	–	7.1E-04

a - Emission factors from AP-42 Section 3.2 for 4-Stroke Lean Burn Engines. NOx and CO emission factors based on <90% load during planned testing. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	117	7	1
CH4	2.2E-03	1.3E-04	1.3E-05
N2O	2.2E-04	1.3E-05	1.3E-06
CO2e [c]		7	1

notes:

a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

J.R. Simplot Company - Project Idaho

EG3 - Diesel Generator

- 100kW Onan #100DGDB, Emergency Generator at Wastewater

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	1.04 MMBtu/hr	Generator Spec. Sheet @ Full Load
Heat Value - No. 2 Distillate	0.138 MMBtu/gallon	40 CFR 98, Subpart C, Table C-1
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	4.41	2.28	–	0.23
CO	0.95	0.5	–	0.05
SO2 [c]	1.52E-03	7.8E-04	–	7.8E-05
PM-10	0.31	0.16	0.0067	0.02
PM-2.5	0.31	0.16	0.0067	0.02
VOC	0.36	0.19	–	0.02

a - Emission factors from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hr average emissions based on 1.0 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

c - SOx emission factor based on ULSD (15 ppm S) and AP-42 Section 3.4, Large Stationary Diesel Engines, Table 3.4-1 (fuel input).

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	163	84	8
CH4	6.6E-03	3.4E-03	3.4E-04
N2O	1.3E-03	6.8E-04	6.8E-05
CO2e [c]		85	8

notes:

a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly and 24-hr average emissions based on 1.0 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

J.R. Simplot Company - Project Idaho

EG4 - Natural Gas Generator

- 7kW Dayton 3W057, Emergency Generator at Tech Center

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	0.12 MMBtu/hr	Based on scaling EG1 to 7kW
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	1.94	0.12	–	0.012
CO	0.557	0.03	–	0.003
SO2	0.000588	3.5E-05	–	3.5E-06
PM-10	0.048	0.003	1.2E-04	2.9E-04
PM-2.5	0.048	0.003	1.2E-04	2.9E-04
VOC	0.12	0.01	–	7.2E-04

a - Emission factors from AP-42 Section 3.2 (maximum of 2-Stroke and 4-Stroke Engines). NOx and CO emission factors based on <90% load during planned testing. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

Greenhouse Gas Emissions

Greenhouse Gas	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	117	7	1
CH4	2.2E-03	1.3E-04	1.3E-05
N2O	2.2E-04	1.3E-05	1.3E-06
CO2e [c]		7	1

notes:

a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly and 24-hour emissions based on 0.1 MMBtu/hr max input, testing engine for only 30 min/day, and annual emissions based on 100 hrs/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

J.R. Simplot Company - Project Idaho

FWP1 - Diesel Fire Water Pump

- 300 hp Cummins NT855F3, fire water pump

	Generator Specifications	
Operating hours	100 hours/year	
Firing rate	2.22 MMBtu/hr	Generator Spec. Sheet @ Full Load
Heat Value - No. 2 Distillate	0.138 MMBtu/gallon	40 CFR 98, Subpart C, Table C-1
Testing Limited to	30 min/day	
- Limit on specific hours to test	(12pm - 7pm)	

Criteria and PSD Pollutant Emissions

Pollutant	Emission Factor (lb/MMBtu)[a]	Potential to Emit [b]		
		lb/hr	lb/hr (24-hr ave)	TPY
NOx	4.41	4.9	–	0.49
CO	0.95	1.1	–	0.11
SO2 [c]	1.52E-03	1.7E-03	–	1.7E-04
PM-10	0.31	0.344	0.0143	3.4E-02
PM-2.5	0.31	0.344	0.0143	3.4E-02
VOC	0.36	0.40	–	4.0E-02

a - Emission factors from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines, 10/96. Conservatively assume PM2.5 emission rates are equivalent to PM10 emission rates.

b - Hourly and 24-hr average emissions based on 2.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

c - SOx emission factor based on ULSD (15 ppm S) and AP-42 Section 3.4, Large Stationary Diesel Engines, Table 3.4-1 (fuel input).

Greenhouse Gas Emissions

Greenhouse Ga	Emission Factor [a] lb/MMBtu	Emission Rate [b] lb/hr	tpy
CO2	163	181	18
CH4	6.6E-03	7.3E-03	7.3E-04
N2O	1.3E-03	1.5E-03	1.5E-04
CO2e [c]		182	18

notes:

a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

b - Hourly and 24-hr average emissions based on 2.2 MMBtu/hr max firing rate, 30 min testing/day and, and annual emissions based on 100 hrs/yr.

c - CO2e calculated based on global warming potential (GWP) for each Greenhouse gas: CO2 = 1; CH4 = 21; and N2O = 310 (40 CFR Part 98, Subpart A).

Boiler Emissions with Limit on Natural Gas Consumption

Maximum Fuel Available to Boilers

Propose	99,000	ton CO2e annual limit
minus	31	ton CO2e from engine testing
minus	13,683	ton CO2e from annual RTO operation
	85,286	tons CO2e available to boilers
	166.4	MMBtu/hr available to boilers
	1,457,829	MMBtu/year available to boilers

compared with 3*98= 294 MMBtu disregarding proposed fuel limit
57%

Potential Annual Emissions If Boilers Limited to 1,457,829 MMBtu/year

	Boilers	Flare	RTO	Engines	Solvents	Total
NOx	13	4	11	1	-	29
CO	27	22	9	0.2	-	58
SO2	0.4	90	0.1	0.0003	-	90
PM10/PM2	5	0.4	29	0.1	-	35
VOC	4	8	21	0.1	3	36

Facility Wide Fuel Limit

Firing rate 1,692,245 MMBtu/year (HHV)

Greenhouse Gas Emissions

Greenhous	Emis.Factor [a] lb/MMBtu	Emission Rate GWP	CO2e
CO2	117	1	98,903
CH4	2.2E-03	21	39
N2O	2.2E-04	310	58
CO2e [c]			99,000

notes:
a - Greenhouse Gas emission factors from 40 CFR 98, Subpart C, Table C-1.

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: March 27, 2012

TO: Dan Pitman, P.E., Permit Writer, Air Quality Division

FROM: Cheryl Robinson, P.E., Air Quality Engineer/Modeling Analyst, Air Quality Division

PROJECT NUMBER: P-2011.0141 PROJ 60966

SUBJECT: Modeling Review for J R Simplot Co – Caldwell Facility
Initial PTC for New Potato Processing Plant (Facility ID 027-00131)

1.0 Summary

On December 6, 2011, DEQ received an application from the J R Simplot Company, Food Group, (Simplot) to construct a new potato processing plant on the same parcel as the existing processing plant (Facility ID 027-00009). Operation of the existing process lines will be phased out as the new processing lines are brought online. The existing processing plant will be demolished once the new plant is fully commissioned. No changes were proposed to the existing wastewater treatment system, digester, or digester gas/biogas flare.

Supplemental modeling information was submitted on February 8, 2012, with a complete set of revised analyses received on February 23, 2012 that reflected increasing the RTO stack height from 70 feet to 85 feet and changes to building downwash due to revised dimensions for the Process Building. Supplemental modeling was received on March 12, 2012 demonstrating that there is no change to the modeled 1-hr NO_2 ambient impacts if the English boiler (Boiler #1) operates at 100 percent capacity during commissioning rather than at the previously modeled 50-percent capacity (short-term NO_2 impacts are driven by emergency generator testing). DEQ verification modeling demonstrated that ambient impacts are less than the $PM_{2.5}$ NAAQS when operating Boiler #1 at 100 percent capacity. Additional modeling was received on March 23, 2012, to address operating the dryers during commissioning.

Air quality analyses involving atmospheric dispersion modeling of emissions associated with the facility were performed to demonstrate the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]) or Toxic Air Pollutant (TAP) increment (Idaho Air Rules Section 203.03). The application and modeling analyses were prepared by ENVIRON's Lynnwood, Washington office.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (Guideline on Air Quality Models). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information demonstrated to the satisfaction of the Department that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
The project results in no change to the currently permitted emissions from the biogas flare. Biogas generation is limited to (529 x 2) scfm at 5391 ppmv H_2S, based on reducing wastewater COD by an average of no more than (2 x 2) million pounds per month on a rolling 12-month average.	Emissions from the biogas flare were not considered in the significance analyses for this project. Full impact analyses presumed combusting 529 scfm of treated biogas in the new boiler(s) and simultaneously combusting 529 scfm of untreated (5391 ppmv H_2S) biogas in the flare. Biogas generation in previous permits was limited to 529 scfm based on reducing wastewater COD by 2 million pounds per month on average.
Biogas is treated to reduce the H_2S concentrations in the gas prior to combusting the gas in any boiler.	Boilers B and C may burn biogas that has been treated to substantially reduce the concentration of H_2S. ENVIRON indicated that preliminary modeling analyses showed that compliance with the 1-hr SO_2 NAAQS could not be assured if untreated biogas is combusted in the boilers.
SO_2 emissions are limited to a maximum of 0.7 lb/hr, combined, from Boilers B and C.	Compliance with the 1-hr SO_2 NAAQS was demonstrated only for treated biogas; modeled SO_2 emissions from Boilers B and C were 0.35 lb/hr from each boiler. Modeled full impact results were about 95% of the 1-hr SO_2 NAAQS, both during and after commissioning. These two boiler stacks are located in close proximity to one another, were modeled using identical exhaust characteristics, and Boilers B & C were presumed to be operating continuously. A combined SO_2 emission limit for these two boilers would be appropriate. Each of the 3 new boilers (A, B, and C) was modeled presuming 8,760 hours per year operation at full 98 MMBtu/hr capacities.
Tier I permit nomenclature / This PTC Unit 1, 166 hp diesel CI engine / EG3, Wastewater Unit 2, 287 hp diesel CI engine / FWP1 Unit 3, 14.8 hp nat gas SI / EG4, Tech center Unit 4, 55 hp nat gas SI / EG1, Warehouse A Unit 5, 68 hp nat gas SI / EG2, Greenhouse	The current PTC application and modeling analyses used a different naming convention for the generators compared to existing facility permits. This "crosswalk" list is intended to reduce confusion with regard to which engine is being discussed.
"Hour of day" operational limits for emergency generator and fire pump engine testing are set to the hours between 11 a.m. and 6 p.m. local time.	These emissions were modeled only for 7 hours in any day, beginning with hour 12 (11 am LST), i.e., between 11a.m. and 6 p.m. AERMOD does not account for daylight savings time, so between 2 a.m. on the second Sunday in March through 2 a.m. on the first Sunday in November of each year, the emissions were modeled as occurring between 12 noon and 7 p.m. MDT. Because insolation and temperatures are typically higher (i.e., typically better dispersion conditions for longer periods in the afternoon) during the period when MDT is in effect compared to winter months, it is recommended that testing be limited to the hours between 11 a.m. and 6 p.m. local time, without regard to whether standard or daylight savings time is in effect.
Routine testing of each emergency generator EG1 through EG4 (Units 4, 5, 1, and 3, respectively, in the facility's Tier I permit) is limited to a maximum of 30 minutes per hour and 100 hrs per year, and testing is conducted between the hours of 11 a.m. and 6 p.m. Testing of EG2, EG3, and EG4 is limited to a maximum of twice per year for each generator.	Compliance with the 1-hr NO_2 NAAQS was demonstrated only for these generator testing assumptions. After commissioning, the full impact NO_2 impacts were predicted to be 75% of the 1-hr NO_2 NAAQS. For the short-term (1-hour) analyses, NO_2 is equal to 80% of NOx. Annual results reflect assuming that NO_2 emissions were equal to 100% of NOx emissions.
Routine testing of the 2.2 MMBtu/hr (287 hp, diesel) Fire Water Pump (FWP1) and annual flow testing of FWP1 are conducted between the hours of 11 a.m. and 6 p.m. Routine testing of FWP1 is limited to 100 hours per year.	FWP1 emissions were modeled only for 7 hours in any day, from 11 am to 6 pm LST.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Production limits: - New Lines 1 & 2 Dryer and Fryer: 55,000 lb/hr each 660 tons per day each - New Lines 3 & 4 Dryer and Fryer: 11,000 lb/hr each 132 tons per day each $PM_{2.5}$ emissions from the RTO after commissioning are limited to a maximum: 6.7 lb/hr. Initial and routine source testing of RTO $PM_{2.5}$ emissions is recommended.	Process PM emissions from the RTO were based on these production rates. 24-hour $PM_{2.5}$ impacts (even with the RTO stack raised to 85 ft) were predicted to reach 97% of the NAAQS during commissioning, and 76% of the NAAQS after commissioning. $PM_{2.5}$ background levels show relatively high variability depending on a number of factors, including whether the area experiences greater or fewer numbers of naturally-caused wildfires. Modeled emission rates presumed that the RTO reduced PM and VOC process emissions from the dryers and fryers by 90%. It's unclear that the RTO will attain this destruction efficiency.
The RTO is fired by natural gas, exclusively. The RTO exhaust parameters meet the following: Exit height: at least 25.91 m (85 ft) above ground level Exit velocity: at least 21.55 m/sec Exit temperature: at least 317 K (111°F)	The RTO is by far the largest source of $PM_{2.5}$ emissions. The demonstration of compliance with the 24-hr $PM_{2.5}$ NAAQS was strongly dependent on the RTO stack height, exhaust parameters, and emission rate. Modeled combustion emissions from the RTO were based on operating the 25.2 MMBtu/hr burner at maximum capacity for 8,760 hours per year.
"During commissioning" operations are as follows: Only one of the new boilers (A, B, or C) is operated at any time. Boiler B or C may be operated on a mix of natural gas and treated biogas. Boiler 1 (the English Boiler) is operated at 100% capacity. No routine operational testing of EG2, EG3, and EG4. Routine operational testing of EG1 and FWP1 is limited to 30 minutes per hour each and occurs only during the hours between 11 am and 6 pm. Existing AMUs are operated at maximum 50% capacity. **AND** <u>"No Dryer Operation"</u> Only one existing line (Line 5, with a fryer only, vented to the WESP), permitted (T1-2011.0117) to process 68,000 pounds per 8-hour shift. Annual flow testing of FWP1 occurs only during the hours between 11 am and 6 pm. **OR** <u>Scenario 1, with Existing Lines 1 and 6</u> Existing Line 1 fryer (vented to the WESP) and dryer, permitted (T1-2011.0117) at 5.5 MMBtu/hr, 75,000 pounds processed per 8-hour shift. Existing Line 6 fryer (vented to the WESP) and dryer, permitted (T1-2011.0117) at 28 MMBtu/hr, 270,000 pounds per 8-hour shift. As production is ramped up using a new fryer and /or dryer, there is a commensurate decrease in production in an existing fryer and/or dryer.	Emissions from Boiler B (at rated capacity) were included in the modeling. However, these 3 boiler stacks are located in close proximity to one another and were modeled using identical exhaust characteristics. Supplemental modeling received on March 12, 2012 demonstrated that operating Boiler #1 at 100% capacity rather than 50% capacity does not change the modeled design value for 1-hr NO_2. DEQ verification modeling confirmed that 24-hour $PM_{2.5}$ impacts (even with the RTO stack raised to 85 ft) were predicted to reach 97% of the NAAQS during commissioning. Natural gas-fired air makeup units are operated at 50%, rather than at 25%, of rated capacity, which should provide a reasonable estimate of emissions even if commissioning occurs during colder months. Supplemental modeling received on March 23, 2012 demonstrated that the increase in ambient impacts from operating both existing dryers at permitted capacity—in addition to the other equipment to be operated "during commissioning"—would be below significant at all receptors and for all pollutants and averaging times, compared to existing permitted operations. DEQ determined that the modeled operating scenarios for commissioning provided reasonable assurance that emissions during this period would not significantly contribute to a violation of the NAAQS. Because it is not feasible to attempt to model all potential scenarios, however, limiting the combined throughputs for existing and new production lines to the previously permitted maximum rates is recommended.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance for this facility located two miles west of Caldwell on Highway 19. Approximate UTM coordinates for the facility are 521.5 km Easting and 4,835 km Northing, in UTM Zone 11 (Datum WGS84). The base elevation at the facility is 714 meters.

2.1.1 Area Classification

The proposed facility is located within Canyon County which is designated as an attainment or unclassifiable area for carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone, particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers ($PM_{2.5}$), and sulfur oxides (SO_x). There are no Class I areas within 10 kilometers of this location.

2.1.2 DEQ Modeling Thresholds

Modeling is typically not required if the changes in estimated criteria pollutant emission rates for a proposed project are below DEQ's modeling thresholds, shown in Table 2. "Case-by-case" thresholds may be used only with prior DEQ approval. "Threshold I" values were used for this project.

Table 2. DEQ CRITERIA POLLUTANT MODELING THRESHOLDS

Criteria Air Pollutants	Averaging Period	DEQ Modeling Threshold			
		Threshold I		Threshold II (Case-by-Case)	
PM_{10}	24-hr	0.22	lb/hr	2.6	lb/hr
$PM_{2.5}$	24-hr	0.054	lb/hr	0.63	lb/hr
	Annual	0.35	T/yr	4.1	T/yr
CO	1-hr, 8-hr	15	lb/hr	175	lb/hr
NO_2	1-hour	0.20	lb/hr	2.4	lb/hr
	Annual	1.2	T/yr	14	T/yr
SO_2	1-hr	0.21	lb/hr	2.5	lb/hr
	24-hr	0.22	lb/hr	2.6	lb/hr
	Annual	1.2	T/yr	14	T/yr
Lead	3-month rolling avg	14	lb/mo		

2.1.3 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the existing unpermitted facility exceed the significant contribution levels (SCLs) of Section 006 of IDAPA 58.01.01, Rules for the Control of Air Pollution in Idaho (Idaho Air Rules), then a cumulative impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02 for Permits to Construct and Section 403.02 for Tier II Operating Permits. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 3. The SCLs and the modeled value that must be used for comparison to the NAAQS are also listed in Table 3.

Table 3. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Contribution Levels[c] ($\mu g/m^3$)[b]**	**Regulatory Limit[d] ($\mu g/m^3$)[b]**	**Modeled Value Used[g, h]**
PM_{10}[a]	24-hour	5.0	150[f]	Maximum 6th highest[i]
$PM_{2.5}$[a]	Annual	0.3[b]	15[e]	$PM_{2.5}$ –Maximum 1st high[J]
	24-hour	1.2[b]	35	$PM_{2.5}$ –Maximum 1st high[J]
Carbon monoxide (CO)	8-hour	500	10,000[f]	Maximum 2nd highest
	1-hour	2,000	40,000[f]	Maximum 2nd highest
Sulfur Dioxide (SO_2)	Annual	1.0	80[e]	Maximum 1st highest
	1-hour[o]	EPA Interim: 3 ppb[m] (~7.8 $\mu g/m^3$)	0.075 ppm[m,n] (196 $\mu g/m^3$)	Maximum 4th highest[m]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest
	1-hour[m]	EPA Interim: 4 ppb[l] (7.5 $\mu g/m^3$)	0.100 ppm[l, n] (188 $\mu g/m^3$)	Maximum 8th highest[l]
Lead (Pb)	Rolling 3-month average	NA	0.15[f, k]	Maximum 1st highest

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

[b] Micrograms per cubic meter.

[c] SCLs are defined in Idaho Air Rules Section 006. $PM_{2.5}$ SCLs (75 FR 64864, October 20, 2010) were adopted as an Idaho temporary rule effective April 26, 2011. The pending rule will become final and effective upon adjournment of the 2012 legislative session if approved by the Idaho Legislature.

[d] Federal NAAQS (see 40 CFR 50) in effect as of July 1 of each year are incorporated by reference during the legislative session the following spring. See Idaho Air Rules Section 107.

[e] Never expected to be exceeded in any calendar year.

[f] Never expected to be exceeded more than once in any calendar year. The 3-hr and 24-hr SO_2 standards were revoked (see 75 FR 35520, June 22, 2010) but will remain in effect until one year after the effective date (~late 2012) of initial area designations for the new 1-hour SO_2 NAAQS (i.e., in effect until ~late 2013).

[g] Concentration at any modeled receptor.

[h] The maximum 1st highest modeled value is always used for significant impact analyses.

[i] PM_{10} concentration at any modeled receptor when using five years of meteorological data. Use the maximum 2nd highest value for analyses with less than five years of meteorological data or one year of site-specific met data.

[j] $PM_{2.5}$ concentration at any modeled receptor when using a single year of site-specific meteorological data or a concatenated file with five years of meteorological data. EPA recommends using the high 8th high 3-year average monitored value for background, and using the highest 24-hr average and highest annual averages across five years of met data for the modeled result (Steven Page memo, Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS, March 23, 2010).

[k] Pb: The EPA's October 15, 2008 standard became effective in Idaho's NSR program when it was incorporated by reference into the Idaho Air Rules, i.e., when the Idaho Legislature adjourned *sine die* on March 29, 2010.

[l] NO_2 concentration at any modeled receptor when using complete year(s) of site-specific met data or five consecutive years of representative meteorological data. Compliance is based on the 3-year average of the 98th percentile of the annual distribution of 1-hour average daily maximum concentrations. EPA Interim SIL, Page memo, dated June 29, 2010.

[m] SO_2 concentration at any modeled receptor when using complete year of site-specific met data or five consecutive years of representative meteorological data. Compliance is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA Interim SIL, Page memo, dated August 23, 2010.

[n] EPA's February 10, 2010 1-hour NO_2 standard (75 FR 6474) and June 22, 2010 1-hour SO_2 standard (75 FR 35520) became effective in Idaho on April 7, 2011.

2.1.4 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.*

Permit 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 emissions increase 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.

In accordance with Section 210.20 of the Idaho Air Rules, a demonstration of compliance with state-only TAPs standards is not required for any TAP that is regulated at the time of permit issuance under 40 CFR Part 60 (New Source Performance Standards [NSPS]), 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants [NESHAP], or 40 CFR Part 63 (NESHAP for Source Categories / MACT standards).

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1] and are currently being updated. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources.

DEQ's recommended background levels for this project—which is located in a predominantly rural area with no co-contributing facilities located nearby—are shown in Table 4. Background values developed by ENVIRON for this project were based on two years of recent monitoring data. These values are shown in italics. Note that background values are typically developed based on three consecutive years of recent monitoring values and that a third year of data (2008) was available for $PM_{2.5}$ measurements at the Nampa Fire Station.

Table 4. DEQ RECOMMENDED BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration (ppb)	Background Concentration ($\mu g/m^3$)	NAAQS	Background Value Reference
PM_{10}	24-hour	---	73 *(85.5)*	150 $\mu g/m^3$	Default: Rural Agricultural *Avg of 24-hr values, Nampa Fire Station, 2009-2010*

[1] Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

Table 4. DEQ RECOMMENDED BACKGROUND CONCENTRATIONS					
Pollutant	**Averaging Period**	**Background Concentration (ppb)**	**Background Concentration ($\mu g/m^3$)**	**NAAQS**	**Background Value Reference**
$PM_{2.5}$	24-hour	---	19.3 20.0 *(16.6)*	35 $\mu g/m^3$	Avg of 98th percentile values, St. Luke's, Meridian, 2008-2010 Avg of 98th percentile values, Nampa Fire Stn, 2008-2010 *Avg of 98th percentile values, Nampa Fire Stn, 2009-2010*
	Annual	---	6.3 7.2 *(6.7)*	15 $\mu g/m^3$	Avg of annual mean values, St. Luke's, Meridian 2008-2010 Avg of annual mean values, Nampa Fire Stn, 2008-2010 *Avg of annual mean values, Nampa Fire Stn, 2009-2010*
Carbon monoxide (CO)	1-hour	Default 3,000	Default 3,600	9,000 ppb (10,000 $\mu g/m^3$)	Default: Rural Agricultural
	8-hour	Default 2,000	Default 2,300	35,000 ppb (40,000 $\mu g/m^3$)	Default: Rural Agricultural
Nitrogen dioxide (NO_2)	1-hour	22.5	42.4 *(88.4)*	100 ppb (188 $\mu g/m^3$)	Avg of high 2nd high 1-hour values plus 1 sigma, 2006-2008 Counties: Burke, Dunn, McKenzie, and Jackson (ND) *Avg of 98th percentile values, St. Luke's Meridian, 2009-2010*
	Annual	1.8	3.5	53 ppb (100 $\mu g/m^3$)	Avg of annual mean values plus 1 sigma, 2006-2008 Counties: Burke, Dunn, McKenzie, and Jackson (ND)
Sulfur dioxide (SO_2)	1-hour	12.65	33.1 *(10.6)*	75 ppb (196 $\mu g/m^3$)	1st high plus 1 sigma, 2006-2008, Fargo ND/Moorhead MN *Avg of 98th percentile values, Nampa Fire Stn, 2009-2010*
	Annual	1.0	2.6	30 ppb (80 $\mu g/m^3$)	Max annual average, 2006-2008, Fargo ND/Moorhead MN
Lead (Pb)	Rolling 3-month average	---	Default 0.03	0.15 $\mu g/m^3$	Default: Rural Agricultural

ppb = parts per billion by volume $\mu g/m^3$ = micrograms per cubic meter 1 sigma = σ = one standard deviation

"Default" values were taken from Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling.* Idaho DEQ, Memorandum to Mary Anderson, March 14, 2003.

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

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

3.1.1 Overview of Analyses

ENVIRON performed air quality analyses using AERMOD in support of the submitted permit application. A brief description of parameters used in the modeling analyses is provided in Table 5.

Table 5. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 11103
Meteorological data	Boise 2005-2009	NWS 1-minute ASOS wind data, surface data, and upper air soundings collected at the Boise Airport from 2005 through 2009. Processed by ENVIRON using AERMINUTE v. 11059, AERSURFACE v. 08009, and AERMET v. 11059.
Terrain	NED 1/3 arc-sec	AERMAP v. 11103, using 1/3-arc second NED terrain data files (NAD83/WGS84).
Building downwash	BPIP-PRIME v. 04274	Building downwash parameters were calculated using the BPIP PRIME algorithm (version 04274).
Receptor Grid	Receptors	Receptor locations were defined in UTM coordinates (NAD83)
	Grids	25-meter (m) spacing along the property boundary. 20-km square with nested grids of 25-m, 50-m, 200-m, and 500-m spacing.

3.1.2 Modeling Protocol and Methodology

A modeling protocol was received electronically by DEQ's modeling coordinator on Wednesday, November 23, 2011 (the day before Thanksgiving). The modeling reviewer was assigned to this project on Tuesday, November 29, in time for the pre-application meeting held that afternoon. The electronic version of the application was submitted to DEQ three working days later, on Monday, December 5. Rather than finishing the protocol review, DEQ reviewed the submitted analyses, which used Boise meteorological data and background values developed by ENVIRON.

Modeling was generally conducted using methods described in the *State of Idaho Air Quality Modeling Guideline*. Default rural dispersion was used.

3.1.3 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. EPA provided a one-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

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 offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer.
- Improved plume rise and buoyancy calculations.
- Improved treatment of terrain effects on dispersion.
- New vertical profiles of wind, turbulence, and temperature.

3.1.4 Meteorological Data

National Weather Service (NWS) surface data, including 1-minute ASOS wind data, and upper air soundings collected at the Boise Airport for the years 2005 through 2009 were obtained by ENVIRON. ASOS wind data were pre-processed using AERMINUTE v. 11059. Surface data were pre-processed using AERSURFACE v. 08009 and land use information from the 1992 National Land Cover Database (NLCD). Surface roughness was calculated for 12 sectors for the data collection site located at an airport, with no continuous snow cover during the winter months, average surface moisture, in a region not considered arid. AERMOD-ready surface and upper air files were produced using AERMET v. 11059.

3.1.5 Terrain Effects

Terrain effects on dispersion were considered in these analyses. ENVIRON used AERMAP v. 11103 to extract the actual elevation of each receptor and determine the controlling hill height elevation from a 1/3-arc second (about 10 meter resolution) tiff file downloaded from the Seamless National Elevation Database (NED). The NED file encompassed the area between -116.530 and -116.929 degrees longitude and 43.526 and 41.813 degrees north latitude (coordinate system ID WGS84)

3.1.6 Facility Layout

The proposed new facility layout is shown in Figure 3-1 (Figure 4-5 from the application).

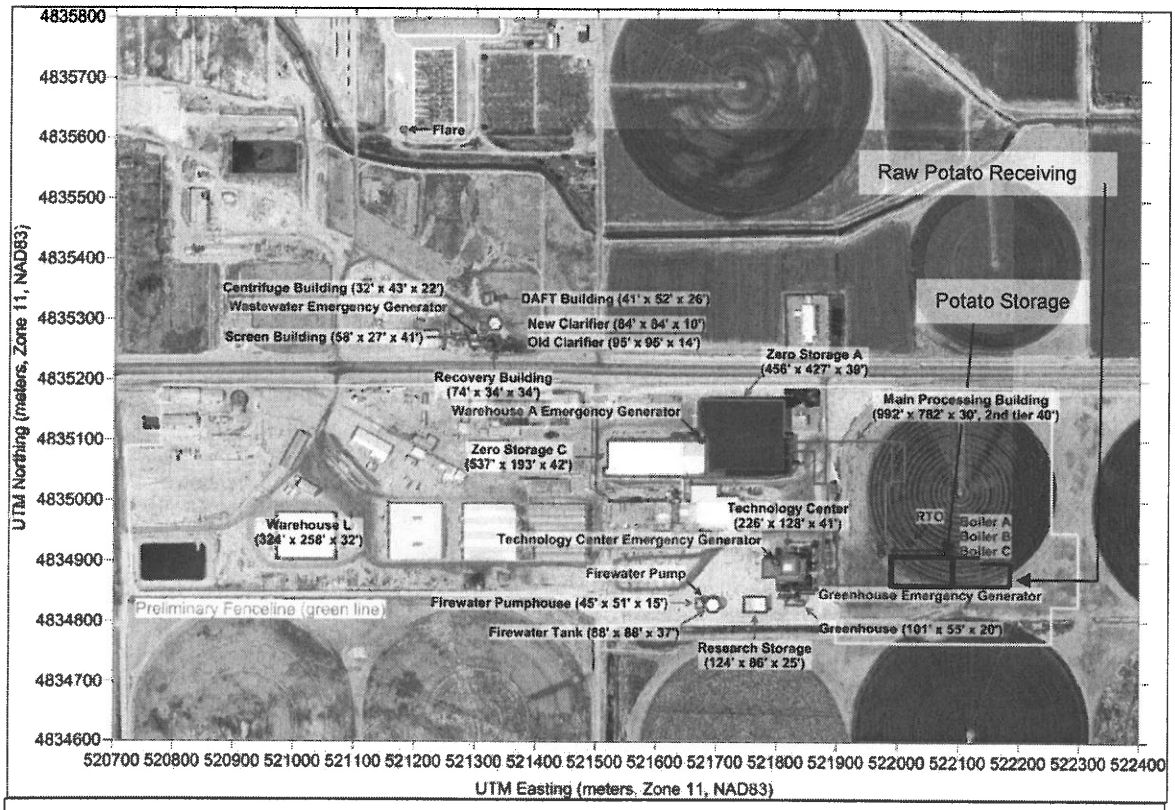

Figure 3-1. SIMPLOT CALDWELL – 2012 IDAHO PROJECT FACILITY LAYOUT

The layout of the main plant sources and buildings is shown in Figure 3-2, based on modeling analyses received on February 23, 2012.

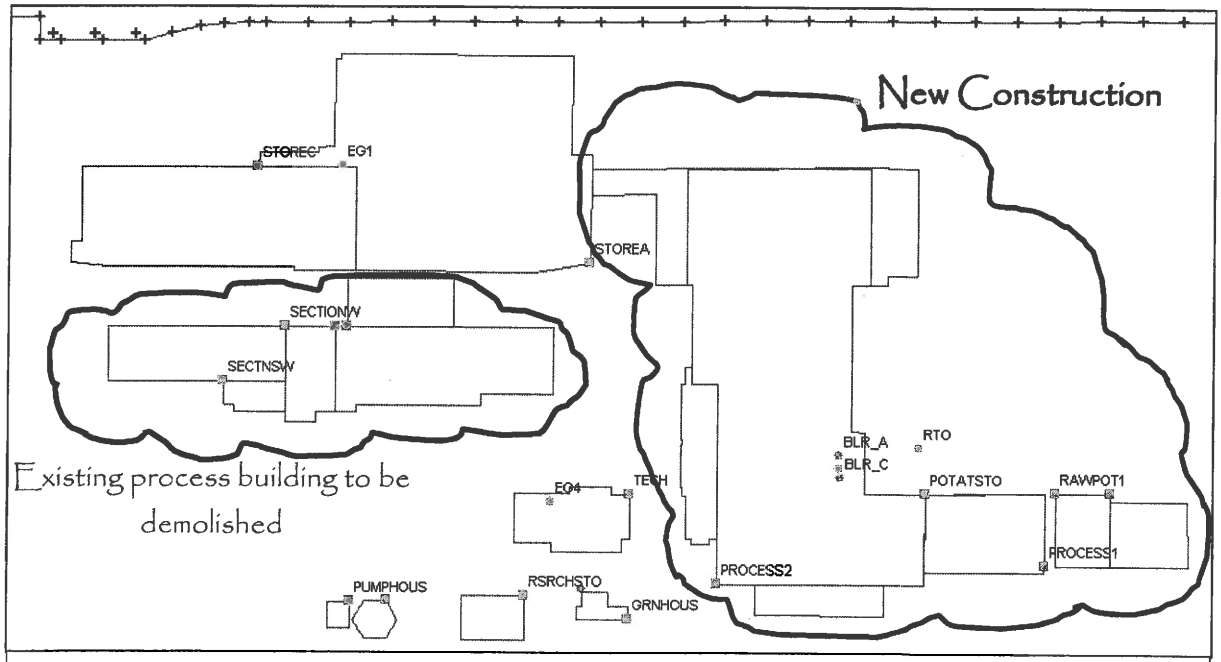

Figure 3-2. 2012 IDAHO PROJECT – MAIN PLANT MODELED LAYOUT

3.1.7 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the submitted modeling analyses. The Building Profile Input Program with Plume RIse Model Enhancements (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emission release parameters for input to AERMOD. Building parameters used in the submitted modeling are summarized in Table 6.

DEQ confirmed that none of the new sources will be affected by downwash[2] from the existing process building, which will remain in place during commissioning, but which will be demolished once the new plant is up and running. Downwash effects from existing buildings as well as from the new plant buildings were included for "during commissioning" modeling analyses, when both the old process line(s) and the new process line(s) will be in operation.

Table 6. BUILDING PARAMETERS

Building	Building Height	Base Elevation (m)	UTM Datum NAD83 Zone 11			
			Easting, X (m)	Northing, Y (m)	Easting, X (m)	Northing, Y (m)
Existing Buildings, Main Plant						
Pumphouse	4.7 m	714	521680.3	4834838.1	521666.7	4834822.7
			521666.7	4834838.1	521680.3	4834822.7
Firewater Storage (water tower)	11.3 m	714	521701.8	4834839.2	521688.4	4834816.1
			521708.4	4834827.6	521681.8	4834827.6
			521701.8	4834816.1	521688.4	4834839.2
Research Storage	7.6 m	714	521784.2	4834842.2	521746.5	4834815.9
			521746.5	4834842.0	521784.3	4834815.9
Tech Center	12.6 m	714	521847.2	4834903.7	521778.2	4834874.7
			521836.2	4834903.9	521800.1	4834874.5
			521836.3	4834908	521800.1	4834869.1
			521811.3	4834908.1	521842.5	4834868.7
			521811.3	4834904.5	521842.4	4834876.6
			521778.3	4834904.5	521847.1	4834876.7
Zero Storage 'A'	11.9 m	714	521823.3	4835042.4	521659.8	4835112.1
			521823.6	4835107.8	521659.7	4835108.8
			521811.4	4835107.9	521624.1	4835108.9
			521811.7	4835167.6	521623.8	4835099.9
			521672.7	4835168.3	521682.3	4835099.9
			521672.8	4835165.1	521682.3	4835037.9
			521669.8	4835165.1	521789.7	4835037.5
			521669.5	4835112.2	---	---
Zero Storage 'C'	12.8 m	714	521623.8	4835099.9	521534.9	4835040.4
			521518.6	4835100.2	521645.3	4835040.1
			521518.5	4835055	521645.3	4835038.1
			521512.4	4835055	521682.3	4835037.9
			521512.4	4835042.5	521682.3	4835099.9
			521518.4	4835041.5	---	---
Greenhouse	5.94 m	714	521846.6	4834828.0	521819.0	4834845.0
			521846.6	4834835.7	521819.0	4834835.7
			521834.5	4834835.7	521816.0	4834835.7
			521834.5	4834845.0	521815.9	4834828.1
Warehouse L	9.7	714	520971.0	4834980.2	521069.7	4834901.5
			521069.7	4834980.2	520972.1	4834901.5

[2] Using BREEZE Downwash Analyst v1.6.0.1, under a complimentary agency license from Trinity Consultants.

Table 6. BUILDING PARAMETERS						
Building	Building Height	Base Elevation (m)	UTM Datum NAD83 Zone 11			
			Easting, X (m)	Northing, Y (m)	Easting, X (m)	Northing, Y (m)
Existing Main Plant Process Building to be Demolished after Commissioning New Plant						
Section_West	13.3 m	714	521641.0	4835004.0	521535.0	4834971.0
			521535.0	4835004.0	521641.0	4834971.0
Section_Southwest	7.7	714	521604.0	4834971.0	521610.0	4834953.0
			521641.0	4834971.0	521610.0	4834957.0
			521641.0	4834953.0	521604.0	4834957.0
Section_Central	6.1	714	521641.0	4835004.0	521659.0	4834953.0
			521671.0	4835004.0	521659.0	4834947.0
			521671.0	4834953.0	521641.0	4834947.0
Section_East	7.5	714	521671.0	4835004.0	521758.0	4834957.0
			521801.0	4835004.0	521683.0	4834957.0
			521801.0	4834964.0	521683.0	4834953.0
			521758.0	4834964.0	521671.0	4834953.0
Section_North	8.1	714	521678.0	4835004.0	521741.0	4835033.0
			521678.0	4835033.0	521741.0	4835004.0
Existing Buildings, Wastewater Treatment Plant						
DAFT Bldg	8 m	714	521310.4	4835342.5	521322.9	4835326.7
			521310.4	4835326.7	521322.9	4835342.5
Clarifier_New	3.1 m	714	521343.0	4835294.0	521317.3	4835294.0
			521336.6	4835305.1	521323.7	4835282.8
			521323.7	4835305.1	521336.6	4835282.8
Clarifier_Old	4.1	714	521344.3	4835263.4	521315.3	4835263.4
			521337.1	4835275.9	521322.6	4835250.8
			521322.6	4835275.9	521337.1	4835250.8
Centrifuge Bldg	6.7		521307.5	4835294.9	521317.2	4835281.8
			521317.2	4835294.9	521307.5	4835281.8
Recover Bldg	10.5 m	714	521288.9	4835265.3	521311.4	4835255.0
			521311.4	4835265.3	521288.9	4835255.0
Screen Bldg	12.6	714	521264.5	4835274.9	521282.1	4835267.6
			521272.8	4835274.9	521272.8	4835267.6
			521272.8	4835273.9	521272.8	4835266.8
			521282.1	4835273.9	521264.5	4835266.8
New Plant Buildings						
Raw Potato Receiving, Tier 1	9.1 m	714	522102.8	4834904.8	522182.4	4834900.5
			522102.8	4834860.8	522135.9	4834900.3
			522182.6	4834861.0	522135.9	4834904.9
Raw Potato Receiving, Tier 2	12.2 m	714	522135.9	4834904.9	522102.8	4834860.8
			522102.8	4834904.8	522135.9	4834860.8
Potato Storage	15.248 m	714	522024.7	4834904.6	522095.9	4834860.8
			522096.7	4834904.8	522095.9	4834857.5
			522096.7	4834860.8	522024.5	4834857.3

Table 6. BUILDING PARAMETERS						
Building	Building Height	Base Elevation (m)	UTM Datum NAD83 Zone 11			
			Easting, X (m)	Northing, Y (m)	Easting, X (m)	Northing, Y (m)
Process Bldg, Tier 1	9.1 m	714	522096.7	4834860.8	521878.8	4834936.9
			522096.7	4834904.8	521878.8	4834934.3
			521988.2	4834904.5	521877.8	4834934.3
			521988.1	4834941.5	521877.9	4834908.7
			521980.5	4834942.4	521878.9	4834908.7
			521980.3	4835030.1	521878.9	4834902.8
			522001.1	4835030.2	521880.9	4834902.8
			522001.1	4835035.7	521880.9	4834876.9
			522019.4	4835035.7	521884.5	4834876.9
			522019.4	4835099.7	521884.5	4834873.4
			522001.1	4835099.7	521895.1	4834873.4
			522001.1	4835100.4	521895.1	4834877.0
			521823.5	4835099.1	521900.2	4834877.0
			521823.5	4835083.8	521900.3	4834849.6
			521862.5	4835083.9	521922.6	4834849.6
			521862.7	4835029.7	521922.5	4834831.0
			521884.5	4835029.8	521999.9	4834830.7
			521884.7	4834980.7	522000.0	4834849.6
			521880.3	4834980.7	522024.4	4834849.4
			521880.3	4834970.3	522024.5	4834857.3
			521877.7	4834970.3	522095.9	4834857.5
			521877.8	4834936.9	522095.9	4834860.8
Process Bldg, Tier 2	12.2 m	714	521900.3	4834849.6	521991.2	4835030.1
			521900.2	4834970.3	521980.2	4835030.1
			521884.7	4834970.3	521980.5	4834942.3
			521884.5	4835029.8	521988.0	4834941.5
			521881.0	4835029.8	521988.1	4834904.4
			521881.0	4835099.4	522024.7	4834904.6
			521990.9	4835100.2	522024.4	4834849.4

3.1.8 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. The ambient air boundary for the Simplot Caldwell facility is shown in Figure 3-3 (Figure 4-1 from the application). The boundary encloses the property owned by Simplot. Public access is controlled by fencing around the main plant area. In the application, Simplot has asserted that the fenced area will be expanded to include the new processing plant, and that much of the surrounding agricultural fields (owned by the Simplot facility) are gated to prevent unauthorized access and posted with "No Trespassing" signs. Plant security guards are available to require trespassers to leave the property. The canal and access road that transect Simplot's wastewater treatment area and Highway 19 (Simplot Boulevard) were treated as ambient air. In accordance with DEQ modeling guidance, this access control is acceptable for PSD minor source permitting.

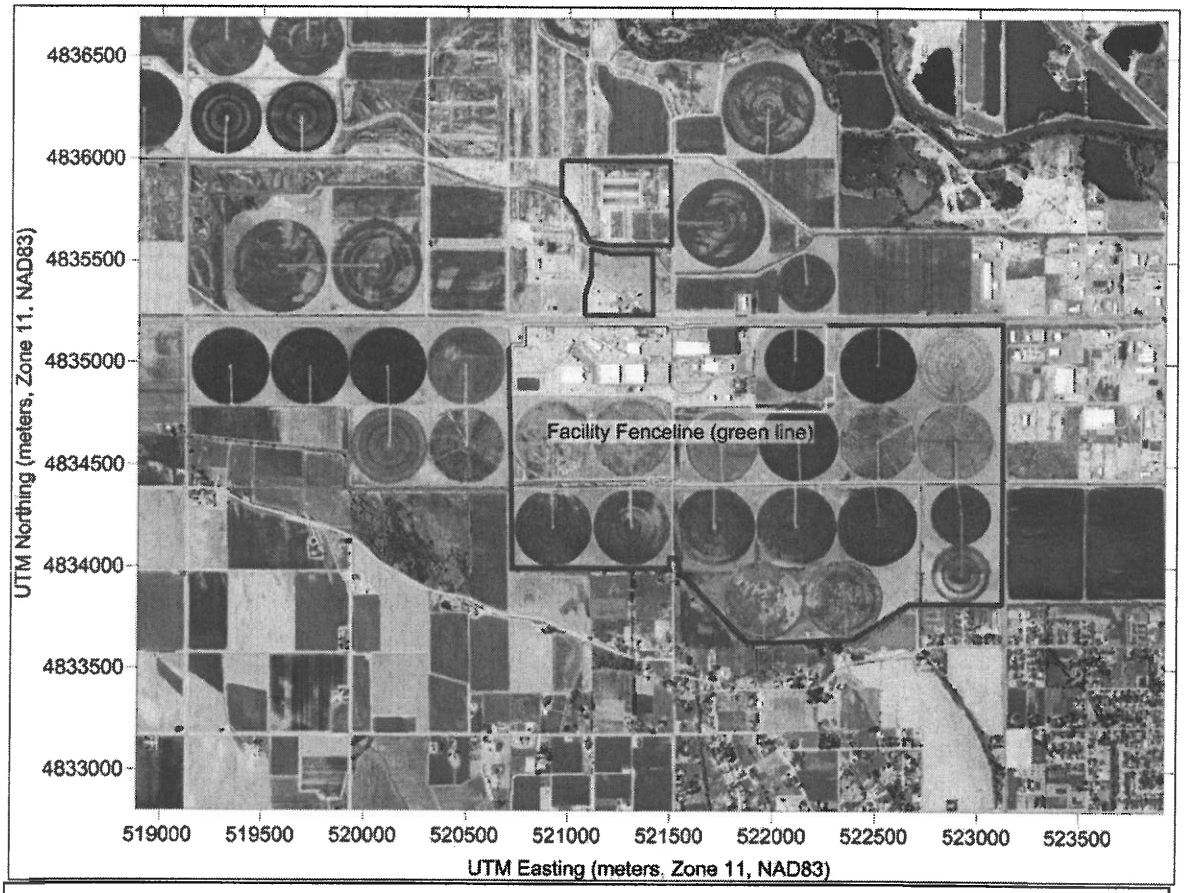

Figure 3-3. AMBIENT AIR BOUNDARY (SHOWN IN BLUE)

3.1.9 Receptor Network

The receptor grids used for the submitted screening modeling analyses are summarized in Table 5, and shown graphically in Figure 3-4 (Figure 4-2 from the application).

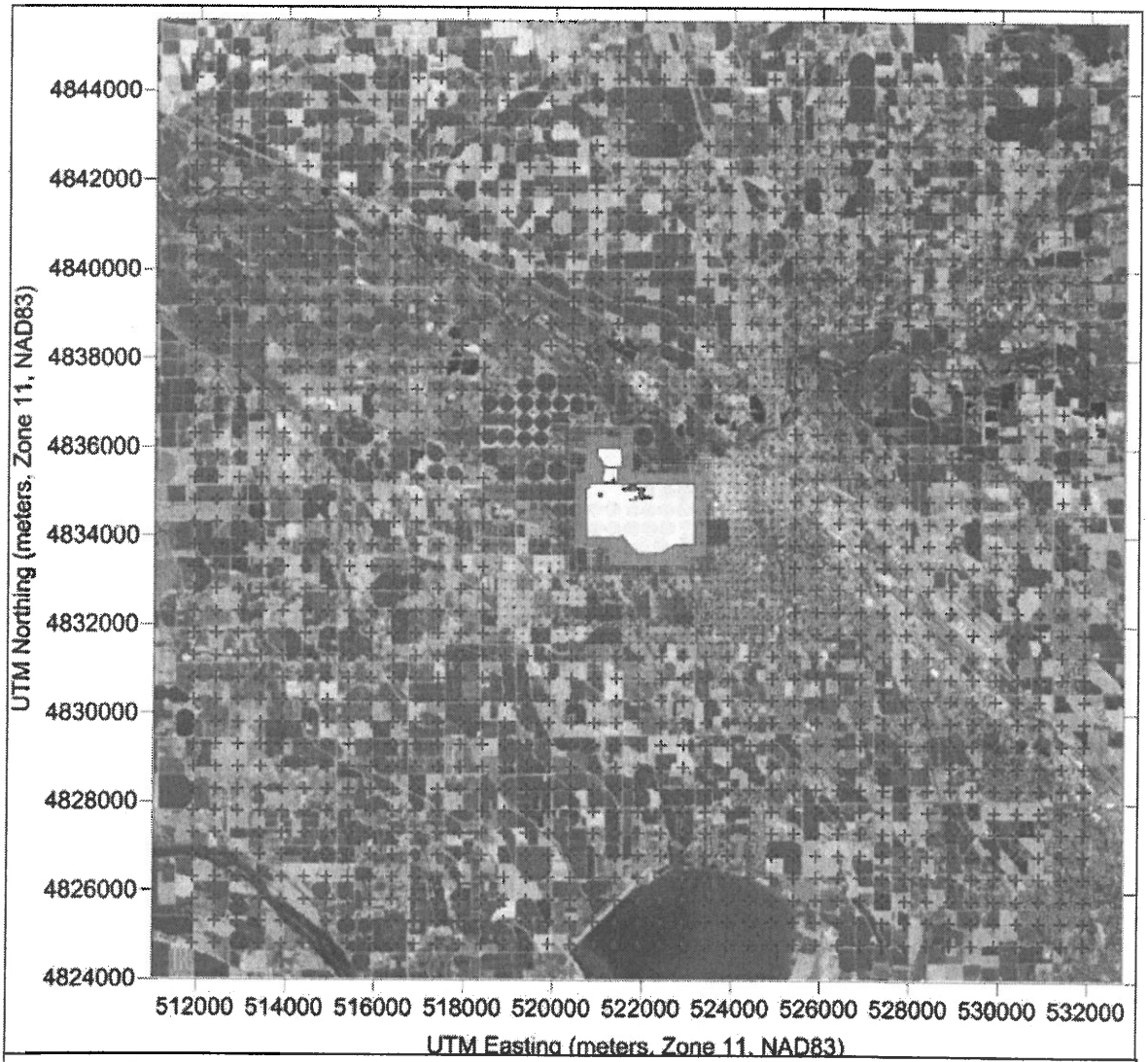

Figure 3-4. RECEPTOR GRID

3.2 Emission Release Parameters

The emissions release parameters are shown in Table 7 for operations during commissioning of the new plant and for operations after the new plant has been fully commissioned.

- All sources were modeled as vertical point sources except for EG4 and FWP1, which were modeled using the beta option in AERMOD for horizontal sources.
- Emissions from the AMUs exhaust through building vents rather than from individual stacks. These emissions were modeled as vertical point sources with 0.001 m/s exit velocity, similar to an approach often used for vertical capped sources.
- The exhaust parameters for the biogas flare for short-term and long-term modeling in accordance with EPA-450/4-88-010, Screening Procedures for Estimating the Air Quality Impact of Stationary Sources. Flare exhaust parameters—presuming all biogas is flared—were based on the maximum allowable biogas flow rate of 529 scfm (0.03174 MMscf/hr) and 198.1 MMscf/yr, limits set in previous permits that correspond to reducing the chemical oxygen demand (COD) of the wastewater by an average of 2 million pounds per month during any 12-month period. Detailed calculations for the flare exhaust parameters are contained in the electronic Excel spreadsheet submitted to DEQ.

Table 7. EMISSION RELEASE PARAMETERS

Source ID	Description	UTM Zone 11 (NAD83)		Base Elev (m)	Stack Height (AGL)	Exit Temp.	Exit Dia.	Exit Velocity (m/s)
		Easting (m)	Northing (m)					
Existing Emission Sources, to be removed								
B8	Boiler No. 8	521625.0	4834927.0	714	44.9 ft (13.7 m)	357oF (435.9 K)	4.0 ft (1.22 m)	11.3
B01	Boiler No. 1 (English Boiler)	521632.0	4834933.0	714	46.5 ft (14.2 m)	350oF (449.8 K)	3.94 ft (1.2 m)	13.8
WESP	Wet ESP	521662.0	4834987.0	714	63 ft (19.2 m)	159oF (343.7 K)	6.0 ft (1.83 m)	8.0
D1A	Line 1 Dryer, Stack A	521616.0	4834953.0	714	64.6 ft (19.7 m)	95.3°F (308.3 K)	2.0 ft (0.64 m)	11.0
D1B	Line 1 Dryer, Stack B	521620.0	4834953.0	714	64.6 ft (19.7 m)	159°F (343.7 K)	2.3 ft (0.70 m)	8.0
D6A	Line 6 Dryer, Stack A	521614.0	4834945.0	714	68.9 ft (21.0 m)	158°F (343.2 K)	2.3 ft (0.71 m)	9.90
D6B	Line 6 Dryer, Stack B	521617.0	4834945.0	714	68.9 ft (21.0 m)	136.4°F (331.2 K)	2.3 ft (0.71 m)	8.42
D6C	Line 6 Dryer, Stack C	521623.0	4834945.0	714	68.9 ft (21.0 m)	136.0°F (330.9 K)	2.3 ft (0.71 m)	5.74
D6D	Line 6 Dryer, Stack D	521626.0	4834945.0	714	68.9 ft (21.0 m)	125°F (325.3 K)	2.3 ft (0.71 m)	6.43
AMU4	Air Makeup Unit, natural gas-fired	521730.0	4834988.0	714	28 ft (8.40 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
AMU5	Air Makeup Unit, natural gas-fired	521709.0	4834988.0	714	28 ft (8.40 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
AMU6	Air Makeup Unit, natural gas-fired	521777.0	4834954.0	714	26 ft (7.80 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
AMU7	Air Makeup Unit, natural gas-fired	521744.0	4834955.0	714	26 ft (7.80 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001

Table 7. EMISSION RELEASE PARAMETERS								
Source ID	Description	UTM Zone 11 (NAD83)		Base Elev (m)	Stack Height (AGL)	Exit Temp.	Exit Dia.	Exit Velocity (m/s)
		Easting (m)	Northing (m)					
AMU8	Air Makeup Unit, natural gas-fired	521711.0	4834955.0	714	26 ft (7.80 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
AMU9	Air Makeup Unit, natural gas-fired	521678.0	4834956.0	714	21 ft (6.40 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
AMU10	Air Makeup Unit, natural gas-fired	521645.0	4834956.0	714	45 ft (13.6 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
AMU11	Air Makeup Unit, natural gas-fired	521611.0	4834957.0	714	45 ft (13.6 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
AMU12	Air Makeup Unit, natural gas-fired	521578.0	4834957.0	714	45 ft (13.6 m)	122°F (323.0 K)	0.66 ft (0.2 m)	0.001
Existing and New Emission Sources for "New Plant"								
BLR_A	**New** Boiler A, Natural gas only	521973.0	4834927.0	714	70 ft (21.3 m)	140°F (333.2 K)	3.5 ft (1.07 m)	12.7
BLR_B	**New** Boiler B, Natural gas & biogas	521973.0	4834919.0	714	70 ft (21.3 m)	140°F (333.2 K)	3.5 ft (1.07 m)	12.7
BLR_C	**New** Boiler C, Natural gas & biogas	521974.0	4834914.0	714	70 ft (21.3 m)	140°F (333.2 K)	3.5 ft (1.07 m)	12.7
RTO	**New** RTO	522021.0	4834932.0	714	**85 ft (25.9 m)**	111°F (317.0 K)	7.0 ft (2.13 m)	21.6
FLAREST	Biogas Flare, short-term emissions	521178.0	4835615.0	712	32.7 ft (9.97 m)	1831.7°F (1273 K)	2.21 ft (0.68 m)	20
FLARELT	Biogas Flare, annual emissions	521178.0	4835615.0	712	30.8 ft (9.40 m)	1831.7°F (1273 K)	1.87 ft (0.57 m)	20
EG1	Emergency Generator Unit 4, 55 hp SI engine, Warehouse A, (palletizers) Generator: 25 kw/ 33.5 hp	521675.0	4835101.0	714	44 ft (13.4 m)	1060°F (844.3 K)	0.17 ft (0.050 m)	32.8
EG2	E.G. Unit 5, 68 hp SI engine, Greenhouse, Generator: 7 kw/ 9.4 hp	521819.0	4834846.0	714	5 ft (1.50 m)	1080°F (855.4 K)	0.17 ft (0.050 m)	32.8
EG3	E.G. Unit 1, 166 hp diesel CI, Wastewater, Generator: 100 kw/134 hp	521308.0	4835272.0	714	8 ft (2.40 m)	1060°F (844.3 K)	0.21 ft (0.060 m)	50
EG4	E.G. Unit 3, 14.8 hp SI engine, Tech Center, **Horizontal,** Generator 7 kw/ 9.4 hp	521800.0	4834899.0	714	41.33 ft (12.6 m)	1080°F (855.4 K)	0.21 ft (0.060 m)	21.0
FWP1	Unit 2, 287 hp diesel fire water pump, **Horizontal,** Generator: 224 kw/ 300 hp	521681.0	4834838.0	714	12 ft (3.70 m)	850°F (727.6 K)	0.4 ft (0.13 m)	50

m = meters ft = feet m/sec = meters per second
°F = degrees Fahrenheit, K = Kelvin

3.3 Emission Rates and Modeling Results

Modeling analyses for this project included an assessment to determine whether the ambient impacts associated with the new emissions sources exceeded significant contribution levels (SCLs), and full impact analyses for pollutants and averaging periods with greater than significant impacts. Two full-impact scenarios were run: during commissioning of the new plant when both existing and new emission sources will be operated, and after commissioning when only the new production plant will be in operation.

3.3.1 Significant Impact Analyses – New Plant Commissioning

Modeling to determine whether the change in ambient impacts during commissioning of the new plant exceeded significant contribution levels (SCLs) compared to existing plant operations was based on the following assumptions:

- "Base case" emission rates and where applicable, hours of operation, for existing operations were taken from the existing Tier I permit, T1-2001.0117.
- "Commissioning" emission rates:
  - Existing Boiler No. 8 is not operated.
  - Boiler No. 1 is operated at 100% capacity.
  - Boiler B is operated at full capacity for 8760 hours per year, burning natural gas and all the available biogas (529 scfm biogas with 108 ppmv H_2S [2% of 5,391 ppmv], produced by reducing the wastewater COD by an average of 2 million pounds per month).
  - The biogas flare is operated at full capacity, burning all the available biogas (529 scfm with 5,391 ppmv H_2S, produced by reducing the wastewater COD by an average of 2 million pounds per month)
  - WESP emissions are from a 2003 source test conducted when all three existing fryers were operating.
  - Emergency generators EG2, EG3, and EG4 are not tested during this period (emissions were not included in 1-hour NO_2 or 1-hour SO_2 analyses).
  - Emergency generator EG1 and FWP1 are operated for a maximum of 30 minutes per hour for each hour between the hours of 11 am and 6 pm, for routine testing.
  - Annual flow testing of FWP1 is not conducted during commissioning if any of the existing dryers are being operated.
  - The 25.2 MMBtu/hr natural gas burner for the RTO operates at full capacity (PM, NO_2, and SO_2 emissions). Modeled PM emissions were set to half the combined value for combustion and process emissions with all production lines operating.
- Scenario 1, with Existing Lines 1 and 6 Dryers:
  - Existing Line 1 fryer (vented to the WESP) and dryer, permitted (T1-2011.0117) at 5.5 MMBtu/hr, 75,000 pounds processed per 8-hour shift.
  - Existing Line 6 fryer (vented to the WESP) and dryer, permitted (T1-2011.0117) at 28 MMBtu/hr, 270,000 pounds per 8-hour shift.
- Scenario 2, with Existing Line 1 Dryer:
  - Existing Line 1 fryer (vented to the WESP) and dryer, permitted (T1-2011.0117) at 5.5 MMBtu/hr, 75,000 pounds processed per 8-hour shift.

Modeled emission rates are shown in Table 8. Sources included in each of the scenarios: Base Case, Scenario 1, and Scenario 2, are indicated by a solid circle in the table.

Table 8. SIGNIFICANT IMPACT EMISSION RATES – COMMISSIONING SCENARIOS (LB/HR)

Pollutant: Source	PM_{10} 24-hr	$PM_{2.5}$ 24-hr	$PM_{2.5}$ Annual	NO_2 1-hr	NO_2 Annual	SO_2 1-hr	Base Case	Commissioning	
								"1"	"2"
B8 @100%	0.602	0.602	0.602	7.92	7.92	0.05	●	--	--
BOI1 @100%	0.732	0.732	0.732	4.82	4.82	0.06	●	●	●
WESP	2.0	2.0	2.0	---	---	---	●	●	●
D1A	3.0	3.0	3.0	0.233	0.233	1.47E-03	●	●	●
D1B	3.0	3.0	3.0	0.233	0.233	1.47E-03	●	●	●
D6A	2.6	2.6	2.6	0.294	0.294	3.53E-03	●	●	--
D6B	2.6	2.6	2.6	0.294	0.294	3.53E-03	●	●	--
D6C	2.6	2.6	2.6	0.294	0.294	3.53E-03	●	●	--
D6D	2.6	2.6	2.6	0.294	0.294	3.53E-03	●	●	--
AMU4 @50%	0.020	0.020	0.010	0.265	0.265	1.59E-03	●	●	●
AMU5 @50%	0.038	0.038	0.019	0.497	0.497	2.98E-03	●	●	●
AMU6 @50%	0.020	0.020	0.010	0.270	0.270	1.62E-03	●	●	●
AMU7 @50%	0.021	0.021	0.010	0.272	0.272	1.63E-03	●	●	●
AMU8 @50%	0.020	0.020	0.010	0.265	0.265	1.59E-03	●	●	●
AMU9 @50%	0.020	0.020	0.010	0.265	0.265	1.59E-03	●	●	●
AMU10 @50%	0.020	0.020	0.010	0.265	0.265	1.59E-03	●	●	●
AMU11 @50%	0.020	0.020	0.010	0.270	0.270	1.62E-03	●	●	●
AMU12 @50%	0.030	0.030	0.015	0.392	0.392	2.36E-03	●	●	●
BLR_A	---	---	---	---	---	---	--	--	--
BLR_B	0.730	0.730	0.730	1.8	1.8	0.69	--	●	●
BLR_C	---	---	---	---	---	---	--	--	--
RTO	3.35	3.35	3.35	2.52	2.52	0.0151	--	●	●
FLAREST/LT	0.142	0.142	0.101	1.30	0.923	28.84	●	●	●
EG1	9.60E-05	9.60E-05	5.28E-05	0.196	4.48E-03	1.37E-04	RT24 [c]	RT [d]	RT [d]
EG2	2.50E-05	2.50E-05	1.37E-05	---	1.16E-03	---	RT24 [c]	--	--
EG3	6.68E-03	6.68E-03	3.66E-03	---	5.21E-02	---	RT24 [c]	--	--
EG4	1.21E-04	1.21E-04	6.62E-05	---	2.66E-03	---	RT24 [c]	--	--
FWP1	0.014 (RT) 0.115[a] (FF) (0.029, FF)	0.014 (RT) 0.115[a] (FF) (0.029, FF)	7.94E-03 (100 hr/yr, RT)	4.90 (RT) 9.76 (FF)	0.112 (100 hr/yr, RT)	3.37E-03 [b] (1 hour, FF)	FF24 [e]	RT [d]	RT [d]

[a] The 60-minute (FF) emission rate was input as 0.014 g/sec (0.115 lb/hr) in the 2/23/12 and 3/23/12 modeling, rather than 3.62E-03 g/s (0.029 lb/hr). This results in overestimating (by a factor of 4) the PM impacts from the fire water pump during annual full flow testing. The 30-minute (RT) emission rate for FWP1was correctly input as 1.81E-03 g/sec (0.014 lb/hr) in each of the submitted modeling analyses.

[b] The SO_2 emission rate used in each of the modeling analyses was based on a full hour, rather than 30 minutes, of operation.

[c] RT24 = Maximum operation of 30 minutes per hour for routine testing, operating each hour in a 24-hour day.

[d] RT = Maximum operation of 30 minutes per hour for routine testing, during the hours between 11 a.m. and 6 p.m.

[d] FF24 = Fire pump full flow test. Operating at maximum hourly emission rates for 24 hours per day.

For each modeling scenario, ENVIRON determined the high 1st high modeled concentration at any receptor for each pollutant and averaging period. The difference or "delta" between the maximum impacts for each commission scenario and the maximum impacts for the base case are shown in Table 9 (Table 5 from supplemental modeling information received on March 23, 2012). As shown in the table, none of the values of "delta" exceed the significant contribution levels (SCLs, known as significant impact levels or SILs in federal air quality regulations).

Table 9. SIGNIFICANCE ANALYSES RESULTS FOR NEW PLANT COMMISSIONING

Pollutant	Ave. Period	Commissioning Period – Existing Plant Concentration [1] (µg/m³)						SIL [2] (µg/m³)	Over SIL?
		2005	2006	2007	2008	2009	MAX		
Commissioning Scenario 1									
NOx	1-hour	-2.6	-2.8	-1.5	-1.6	-3.1	-1.5	7.5	No
	Annual	-0.0018	-0.0014	-0.0020	-0.0019	-0.0023	-0.0014	1	No
PM10/PM2.5 [3]	24-hour	0.7	1.1	0.2	0.3	0.3	1.1	1.2	No
	Annual	0.2	0.2	0.2	0.2	0.2	0.2	0.3	No
SO2	1-hour	0.8	0.6	1.2	1.0	1.3	1.3	7.8	No
Commissioning Scenario 2									
NOx	1-hour	-2.7	-2.9	-1.5	-1.6	-3.1	-1.5	7.5	No
	Annual	-0.002	-0.002	-0.002	-0.002	-0.003	-0.002	1	No
PM10/PM2.5 [3]	24-hour	0.04	-0.02	0.05	0.07	0.2	0.2	1.2	No
	Annual	-0.002	0.011	0.031	-0.0004	-0.001	0.031	0.3	No
SO2	1-hour	0.8	0.6	1.2	1.0	1.3	1.3	7.8	No

Notes:

1 – Maximum AERMOD-predicted change in ambient concentration for Project Idaho commissioning period (commissioning scenario concentration minus existing Plant 2 concentration).

2 – Significant Impact Levels from IDEQ Modeling Guidance (Doc. I D AQ-011 (rev. 2 July 2011) and IDAPA 58.01.01.006.107.

3 – $PM_{2.5}$ emissions are the same as PM_{10} emissions; therefore, AERMOD-predicted results for both PM_{10} and $PM_{2.5}$ are combined in the table and compared to the more stringent $PM_{2.5}$ SILs.

Note that the significant impact associated with proposed changes in operation are typically determined by subtracting the maximum impacts associated with the new operational conditions from the modeled design value (a value less than the highest 1st high for all short-term standards except for the 24-hr $PM_{2.5}$ NAAQS) for existing operations. However, because these analyses apply only to a relatively short transitional period and a number of conservative assumptions have been included in the modeling for Scenarios 1 and 2, DEQ has determined that in this case using the maximum values for the base case is still reasonably protective of the NAAQS.

3.3.2 Change in Emissions due to the Modification - New vs. Old Plant Operations

As shown in Table 10, the emissions of CO and lead from proposed new plant operations are below DEQ's modeling thresholds. Modeling was required for all averaging periods for NO_2, SO_2, PM_{10}, and $PM_{2.5}$ (shown in bold in the table).

Table 10. EMISSIONS INCREASE – CRITERIA POLLUTANTS												
Criteria Air Pollutants	Boiler A		Boiler B		Boiler C		RTO		Total Emissions Increase		Modeling Thresholds	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
NO_2	1.8	7.8	1.8	7.8	1.8	7.8	2.5	11.0	**7.9**	**34.5**	0.2	1.2
CO	3.6	---	3.6	---	3.6	---	2.1	---	12.9	---	15	---
SO_2	0.1	0.3	0.3	1.2	0.3	1.2	1.5E-02	0.1	**0.6**	**2.6**	0.21	1.2
PM_{10}	0.7	---	0.7	---	0.7	---	6.7	---	**8.9**	---	0.22	---
$PM_{2.5}$	0.7	3.2	0.7	3.2	0.7	3.2	6.7	29.4	**8.9**	**39.0**	0.054	0.35
Pb x 10^5	4.8	21	4.8	21	4.8	21	1.2	5.4	15.6	68.5	---	
									0.11	lb/mo	14 lb/mo	---

As shown in Table 11, increased emissions of several carcinogenic TAPs exceed the screening EL. However, as discussed in a previous section in this memo, no further demonstration of compliance is required for state-regulated TAPs that are already regulated under an NSPS or MACT. Using PM as a surrogate, the area source boiler NESHAP, 40 CFR 63 Subpart JJJJJJ, regulates emissions of metallic hazardous air pollutant (HAPs) including arsenic, beryllium, cadmium, chromium, lead, manganese, and nickel. Using CO as a surrogate, Subpart JJJJJJ regulates emissions of organic HAPs including polycyclic organic matter (which includes PAHs as a subset, including the EPA 7-PAH group). Although not specifically mentioned in Subpart JJJJJJ, the boiler MACT for major sources of HAPs (40 CFR 63 Subpart DDDDD) specifically includes formaldehyde and benzene in the list of organic HAPs to be controlled using CO as a surrogate.

Each of the pollutants shown in Table 11 with an increase in emissions greater than the screening EL is regulated under the boiler "MACT" for area sources. In accordance with Section 210.20 of the Idaho Air Rules, those emissions have been removed from the emissions increase calculations. As a result, modeling for naphthalene and the 7-PAH group is no longer required for this project. Emissions of formaldehyde, arsenic, cadmium, chromium VI, and nickel from the RTO must still be modeled for comparison with the acceptable ambient concentration for carcinogens (AACC) for each of these TAPs.

Table 11. EMISSIONS INCREASE – TOXIC AIR POLLUTANTS								
Carcinogenic TAP (IDAPA 58.01.01.585)	CASN	Boiler A	Boiler B	Boiler C	RTO	Total	EL	Over EL?
		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	
3-Methylchloranthrene	91-57-6	1.7E-07	1.7E-07	1.7E-07	4.4E-08	4.4E-08	2.5E-06	No
Benzene	71-43-2	2.0E-04	2.0E-04	2.0E-04	5.2E-05	5.2E-05	8.0E-04	No
Formaldehyde	50-00-0	7.2E-03	7.2E-03	7.2E-03	1.9E-03	1.9E-03	5.1E-04	**Yes Yes**
Naphthalene (PAH)	91-20-3	5.9E-05	5.9E-05	5.9E-05	1.5E-05	1.5E-05	9.1E-05	**Yes** No
Arsenic	7440-38-2	1.9E-05	1.9E-05	1.9E-05	4.9E-06	4.9E-06	1.5E-06	**Yes Yes**
Beryllium	7440-41-7	1.2E-06	1.2E-06	1.2E-06	3.0E-07	3.0E-07	2.8E-05	No
Cadmium	7440-43-9	1.1E-04	1.1E-04	1.1E-04	2.7E-05	2.7E-05	3.7E-06	**Yes Yes**
Chromium VI	7440-47-3_CrVI	5.4E-06	5.4E-06	5.4E-06	1.4E-06	1.4E-06	5.6E-07	**Yes Yes**
Nickel	7440-02-0	2.0E-04	2.0E-04	2.0E-04	5.2E-05	5.2E-05	2.7E-05	**Yes Yes**
Section 586, Polycyclic Organic Compounds (EPA's 7-PAH Group)								
Benz(a)anthracene	56-55-3	1.7E-07	1.7E-07	1.7E-07	4.4E-08	4.4E-08	-	-
Benzo(a)pyrene	50-32-8	1.2E-07	1.2E-07	1.2E-07	3.0E-08	3.0E-08	-	-
Benzo(b)fluoranthene	205-99-2	1.7E-07	1.7E-07	1.7E-07	4.4E-08	4.4E-08	-	-
Benzo(k)fluoranthene	207-08-9	1.7E-07	1.7E-07	1.7E-07	4.4E-08	4.4E-08	-	-
Chrysene	218-01-9	1.7E-07	1.7E-07	1.7E-07	4.4E-08	4.4E-08	-	-
Dibenzo(a,h)anthrancene	53-70-3	1.2E-07	1.2E-07	1.2E-07	3.0E-08	3.0E-08	-	-
Indeno(1,2,3-cd)pyrene	193-39-5	1.7E-07	1.7E-07	1.7E-07	4.4E-08	4.4E-08	-	-
"POM" Total	*PAH*	1.1E-06	1.1E-06	1.1E-06	2.8E-07	**2.8E-07**	**2.0E-06**	**Yes No**

3.3.3 Toxic Air Pollutant Analyses – New Construction Modeled Emissions and Results

ENVIRON conducted modeling for seven carcinogenic TAPs using the emission rates shown in Table 11, including—although not required—the TAPs emissions from the three new boilers. As shown in Table 12 (Table 4-4 from the submitted application), maximum ambient impacts associated with these TAPs emissions are below the applicable acceptable ambient concentration for carcinogens (AACC) increment.

Table 12. MODELED TAPS CONCENTRATIONS FROM

Toxic Air Pollutant	Ave. Period	Project Only Concentration [1] ($\mu g/m^3$)	AACC [2] ($\mu g/m^3$)	Over AACC?
Arsenic	Annual	4.0E-05	2.3E-04	no
Cadmium	Annual	2.2E-04	5.6E-04	no
Chromium VI	Annual	1.0E-05	8.3E-05	no
Formaldehyde	Annual	1.5E-02	7.7E-02	no
Naphthalene	Annual	1.2E-04	1.4E-02	no
Nickel	Annual	4.2E-04	4.2E-03	no
PAH	Annual	2.3E-06	1.4E-02	no

Notes:

1 – Maximum AERMOD-predicted ambient concentration for new Project Idaho sources.

2 – Acceptable Ambient Concentration for Carcinogens from IDAPA 58.01.01.586.

3.3.4 Significant Impact Analyses – New Plant Modeled Emissions and Results

ENVIRON conducted modeling for NO_2, SO_2, PM_{10}, and $PM_{2.5}$ emissions associated with operating just the new plant equipment to determine whether ambient impacts were above significant contribution levels (SCLs). No credit was taken for the emissions reduction associated with removing sources from the existing plant. Modeled emission rates for the significant impact analyses are shown in Table 13. These sources were presumed to operate 8760 hours per year. The available biogas is distributed evenly between Boilers B and C.

Table 13. SIA – MODELED HOURLY EMISSION RATES (LB/HR)

Pollutant: Source	PM_{10} 24-hr	$PM_{2.5}$ 24-hr	$PM_{2.5}$ Annual	NO_2 1-hr	NO_2 Annual	SO_2 1-hr	SO_2 Annual
BLR_A	0.730	0.730	0.730	1.78	1.78	0.058	0.058
BLR_B	0.730	0.730	0.730	1.78	1.78	0.346	0.263
BLR_C	0.730	0.730	0.730	1.78	1.78	0.346	0.263
RTO	6.71	6.71	6.71	2.52	2.52	0.0151	0.0151

The maximum modeled impacts over the five-year period represented by the meteorological data are shown in Table 14. A full impact analysis is required for each pollutant and averaging time with impacts greater than significant. Note that these results reflect raising the RTO stack height from 70 feet to 85 feet.

Table 14. SIA – MODELING RESULTS

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	SCL ($\mu g/m^3$)	Exceeds SCL, Full Impact Modeling Required?
PM_{10}	24-hr	9	5	Yes
$PM_{2.5}$	24-hr	9	1.2	Yes
	Annual	2	0.3	Yes

Table 14. SIA – MODELING RESULTS				
Pollutant	**Averaging Period**	**Modeled Impact ($\mu g/m^3$)**	**SCL ($\mu g/m^3$)**	**Exceeds SCL, Full Impact Modeling Required?**
NO_2	1-hr	70	7.5	Yes
	Annual	2.4	1	Yes
SO_2	1-hr	10	7.8	Yes
	Annual	0.2	1	**No**

3.3.5 Full Impact Analyses – New Plant Modeled Emissions and Results

Modeling to determine ambient impacts after commissioning the new plant was based on the following assumptions:

- Boiler A is operated at full 98 MMBtu/hr capacity for 8760 hours per year, burning only natural gas.
- Boilers B and C are each operated at full 98 MMBtu/hr capacity for 8760 hours per year, each burning natural gas and half of the treated 529 scfm biogas produced by reducing the wastewater COD by an average of 2 million pounds per month (i.e., 264.5 scfm biogas with 108 ppmv H_2S,).
- The biogas flare is operated at full capacity, burning all the available biogas (529 scfm with 5,391 ppmv H_2S) produced by reducing the wastewater COD by an average of 2 million pounds per month.
- Emergency generators EG1, EG2, EG3, and EG4 are each tested for 30 minutes per hour and the fire water pump FWP1 is tested for a full hour for each hour between the hours of 11 am and 6 pm.
- Routine operational testing of EG1, EG2, EG3, EG4, and FWP1 is limited to a maximum of 100 hours per year each.

Modeled emission rates are shown in Table 15 for operation of the facility after commissioning. Short-term emissions of NO_2 and SO_2 from operational testing of EG2, EG3, and EG4 were not included in the modeling analyses because these sources are each tested only twice each year. ENVIRON has asserted that testing of these generators could not produce either the 4th highest maximum value for 1-hour SO_2 modeling, nor the 8th highest maximum value for 1-hour NO_2 modeling.

Table 15. FULL IMPACT EMISSION RATES – NEW PLANT NORMAL OPERATIONS (LB/HR)						
Pollutant: Source	**PM_{10} 24-hr**	**$PM_{2.5}$ 24-hr**	**$PM_{2.5}$ Annual**	**NO_2 1-hr**	**NO_2 Annual**	**SO_2 1-hr**
BLR_A	0.730	0.730	0.730	1.78	1.78	0.058
BLR_B	0.730	0.730	0.730	1.78	1.78	0.346
BLR_C	0.730	0.730	0.730	1.78	1.78	0.346
RTO	6.71	6.709	6.709	2.52	2.52	0.0151
FLAREST/LT	0.14	0.142	0.101	1.30	0.923	28.84
EG1	9.60E-05	9.60E-05	5.28E-05	0.196	4.48E-03	1.37E-04
EG2	2.50E-05	2.50E-05	1.37E-05	---	1.16E-03	---
EG3	6.68E-03	6.68E-03	3.66E-03	---	5.21E-02	---
EG4	1.21E-04	1.21E-04	6.62E-05	---	2.66E-03	---
FWP1	0.115[a] (0.029, 1 hr)	0.115[a] (0.029, 1 hr)	7.94E-03 (100 hr/yr)	9.76 (1 hr)	0.112 (100 hr/yr)	3.37E-03 (1 hr)

[a] The 60-minute emission rate was input as 0.014 g/sec (0.115 lb/hr) in the 2/23/12 and 3/23/12 submitted modeling, rather than 3.62E-03 g/s (0.029 lb/hr). This results in overestimating (by a factor of 4) the PM impacts from the fire water pump during annual full flow testing.

Full impact analyses were conducted for each pollutant and averaging time with impacts greater than significant for expected emissions during commissioning and for the potential to emit for the new plant after commissioning is complete. As shown in Tables 16 and 17, NAAQS compliance was demonstrated for all pollutants and averaging times using either the background values developed by ENVIRON or the recommended background values developed by DEQ (shown in parentheses). Note that these results reflect raising the RTO stack height to 85 ft.

Table 16. FULL IMPACT MODELING RESULTS – DURING COMMISSIONING [a]

Pollutant	Averaging Period	Modeled Ambient Impact ($\mu g/m^3$)	Background Value ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent Of NAAQS
PM_{10}	24-hr	12.6	85.5 (73)	98.1 (85.6)	150	65.4% (57.1%)
$PM_{2.5}$	24-hr	14	16.6 (20.0)	30.6 (33.3)	35	87.4% **(97.1%)**
	Annual	3.1	6.7 (7.2)	9.8 (10.3)	15	65.3% (68.7%)
NO_2	1-hour	93.2 x 80% = 78.6	88.4 (42.4)	167 (121)	188	88.8% (64.4%)
	Annual	5.5	48.7 (3.5)	54.2 (9.0)	100	54.2% (9.0%)
SO_2	1-hour	152.2	10.6 (33.1)	162.8 (185.3)	196	83.1% **(94.5%)**

[a] These modeling results are for information only, and helped guide the significance analyses conducted for the commissioning scenarios. Modeled impacts shown in this table are the design values resulting from the "Scenario 2" emissions without operating any of the existing dryers or taking credit for any negative emission rates associated with equipment that will not be operated during plant commissioning.

Table 17. FULL IMPACT MODELING RESULTS - NEW PLANT OPERATIONS ONLY

Pollutant	Averaging Period	Modeled Ambient Impact ($\mu g/m^3$)	Background Value ($\mu g/m^3$)	Total Ambient Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent Of NAAQS
PM_{10}	24-hr	6.6	85.5 (73)	92.1 (79.6)	150	61.4% (53.1%)
$PM_{2.5}$	24-hr	7.2	16.6 (20.0)	23.8 (27.2)	35	68.0% **(77.7%)**
	Annual	1.6	6.7 (7.2)	8.3 (8.8)	15	55.3% (58.7%)
NO_2	1-hour	123 x 80% = 98.5	88.4 (42.4)	186.9 (140.9)	188	99.4% (74.9%)
	Annual	2.7	48.7 (3.5)	51.4 (6.2)	100	51.4% (6.2%)
SO_2	1-hour	152.2	10.6 (33.1)	162.8 (185.3)	196	83.1% (94.5%)

4.0 Conclusions

The submitted ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from sources operating during commissioning of Simplot's new Caldwell potato processing plant, and emissions from the new plant after commissioning is complete, will not cause or significantly contribute to a violation of any air quality standard.

APPENDIX C – PROCESSING FEE

PTC Fee Calculation

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: JR Simplot Co - Caldwell Facility
Address: P.O Box 1059
City: Caldwell
State: Idaho
Zip Code: 83606
Facility Contact: Burl Ackerman
Title: Environmental Manager
AIRS No.: 027-00131

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		47.9	-47.9
SO_2	2.0	0	2.0
CO	0.0	16.3	-16.3
PM10	0.0	87.7	-87.7
VOC	30.1	0	30.1
TAPS/HAPS	0.0	0	0.0
Total:	0.0	151.9	**-119.8**
Fee Due	**$ 1,000.00**		

Comments: There are HAP/TAP emissions changes but they would nat affect the fee.