# Statement of Basis

**Permit to Construct P-2010.0182**
**Project No. 60668**

**City of Nampa**
**City of Nampa WWTP**
**Nampa, Idaho**

**Facility ID No. 027-00110**

**Final**

**April 4, 2011**
**Darrin Pampaian, P.E.**
**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 |
| AFS | AIRS Facility Subsystem |
| AIRS | Aerometric Information Retrieval System |
| AQCR | Air Quality Control Region |
| ASTM | American Society for Testing and Materials |
| BACT | Best Available Control Technology |
| BMP | best management practices |
| Btu | British thermal units |
| CAA | Clean Air Act |
| CAM | Compliance Assurance Monitoring |
| CAS No. | Chemical Abstracts Service registry number |
| CBP | concrete batch plant |
| CEMS | continuous emission monitoring systems |
| cfm | cubic feet per minute |
| CFR | Code of Federal Regulations |
| CI | compression ignition |
| CMS | continuous monitoring systems |
| CO | carbon monoxide |
| COMS | continuous opacity monitoring systems |
| DEQ | Department of Environmental Quality |
| dscf | dry standard cubic feet |
| EL | screening emission levels |
| EPA | U.S. Environmental Protection Agency |
| FEC | Facility Emissions Cap |
| gpm | gallons per minute |
| gph | gallons per hour |
| gr | grain (1 lb = 7,000 grains) |
| HAP | hazardous air pollutants |
| HMA | hot mix asphalt |
| hp | horsepower |
| hr/yr | hours per year |
| 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 |
| lb/qtr | pound per quarter |
| m | meters |
| MACT | Maximum Achievable Control Technology |
| mg/dscm | milligrams per dry standard cubic meter |
| MMBtu | million British thermal units |
| MMscf | million standard cubic feet |
| NAAQS | National Ambient Air Quality Standard |
| NAICS | North American Industry Classification System |
| 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 |
| PC | permit condition |
| PCB | polychlorinated biphenyl |
| PERF | Portable Equipment Relocation Form |
| PM | particulate matter |
| $PM_{10}$ | 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 |
| PTC/T2 | permit to construct and Tier II operating permit |
| PTE | potential to emit |
| RAP | recycled asphalt pavement |
| RFO | reprocessed fuel oil |
| Rules | Rules for the Control of Air Pollution in Idaho |
| scf | standard cubic feet |
| SCL | significant contribution limits |
| SIC | Standard Industrial Classification |
| SIP | State Implementation Plan |
| SM | synthetic minor |
| SM80 | synthetic minor facility with emissions greater than or equal to 80% of a major source threshold |
| $SO_2$ | sulfur dioxide |
| $SO_X$ | sulfur oxides |
| T/yr | tons per consecutive 12-calendar month period |
| T2 | Tier II operating permit |
| TAP | toxic air pollutants |
| TEQ | toxicity equivalent |
| T-RACT | Toxic Air Pollutant Reasonably Available Control Technology |
| U.S.C. | United States Code |
| UTM | Universal Transverse Mercator |
| VOC | volatile organic compounds |
| $yd^3$ | cubic yards |
| $\mu g/m^3$ | micrograms per cubic meter |

## FACILITY INFORMATION

### *Description*

The City of Nampa operates a Waste Water Treatment Plant (WWTP) to manage and treat industrial and municipal wastewater. The facility operates five anaerobic digesters, of which three are primary digesters, and two are secondary digesters. Biogas is generated by the anaerobic digesters. The typical composition of biogas ranges from 55% to 60% methane ($CH_4$), 40% to 45% carbon dioxide ($CO_2$), and less than 1% hydrogen sulfide ($H_2S$). The accumulated biogas is collected and conveyed via piping to four dual-fuel fired boilers. The boilers use biogas as the primary fuel and natural gas as the secondary fuel. The biogas is combusted in the boilers to produce steam for heat for use in the anaerobic digesters. Any excess biogas produced is conveyed to the candlestick flare, mixed with atmospheric oxygen, and combusted. The City of Nampa is requesting a biogas production limit of 210,000 cubic feet per day (cf/day) for each anaerobic digester. This production limit is proposed to be measured based on the average cf/day. In addition, the proposed limit for the hydrogen sulfide ($H_2S$) concentration entering each boiler from each anaerobic digester is 1,200 parts per million by volume (ppmv), based on the most recent consecutive 12-month average of all monitored values obtained by the hydrogen sulfide monitor.

Three diesel-fired emergency standby IC engines powering electrical generators are used to supply emergency backup power to the entire WWTP facility. The three emergency IC engines are located in a stand-alone building near the southern perimeter of the facility. Each IC engines has a separate horizontal exhaust stack that exits out the top of the building in a 90 degree angle towards the primary digesters to the north. The City of Nampa is requesting to permit each generator to run a maximum of 100 hours per year for testing and maintenance and required regulatory purposes. Generator maintenance and testing will be limited to 6 hours per day to account for load bank testing. A 3,000 gallon above ground storage tank (AST) is used to store ultra low sulfur diesel fuel for the emergency generators.

There are eight natural gas-fired heaters located in two of the shop bays (4 space heaters in each shop bay). The space heaters are used for comfort heating in the winter months.

There is also one direct fired natural gas-fired gas pressure washer located in the Truck Shop that is used intermittently for cleaning purposes.

### *Permitting History*

This is the initial PTC for an existing facility that was constructed in 1948, and subsequently modified in 1964, 1980, and 2010, thus there is no permitting history.

### *Application Scope*

This is the initial PTC for an existing facility that was constructed in 1948.

### *Application Chronology*

| | |
|---|---|
| December 14, 2010 | DEQ received an application and an application fee. |
| December 29, 2010 – January 12, 2011 | DEQ provided an opportunity to request a public comment period on the application and proposed permitting action. |
| January 12, 2011 | DEQ determined that the application was complete. |
| March 10, 2011 | DEQ made available the draft permit and statement of basis for peer and regional office review. |
| March 14, 2011 | DEQ made available the draft permit and statement of basis for applicant review. |
| April 1, 2011 | DEQ received the permit processing fee. |

April 4, 2011 DEQ issued the final permit and statement of basis.

## TECHNICAL ANALYSIS

### *Emissions Units and Control Devices*

**Table 1 EMISSIONS UNIT AND CONTROL DEVICE INFORMATION**

| ID No. | Source Description | Control Equipment Description | Emissions Point ID No. and Description |
|---|---|---|---|
| N/A | **Anaerobic Digester #1:**<br>Storage capacity: 881,000 gallons<br>Gas generation capacity: 210,000 scf/day<br>Installation date: 1964 | Biogas is combusted in the boilers or the flare | N/A |
| N/A | **Anaerobic Digester #2:**<br>Storage capacity: 881,000 gallons<br>Gas generation capacity: 210,000 scf/day<br>Installation date: 1980 | Biogas is combusted in the boilers or the flare | N/A |
| N/A | **Anaerobic Digester #3:**<br>Storage capacity: 881,000 gallons<br>Gas generation capacity: 210,000 scf/day<br>Installation date: 2010 | Biogas is combusted in the boilers or the flare | N/A |
| N/A | **Anaerobic Digester #4:**<br>Storage capacity: 433,000 gallons<br>Gas generation capacity: 210,000 scf/day<br>Installation date: 1948 | Biogas is combusted in the boilers or the flare | N/A |
| N/A | **Anaerobic Digester #5:**<br>Storage capacity: 433,000 gallons<br>Gas generation capacity: 210,000 scf/day<br>Installation date: 1948 | Biogas is combusted in the boilers or the flare | N/A |
| **Boiler #1** | **Boiler #1:**<br>Manufacturer: Federal<br>Model: FRPP 500 LB<br>Heat input capacity: 2.25 MMBtu/hr<br>Steam generation capacity: 1,000 lb/hr<br>Fuel: biogas only<br>Installation date: 1980 | N/A | BOILER1:<br>Exit height: 21 ft (6.40 m)<br>Exit diameter: 1.25 ft (0.38 m)<br>Exit flow rate: 428 acfm<br>Exit temperature: 240 °F (388.71 K) |
| **Boiler #2** | **Boiler #2:**<br>Manufacturer: Burnham Commercial<br>Model: 4FW 311A 50DG NG WEB<br>Heat input capacity: 2.603 MMBtu/hr<br>Steam generation capacity: 1,000 lb/hr<br>Fuel: biogas only<br>Installation date: 2008 | N/A | BOILER2:<br>Exit height: 21 ft (6.40 m)<br>Exit diameter: 1.0 ft (0.30 m)<br>Exit flow rate: 1,091 acfm<br>Exit temperature: 460 °F (510.93 K) |
| **Boiler #3** | **Boiler #3:**<br>Manufacturer: Burnham Commercial<br>Model: 4FW 311A 50DG NG WEB<br>Heat input capacity: 2.603 MMBtu/hr<br>Steam generation capacity: 1,000 lb/hr<br>Fuel: biogas only<br>Installation date: 2010 | N/A | BOILER3:<br>Exit height: 21 ft (6.40 m)<br>Exit diameter: 1.18 ft (0.36 m)<br>Exit flow rate: 1,091 acfm<br>Exit temperature: 460 °F (510.93 K) |
| **Boiler #4** | **Boiler #4:**<br>Manufacturer: Burnham Commercial<br>Model: 4FW 311A 50DG NG WEB<br>Heat input capacity: 2.603 MMBtu/hr<br>Steam generation capacity: 1,000 lb/hr<br>Fuel: biogas only<br>Installation date: 2010 | N/A | BOILER4:<br>Exit height: 21 ft (6.40 m)<br>Exit diameter: 1.18 ft (0.36 m)<br>Exit flow rate: 1,091 acfm<br>Exit temperature: 460 °F (510.93 K) |

**Table 2 EMISSIONS UNIT AND CONTROL DEVICE INFORMATION (continued)**

| ID No. | Source Description | Control Equipment Description | Emissions Point ID No. and Description |
|---|---|---|---|
| **Flare** | **Candlestick Flare:**<br>Manufacturer: Varec<br>Model: WG 244WS01912119S6<br>Heat input capacity: 6.13 MMBtu/hr<br>Installation date:2010 | N/A | FLARE:<br>Exit height: 18.34 ft (5.59 m)<br>Exit diameter: 1.41 ft (0.43 m)<br>Exit flow rate: 6,234 acfm<br>Exit temperature: 1,831 °F (1,273 K) |
| **Generator #1** | **Emergency IC Engine #1:**<br>Manufacturer: Caterpillar<br>Model: C27<br>Serial #: MJE01635<br>Maximum power rating: 1,214 bhp<br>Tier certification: 2<br>Fuel: diesel fuel only<br>Installation date: 2009 | N/A | GEN1:<br>Exit height: 16.73 ft (5.10 m)<br>Exit diameter: 0.66 ft (0.20 m)<br>Exit flow rate: 4,003 acfm<br>Exit temperature: 850 °F (727.82 K) |
| **Generator #2** | **Emergency IC Engine #2:**<br>Manufacturer: Caterpillar<br>Model: C27<br>Serial #: MJE01769<br>Maximum power rating: 1,214 bhp<br>Tier certification: 2<br>Fuel: diesel fuel only<br>Installation date: 2009 | N/A | GEN2:<br>Exit height: 16.73 ft (5.10 m)<br>Exit diameter: 0.66 ft (0.20 m)<br>Exit flow rate: 4,003 acfm<br>Exit temperature: 850 °F (727.82 K) |
| **Generator #3** | **Emergency IC Engine #3:**<br>Manufacturer: Caterpillar<br>Model: C27<br>Serial #: MJE01770<br>Maximum power rating: 1,214 bhp<br>Tier certification: 2<br>Fuel: diesel fuel only<br>Installation date: 2009 | N/A | GEN3:<br>Exit height: 16.73 ft (5.10 m)<br>Exit diameter: 0.66 ft (0.20 m)<br>Exit flow rate: 4,003 acfm<br>Exit temperature: 850 °F (727.82 K) |
| **VSB Heater 1** | **Heater #1:**<br>Manufacturer: Sterling<br>Model: QVSF<br>Heat input capacity: 0.200 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2009 | N/A | VSB1:<br>Exit height: 31.59 ft (9.63 m)<br>Exit diameter: 0.43 ft (0.13 m)<br>Exit flow rate: 2,576 acfm<br>Exit temperature: 88.5 °F (304.54 K) |
| **VSB Heater 2** | **Heater #2:**<br>Manufacturer: Sterling<br>Model: QVSF<br>Heat input capacity: 0.200 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2009 | N/A | VSB2:<br>Exit height: 31.76 ft (9.68 m)<br>Exit diameter: 0.43 ft (0.13 m)<br>Exit flow rate: 2,576 acfm<br>Exit temperature: 88.5 °F (304.54 K) |
| **VSB Heater 3** | **Heater #3:**<br>Manufacturer: Sterling<br>Model: QVSF<br>Heat input capacity: 0.200 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2009 | N/A | VSB3:<br>Exit height: 31.92 ft (9.73 m)<br>Exit diameter: 0.43 ft (0.13 m)<br>Exit flow rate: 2,576 acfm<br>Exit temperature: 88.5 °F (304.54 K) |
| **VSB Heater 4** | **Heater #4:**<br>Manufacturer: Sterling<br>Model: QVSF<br>Heat input capacity: 0.200 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2009 | N/A | VSB4:<br>Exit height: 31.66 ft (9.65 m)<br>Exit diameter: 0.43 ft (0.13 m)<br>Exit flow rate: 2,576 acfm<br>Exit temperature: 88.5 °F (304.54 K) |
| **LTS Heater 1** | **Heater #5:**<br>Manufacturer: ADP<br>Model: SEP<br>Heat input capacity: 0.145 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2001 | N/A | LTS1:<br>Exit height: 18.00 ft (5.49 m)<br>Exit diameter: 0.33 ft (0.10 m)<br>Exit flow rate: 1,834 acfm<br>Exit temperature: 82.5 °F (301.21 K) |

Table 3 EMISSIONS UNIT AND CONTROL DEVICE INFORMATION (continued)

| ID No. | Source Description | Control Equipment Description | Emissions Point ID No. and Description |
|---|---|---|---|
| LTS Heater 2 | **Heater #6:**<br>Manufacturer: ADP<br>Model: SEP<br>Heat input capacity: 0.145 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2001 | N/A | LTS2:<br>Exit height: 18.00 ft (5.49 m)<br>Exit diameter: 0.33 ft (0.10 m)<br>Exit flow rate: 1,834 acfm<br>Exit temperature: 82.5 °F (301.21 K) |
| LTS Heater 3 | **Heater #7:**<br>Manufacturer: ADP<br>Model: SEP<br>Heat input capacity: 0.145 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2001 | N/A | LTS3:<br>Exit height: 18.00 ft (5.49 m)<br>Exit diameter: 0.33 ft (0.10 m)<br>Exit flow rate: 1,834 acfm<br>Exit temperature: 82.5 °F (301.21 K) |
| LTS Heater 4 | **Heater #8:**<br>Manufacturer: ADP<br>Model: SEP<br>Heat input capacity: 0.145 MMBtu/hr<br>Fuel: biogas only<br>Installation date: 2001 | N/A | LTS4:<br>Exit height: 18.00 ft (5.49 m)<br>Exit diameter: 0.33 ft (0.10 m)<br>Exit flow rate: 1,834 acfm<br>Exit temperature: 82.5 °F (301.21 K) |
| Hotsy | **Pressure Washer:**<br>Manufacturer: Hotsy<br>Model: S5735-3<br>Heat input capacity: 0.657 MMBtu/hr<br>Fuel: diesel fuel only<br>Installation date: 1998 | N/A | HOTSY:<br>Exit height: 21.0 ft (6.40 m)<br>Exit diameter: 0.98 ft (0.30 m)<br>Exit flow rate: 336 acfm<br>Exit temperature: 500 °F (533.15 K) |

## *Emissions Inventories*

### Potential to Emit

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

Using this definition of Potential to Emit an emission inventory was developed for the four boilers, the flare, the three emergency IC engines, eight heaters, and the pressure washer at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant PTE were based on emission factors from AP-42, Manufacturer's guarantees, and operation of 8,760 hours per year.

### Uncontrolled Potential to Emit

Using the definition of Potential to Emit, uncontrolled Potential to Emit is then defined as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall **not** be treated as part of its design **since** the limitation or the effect it would have on emissions **is not** state or federally enforceable.

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

The following table presents the uncontrolled Potential to Emit for criteria pollutants as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations and the assumptions used to determine emissions for each emissions unit. For this facility the uncontrolled PTE is the same as the PTE because all emissions were calculated at full-time operation of 8,760 hrs/yr and there are no add-on controls used on any of the equipment being permitted.

**Table 4 UNCONTROLLED POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS**

| Emissions Unit | $PM_{10}$ T/yr | $SO_2$ T/yr | $NO_X$ T/yr | CO T/yr | VOC T/yr | Lead lb/quarter |
|---|---|---|---|---|---|---|
| **Point Sources** | | | | | | |
| **Boiler #1**[1] | 0.27 | 7.52 | 3.17 | 4.02 | 0.43 | 0.00 |
| **Boiler #2**[1] | 0.31 | 8.70 | 3.67 | 4.65 | 0.50 | 0.00 |
| **Boiler #3**[1] | 0.31 | 8.70 | 3.67 | 4.65 | 0.50 | 0.00 |
| **Boiler #4**[1] | 0.31 | 8.70 | 3.67 | 4.65 | 0.50 | 0.00 |
| **Candlestick Flare** | 0.29 | 6.79 | 1.83 | 9.93 | 1.69 | 0.00 |
| **Emergency IC Engine #1** | 0.03 | 0.00 | 4.26 | 0.28 | 0.04 | 0.00 |
| **Emergency IC Engine #2** | 0.03 | 0.00 | 4.26 | 0.28 | 0.04 | 0.00 |
| **Emergency IC Engine #3** | 0.03 | 0.00 | 4.26 | 0.28 | 0.04 | 0.00 |
| **Heater #1** | 0.0065 | 0.0005 | 0.0858 | 0.0721 | 0.0047 | 0.00 |
| **Heater #2** | 0.0065 | 0.0005 | 0.0858 | 0.0721 | 0.0047 | 0.00 |
| **Heater #3** | 0.0065 | 0.0005 | 0.0858 | 0.0721 | 0.0047 | 0.00 |
| **Heater #4** | 0.0065 | 0.0005 | 0.0858 | 0.0721 | 0.0047 | 0.00 |
| **Heater #5** | 0.0047 | 0.0004 | 0.0622 | 0.0522 | 0.0034 | 0.00 |
| **Heater #6** | 0.0047 | 0.0004 | 0.0622 | 0.0522 | 0.0034 | 0.00 |
| **Heater #7** | 0.0047 | 0.0004 | 0.0622 | 0.0522 | 0.0034 | 0.00 |
| **Heater #8** | 0.0047 | 0.0004 | 0.0622 | 0.0522 | 0.0034 | 0.00 |
| **Pressure Washer** | 0.0214 | 0.0017 | 0.2821 | 0.2369 | 0.0155 | 0.00 |
| **Total, Point Sources** | **1.65** | **40.42** | **29.66** | **29.47** | **3.79** | **0.00** |

[1] – Boilers #1 thru #4 are dual fuel fired on biogas and natural gas. Therefore, the uncontrolled PTE was the worst-case on a pollutant-by-pollutant basis for the two fuels.

The following table presents the uncontrolled Potential to Emit for HAP pollutants as submitted by the Applicant and verified by DEQ staff.

**Table 5 UNCONTROLLED POTENTIAL TO EMIT FOR HAPs**

| HAP Pollutants | PTE (T/yr) |
|---|---|
| Acetaldehyde | 1.51E-04 |
| Acrolein | 4.73E-05 |
| Benzene | 5.57E-03 |
| Formaldehyde | 9.02E-03 |
| Hexane | 2.05E-01 |
| Hydrogen Sulfide | 7.20E-01 |
| Napthalene | 8.50E-04 |
| Toluene | 2.08E-03 |
| Xylene | 1.16E-03 |
| POM | 6.67E-07 |
| Arsenic | 2.10E-05 |
| Beryllium | 1.26E-06 |
| Cadmium | 1.16E-04 |
| Chromium | 1.47E-04 |
| Cobalt | 8.84E-06 |
| Manganese | 4.00E-05 |
| Mercury | 2.74E-05 |
| Nickel | 2.21E-04 |
| Selenium | 2.52E-06 |
| **Total** | **0.94** |

## Pre-Project Potential to Emit

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

This is an existing facility. However, since this is the first time the facility is receiving a permit, pre-project emissions are set to zero for all criteria pollutants.

## Post Project Potential to Emit

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

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

**Table 6 POST PROJECT POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS**

| Emissions Unit | $PM_{10}$ | | $SO_2$ | | $NO_X$ | | CO | | VOC | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr[a] | T/yr[b] | lb/hr[a] | T/yr[b] | lb/hr[a] | T/yr[b] | lb/hr[a] | T/yr[b] | lb/hr[a] | T/yr[b] | lb/hr | T/yr |
| **Point Sources** | | | | | | | | | | | | |
| **Boiler #1[c]** | 0.06 | 0.27 | 1.72 | 7.52 | 0.72 | 3.17 | 0.92 | 4.02 | 0.10 | 0.43 | 0 | 0 |
| **Boiler #2[c]** | 0.07 | 0.31 | 1.99 | 8.70 | 0.84 | 3.67 | 1.06 | 4.65 | 0.11 | 0.50 | 0 | 0 |
| **Boiler #3[c]** | 0.07 | 0.31 | 1.99 | 8.70 | 0.84 | 3.67 | 1.06 | 4.65 | 0.11 | 0.50 | 0 | 0 |
| **Boiler #4[c]** | 0.07 | 0.31 | 1.99 | 8.70 | 0.84 | 3.67 | 1.06 | 4.65 | 0.11 | 0.50 | 0 | 0 |
| **Candlestick Flare** | 0.07 | 0.29 | 1.55 | 6.79 | 0.42 | 1.83 | 2.27 | 9.93 | 0.39 | 1.69 | 0 | 0 |
| **Emergency IC Engine #1** | 0.13 | 0.03 | 0.01 | 0.00 | 17.02 | 4.26 | 1.13 | 0.28 | 0.15 | 0.04 | 0 | 0 |
| **Emergency IC Engine #2** | 0.13 | 0.03 | 0.01 | 0.00 | 17.02 | 4.26 | 1.13 | 0.28 | 0.15 | 0.04 | 0 | 0 |
| **Emergency IC Engine #3** | 0.13 | 0.03 | 0.01 | 0.00 | 17.02 | 4.26 | 1.13 | 0.28 | 0.15 | 0.04 | 0 | 0 |
| **Heater #1** | 0.001 | 0.0065 | 0.000 | 0.0005 | 0.020 | 0.0858 | 0.016 | 0.0721 | 0.001 | 0.0047 | 0 | 0 |
| **Heater #2** | 0.001 | 0.0065 | 0.000 | 0.0005 | 0.020 | 0.0858 | 0.016 | 0.0721 | 0.001 | 0.0047 | 0 | 0 |
| **Heater #3** | 0.001 | 0.0065 | 0.000 | 0.0005 | 0.020 | 0.0858 | 0.016 | 0.0721 | 0.001 | 0.0047 | 0 | 0 |
| **Heater #4** | 0.001 | 0.0065 | 0.000 | 0.0005 | 0.020 | 0.0858 | 0.016 | 0.0721 | 0.001 | 0.0047 | 0 | 0 |
| **Heater #5** | 0.001 | 0.0047 | 0.000 | 0.0004 | 0.014 | 0.0622 | 0.012 | 0.0522 | 0.001 | 0.0034 | 0 | 0 |
| **Heater #6** | 0.001 | 0.0047 | 0.000 | 0.0004 | 0.014 | 0.0622 | 0.012 | 0.0522 | 0.001 | 0.0034 | 0 | 0 |
| **Heater #7** | 0.001 | 0.0047 | 0.000 | 0.0004 | 0.014 | 0.0622 | 0.012 | 0.0522 | 0.001 | 0.0034 | 0 | 0 |
| **Heater #8** | 0.001 | 0.0047 | 0.000 | 0.0004 | 0.014 | 0.0622 | 0.012 | 0.0522 | 0.001 | 0.0034 | 0 | 0 |
| **Pressure Washer** | 0.005 | 0.0214 | 0.000 | 0.0017 | 0.064 | 0.2821 | 0.054 | 0.2369 | 0.004 | 0.0155 | 0 | 0 |
| **Post Project Totals** | **0.74** | **1.65** | **9.27** | **40.42** | **54.92** | **29.66** | **9.93** | **29.47** | **1.28** | **3.79** | **0.00** | **0.00** |

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) Boilers #1 thru #4 are fired on biogas and natural gas. Therefore, the uncontrolled PTE was the worst-case on a pollutant-by-pollutant basis for the two fuels.

The following table presents the post project Potential to Emit for HAP pollutants from all emissions units at the facility as determined by the Applicant and verified by DEQ staff.

**Table 7 POST PROJECT POTENTIAL TO EMIT FOR HAPs**

| HAP Pollutants | PTE (T/yr) |
|---|---|
| Acetaldehyde | 1.51E-04 |
| Acrolein | 4.73E-05 |
| Benzene | 5.57E-03 |
| Formaldehyde | 9.02E-03 |
| Hexane | 2.05E-01 |
| Hydrogen Sulfide | 7.20E-01 |
| Napthalene | 8.50E-04 |
| Toluene | 2.08E-03 |
| Xylene | 1.16E-03 |
| POM | 6.67E-07 |
| Arsenic | 2.10E-05 |
| Beryllium | 1.26E-06 |
| Cadmium | 1.16E-04 |
| Chromium | 1.47E-04 |
| Cobalt | 8.84E-06 |
| Manganese | 4.00E-05 |
| Mercury | 2.74E-05 |
| Nickel | 2.21E-04 |
| Selenium | 2.52E-06 |
| **Total** | **0.94** |

## Change in Potential to Emit

The project's change in Potential to Emit is used to determine if a public comment period may be required or if emissions modeling may be required, and to determine the processing fee per IDAPA 58.01.01.225.

The following table presents the change in the Potential to Emit for criteria pollutants as a result of this project.

**Table 8 CHANGES IN POTENTIAL TO EMIT FOR CRITERIA POLLUTANTS**

| | $PM_{10}$ | | $SO_2$ | | $NO_X$ | | CO | | VOC | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr | lb/hr | T/yr |
| **Point Sources** | | | | | | | | | | | | |
| **Pre-Project Potential to Emit** | 0.0 | 0.0 | 0.0. | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| **Post Project Potential to Emit** | 0.74 | 1.65 | 9.27 | 40.42 | 54.92 | 29.66 | 9.93 | 29.47 | 1.28 | 3.79 | 0.0 | 0.0 |
| **Changes in Potential to Emit** | **0.74** | **1.65** | **9.27** | **40.42** | **54.92** | **29.66** | **9.93** | **29.47** | **1.28** | **3.79** | **0.00** | **0.00** |

## Non-Carcinogenic TAPs Potential to Emit

A summary of the non-carcinogenic PTE increase of toxic air pollutants (TAP) is provided in the following table. Pre- and post project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

**Table 9 PRE- AND POST PROJECT NON-CARCINOGENIC TAP EMISSIONS SUMMARY**
**POTENTIAL TO EMIT**

| Non-Carcinogenic Toxic Air Pollutants | Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr) | Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr) | Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr) | Non-Carcinogenic Screening Emission Level (lb/hr) | Exceeds Screening Level? (Y/N) |
|---|---|---|---|---|---|
| **Acrolein** | 0.0 | 1.08E-05 | **0.000011** | 1.70E-02 | No |
| **Ammonia** | 0.0 | 1.12E-01 | **0.1120** | 1.20E+00 | No |
| **Barium** | 0.0 | 1.06E-04 | **0.0001** | 3.30E-02 | No |
| **Cobalt** | 0.0 | 2.02E-06 | **0.000002** | 3.30E-03 | No |
| **Copper** | 0.0 | 2.04E-05 | **0.0000** | 1.30E-02 | No |
| **Hexane** | 0.0 | 4.68E-02 | **0.0468** | 1.20E+01 | No |
| **Hydrogen Sulfide** | 0.0 | 1.64E-01 | **0.1640** | 9.33E-01 | No |
| **Manganese** | 0.0 | 9.13E-06 | **0.000009** | 6.70E-02 | No |
| **Mercury** | 0.0 | 6.25E-06 | **0.000006** | 1.00E-03 | No |
| **Molybdenum** | 0.0 | 2.64E-05 | **0.000026** | 3.33E-01 | No |
| **Pentane** | 0.0 | 6.76E-02 | **0.0676** | 1.18E+02 | No |
| **Selenium** | 0.0 | 5.76E-07 | **0.000001** | 1.30E-02 | No |
| **Toluene** | 0.0 | 4.74E-04 | **0.0005** | 2.50E+01 | No |
| **Vanadium** | 0.0 | 5.52E-05 | **0.0001** | 3.00E-03 | No |
| **Xylenes** | 0.0 | 2.65E-04 | **0.0003** | 2.90E+-01 | No |
| **Zinc** | 0.0 | 6.97E-04 | **0.0007** | 3.33E-01 | No |

Therefore, modeling is not required for any TAPs because none of the 24-hour average non-carcinogenic screening EL identified in IDAPA 58.01.01.585 were exceeded.

## Carcinogenic TAPs Potential to Emit

A summary of the carcinogenic PTE emissions increase of toxic air pollutants (TAP) is provided in the following table. Pre- and post project, as well as the change in, carcinogenic TAP emissions are presented in the following table:

**Table 10 PRE- AND POST PROJECT CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT**

| Carcinogenic Toxic Air Pollutants | Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr) | Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr) | Change in Annual Average Emissions Rates for Units at the Facility (lb/hr) | Carcinogenic Screening Emission Level (lb/hr) | Exceeds Screening Level? (Y/N) |
|---|---|---|---|---|---|
| 3-Methylchloanthrene | 0.0 | 4.68E-08 | **0.0000000** | 2.50E-06 | No |
| Acetaldehyde | 0.0 | 3.46E-05 | **0.000035** | 3.00E-03 | No |
| Arsenic | 0.0 | 4.08E-06 | **0.000004** | 1.50E-06 | **Yes** |
| Benzene | 0.0 | 1.27E-03 | **0.0013** | 8.00E-04 | **Yes** |
| Benzo(a)pyrene | 0.0 | 3.84E-07 | **0.000000** | 2.00E-06 | No |
| Beryllium | 0.0 | 2.88E-07 | **0.000000** | 2.80E-05 | No |
| Cadmium | 0.0 | 2.64E-05 | **0.000026** | 3.70E-06 | **Yes** |
| Chromium | 0.0 | 3.36E-05 | **0.000034** | 3.30E-02 | No |
| Formaldehyde | 0.0 | 2.06E-03 | **0.0021** | 5.10E-04 | **Yes** |
| Napthalene | 0.0 | 1.94E-04 | **0.0002** | 9.10E-05 | **Yes** |
| Nickel | 0.0 | 5.04E-05 | **0.0001** | 2.75E-05 | No |
| PAH | 0.0 | 3.05E-04 | **0.0003** | 9.10E-05 | **Yes** |
| POM | 0.0 | 1.52E-07 | **0.000000** | 2.00E-06 | No |

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Therefore, modeling is required for Arsenic, Benzene, Cadmium, Formaldehyde, Napthalene, and PAH because the annual average carcinogenic screening EL identified in IDAPA 58.01.01.586 were exceeded.

**Post Project HAP Potential to Emit**

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

**Table 11 HAP EMISSIONS SUMMARY POTENTIAL TO EMIT**

| HAP Pollutants | PTE (T/yr) |
|---|---|
| Acetaldehyde | 1.51E-04 |
| Acrolein | 4.73E-05 |
| Benzene | 5.57E-03 |
| Formaldehyde | 9.02E-03 |
| Hexane | 2.05E-01 |
| Hydrogen Sulfide | 7.20E-01 |
| Napthalene | 8.50E-04 |
| Toluene | 2.08E-03 |
| Xylene | 1.16E-03 |
| POM | 6.67E-07 |
| Arsenic | 2.10E-05 |
| Beryllium | 1.26E-06 |
| Cadmium | 1.16E-04 |
| Chromium | 1.47E-04 |
| Cobalt | 8.84E-06 |
| Manganese | 4.00E-05 |
| Mercury | 2.74E-05 |
| Nickel | 2.21E-04 |
| Selenium | 2.52E-06 |

### *Ambient Air Quality Impact Analyses*

As presented in the Modeling Memo in Appendix B, the estimated emission rates of $PM_{10}$, $SO_2$, $NO_X$, and TAPs from this project were below/exceeded applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

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

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

## REGULATORY ANALYSIS

### *Attainment Designation (40 CFR 81.313)*

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

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

## *Facility Classification AIRS/AFS*

"Synthetic Minor" for AIRS/AFS classification for criteria pollutants is defined as the uncontrolled Potential to Emit for criteria pollutants are above the applicable major source thresholds and the Potential to Emit for criteria pollutants fall below the applicable major source thresholds. Therefore, the following table compares the uncontrolled Potential to Emit and the Potential to Emit for criteria pollutants to the Major Source thresholds to determine if the facility will be "Synthetic Minor."

**Table 12 UNCONTROLLED PTE AND PTE FOR CRITERIA POLLUTANTS COMPARED TO THE MAJOR SOURCE THRESHOLDS**

| Pollutant | Uncontrolled PTE (T/yr) | PTE (T/yr) | Major Source Thresholds (T/yr) | Uncontrolled PTE Exceeds the Major Source Threshold and PTE Exceeds the Major Source Threshold? |
|---|---|---|---|---|
| $PM_{10}$ | 1.65 | 1.65 | 100 | No |
| $SO_2$ | 40.42 | 40.42 | 100 | No |
| $NO_X$ | 29.66 | 29.66 | 100 | No |
| CO | 29.47 | 29.47 | 100 | No |
| VOC | 3.79 | 3.79 | 100 | No |

"Synthetic Minor" for AIRS/AFS classification for HAP pollutants is defined as the uncontrolled Potential to Emit for HAP pollutants are above the applicable major source thresholds and the Potential to Emit for HAPs pollutants fall below the applicable major source thresholds. Therefore, the following table compares the uncontrolled Potential to Emit and the Potential to Emit for HAP pollutants to the Major Source thresholds to determine if the facility will be "Synthetic Minor."

**Table 13 UNCONTROLED PTE AND PTE FOR HAPs POLLUTANTS COMPARED TO THE MAJOR SOURCE THRESHOLDS**

| HAP Pollutant | Uncontrolled PTE (T/yr) | PTE (T/yr) | Major Source Thresholds (T/yr) | Uncontrolled PTE Exceeds the Major Source Threshold and PTE Exceeds the Major Source Threshold? |
|---|---|---|---|---|
| Acetaldehyde | 1.51E-04 | 1.51E-04 | 10 | No |
| Acrolein | 4.73E-05 | 4.73E-05 | 10 | No |
| Benzene | 5.57E-03 | 5.57E-03 | 10 | No |
| Formaldehyde | 9.02E-03 | 9.02E-03 | 10 | No |
| Hexane | 2.05E-01 | 2.05E-01 | 10 | No |
| Hydrogen Sulfide | 7.20E-01 | 7.20E-01 | 10 | No |
| Napthalene | 8.50E-04 | 8.50E-04 | 10 | No |
| Toluene | 2.08E-03 | 2.08E-03 | 10 | No |
| Xylene | 1.16E-03 | 1.16E-03 | 10 | No |
| POM | 6.67E-07 | 6.67E-07 | 10 | No |
| Arsenic | 2.10E-05 | 2.10E-05 | 10 | No |
| Beryllium | 1.26E-06 | 1.26E-06 | 10 | No |
| Cadmium | 1.16E-04 | 1.16E-04 | 10 | No |
| Chromium | 1.47E-04 | 1.47E-04 | 10 | No |
| Cobalt | 8.84E-06 | 8.84E-06 | 10 | No |
| Manganese | 4.00E-05 | 4.00E-05 | 10 | No |
| Mercury | 2.74E-05 | 2.74E-05 | 10 | No |
| Nickel | 2.21E-04 | 2.21E-04 | 10 | No |
| Selenium | 2.52E-06 | 2.52E-06 | 10 | No |
| **Total** | **0.94** | **0.94** | 25 | No |

As demonstrated in Table 12, the facility has an uncontrolled potential to emit for $PM_{10}$, $SO_2$, $NO_X$, CO, and VOC emissions less than the Major Source thresholds of 100 T/yr for each pollutant. In addition, as demonstrated in Table 13 the facility has an uncontrolled potential for each HAP less than the Major Source threshold of 10 T/yr and for all HAPs combined less than the Major Source threshold of 25 T/yr. Therefore, this facility is not designated as a Synthetic Minor facility.

## *Permit to Construct (IDAPA 58.01.01.201)*

IDAPA 58.01.01.201 Permit to Construct Required

The PTC rules under IDAPA 58.01.01.201 require that "No owner or operator may commence construction or modification of any stationary source, facility, major facility, or major modification without first obtaining a permit to construct from the Department which satisfies the requirements of Sections 200 through 228 unless the source is exempted in any of Sections 220 through 223." Therefore, DEQ staff analyzed the data from the permit application for this existing WWTP operation to determine if it is exempt from obtaining a PTC according to Sections 220 through 223.

IDAPA 58.01.01.220 General Exemption Criteria for Permit to Construct Exemptions

In accordance with IDAPA 58.01.01.220.01.a, the maximum capacity of the source to emit an air pollutant under its physical and operational design without consideration of limitations on emissions such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored, or processed shall not equal or exceed 100 tons/yr for all regulated air pollutants. As previously presented in Table 4, Uncontrolled Potential to Emit for Criteria Pollutants, and Table 5, Uncontrolled Potential to Emit for HAPs, the proposed project results in uncontrolled potential emissions of less than 100 tons/yr for all regulated air pollutants. Therefore, the project meets the criteria set forth in Section 220 and may be exempt from PTC requirements. In addition, the criteria set forth in Section 221, 222, or 223 must be met to be exempt from PTC requirements.

IDAPA 58.01.01.221 Category I Exemption Criteria

In accordance with IDAPA 58.01.01.221.01, the maximum capacity of a source to emit an air pollutant under its physical and operational design considering limitations on emissions such as air pollution control equipment, restrictions on hours of operation and restrictions on the type and amount of material combusted, stored or processed shall be less than ten percent (10%) of the significant emission rates set out in the definition of significant at Section 006. The following table compares the post-project facility-wide annual PTE to 10% of the significance threshold listed in IDAPA 58.01.01.006.104 in order to determine if the project may qualify for a Category I exemption.

**Table 14 PTE FOR CRITERIA POLLUTANTS COMPARED TO THE SIGNIFICANCE THRESHOLDS**

| Pollutant | PTE (T/yr) | 10% of the Significance Threshold (T/yr) | Exceeds 10% of the Significance Threshold? |
|---|---|---|---|
| $PM_{10}$ | 1.65 | 1.5 | Yes |
| $SO_2$ | 40.42 | 4.0 | Yes |
| $NO_X$ | 29.66 | 4.0 | Yes |
| CO | 29.47 | 10.0 | Yes |
| VOC | 3.79 | 4.0 | No |

The potential $PM_{10}$, $SO_2$, $NO_X$, and CO emissions rates of the proposed project is indicated in the table above, which is above 10% of the significant emission rate listed in IDAPA 58.01.01.006.104. Therefore, this existing Waste Water Treatment Plant operation does not qualify for a Category I exemption.

## *Tier II Operating Permit (IDAPA 58.01.01.401)*

IDAPA 58.01.01.401 Tier II Operating Permit

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

## *Visible Emissions (IDAPA 58.01.01.625)*

IDAPA 58.01.01.625 Visible Emissions

The sources of $PM_{10}$ emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 16, 22, and 30.

## *Standards for New Sources (IDAPA 58.01.01.676)*

IDAPA 58.01.01.676 Standards for New Sources

A person shall not discharge into the atmosphere from any fuel burning equipment with a maximum rated input of ten (10) million BTU's per hour or more, and commencing operation on or after October 1, 1979, particulate matter in excess of 0.015 gr/dscf at an $O_2$ level of 3% for gas combustion.

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. In addition, all four boilers at this facility were installed after October 1, 1979. Therefore, this Rule applies to the four boilers at this facility.

Permit Condition 17 includes the requirements of this section.

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

IDAPA 58.01.01.301 Requirement to Obtain Tier I Operating Permit

IDAPA 58.01.01.006.118 defines a Tier I source as "Any source located at a major facility as defined in Section 008." IDAPA 58.01.01.008.10 defines a Major Facility as either:

- For HAPS a facility with the potential to emit ten (10) tons per year (tpy) or more of any hazardous air pollutant, other than radionuclides, or
- The facility emits or has the potential to emit twenty-five (25) tpy or more of any combination of any hazardous air pollutants, other than radionuclides.

or, for non-attainment areas (Note: The State of Idaho currently has no serious non-attainment areas therefore the Major Source threshold is defined as follows):

- The facility emits or has the potential to emit one hundred (100) tons per year or more of any regulated air pollutant. The fugitive emissions shall not be considered in determining whether the facility is major unless the facility is a "Designated Facility":

Therefore, it needs to be determined if this facility is a HAP Major Source. The following table compares this facility's post-project facility-wide annual PTE for all HAPs emitted by the source to the HAPS Major Source thresholds in order to determine if this facility is a HAPs Major Source.

**Table 15 PTE FOR HAP POLLUTANTS COMPARED TO THE HAP MAJOR SOURCE THRESHOLDS**

| HAP Pollutants | PTE (T/yr) | Major Source Threshold (T/yr) | Exceeds the Major Source Threshold? |
|---|---|---|---|
| Acetaldehyde | 1.51E-04 | 10 | No |
| Acrolein | 4.73E-05 | 10 | No |
| Benzene | 5.57E-03 | 10 | No |
| Formaldehyde | 9.02E-03 | 10 | No |
| Hexane | 2.05E-01 | 10 | No |
| Hydrogen Sulfide | 7.20E-01 | 10 | No |
| Napthalene | 8.50E-04 | 10 | No |
| Toluene | 2.08E-03 | 10 | No |
| Xylene | 1.16E-03 | 10 | No |
| POM | 6.67E-07 | 10 | No |
| Arsenic | 2.10E-05 | 10 | No |
| Beryllium | 1.26E-06 | 10 | No |
| Cadmium | 1.16E-04 | 10 | No |
| Chromium | 1.47E-04 | 10 | No |
| Cobalt | 8.84E-06 | 10 | No |
| Manganese | 4.00E-05 | 10 | No |
| Mercury | 2.74E-05 | 10 | No |
| Nickel | 2.21E-04 | 10 | No |
| Selenium | 2.52E-06 | 10 | No |
| **Total** | 0.94 | **25** | **No** |

As presented in the preceding table the PTE for each HAP is less than 10 T/yr and the PTE for all HAPs combined is less than 25 T/yr. Therefore, this facility is/is not a HAPs Major Source subject to Tier I requirements.

Therefore, it needs to be determined if this facility is a criteria pollutant Major Source. As discussed previously the City of Nampa WWTP facility is located in Canyon County (AQCR 64), which is designated as unclassifiable/attainment for $PM_{2.5}$, $PM_{10}$, $SO_2$, $NO_X$, CO, and Ozone for federal and state criteria air pollutants. Therefore, the following table compares the post-project facility-wide annual PTE for all criteria pollutants emitted by the source to the applicable criteria pollutant Major Source thresholds in order to determine if the facility is a criteria pollutant Major Source.

Table 16 PTE FOR CRITERIA POLLUTANTS COMPARED TO THE CRITERIA POLLUTANT MAJOR SOURCE THRESHOLDS

| Criteria Pollutants | PTE (T/yr) | Major Source Threshold (T/yr) | Exceeds the Major Source Threshold? |
|---|---|---|---|
| $PM_{10}$ | 1.65 | 100 | No |
| $SO_2$ | 40.42 | 100 | No |
| $NO_X$ | 29.66 | 100 | No |
| CO | 29.47 | 100 | No |
| VOC | 3.79 | 100 | No |

As presented in the preceding table the PTE for each criteria pollutant is less than 100 T/yr. Therefore, this facility is not a criteria pollutant Major Source subject to Tier I requirements.

## *PSD Classification (40 CFR 52.21)*

40 CFR 52.21 Prevention of Significant Deterioration of Air Quality

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

## *NSPS Applicability (40 CFR 60)*

Because the facility has four boilers, a flare, and three emergency compression ignition IC engines the following NSPS requirements may apply to this facility:

- 40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- 40 CFR 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

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

All four boilers at this facility combust natural gas and biogas as fuel as required by Permit Condition 18. Therefore, the only Sections of this subpart that may be applicable to the four 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).

§ 60.40c Applicability and Delegation of Authority

Section (a) specifies that except as provided in paragraph (d) 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).

As previously presented in the Technical Analysis Section all four boilers at this facility are rated at less than 10 MMBTU/hr. Therefore, Subpart Dc does not apply to the four boilers at this facility.

**40 CFR 60, Subpart IIII** **Standards of Performance for Stationary Compression Ignition Internal Combustion Engines**

§ 60.4200 Applicability

Section (a) specifies that the provisions of this subpart are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE) as specified in paragraphs (a)(1) through (3) of this section. For the purposes of this subpart, the date that construction commences is the date the engine is ordered by the owner or operator.

- (1) Manufacturers of stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is:
  - (i) 2007 or later, for engines that are not fire pump engines,
  - (ii) The model year listed in table 3 to this subpart or later model year, for fire pump engines.
- **(2) Owners and operators of stationary CI ICE that commence construction after July 11, 2005 where the stationary CI ICE are:**
  - **(i) Manufactured after April 1, 2006 and are not fire pump engines, or**
  - (ii) Manufactured as a certified National Fire Protection Association (NFPA) fire pump engine after July 1, 2006.
- (3) Owners and operators of stationary CI ICE that modify or reconstruct their stationary CI ICE after July 11, 2005.

(b) The provisions of this subpart are not applicable to stationary CI ICE being tested at a stationary CI ICE test cell/stand.

(c) If you are an owner or operator of an area source subject to this subpart, you are exempt from the obligation to obtain a permit under 40 CFR part 70 or 40 CFR part 71, provided you are not required to obtain a permit under 40 CFR 70.3(a) or 40 CFR 71.3(a) for a reason other than your status as an area source under this subpart. Notwithstanding the previous sentence, you must continue to comply with the provisions of this subpart applicable to area sources.

(d) Stationary CI ICE may be eligible for exemption from the requirements of this subpart as described in 40 CFR part 1068, subpart C (or the exemptions described in 40 CFR part 89, subpart J and 40 CFR part 94, subpart J, for engines that would need to be certified to standards in those parts), except that owners and operators, as well as manufacturers, may be eligible to request an exemption for national security.

As previously presented in the Technical Analysis Section all three CI IC engines at this facility were manufactured in 2009. Per the Applicant the displacement of each 4-cylinder engine is 27.03 l, which equals 6.8 l/cylinder. The engines are not used fore fire pumps. Therefore, Subpart IIII does apply to the three CI IC engines at this facility.

§ 60.4205 What emission standards must I meet for emergency engines if I am an owner or operator of a stationary CI internal combustion engine?

Section (b) specifies that owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new non-road CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.

§ 60.4202 What emission standards must I meet for emergency engines if I am a stationary CI internal combustion engine manufacturer?

Section (a) specifies that (a) Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later emergency stationary CI ICE with a maximum engine power less than or equal to 2,237 kW (3,000 bhp) and a displacement of less than 10 liters per cylinder that are not fire pump engines to the emission standards specified in paragraphs (a)(1) through (2) of this section.

- (1) For engines with a maximum engine power less than 37 kW (50 bhp):
  - (i) The certification emission standards for new non-road CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants for model year 2007 engines, and
  - (ii) The certification emission standards for new non-road CI engines in 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, 40 CFR 1039.115, and table 2 to this subpart, for 2008 model year and later engines.
- (2) For engines with a maximum engine power greater than or equal to 37 kW (50 bhp), the certification emission standards for new non-road CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants beginning in model year 2007.

| Requirements of Title 13 CCR, Section 2423 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Source | Maximum Rated Power | Model Year | $NO_X$ | VOC | $NO_X$ + VOC | CO | PM |
| Title 13 CCR, §2423 | ≥ 751.0 bhp (≥ 560 kW) | 2000-2005 (Tier 1) | 6.9 g/bhp-hr (9.2 g/kW-hr) | 1.0 g/bhp-hr (1.3 g/kW-hr) | -- | 8.5 g/bhp-hr (11.4 g/kW-hr) | 0.40 g/bhp-hr (0.54 g/kW-hr) |
| Title 13 CCR, §2423 | ≥ 751.0 bhp (≥ 560 kW) | 2006 and later (Tier 2) | -- | -- | 4.8 g/bhp-hr (6.4 g/kW-hr) | 2.6 g/bhp-hr (3.5 g/kW-hr) | 0.15 g/bhp-hr (0.20 g/kW-hr) |

The Applicant has proposed to permit three Caterpillar model number MJE01770 Tier 2 certified IC engines that meets these emissions limit requirements. Therefore, the requirements of this section have been met.

§ 60.4206 How long must I meet the emission standards if I am an owner or operator of a stationary CI internal combustion engine?

Owners and operators of stationary CI ICE must operate and maintain stationary CI ICE that achieve the emission standards as required in §60.4204 and §60.4205 according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.

Permit Conditions 33 and 38 include the requirements of this section.

§ 60.4207 What fuel requirements must I meet if I am an owner or operator of a stationary CI internal combustion engine subject to this subpart?

Section (b) specifies that beginning October 1, 2010, owners and operators of stationary CI ICE subject to this subpart with a displacement of less than 30 liters per cylinder that use diesel fuel must use diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel.

Permit Condition 32 includes the requirements of this section.

§ 60.4208 What is the deadline for importing or installing stationary CI ICE produced in the previous model year?

Sections (a) through (h) specify the following:

**(a) After December 31, 2008, owners and operators may not install stationary CI ICE (excluding fire pump engines) that do not meet the applicable requirements for 2007 model year engines.**

(b) After December 31, 2009, owners and operators may not install stationary CI ICE with a maximum engine power of less than 19 kW (25 bhp) (excluding fire pump engines) that do not meet the applicable requirements for 2008 model year engines.

(c) After December 31, 2014, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 19 kW (25 bhp) and less than 56 kW (75 bhp) that do not meet the applicable requirements for 2013 model year non-emergency engines.

(d) After December 31, 2013, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 56 kW (75 bhp) and less than 130 KW (175 bhp) that do not meet the applicable requirements for 2012 model year non-emergency engines.

(e) After December 31, 2012, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 130 kW (175 bhp), including those above 560 KW (750 bhp), that do not meet the applicable requirements for 2011 model year non-emergency engines.

(f) After December 31, 2016, owners and operators may not install non-emergency stationary CI ICE with a maximum engine power of greater than or equal to 560 kW (750 bhp) that do not meet the applicable requirements for 2015 model year non-emergency engines.

**(g) In addition to the requirements specified in §§60.4201, 60.4202, 60.4204, and 60.4205, it is prohibited to import stationary CI ICE with a displacement of less than 30 liters per cylinder that do not meet the applicable requirements specified in paragraphs (a) through (f) of this section after the dates specified in paragraphs (a) through (f) of this section.**

(h) The requirements of this section do not apply to owners or operators of stationary CI ICE that have been modified, reconstructed, and do not apply to engines that were removed from one existing location and reinstalled at a new location.

If the facility decides to change out/replace any of the three IC engines at the facility they will have to meet the requirements of this section at that time.

Permit Condition 34 includes the requirements of this section.

§ 60.4209 What are the monitoring requirements if I am an owner or operator of a stationary CI internal combustion engine?

**If you are an owner or operator, you must meet the monitoring requirements of this section. In addition, you must also meet the monitoring requirements specified in §60.4211.**

**(a) If you are an owner or operator of an emergency stationary CI internal combustion engine, you must install a non-resettable hour meter prior to startup of the engine.**

(b) If you are an owner or operator of a stationary CI internal combustion engine equipped with a diesel particulate filter to comply with the emission standards in §60.4204, the diesel particulate filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached.

The three IC engines are used for emergency standby purposes and are not equipped diesel particulate filters to comply with the emission standards in §60.4204. Therefore, only the non-resettable hour meter requirement is applicable to the three IC engines at this facility.

Permit Condition 35 includes the requirements of this section.

§ 60.4210 What are my compliance requirements if I am a stationary CI internal combustion engine manufacturer?

**Section (a) specifies that Stationary CI internal combustion engine manufacturers must certify their stationary CI ICE with a displacement of less than 10 liters per cylinder to the emission standards specified in §60.4201(a) through (c) and §60.4202(a), (b) and (d) using the certification procedures required in 40 CFR part 89, subpart B, or 40 CFR part 1039, subpart C, as applicable, and must test their engines as specified in those parts. For the purposes of this subpart, engines certified to the standards in table 1 to this subpart shall be subject to the same requirements as engines certified to the standards in 40 CFR part 89.** For the purposes of this subpart, engines certified to the standards in table 4 to this subpart shall be subject to the same requirements as engines certified to the standards in 40 CFR part 89, except that engines with NFPA nameplate power of less than 37 kW (50 bhp) certified to model year 2011 or later standards shall be subject to the same requirements as engines certified to the standards in 40 CFR part 1039.

As discussed previously the Applicant has proposed to permit three Caterpillar model number MJE01770 Tier 2 certified IC engines that meets these emissions limit requirements. Therefore, the requirements of this section have been met.

§ 60.4211 What are my compliance requirements if I am an owner or operator of a stationary CI internal combustion engine?

Section (a) specifies that if you are an owner or operator and must comply with the emission standards specified in this subpart, you must operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition, owners and operators may only change those settings that are permitted by the manufacturer. You must also meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

Section (c) specifies that if you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's specifications.

Section (e) specifies that emergency stationary ICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. **Maintenance checks and readiness testing of such units is limited to 100 hours per year.** There is no time limit on the use of emergency stationary ICE in emergency situations. Anyone may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. For owners and operators of emergency engines meeting standards under §60.4205 but not §60.4204, any operation other than emergency operation, and maintenance and testing as permitted in this section, is prohibited.

As discussed previously Permit Conditions 33 and 38 include the requirements of this section. In addition, Permit Condition 31 includes the requirements of this section.

§ 60.4212 What test methods and other procedures must I use if I am an owner or operator of a stationary CI internal combustion engine with a displacement of less than 30 liters per cylinder?

Section (a) specifies that owners and operators of stationary CI ICE with a displacement of less than 30 liters per cylinder who conduct performance tests pursuant to this subpart must do so according to paragraphs (a) through (d) of this section.

There are no source testing requirements for the three IC engines. Therefore, the requirements of this section are not applicable to the three IC engines at this facility.

§ 60.4214 What are my notification, reporting, and recordkeeping requirements if I am an owner or operator of a stationary CI internal combustion engine?

Section (a) specifies that the owners and operators of non-emergency stationary CI ICE that are greater than 2,237 kW (3,000 bhp), or have a displacement of greater than or equal to 10 liters per cylinder, or are pre-2007 model year engines that are greater than 130 kW (175 bhp) and not certified, must meet the requirements of paragraphs (a)(1) and (2) of this section.

(1) Submit an initial notification as required in §60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section.

- (i) Name and address of the owner or operator;

- (ii) The address of the affected source;
- (iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
- (iv) Emission control equipment; and
- (v) Fuel used.

(2) Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.

- (i) All notifications submitted to comply with this subpart and all documentation supporting any notification.
- (ii) Maintenance conducted on the engine.
- (iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.
- (iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

(b) **If the stationary CI internal combustion engine is an emergency stationary internal combustion engine, the owner or operator is not required to submit an initial notification. Starting with the model years in table 5 to this subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the owner or operator must keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The owner must record the time of operation of the engine and the reason the engine was in operation during that time.**

(c) If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the owner or operator must keep records of any corrective action taken after the backpressure monitor has notified the owner or operator that the high backpressure limit of the engine is approached.

The three IC engines are used for emergency standby purposes, are Tier 2 certified IC engines, and are not equipped diesel particulate filters to comply with the emission standards in §60.4204. Therefore, there are no notification requirements applicable to the three IC engines at this facility.

## *NESHAP Applicability (40 CFR 61)*

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

## *MACT Applicability (40 CFR 63)*

Because the facility has four boilers, a flare, and three emergency compression ignition IC engines the following MACT requirements may apply to this facility:

- 40 CFR 63, Subpart ZZZZ – National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

| **40 CFR 63, Subpart ZZZZ** | **National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines** |
|---|---|
| § 63.6590 | What parts of my plant does this subpart cover |

*Stationary RICE subject to Regulations under 40 CFR Part 60* - An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines. No further requirements apply for such engines under this part.

As discussed previously in the NSPS Applicability Section, the three IC engines at this facility are subject to NSPS Subpart IIII. Therefore, NESHAP Subpart ZZZZ is not applicable to the three IC engines at this facility.

## *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 condition 1 establishes the permit to construct scope.

Permit condition 2 provides a description of the purpose of the permit and the regulated sources, the process, and the control devices used at the facility.

Permit condition 3 provides a process description of the anaerobic digester process at this facility.

Permit condition 4 provides a description of the control devices used on the anaerobic digester equipment at this facility.

Permit condition 5 establishes that there are to be no emissions of odorous gases, liquids, or solids from the anaerobic digester operations into the atmosphere in such quantities that cause air pollution.

Permit condition 6 establishes that average annual concentration of hydrogen sulfide ($H_2S$) of the biogas entering the boilers and the flare shall not exceed 1,200 ppmv. The $H_2S$ concentration limitation was proposed by the Applicant and was subsequently used during the ambient air quality modeling analysis.

Permit Condition 7 establishes a daily biogas production limit for each of the anaerobic digester operations as proposed by the Applicant.

Permit Condition 8 establishes that biogas produced from the on-site anaerobic digesters shall only be combusted in Boiler #1, Boiler #2, Boiler #3, Boiler #4, or the Candlestick Flare as proposed by the Applicant.

Permit condition 9 establishes that the permittee monitor and record odor complaints to demonstrate compliance with permit condition 5.

Permit condition 10 establishes that the Permittee monitor biogas $H_2S$ concentration to demonstrate compliance with permit condition 6.

Permit condition 11 establishes that the Permittee monitor biogas production to demonstrate compliance with permit condition 7.

Permit Condition 12 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Permit condition 13 provides a process description of the dual fuel-fired boilers at this facility.

Permit condition 14 provides a description of the control devices used on the dual fuel-fired boiler equipment at this facility.

Permit condition 15 establishes hourly and annual emissions limits for $PM_{10}$, $SO_2$, $NO_X$, CO, and VOC emissions from the dual fuel-fired boilers at this facility.

As discussed previously, Permit Condition 16 establishes a 20% opacity limit for the Boilers #1, #2, #3, and #4 stacks or functionally equivalent openings associated with Boilers #1, #2, #3, and #4.

As discussed previously, Permit Condition 17 establishes the PM grain loading limit for fuel burning equipment as required by IDAPA 58.01.01.676.

Permit condition 18 establishes that Boilers #1, #2, #3, and #4 shall only combust biogas or natural gas as fuel as proposed by the Applicant.

Permit condition 19 provides a process description of the candlestick flare process at this facility.

Permit condition 20 provides a description of the control devices used on the candlestick flare equipment at this facility.

Permit condition 21 establishes hourly and annual emissions limits for $PM_{10}$, $SO_2$, $NO_X$, CO, and VOC emissions from the candlestick flare at this facility.

As discussed previously, Permit Condition 22 establishes a 20% opacity limit for the Candlestick Flare or functionally equivalent openings associated with the Candlestick Flare.

Permit condition 23 establishes that the Candlestick Flare shall have a flare ignition system in order to assure proper operation of the flare.

Permit condition 24 establishes that the Candlestick Flare shall only combust biogas as fuel as proposed by the Applicant.

Permit Condition 25 establishes that the flare ignition system must be monitored using a ultraviolet beam sensor, infrared sensor, or an alternative equivalent device to demonstrate compliance with permit condition 23.

Permit Condition 26 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

Permit condition 27 provides a process description of the diesel-fired emergency standby IC engines process at this facility.

Permit condition 28 provides a description of the control devices used on the diesel-fired emergency standby IC engines at this facility.

Permit condition 29 establishes hourly and annual emissions limits for $PM_{10}$, $SO_2$, $NO_X$, CO, and VOC emissions from the IC Engines #1, #2, and #3 at this facility.

As discussed previously, Permit Condition 30 establishes a 20% opacity limit for the IC Engines #1, #2, and #3 stacks or functionally equivalent openings associated with IC Engines #1, #2, and #3.

Permit Condition 31 establishes daily and annual hourly operational limits for IC Engines #1, #2, and #3 as proposed by the Applicant. The daily and annual hourly operational limits were proposed by the Applicant and were subsequently used during the ambient air quality modeling analysis.

Permit condition 32 establishes that IC Engines #1, #2, and #3 shall only combust ASTM Grades 1 or 2, or a mixture of ASTM Grades 1 and 2, which has a maximum sulfur content of 0.0015% (15 ppm) by weight as fuel as proposed by the Applicant.

As discussed previously, Permit Condition 33 establishes operation and maintenance requirement for IC Engines #1, #2, and #3 as required by 40 CFR 60, IIII for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

As discussed previously, Permit Condition 34 establishes engine replacement requirements for IC Engines #1, #2, and #3 as required by 40 CFR 60, IIII for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

As discussed previously, Permit Condition 35 establishes that IC Engines #1, #2, and #3 be equipped with non-resettable hour meters as required by 40 CFR 60, IIII for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

Permit condition 36 establishes that the federal requirements of 40 CFR Part 60 are incorporated by reference into the requirements of this permit per current DEQ guidance.

Permit Condition 37 incorporates 40 CFR 60, Subpart A – General Provisions.

Permit condition 38 establishes that the Permittee monitor and record daily operation of IC Engines #1, #2, and #3 to demonstrate compliance with permit condition 31.

Permit condition 39 establishes that the Permittee shall maintain delivery receipts showing the ASTM grade and the percent sulfur content by weight for each shipment of distillate fuel oil to demonstrate compliance with permit condition 32.

Permit condition 40 establishes that the Permittee shall maintain records of the operation and maintenance of IC engines #1, #2, and #3 to demonstrate compliance with permit condition 33.

Permit Condition 41 establishes that the permittee shall maintain records as required by the Recordkeeping General Provision.

There was no permit section created for the heaters and the pressure washer since the sources had negligible emissions.

## 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 or IDAPA 58.01.01.404.01.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

Boiler #1 PTE Emissions Calculations:

Boiler #1 is dual fuel fired on biogas and natural gas. Therefore, PTE calculations were performed for both fuels with the worst-case on a pollutant by pollutant basis being used for PTE.

**Table A.1 BOILER #1 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING BIOGAS**

| Emissions Unit | Rated Heat Input (MMBtu/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMBtu)[1,2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Boiler #1 | 2.25 | 8,760 | $PM_{10}$ | 0.027 | 0.06 | 0.27 |
| | | | $SO_2$ | 0.763 | 1.72 | 7.52 |
| | | | $NO_x$ | 0.322 | 0.72 | 3.17 |
| | | | CO | 0.408 | 0.92 | 4.02 |
| | | | VOC | 0.044 | 0.10 | 0.43 |

[1] – Rated heat input is based upon the full heat input rating of the boiler and annual operation of 8,760 hrs/yr. Then the bio-gas fuel use limit of 8,800 scf/hr, with a higher heating value (HHV) of 700 Btu/scf, is taken into account with the remaining heat input from natural gas.

[2] – Based on AP-42 Table 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

**Table A.2 BOILER #1 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING NATURAL GAS**

| Emissions Unit | Rated Heat Input (MMBtu/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMBtu)[1,2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Boiler #1 | 2.25 | 8,760 | $PM_{10}$ | 0.010 | 0.02 | 0.10 |
| | | | $SO_2$ | 0.017 | 0.04 | 0.17 |
| | | | $NO_x$ | 0.118 | 0.27 | 1.16 |
| | | | CO | 0.150 | 0.34 | 1.48 |
| | | | VOC | 0.016 | 0.04 | 0.16 |

[1] – Rated heat input is based upon the full heat input rating of the boiler and annual operation of 8,760 hrs/yr. Then the natural fuel use limit of 2,200 scf/hr, with a higher heating value (HHV) of 1,020 Btu/scf, is taken into account with the remaining heat input from natural gas.

[2] – Based on AP-42 Table 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

Boilers #2, #3, and #4 PTE Emissions Calculations:

Boilers #2, #3, and #4 are dual fuel fired on biogas and natural gas. Therefore, PTE calculations were performed for both fuels with the worst-case on a pollutant by pollutant basis being used for PTE.

**Table A.3 BOILER #2, #3, AND #4 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING BIOGAS**

| Emissions Unit | Rated Heat Input (MMBtu/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMBtu)[1,2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Boilers #2, #3, and #4 | 2.603 | 8,760 | $PM_{10}$ | 0.027 | 0.07 | 0.31 |
| | | | $SO_2$ | 0.763 | 1.99 | 8.70 |
| | | | $NO_x$ | 0.322 | 0.84 | 3.67 |
| | | | CO | 0.408 | 1.06 | 4.65 |
| | | | VOC | 0.044 | 0.11 | 0.50 |

[1] – Rated heat input is based upon the full heat input rating of the boiler and annual operation of 8,760 hrs/yr. Then the bio-gas fuel use limit of 8,800 scf/hr, with a higher heating value (HHV) of 700 Btu/scf, is taken into account with the remaining heat input from natural gas.

[2] – Based on AP-42 Table 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

**Table A.4 BOILERS #2, #3, AND #4 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING NATURAL GAS**

| Emissions Unit | Rated Heat Input (MMBtu/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMBtu)[1,2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Boilers #2, #3, and #4 | 2.603 | 8,760 | $PM_{10}$ | 0.010 | 0.03 | 0.11 |
| | | | $SO_2$ | 0.017 | 0.04 | 0.19 |
| | | | $NO_x$ | 0.118 | 0.31 | 1.35 |
| | | | CO | 0.150 | 0.39 | 1.71 |
| | | | VOC | 0.016 | 0.04 | 0.18 |

[1] – Rated heat input is based upon the full heat input rating of the boiler and annual operation of 8,760 hrs/yr. Then the natural fuel use limit of 2,200 scf/hr, with a higher heating value (HHV) of 1,020 Btu/scf, is taken into account with the remaining heat input from natural gas.

[2] – Based on AP-42 Table 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

Candlestick Flare PTE Emissions Calculations:

The candlestick flare is fired on biogas. Therefore, PTE calculations were performed for biogas only.

**Table A.5 BOILER #5 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING BIOGAS**

| Emissions Unit | Rated Heat Input (MMBtu/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMBtu)[1,2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Candlestick Flare | 6.13 | 8,760 | $PM_{10}$ | 0.0107 | 0.07 | 0.29 |
| | | | $SO_2$ | 0.253 | 1.55 | 6.79 |
| | | | $NO_x$ | 0.068 | 0.42 | 1.83 |
| | | | CO | 0.37 | 2.27 | 9.93 |
| | | | VOC | 0.063 | 0.39 | 1.69 |

[1] – Rated heat input is based upon the full heat input rating of the boiler and annual operation of 8,760 hrs/yr. Then the bio-gas fuel use limit of 8,800 scf/hr, with a higher heating value (HHV) of 700 Btu/scf, is taken into account with the remaining heat input from natural gas.

[2] – Based on AP-42 Tables 1.4-1 and 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

Emergency IC Engines PTE Emissions Calculations:

For the three diesel-fired IC engines the Applicant has supplied the fuel consumption at full rated horsepower. The heat input to the engine is calculated as follows:

Heat $Input_{IC\ Engine}$ (MMBtu/hr) = Fuel consumption (gal/hr) x Fuel heat content (Btu/gal) ÷ 1,000,000 Btu/MMBtu

Heat $Input_{IC\ Engine}$ MMBtu/hr = 57.2 gal/hr x 140,000 Btu/gal ÷ 1,000,000 Btu/MMBtu

**Fuel $Use_{IC\ Engine}$ MMBtu/hr = 8.01 MMBtu/hr**

**Table A.6 IC ENGINE IC ENGINE #1, #2, AND #3 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS**

| Emissions Unit | Rated Heat Input (MMBtu/hr) | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMBtu)[1] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| IC Engines #1, 2, and #3 | 8.01 | 500 | $PM_{10}$ | 0.016 | 0.13 | 0.03 |
| | | | $SO_2$ | 0.0015 | 0.01 | 0.00 |
| | | | $NO_x$ | 2.125 | 17.02 | 4.26 |
| | | | CO | 0.141 | 1.13 | 0.28 |
| | | | VOC | 0.019 | 0.15 | 0.04 |

[1] – Based on AP-42 Table 3.4-1 (10/96) for $SO_2$ for Large Stationary Diesel and All Stationary Dual Fuel Engines IC engines combusting diesel with a sulfur content of 0.0015% by weight. The Manufacturer's guarantee was used for $PM_{10}$, $NO_X$, CO, and VOC (with all PM being assumed to be $PM_{10}$ and all HC assumed to be VOC).

Heaters #1, #2, #3, and #4 PTE Emissions Calculations:

Heaters #1, #2, #3, and #4 are fired on natural gas. Therefore, PTE calculations were performed for natural only.

**Table A.7 BOILER #1, #2, #3, AND #4 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING NATURAL GAS**

| Emissions Unit | Rated Heat Input (MMscf/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMscf)[2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Heaters #1, #2, #3, and #4 | 0.000196 | 8,760 | $PM_{10}$ | 7.6 | 0.001 | 0.0065 |
| | | | $SO_2$ | 0.6 | 0.000 | 0.0005 |
| | | | $NO_x$ | 100 | 0.020 | 0.0858 |
| | | | CO | 84 | 0.016 | 0.0721 |
| | | | VOC | 5.5 | 0.001 | 0.0047 |

[1] – Rated heat input is based upon a heat content of natural gas of 1,020 Btu/scf.
[2] – Based on AP-42 Tables 1.4-1 and 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

Heaters #5, #6, #7, and #8 PTE Emissions Calculations:

Heaters #5, #6, #7, and #8 are fired on natural gas. Therefore, PTE calculations were performed for natural only.

**Table A.8 BOILER #5, #6, #7, AND #8 HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING NATURAL GAS**

| Emissions Unit | Rated Heat Input (MMscf/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMscf)[2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Heaters #5, #6, #7, and #8 | 0.000142 | 8,760 | $PM_{10}$ | 7.6 | 0.001 | 0.0047 |
| | | | $SO_2$ | 0.6 | 0.000 | 0.0004 |
| | | | $NO_x$ | 100 | 0.014 | 0.0622 |
| | | | CO | 84 | 0.012 | 0.0522 |
| | | | VOC | 5.5 | 0.001 | 0.0034 |

[1] – Rated heat input is based upon a heat content of natural gas of 1,020 Btu/scf.
[2] – Based on AP-42 Tables 1.4-1 and 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

Pressure Washer PTE Emissions Calculations:

The Pressure Washer is fired on natural gas. Therefore, PTE calculations were performed for natural only.

**Table A.9 PRESSURE WASHER HOURLY AND ANNUAL PTE FOR CRITERIA POLLUTANTS WHEN COMBUSTING NATURAL GAS**

| Emissions Unit | Rated Heat Input (MMscf/hr)[1] | Annual Hours of Operation (hrs/yr) | Criteria Pollutant | Emissions Factors (lb/MMscf)[2] | Hourly Emissions (lb/hr) | Annual Emissions (ton/yr) |
|---|---|---|---|---|---|---|
| Pressure Washer | 0.000644 | 8,760 | $PM_{10}$ | 7.6 | 0.005 | 0.0214 |
| | | | $SO_2$ | 0.6 | 0.000 | 0.0017 |
| | | | $NO_x$ | 100 | 0.064 | 0.2821 |
| | | | CO | 84 | 0.054 | 0.2369 |
| | | | VOC | 5.5 | 0.004 | 0.0155 |

[1] – Rated heat input is based upon a heat content of natural gas of 1,020 Btu/scf.
[2] – Based on AP-42 Tables 1.4-1 and 1.4-2 (7/98) for $PM_{10}$, $NO_X$, CO, and VOC and mass balance for $SO_2$ (conservatively assuming 100% of $H_2S$ is converted to $SO_2$).

Facility-Wide TAPs PTE Emissions Summary:

The following table summarizes facility-wide total non-carcinogenic TAPs emissions at the facility.

**Table A.10 NON-CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT**

| Non-Carcinogenic Toxic Air Pollutants | 24-hour Average Facility-Wide Emissions Rates for Units at the Facility (lb/hr) |
|---|---|
| Acrolein | 1.08E-05 |
| Ammonia | 1.12E-01 |
| Barium | 1.06E-04 |
| Cobalt | 2.02E-06 |
| Copper | 2.04E-05 |
| Hexane | 4.68E-02 |
| Hydrogen Sulfide | 1.64E-01 |
| Manganese | 9.13E-06 |
| Mercury | 6.25E-06 |
| Molybdenum | 2.64E-05 |
| Pentane | 6.76E-02 |
| Selenium | 5.76E-07 |
| Toluene | 4.74E-04 |
| Vanadium | 5.52E-05 |
| Xylenes | 2.65E-04 |
| Zinc | 6.97E-04 |

The following table summarizes facility-wide total carcinogenic TAPs emissions at the facility.

**Table A.11 CARCINOGENIC TAP EMISSIONS SUMMARY POTENTIAL TO EMIT**

| Carcinogenic Toxic Air Pollutants | 24-hour Average Facility-Wide Emissions Rates for Units at the Facility (lb/hr) |
|---|---|
| 3-Methylchloanthrene | 4.68E-08 |
| Acetaldehyde | 3.46E-05 |
| Arsenic | 4.08E-06 |
| Benzene | 1.27E-03 |
| Benzo(a)pyrene | 3.84E-07 |
| Beryllium | 2.88E-07 |
| Cadmium | 2.64E-05 |
| Chromium | 3.36E-05 |
| Formaldehyde | 2.06E-03 |
| Napthalene | 1.94E-04 |
| Nickel | 5.04E-05 |
| PAH | 3.05E-04 |
| POM | 1.52E-07 |

Facility-Wide HAPs PTE Emissions Summary:

The following table summarizes facility-wide total HAPs emissions at the facility.

**Table A. 12 HAP EMISSIONS SUMMARY POTENTIAL TO EMIT**

| Non-Carcinogenic Toxic Air Pollutants | PTE (T/yr) |
|---|---|
| **Acetaldehyde** | 1.51E-04 |
| **Acrolein** | 4.73E-05 |
| **Benzene** | 5.57E-03 |
| **Formaldehyde** | 9.02E-03 |
| **Hexane** | 2.05E-01 |
| **Hydrogen Sulfide** | 7.20E-01 |
| **Napthalene** | 8.50E-04 |
| **Toluene** | 2.08E-03 |
| **Xylene** | 1.16E-03 |
| **POM** | 6.67E-07 |
| **Arsenic** | 2.10E-05 |
| **Beryllium** | 1.26E-06 |
| **Cadmium** | 1.16E-04 |
| **Chromium** | 1.47E-04 |
| **Cobalt** | 8.84E-06 |
| **Manganese** | 4.00E-05 |
| **Mercury** | 2.74E-05 |
| **Nickel** | 2.21E-04 |
| **Selenium** | 2.52E-06 |

# APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

***MEMORANDUM***

**DATE:** March 2, 2011

**TO:** Darrin Pampaian, P.E., Staff Engineer, Air Program

**FROM:** Darrin Mehr, Air Quality Analyst, Air Program

**PROJECT NUMBER:** P-2010.0182 Project 60668

**SUBJECT:** Modeling Demonstration for a PTC Application for the Existing Wastewater Treatment Plant Anaerobic Digester Array and Combustion Equipment at the City of Nampa's Facility in Nampa, Idaho

## 1.0 Summary

The City of Nampa, Wastewater Division, (Nampa) submitted a Permit to Construct (PTC) application for the existing facility which treats wastewater from industrial and municipal sources at the facility's Nampa, Idaho site. The wastewater treatment plant (WWTP) facility operates the following emissions units:

- Three primary anaerobic digesters.
- Two secondary anaerobic digesters.
- Four dual-fueled boilers fired on natural gas or biogas.
- Three standby emergency generators fired on diesel.
- One elevated open flare (also called a candlestick flare) for incinerating excess biogas.
- Eight natural gas-fired space heaters

The project timeline and associated submittals primarily reflecting the modeling demonstration are listed below:

- December 14, 2010: The PTC application was received by DEQ.
- January 12, 2011: The PTC application was declared complete.

The facility is not a *designated facility*, as defined in IDAPA 58.01.01.006, Rules for the Control of Air Pollution in Idaho (Idaho Air Rules). The facility's potential to emit (PTE) of particulate matter with an aerodynamic diameter of ten microns or less ($PM_{10}$), sulfur dioxide ($SO_2$), carbon monoxide (CO), and nitrogen oxides ($NO_x$) each is less than 100 tons per year (T/yr). The facility is not a major facility under the New Source Review (NSR) PSD program.

The proposed project is subject to review under Section 200 of Idaho Air Rules. Idaho Air Rules Section 203.02 requires the facility to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). Idaho Air Rules Section 210 requires the facility to demonstrate compliance with the toxic air pollutants (TAPs) increments, which are listed in Sections 585 and 586.

The submitted modeling analyses: 1) utilized appropriate methods and models; 2) were conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when combined with a reasonably conservative background

concentration value appropriate for the area, were below national ambient air quality standards and other applicable increments at all ambient air locations.

The submitted modeling analyses were conducted by CH2M HILL, on behalf of the City of Nampa. Key assumptions and results that should be considered in the development of the permit are shown in Table 1.

Air impact analyses are required by the 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 operations of the proposed facility 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** |
| Backup generators 1, 2, and 3 (GEN1, GEN2, and GEN3)<br><br>Each emergency backup generator was modeled with exhaust parameters estimated at 50% load. Emission rates were stated as being calculated at rated capacity (100% load).<br>Each generator was modeled with emission rates for reduced operating on daily and annual bases: 6 hours per day, and 500 hours per year. | Generator engines 1, 2, and 3 were modeled with conservative exhaust parameters.<br><br>Modeled operating hours for each generator engine were 6 hours in any 24-hour period and 500 hours in any year. |
| Shop Heaters and Hotsy Units (VSBHEAT1—VSBHEAT4, LTSHEAT1—LTSHEAT4, and LTSHOTSY)<br><br>Shop Heater units and the LTS Hotsy were modeled with exhaust parameters that were derated to 80% load.<br><br>Each of these units was fueled on natural gas only—no biogas. | Shop Heaters and LTS Hotsy unit were modeled with conservative exhaust parameters.<br><br>These emissions units were modeled for 24 hours per day and 8,760 hours per year with emissions rates calculated at 100% rated capacity for natural gas fuel only. |
| Flare<br><br>The flare was assumed to combust up to 210,000 standard cubic feet per day (scf/day) of biogas. The flare's capacity was based on 700 Btu/scf heat content in the biogas.<br><br>The flare was modeled at 6.13 million Btu's per hour (MMBtu/hr) of continuous operation. | This modeling demonstration accounted for 210,000 scf of biogas flared per day and 76.7 million scf of biogas flared per year. |
| Boilers (BOILER1—BOILER4)<br>Boiler 1 (Federal boiler) was modeled using exhaust parameters based on 50% capacity which was conservative.<br><br>Boilers 2, 3, and 4 were modeled using exhaust parameters for the maximum rated capacity of each unit. | All boilers are dual fuel boilers and are fired primarily on biogas with a heat input capacity of 6.13 MMBtu/hr and with natural gas as a backup at heat input capacities of 2.25 MMBtu/hr for Boiler 1 and 2.60 MMBtu/hr for Boilers 2, 3, and 4. |
| The requested level of biogas production was 210,000 standard cubic feet per day (scf/day) for each of five digesters.<br><br>The total requested facility-wide production level of biogas was 1,050,000 scf/day. | The corresponding annual biogas production limit would be 3.833E+08 scf/yr (or 383.3 MM scf/yr). |
| Hydrogen sulfide ($H_2S$) in the biogas was limited to 1,200 parts per million on a volumetric basis ($ppm_v$). The $H_2S$ concentration is directly related to $SO_2$ emissions.<br><br>$H_2S$ content in the digester biogas has a direct correlation to the $SO_2$ emissions from any source combusting biogas. | The same concentration of 1,200 $ppm_v$ of $H_2S$ was used for 3-hour, 24-hour and annual averaging periods. No additional short-term peak $H_2S$ concentration scenarios in the biogas were included in the modeling demonstration.<br><br>Based on the modeling results there is a significant margin of compliance for $SO_2$ NAAQS, and the maximum, or worst-case, biogas $H_2S$ content could be increased above the 1,200 $ppm_v$ value assumed in the modeling. An alternative short-term allowable threshold has not been determined at this time. |
| Ambient impacts of all NAAQS pollutants and TAPs are well below the allowable ambient standards. No specific operating requirements that are more stringent than those proposed or in additional to those proposed by the City of Nampa are recommended by modeling staff for this facility-wide PTC. | Additional sensitivity runs to determine alternative backup generator operating hours, higher peak hydrogen sulfide content in the biogas on 3-hour and 24-hour bases, or an evaluation of the ambient impacts that would be predicted using standard modeling procedures for capped and horizontal sources with the regulatory guideline version of AERMOD, Version 09292, were not conducted by DEQ. Comment is restricted to the modeling scenario presented by the applicant. |

# 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.

### *2.1.1 Area Classification*

The Nampa WWTP facility is located in Canyon County, which is designated as an attainment or unclassifiable area for sulfur dioxide ($SO_2$), nitrogen dioxide ($NO_2$), carbon monoxide (CO), lead (Pb), ozone ($O_3$), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers ($PM_{10}$), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$).

There are no Class I areas within 10 kilometers of the facility.

### *2.1.2 Significant and Full Impact Analyses*

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the project exceed the significant contribution levels (SCLs) of Idaho Air Rules Section 006, then a cumulative—or full— impact analysis is needed to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02 for PTCs. 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 cumulative pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. The SCLs and the modeled value that must be used for comparison to the NAAQS are also listed in Table 2.

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into Idaho regulation. EPA has asserted through a policy memorandum (October 23, 1997) that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding $PM_{10}$ standard. DEQ allows a direct surrogate use of $PM_{10}$ modeling results and does not require the adjustments and justifications for surrogate use as suggested by the EPA March 23, 2010, Stephen Page Memo (Memorandum from Stephan Page, Director of Office of Air Quality Planning and Standards, EPA, *Modeling Procedures for Demonstrating Compliance with $PM_{2.5}$ NAAQS*, March 23, 2010). Although the $PM_{10}$ annual standard was revoked in 2006, compliance with the revoked $PM_{10}$ annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard. State Implementation Plans (SIPs) for implementing $PM_{2.5}$ are due to EPA by May 2011 and permits issued after that date are required to address $PM_{2.5}$ emissions and impacts to ambient air.

New $NO_2$ and $SO_2$ short-term standards have recently been promulgated by EPA. The standards will not be applicable for permitting purposes in Idaho until they are incorporated by reference *sine die* into Idaho Air Rules (Spring 2011).

| Table 2. APPLICABLE REGULATORY LIMITS | | | | |
|---|---|---|---|---|
| Pollutant | Averaging Period | Significant Impact Levels[a] ($\mu g/m^3$)[b] | Regulatory Limit[c] ($\mu g/m^3$) | Modeled Value Used[d] |
| $PM_{10}$[e] | Annual[f] | 1.0 | 50[g] | Maximum 1st highest[h] |
| | 24-hour | 5.0 | 150[i] | Maximum 6th highest[j] |
| $PM_{2.5}$[k] | Annual | 0.3 | 15[l] | Use $PM_{10}$ as surrogate |
| | 24-hour | 1.2 | 35[m] | Use $PM_{10}$ as surrogate |
| Carbon monoxide (CO) | 8-hour | 500 | 10,000[n] | Maximum 2nd highest[h] |
| | 1-hour | 2,000 | 40,000[n] | Maximum 2nd highest[h] |
| Sulfur Dioxide ($SO_2$) | Annual | 1.0 | 80[g] | Maximum 1st highest[h] |
| | 24-hour | 5 | 365[n] | Maximum 2nd highest[h] |
| | 3-hour | 25 | 1,300[n] | Maximum 2nd highest[h] |
| | 1-hour | 3 ppb[o] (7.8 $\mu g/m^3$) | 75 ppb[p] (196 $\mu g/m^3$) | Mean of maximum 4th highest[q] |
| Nitrogen Dioxide ($NO_2$) | Annual | 1.0 | 100[g] | Maximum 1st highest[h] |
| | 1-hour | 4 ppb[o] (7.5 $\mu g/m^3$) | 100 ppb[r] (188 $\mu g/m^3$) | Mean of maximum 8th highest[s] |
| Lead (Pb) | Quarterly | NA | 1.5[g] | Maximum 1st highest[h] |
| | 3-month[t] | NA | 0.15[g] | Maximum 1st highest[h] |

a. Idaho Air Rules Section 006.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107. Federal NAAQS (see 40 CFR 50) in effect as of July 1 of each year are incorporated by reference in to Idaho Air Rules when the legislature adjourns sine die (the following spring).
d. The maximum 1st highest modeled value is always used for the significant impact analysis.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers.
f. The annual $PM_{10}$ standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a $PM_{10}$ analysis that demonstrates compliance with the revoked $PM_{10}$ standard.
g. Not to be exceeded in any calendar year.
h. Concentration at any modeled receptor.
i. Never expected to be exceeded more than once in any calendar year.
j. Concentration at any modeled receptor when using five years of meteorological data.
k. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
l. 3-year average of annual concentration.
m. 3-year average of the upper 98th percentile of 24-hour concentrations.
n. Not to be exceeded more than once per year.
o. Interim SIL established by EPA policy memorandum.
p. 3-year average of the upper 99th percentile of the distribution of maximum daily 1-hour concentrations.
q. Mean (of 5 years of data) of the maximum of 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
r. 3-year average of the upper 98th percentile of the distribution of maximum daily 1-hour concentrations.
s. Mean (of 5 years of data) of the maximum of 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled.
t. 3-month rolling average.

### *2.1.3 TAPs Analyses*

The increase in emissions from this project were required to demonstrate compliance with the toxic air pollutant (TAP) increments, with an ambient impact dispersion analysis required for any TAP having a requested potential emission rate that exceeds the screening emission rate limit (EL) specified by Idaho Air Rules Section 585 or 586.

This project involves the initial PTC for a constructed and operating facility. TAPs were applied to the existing facility as if the entire facility's requested emissions were proposed to be emitted by a Greenfield facility. The emissions units being permitted in this project have combustion by-products from operation of generator engines on diesel fuel, space heating units operating on natural gas, boilers operating either on biogas or natural gas backup, and the exposed flare which incinerates excess biogas. These combustion by-products are predicted to increase emissions of several TAPs.

## 2.2 Background Concentrations

Background concentration values were provided by DEQ for this project. Background concentrations for $SO_2$, and $NO_2$ were based on a background concentration study performed by DEQ in March 2003[1]. The $PM_{10}$ background concentration was determined using Nampa monitoring data. The WWTP location is influenced by a nearby industrial source—The Amalgamated Sugar Company (TASCO) Nampa facility. The ambient background concentration values were modified to reflect the additional contribution of this source to the ambient background concentrations.

TASCO's facility is located approximately ½ mile due north of the WWTP. The ambient background of a location within 1 kilometer of a source of emissions of 150 tons per year or more is expected to be influenced by that source. Rather than use the information listed in Table 14 of the DEQ background concentration memorandum, DEQ based the additional background contributions on results from previous TASCO modeling analyses.

The J.R. Simplot, Food Group, facility (formerly owned and operated by Nestlé Foods and Carnation) is approximately 1.5 miles from the WWTP facility, and was not regarded as a "nearby source" due to distance criteria. Potential emission rates for the Simplot facility were not researched.

Background concentrations for $SO_2$ and $NO_2$ were established using small town/suburban default concentrations for the baseline ambient concentrations, and the modeled TASCO impacts for these pollutants were added to determine the project's ambient background values. The $PM_{10}$ backgrounds were determined using TASCO's predicted impacts at the WWTP site and recent data collected at the monitoring site in Nampa. The $PM_{10}$ monitor is located at 923 1st Street South in Nampa, and is less than 1.5 miles southwest of the WWTP facility. The provided background values are listed in Table 3.

**Table 3. BACKGROUND CONCENTRATIONS**

| Pollutant | Averaging Period | Baseline Background Concentration ($\mu g/m^3$)[a] | Source-Influenced Impact at the WWTP Location[b] ($\mu g/m^3$) | Total Ambient Background Concentration ($\mu g/m^3$) |
|---|---|---|---|---|
| $PM_{10}$[c] | Annual | 27 | 2 | 29 |
| | 24-hour | 94 | 20 | 114 |
| Sulfur Dioxide ($SO_2$) | Annual | 8 | 5 | 13 |
| | 24-hour | 26 | 60 | 86 |
| | 3-hour | 42 | 250 | 292 |
| Nitrogen Dioxide ($NO_2$) | Annual | 32 | 4 | 36 |

a. Micrograms per cubic meter.
b. Amalgamated Sugar Company's modeled ambient impact at the Nampa Wastewater Treatment Plant's location.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers.

# 3.0 Modeling Impact Assessment

## 3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in the submitted modeling analyses.

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. MODELING PARAMETERS | | |
|---|---|---|
| **Parameter** | **Description/ Values** | **Documentation/Additional Description** |
| Model | AERMOD | AERMOD, Version 09292, with the Beta option for capped and horizontal releases from point sources selected. This is a modified version of AERMOD Version 06341. |
| Meteorological data | 2001-2005 | DEQ provided a pre-processed data set of individual year and concatenated 5 year files of Boise airport surface data and Boise airport upper air data covering the years 2001-2005. |
| Terrain | Considered | 3-dimensional receptor coordinates were obtained by CH2M HILL from a National Elevation Dataset (NED) file for the surrounding area. |
| Building downwash | Downwash algorithm | AERMOD, Version 09292 uses BPIP-Prime and the PRIME algorithms to evaluate structure-induced downwash effects. |
| Receptor grid | Grid 1 | Approximately 24-meter or less spacing surrounding the facility's fenced property boundary |
| | Grid 2 | 100-meter spacing in a 2,800 meter (X) by 2,700 meter (Y) grid centered on the facility |
| | Grid 3 | 500-meter spacing in a 11,500 meter (X) by 11,500 meter (Y) grid centered on Grid 2 |

### *3.1.1 Modeling Protocol*

A modeling protocol was submitted to DEQ by CH2M HILL, on behalf of the City of Nampa, on November 10, 2010. The modeling protocol was conditionally approved, with comments, by DEQ on December 2, 2010.

Modeling was conducted using methods documented in the modeling protocol and the *State of Idaho Air Quality Modeling Guideline*.

### *3.1.2 Model Selection*

The Beta version of AERMOD, Version 09292 was used to conduct the ambient air analyses for NAAQS and TAPs compliance demonstrations. The Beta version is used for modeling capped and horizontal point sources and is a modified version of AERMOD, Version 06341. This version of AERMOD is not the regulatory guideline model, and its use is conditionally approved by DEQ for minor source modeling in situations where building-induced downwash effects from capped or horizontally-oriented point source stacks are evaluated. All of the Nampa WWTP point sources are either capped or horizontal releases.

### *3.1.3 Meteorological Data*

DEQ supplied an AERMOD-ready meteorological dataset that spans the years 2001 through 2005. Surface data were obtained from the Boise airport. Upper air data were obtained for the corresponding years for the Boise airport.

### *3.1.4 Terrain Effects*

The modeling analyses considered elevated terrain. The elevation of each receptor was obtained from National Elevation Dataset (NED) files for the area surrounding the facility. A NED file was used as input to AERMAP to establish the elevations of receptors. The NED files were included in the modeling submittal. The geographic project file listed a NAD83 datum. The AERMAP output projection file listed the WGS84 coordinate system so receptor data is based on the WGS84 system. Base elevations for the emission sources and buildings were accepted as submitted, and the model inputs appear to match fairly well with graphic information available on the Google Earth website (also based on WGS84).

### *3.1.5 Facility Layout*

DEQ checked the site plan submitted with the permit application to verify the facility's proposed layout. The site plan was created independently of the modeling demonstration's input files and matched the modeling files. The facility layout and location of emission sources were accepted as submitted.

Google Earth imagery from June 2007 was available for this location. This apparently pre-dated the construction of Primary Digester No. 3 and the VSB Building.

Google Earth data placed the southeast corner of the "GENERATOR BUILDING" at approximate coordinates of Zone 11, 533,696 meters Easting (m E) and 4,827,165 meters Northing (m N). The model inputs placed the corner of this building at coordinates of Zone 11, 533,690 m E and 4,827,166 m N. The coordinate system listed in the modeling setup was NAD27 coordinate system which was used for the USGS digital elevation map (DEM) 7.5 minute map data. Generally, coordinates determined using NED files will have a NAD83 system designation.

The location of the buildings and point sources matched very well with Figure 1—Site Layout. Because the surrounding area is relatively flat terrain and the ambient design concentrations for each pollutant and averaging period was predicted to occur at the ambient air boundary, the correct proximity of sources and structures in relation to the ambient air boundary is more critical to demonstrating compliance than a possible slight translation of the entire facility.

### *3.1.6 Building Downwash*

Plume downwash effects caused by structures at the facility were accounted for in the modeling analyses. The Building Profile Input Program-Plume Rise and Building Downwash Model (BPIP-PRIME) was used by the applicant to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters. The output from BPIP-PRIME was used as input to AERMOD, Version 09292, to account for building-induced downwash effects.

Buildings and other structures may cause plume downwash of nearby emissions points. Modeling guidance indicates that emissions points located within "5L" of a building, where "L" is the lesser dimension of building height or projected width, may be affected by downwash. The applicant's BPIP building analysis included all buildings in the area that could reasonably be expected to cause plume downwash.

### *3.1.7 Ambient Air Boundary*

Ambient air was determined to exist for all areas immediately exterior to the facility's property boundary. The application states that the facility is fenced and the site layout also displays a fenceline around the entire perimeter of the facility. This approach follows the methods of determining the ambient air boundary as specified in the *State of Idaho Air Quality Modeling Guideline*.

### *3.1.8 Receptor Network*

The receptor grid used by the City of Nampa met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined the receptor grid was adequate to reasonably resolve the maximum modeled ambient impacts.

A small grid of denser spacing than 100 meters could have been placed in areas of maximum impacts and design concentration impacts to verify that the maximum impacts had been determined. However, when weighing in the 24-meter maximum fenceline receptor spacing, the margin of compliance between the predicted ambient impacts with conservative background concentrations added and the allowable NAAQS, and the considering that all sources modeled were modeled as capped or horizontal sources and the highest impacts would be expected to occur at or very near the ambient boundary, no additional refinement of the receptor network was requested, and no sensitivity analyses were conducted by DEQ. TAPs impacts were also well below allowable increments.

## 3.2 Emission Rates

### *3.2.1 Modeled Emission Rates*

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application. The following approach was used for Nampa WWTP's modeling demonstration:

- All modeled criteria air pollutant and TAP emissions rates were equal to or greater than the facility's emissions calculated in the PTC application and the permit allowable emission rates listed in the proposed air quality permit.

Table 5 lists the hourly emission rates that were modeled to evaluate whether maximum impacts exceed significant contribution levels (SCLs) and to demonstrate compliance with NAAQS for pollutants with short term averaging periods of 24 hours or less. The emission rates listed in Table 5 were modeled continuously for 24 hours per day. The modeled emissions rates used for the SCL and NAAQS analyses were identical because this project is for the initial PTC for a facility where all emissions have already been constructed.

Modeling applicability is based on the initial projected potential emissions identified in the applicant's protocol, or the initial PTC application, if potential emission estimates are not available at the time a protocol is submitted for DEQ review and approval. This project's potential emissions of CO were estimated to be 9.5 lb/hr, which was below the 14 lb/hr presumptively exempt modeling threshold. Lead emissions were estimated to be less than 1 pound per year, which is far below the most restrictive secondary modeling threshold of 10 pounds per month. Modeling was not required for these pollutants. Naphthalene emissions were estimated to be 3.9E-04 lb/hr facility-wide, which is below the screening emission rate limit listed in Section 585 of the Idaho Air Rules.

| Table 5. MODELED SHORT-TERM EMISSIONS RATES | | | |
|---|---|---|---|
| Source ID | Description | $PM_{10}$[b], 24-hour avg (lb/hr)[a] | $SO_2$[c] (lb/hr) |
| VSBHEAT1 | VSB Heater #1 | 0.0015 | 1.2E-04 |
| VSBHEAT2 | VSB Heater #2 | 0.0015 | 1.2E-04 |
| VSBHEAT3 | VSB Heater #3 | 0.0015 | 1.2E-04 |
| VSBHEAT4 | VSB Heater #4 | 0.0015 | 1.2E-04 |
| LTSHEAT1 | LTS Heater #1 | 0.0011 | 8.5E-05 |
| LTSHEAT2 | LTS Heater #2 | 0.0011 | 8.5E-05 |
| LTSHEAT3 | LTS Heater #3 | 0.0011 | 8.5E-05 |
| LTSHEAT4 | LTS Heater #4 | 0.0011 | 8.5E-05 |
| LTSHOTSY | LTS Hotsy Unit | 0.0049 | 3.9E-04 |
| BOILER1 | Boiler #1 | 0.061 | 1.72 |
| BOILER2 | Boiler #2 | 0.061 | 1.72 |
| BOILER3 | Boiler #3 | 0.061 | 1.72 |
| BOILER4 | Boiler #4 | 0.061 | 1.72 |
| GEN1 | Generator #1 | 0.033 | 0.0121[d] (0.003)[e] |
| GEN2 | Generator #2 | 0.033 | 0.0121[d] (0.003)[e] |
| GEN3 | Generator #3 | 0.033 | 0.0121[d] (0.003)[e] |
| FLARE | Candlestick Flare | 0.067 | 1.55 |

a. Pounds per hour
b. Particulate matter with a mean aerodynamic diameter of ten microns or less
c. Sulfur dioxide
d 3-hour average emission rate
e 24-hour average emission rate

Table 6 lists the hourly emission rates that were modeled to evaluate whether maximum impacts exceeded the significant contribution levels (SCLs) and to demonstrate compliance with the NAAQS in the full impact analysis for $PM_{10}$ and $NO_2$ with an annual averaging period. The emission rates listed in Table 6 were modeled continuously for 8,760 hours per year.

There were no additional limitations on operation applied in the modeling demonstration beyond those used in estimating the modeled emission rates. Hours of operation limitations and any reduced capacity limitations would have been accounted for in the modeled hourly emission rates for all averaging periods. For example, note the different emission rates for $SO_2$ emissions from the three generator sets for 3-hour average emission rates versus the 24-hour average emission rates.

| Table 6. MODELED ANNUAL AVERAGE EMISSIONS RATES | | | | |
|---|---|---|---|---|
| Source ID | Description | $PM_{10}$[a] (lb/hr)[b] | $NO_x$[c] (lb/hr) | $SO_2$[d] (lb/hr) |
| VSBHEAT1 | VSB Heater #1 | 0.0015 | 0.020 | 1.2E-04 |
| VSBHEAT2 | VSB Heater #2 | 0.0015 | 0.020 | 1.2E-04 |
| VSBHEAT3 | VSB Heater #3 | 0.0015 | 0.020 | 1.2E-04 |
| VSBHEAT4 | VSB Heater #4 | 0.0015 | 0.020 | 1.2E-04 |
| LTSHEAT1 | LTS Heater #1 | 0.0011 | 0.014 | 8.5E-05 |
| LTSHEAT2 | LTS Heater #2 | 0.0011 | 0.014 | 8.5E-05 |
| LTSHEAT3 | LTS Heater #3 | 0.0011 | 0.014 | 8.5E-05 |
| LTSHEAT4 | LTS Heater #4 | 0.0011 | 0.014 | 8.5E-05 |
| LTSHOTSY | LTS Hotsy Unit | 0.0049 | 0.064 | 3.9E-04 |
| BOILER1 | Boiler #1 | 0.061 | 0.72 | 1.72 |
| BOILER2 | Boiler #2 | 0.061 | 0.72 | 1.72 |
| BOILER3 | Boiler #3 | 0.061 | 0.72 | 1.72 |
| BOILER4 | Boiler #4 | 0.061 | 0.72 | 1.72 |
| GEN1 | Generator #1 | 0.0074 | 0.97 | 6.9E-04 |
| GEN2 | Generator #2 | 0.0074 | 0.97 | 6.9E-04 |
| GEN3 | Generator #3 | 0.0074 | 0.97 | 6.9E-04 |
| FLARE | Candlestick Flare | 0.066 | 0.42 | 1.55 |

a. Particulate matter with a mean aerodynamic diameter of ten microns or less
b Pounds per hour
c Nitrogen dioxide
d Sulfur dioxide

The carcinogenic TAP annual average emission rates listed in Table 7 were modeled to demonstrate compliance with the applicable acceptable ambient concentration (AACC) increments. The emission rates were modeled continuously for 8,760 hours per year without any additional restrictions on the emission rates or hours of operation. Emissions of all other TAPs were estimated to be below emissions screening levels (ELs) listed in Idaho Air Rules Sections 585 and 586, and air impact analyses were not required.

| Table 7. MODELED CARCINOGENIC TOXIC AIR POLLUTANTS EMISSIONS RATES | | | | | | | |
|---|---|---|---|---|---|---|---|
| Source ID | Description | Arsenic (lb/hr)[a] | Benzene (lb/hr) | Cadmium (lb/hr) | Formaldehyde (lb/hr) | Nickel (lb/hr) | PAHs[b] (lb/hr) |
| VSBHEAT1 | VSB Heater #1 | 3.9E-08 | 4.1E-07 | 2.2E-07 | 1.5E-05 | 4.1E-07 | -- |
| VSBHEAT2 | VSB Heater #2 | 3.9E-08 | 4.1E-07 | 2.2E-07 | 1.5E-05 | 4.1E-07 | -- |
| VSBHEAT3 | VSB Heater #3 | 3.9E-08 | 4.1E-07 | 2.2E-07 | 1.5E-05 | 4.1E-07 | -- |
| VSBHEAT4 | VSB Heater #4 | 3.9E-08 | 4.1E-07 | 2.2E-07 | 1.5E-05 | 4.1E-07 | -- |
| LTSHEAT1 | LTS Heater #1 | 2.9E-08 | 3.0E-07 | 1.6E-07 | 1.1E-05 | 3.0E-07 | -- |
| LTSHEAT2 | LTS Heater #2 | 2.9E-08 | 3.0E-07 | 1.6E-07 | 1.1E-05 | 3.0E-07 | -- |
| LTSHEAT3 | LTS Heater #3 | 2.9E-08 | 3.0E-07 | 1.6E-07 | 1.1E-05 | 3.0E-07 | -- |
| LTSHEAT4 | LTS Heater #4 | 2.9E-08 | 3.0E-07 | 1.6E-07 | 1.1E-05 | 3.0E-07 | -- |
| LTSHOTSY | LTS Hotsy Unit | 1.3E-07 | 1.4E-06 | 7.1E-07 | 4.8E-05 | 1.4E-06 | -- |
| BOILER1 | Boiler #1 | 1.2E-06 | 5.1E-05 | 6.6E-06 | 4.5E-04 | 1.3E-05 | 3.5E-06 |
| BOILER2 | Boiler #2 | 1.2E-06 | 5.1E-05 | 6.6E-06 | 4.5E-04 | 1.3E-05 | 3.5E-06 |
| BOILER3 | Boiler #3 | 1.2E-06 | 5.1E-05 | 6.6E-06 | 4.5E-04 | 1.3E-05 | 3.5E-06 |
| BOILER4 | Boiler #4 | 1.2E-06 | 5.1E-05 | 6.6E-06 | 4.5E-04 | 1.3E-05 | 3.5E-06 |
| GEN1 | Generator #1 | -- | 3.5E-04 | -- | 3.6E-05 | -- | 9.7E-05 |
| GEN2 | Generator #2 | -- | 3.5E-04 | -- | 3.6E-05 | -- | 9.7E-05 |
| GEN3 | Generator #3 | -- | 3.5E-04 | -- | 3.6E-05 | -- | 9.7E-05 |
| FLARE | Candlestick Flare | -- | 8.4E-08 | -- | 6.1E-07 | -- | 7.4E-09 |

a Pounds per hour
b. Total polyaromatic hydrocarbons

## 3. 3 Emission Release Parameters

### *3.3.1 Point Sources*

Table 8 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. All point sources except the flare were modeled as a vertical release with a raincap obstruction or as a horizontally-oriented release.

The flare was modeled as a point source with the equivalent diameter exhaust parameter that was calculated according to EPA SCREEN3 model guidance methods for equivalent diameter and an effective release height. This is an appropriate method for modeling an open flare as a point source. Exhaust temperature and exit velocity values used the standard SCREEN3 values of 1273 Kelvin (or 1832 degrees Fahrenheit) and 20 meters per second, respectively.

Exhaust parameters for one of the four dual fuel-fired boilers, three diesel-fired emergency backup generators, and eight natural gas-fired space heaters were altered to reflect conservative values based on each unit operating at reduced capacity. Exhaust flow rates were adjusted to an elevation of 3,000 feet rather than 2,460 feet at this site, but this will not affect the values used in a manner that will affect the compliance determination. Point source exhaust parameters, including the exit temperature, and exhaust flow rate were justified in the modeling report and additional supporting emails and application submittals. Boiler exhaust stack velocities for Boilers 2, 3 and 4 were supported by the Burnham Commercial Boiler Company specification sheets. The January 1980 specification sheet for Boiler 1 (Federal Boiler) did not appear to list any exhaust flow rate data, but the exhaust parameters used in the modeling demonstration appeared to be conservative. DEQ accepted the modeled exit temperatures, stack release heights, and diameters as submitted.

| Table 8. POINT SOURCE STACK PARAMETERS | | | | | | |
|---|---|---|---|---|---|---|
| **Release Point** | **Description** | **Release Orientation** | **Stack Height (m)[a]** | **Stack Gas Flow Temperature (K)[b]** | **Stack Gas Flow Velocity (m/sec)[c]** | **Stack Diameter (m)** |
| VSBHEAT1 | VSB Heater #1 | Raincap | 9.63 | 304.5 | 96.0 | 0.13 |
| VSBHEAT2 | VSB Heater #2 | Raincap | 9.68 | 304.5 | 96.0 | 0.13 |
| VSBHEAT3 | VSB Heater #3 | Raincap | 9.73 | 304.5 | 96.0 | 0.13 |
| VSBHEAT4 | VSB Heater #4 | Raincap | 9.65 | 304.5 | 96.0 | 0.13 |
| LTSHEAT1 | LTS Heater #1 | Raincap | 5.49 | 301.2 | 107.0 | 0.10 |
| LTSHEAT2 | LTS Heater #2 | Raincap | 5.49 | 301.2 | 107.0 | 0.10 |
| LTSHEAT3 | LTS Heater #3 | Raincap | 5.49 | 301.2 | 107.0 | 0.10 |
| LTSHEAT4 | LTS Heater #4 | Raincap | 5.49 | 301.2 | 107.0 | 0.10 |
| LTSHOTSY | LTS Hotsy Unit | Raincap | 6.40 | 533.2 | 2.2 | 0.30 |
| BOILER1 | Boiler #1 | Raincap | 6.40 | 388.7 | 1.8 | 0.38 |
| BOILER2 | Boiler #2 | Raincap | 6.40 | 510.9 | 7.1 | 0.30 |
| BOILER3 | Boiler #3 | Raincap | 6.40 | 510.9 | 5.2 | 0.36 |
| BOILER4 | Boiler #4 | Raincap | 6.40 | 510.9 | 5.2 | 0.36 |
| GEN1 | Generator #1 | Horizontal | 5.11 | 727.8 | 57.7 | 0.20 |
| GEN2 | Generator #2 | Horizontal | 5.11 | 727.8 | 57.7 | 0.20 |
| GEN3 | Generator #3 | Horizontal | 5.11 | 727.8 | 57.7 | 0.20 |
| FLARE | Candlestick Flare | Open Flare / Equivalent Point Source Derived Parameters | 5.59 | 1273 | 20.0 | 0.43 |

a. Meters
b. Kelvin
c. Meters per second

## 3.4 Results for Ambient Impact Analyses

### 3.4.1 *Significant Impact Analyses*

A significant impact analysis was not performed for this project. The modeling demonstration modeled requested emission rates for all emissions units at the facility and included several operational constraints for the emergency backup generators, the space heater units and the Hotsy unit that reflect emissions and exhaust parameters at levels below maximum rated capacity that are generally used in significant impact analyses.

Lead emissions were not modeled and were expected to be below modeling thresholds for significant and full impact analyses. Emissions of CO were modeled, but were below the presumptive minimum modeling thresholds. Modeling was not required for these pollutants and DEQ did not provide background concentrations for CO.

### 3.4.2 *Full Impact Analyses*

A full impact analysis was performed by adding the ambient background concentrations provided by DEQ to the facility's ambient impacts predicted to occur due to the facility's potential emissions to the for $PM_{10}$, $SO_2$, and $NO_2$. The results of the full impact analysis submitted by the City of Nampa are listed in Table 9.

| Table 9. RESULTS OF FULL IMPACT ANALYSES | | | | | | |
|---|---|---|---|---|---|---|
| Pollutant | Averaging Period | Modeled Design Concentration ($\mu g/m^3$)[a] | Background Concentration ($\mu g/m^3$) | Total Ambient Impact ($\mu g/m^3$) | NAAQS[b] ($\mu g/m^3$) | Percent of NAAQS |
| $PM_{10}$[c] | 24-hour | 5.28 | 114 | 119.3 | 150 | 80% |
| | Annual | 0.85 | 29 | 29.9 | 50 | 60% |
| $NO_2$[d] | Annual | 21.09 (23.52)[f] | 36 | 57.1 (59.5)[f] | 100 | 57% (60%)[f] |
| $SO_2$[e] | 3-hour | 405.57 | 292 | 697.6 | 1,300 | 54% |
| | 24-hour | 115.20 | 86 | 201.2 | 365 | 55% |
| | Annual | 19.60 (21.72)[f] | 13 | 32.6 (34.7)[f] | 80 | 41% (43%)[f] |

a. Micrograms per cubic meter
b. National ambient air quality standards
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
d. Nitrogen dioxide
e. Sulfur dioxide
f. Results of a DEQ sensitivity run for $NO_2$ and $SO_2$ annual average impacts using individual year meteorological data files instead of a 5-year concatenated file.

DEQ identified incorrect procedures used in the analysis to estimate maximum annual impacts of $NO_2$ and $SO_2$ after the application was already declared complete. In consideration of the large margin of compliance for both of these NAAQS based on the results predicted by modeling the 5-year concatenated period, DEQ decided performing a simple sensitivity analysis using the maximum ambient impact of the 5 individual years was appropriate. The modeling submittal specified the use of an annual averaging period with a 5-year concatenated meteorological data file (five individual years of data joined in a single data file). This approach does not provide the highest 1st high ambient impact from all five individual years within the concatenated file. The model selects the 1st high ambient impact for only the first year of meteorological data. The correct procedure is to run each year separately, specifying an annual averaging period. This requirement applies to both $NO_2$ and $SO_2$ annual NAAQS compliance demonstrations. The submitted modeling demonstration for the annual $PM_{10}$ NAAQS presented results for 5 individual years of meteorological data, with a design concentration that was even below the significant contribution level of 1.0 $\mu g/m^3$, annual average.

$NO_2$ impacts were assumed to be equivalent to 100% $NO_x$ impacts, without any adjustment for $NO_2$ to $NO_x$ conversion. This is the most conservative approach and total ambient impacts did not approach the annual $NO_2$ NAAQS.

### *3.4.3 Toxic Air Pollutant Impact Analyses*

Dispersion modeling for TAPs was required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 586 for carcinogenic TAPs. This project is expected to cause emission increases that exceeded the screening emission rate limits for carcinogenic TAPs only. The requested emission increases were modeled to demonstrate compliance with the allowable TAP increments and the results of the TAPs analyses are listed in Table 10, and the impacts reflect the final equipment requested to be constructed in this PTC action. The predicted ambient TAPs impacts were below allowable increments.

| Table 10. RESULTS OF TAPs ANALYSES | | | | |
|---|---|---|---|---|
| Toxic Air Pollutant | CAS[a] | Maximum Modeled Concentration ($\mu g/m^3$)[b] | AACC[c] ($\mu g/m^3$) | Percent of AACC |
| Arsenic | 7440-38-2 | 1.E-05 | 2.3E-04 | 4.3% |
| Benzene | 71-43-2 | 6.5E-03 | 1.2E-01 | 5.4% |
| Cadmium | 7440-43-9 | 8.E-05 | 5.6E-04 | 14.3% |
| Formaldehyde | 50-00-0 | 5.3E-03 | 7.7E-02 | 6.9% |
| Nickel | 7440-02-0 | 1.4E-04 | 4.2E-03 | 3.3% |
| Total Polyaromatic Hydrocarbons | NA | 1.7E-03 | 0.014 | 12.1% |

a. Chemical Abstract Service Number
b. Micrograms per cubic meter
c Acceptable ambient concentration for carcinogens

## 4.0 Conclusions

The ambient air impact analysis submitted demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.

# APPENDIX C – FACILITY DRAFT COMMENTS

## The following comments were received from the facility on March 18, 2011:

**Facility Comment:** Permit Condition 7, Page 6 - Biogas Production limits: The facility already has biogas flow monitors installed on the inlet of each boiler and flare to measure the amount of biogas produced each day. Emission estimates for the boilers and flare were based on a maximum of 210,000 scf per day of biogas. Therefore, it seems logical to require a flow meter on the inlet of each boiler. Recommended language- "Biogas production from the combined anaerobic digesters to each boiler and flare shall not exceed 210,000 scf per day, based on the average scf produced per day over any consecutive 12-month period."

**DEQ Response:** The permit condition will be changed to read "Biogas production from the five anaerobic digesters and combusted in Boiler #1, Boiler #2, Boiler #3, Boiler #4, and the Candlestick Flare shall not exceed 1,050,000 scf per day, based on the average scf combusted per day over any consecutive 12-month period."

**Facility Comment:** Permit Condition 10, Page 7 - Biogas $H_2S$ Concentration Monitoring: Request a provision to allow facility 180 days to install a $H_2S$ monitor. An $H_2S$ monitor is sophisticated equipment that takes time to install. The City of Nampa needs time to secure an outside vendor to install a $H_2S$ monitor and tie it into their SCADA system.

**DEQ Response:** The requested change will be made to the permit.

**Facility Comment:** Permit Condition 11, Page 7 - Biogas Production Monitoring, Bullet 1: Recommended language – "The permittee shall install, calibrate, maintain, and operate a biogas flow meter that shall be placed at the inlet of each boiler and flare, in order to determine the total quantity of biogas produced each day. The biogas flow meter..."

**DEQ Response:** The permit condition will be changed to read "The permittee shall install, calibrate, maintain, and operate biogas flow meters that shall be placed at the inlets of Boiler #1, Boiler #2, Boiler #3, Boiler #4, and the Candlestick Flare, in order to determine the total quantity of biogas combusted. Each of the biogas flow meters shall be installed, operated, and maintained in accordance with the O&M manual and the manufacturer specifications."

**Facility Comment:** The natural gas emissions for the Heaters and Pressure Washer are negligible based upon the limits established in Table 10. Therefore, we request that this section be eliminated.

**DEQ Response:** The requested change will be made.

# APPENDIX D – 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:** City of Nampa, WWTP
**Address:** 340 W. Railroad St.
**City:** Nampa
**State:** ID
**Zip Code:** 83687
**Facility Contact:** Greg Pearce
**Title:** Plant Manager
**AIRS No.:** 027-00110

**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) |
| $NO_x$ | 29.7 | 0 | 29.7 |
| $SO_2$ | 40.4 | 0 | 40.4 |
| CO | 29.5 | 0 | 29.5 |
| PM10 | 1.7 | 0 | 1.7 |
| VOC | 3.8 | 0 | 3.8 |
| TAPS/HAPS | 0.0 | 0 | 0.0 |
| Total: | 0.0 | 0 | **105.0** |
| | | | |
| Fee Due | $ **7,500.00** | | |

Comments: