

**ALLEGHENY COUNTY HEALTH DEPARTMENT  
AIR QUALITY PROGRAM**

December 2, 2016

**SUBJECT:** Bay Valley Foods, LLC  
1080 River Avenue  
Pittsburgh, PA 15212-5995  
Allegheny County

**Title V Operating Permit No. 0079 (renewal)**

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**FACILITY DESCRIPTION:**

The Bay Valley Foods facility in Pittsburgh is a manufacturing and packaging facility for baby foods and soups, along with other specialty foods. In addition to the production and packaging equipment, the facility has five (5) natural gas-fired boilers, which provide steam to the facility.

The facility is a major source of nitrogen oxides (NO<sub>x</sub>) and carbon monoxide (CO) as defined in §2101.20 of Article XXI. The facility is a minor source of particulate matter (PM), particulate matter <10 µm in diameter (PM<sub>10</sub>), particulate matter <2.5 µm in diameter (PM<sub>2.5</sub>), sulfur oxides (SO<sub>x</sub>), and hazardous air pollutants (HAP). The facility is also a major source of greenhouse gas emissions (CO<sub>2</sub>e) as defined in the U.S. EPA Greenhouse Gas Tailoring Rule.

**OPERATING PERMIT DESCRIPTION**

This is a Title V renewal for Bay Valley Foods, LLC located in Pittsburgh, PA, Allegheny County. The original operating permit was issued on June 14, 2005 under the Del Monte Corporation, then DLM Foods. Since the original issuance, Installation Permit #0079-I003 was issued on October 10, 2008 to incorporate an air

pollution control system as part of compliance with case-by-case MACT for 40 CFR Part 63, Subpart DDDDD. However, since that time, the facility switched from coal-fired boilers to all natural gas-fired boilers and the air pollution control system and all coal handling was removed. This was done under Installation Permit #0079-I005 (issued April 6, 2015). The facility also removed the capacity factor on the No. 8 Zurn Boiler under Installation Permit #0079-I004 (issued October 4, 2013). The renewal permit will incorporate the conditions of both Installation Permit #0079-I004 and Installation Permit #0079-I005.

Additionally, since the previous Title V Operating Permit issuance, the facility removed a diesel fuel tank (D002), the bulk starch silo (E001), the coal silos (E003 & E004), the fly ash silo (E005), and the following emergency generators: Kohler COM-6 (EG002), Clarke PDEP (EG003), Kohler 30R2882 (EG005), Kohler 10RYGL (EG007), Caterpillar SR-4 (EG008), and Allis Chalmers 11000 (EG009).

**PERMIT APPLICATION COMPONENTS:**

1. Title V Operating Permit #0079, issued June 14, 2005
2. Title V Operating Permit application #0079, dated October 6, 2015
3. Installation Permit #0079-I003, issued October 10, 2008 (Dry Scrubber System – *no longer in operation*)
4. Installation Permit #0079-I004, issued October 4, 2013 (No. 8 Zurn Boiler capacity factor removal)
5. Installation Permit #0079-I005, issued April 15, 2015 (Conversion from coal to natural gas)
6. Correspondence, dated October 30, 2015 (Additional information to permit application)
7. Correspondence, dated October 22, 2015 (Status of No. 2 Boiler)
8. Correspondence, dated February 11, 2014 (Removal of coal delivery system)
9. Plan Approval Order and Agreement (RACT) No. 211, issued March 8, 1996, amended June 9, 2005
10. Operating Permit #3033609-000-00500, issued February 26, 1993

**Determinations**

There was only one request for determination (RFD) received since the last permit issuance. It was received from Del Monte Foods on July 14, 2005, for a short-term project using waste coal. The Department responded on July 21, 2005 with an exemption from permitting. The project was short-term, and the facility no longer combusts coal. No other requests for determination (RFDs) were received from the facility since the last permit issuance.

**EMISSION SOURCES:**

**Table 1: Emissions Sources**

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
B001	#1 Boiler – Combustion Engineering Traveling Grate	none	75 MMBtu/hr	Natural Gas	S001
B002	#2 Boiler – Combustion Engineering Traveling Grate	Low-NO <sub>x</sub> Burners	91 MMBtu/hr	Natural Gas	S001
B003	#3 Boiler – Babcock & Wilcox Traveling Grate	none	42.2 MMBtu/hr	Natural Gas	S002
B004	#4 Boiler – Babcock & Wilcox Traveling Grate	none	42.2 MMBtu/hr	Natural Gas	S002
B008	#8 Zurn Boiler	Low-NO <sub>x</sub> Burners; Flue Gas Recirculation	210 MMBtu/hr	Natural Gas	S002
D001	Diesel Fuel Tank	none	1,000 gallons	Diesel	--
D006	Diesel Fuel Tank	none	115 gallons	Diesel	--
E002	Bulk Flour Silo	Enclosure w/Bag Filter	42.8'×11'	Flour	--

I.D.	SOURCE DESCRIPTION	CONTROL DEVICE(S)	MAXIMUM CAPACITY	FUEL/RAW MATERIAL	STACK I.D.
G001	Glue Operations	none	--	Glue	--
G002	Ink Operations	none	--	Ink	--
EG001	Katolight 460T Emergency Generator	none	341,200 Btu/hr	LP Gas	
EG004	Spectrum 290DSJ Emergency Generator	none	85,300 Btu/hr	Diesel	
EG010	Patterson Fire Pump Engine	none	186,000 Btu/hr	Diesel	
AC-1	Sullair/Caterpillar 3408 DITA Air Compressor	none	460,365 Btu/hr	Diesel	AC-1
F001	Roads and Vehicles	none	--	--	--

**STACKS:**

**Table 2: Stacks**

Stack ID	Material	Height	Diameter	Exhaust Rate	Exhaust Temperature
S001	Brick	250 ft	10 ft	100,000 acfm	390 °F
S002	Brick	250 ft	10 ft	53,000 acfm	250 °F
S005	Steel	12 ft	4"	250 acfm	100 °F
S007	Steel	12 ft	2"	--	--
AC-1	Steel	8 ft	9"	1,035 acfm	930 °F

**METHOD OF DEMONSTRATING COMPLIANCE:**

Methods of demonstrating compliance with the emission standards set in this permit are summarized in the table below. See operating permit No. 0079 for the specific conditions for determining compliance with the applicable requirements. Compliance with the short-term (lb/hr) limits must be maintained at all times, including startup and shutdown unless explicitly stated otherwise in the permit. Any emissions due to startup and/or shutdown are included in facility's total annual emissions.

**Table 3: Method(s) of Demonstrating Compliance**

TVOP Section	Process	Method(s) of Demonstrating Compliance
V.A	No. 1 Boiler	<ul style="list-style-type: none"> <li>• Testing for NO<sub>x</sub> &amp; CO at least once every 2 years</li> <li>• Monthly tests for NO<sub>x</sub> &amp; CO with a portable fuel analyzer</li> <li>• Recordkeeping of fuel use</li> </ul>
V.B	No. 2 Boiler	<ul style="list-style-type: none"> <li>• Testing for NO<sub>x</sub> &amp; CO at least once every 2 years</li> <li>• Monthly tests for NO<sub>x</sub> &amp; CO with a portable fuel analyzer</li> <li>• Recordkeeping of fuel use</li> </ul>
V.C	No. 3 & No. 4 Boilers	<ul style="list-style-type: none"> <li>• Testing for NO<sub>x</sub> &amp; CO at least once every 2 years</li> <li>• Monthly tests for NO<sub>x</sub> &amp; CO with a portable fuel analyzer</li> <li>• Recordkeeping of fuel use</li> </ul>
V.D	No. 8 Zurn Boiler	<ul style="list-style-type: none"> <li>• Testing for NO<sub>x</sub> &amp; CO at least once every 2 years</li> <li>• Continuous emissions monitoring (CEMs) for NO<sub>x</sub> &amp; O<sub>2</sub></li> <li>• Recordkeeping of fuel use</li> </ul>
VI.A	Emergency Generators, Fire	<ul style="list-style-type: none"> <li>• Recordkeeping of fuel use</li> </ul>

TVOP Section	Process	Method(s) of Demonstrating Compliance
	Pump Engine, and Air Compressor	<ul style="list-style-type: none"> <li>Recordkeeping of operating hours</li> </ul>
VI.B	Bulk Flour Silo	<ul style="list-style-type: none"> <li>Recordkeeping of monthly and annual throughput</li> </ul>

**EMISSION CALCULATIONS**

**Boilers No. 1, No. 3, & No. 4**

**Basis:**

Heating rate:	75 MMBtu/hr (Boiler No. 1) 42.2 MMBtu/hr per boiler (Boilers No. 3 & No. 4)
Natural gas heating value:	1,050 Btu/scf
Operation:	8,760 hrs/yr

Emission calculations for SO<sub>x</sub> and VOC were based on emission factors of 0.6 lb/MMscf and 5.5 lb/MMscf respectively found in U.S. EPA AP-42 Section 1.4: *Natural Gas Combustion (7/98)*; PM emissions were based on Article XXI emission limits (§2104.02) of 0.008 lb/MMBtu. A 10% adjustment was added to all emissions calculated with AP-42 factors to account for operational variability. All PM was assumed to be PM<sub>10</sub>; all PM<sub>10</sub> was assumed to be PM<sub>2.5</sub>. PM emissions represent total particulate (condensable and filterable).

Because these boilers have until recently combusted primarily coal, Bay Valley Foods did not have significant data on NO<sub>x</sub> and CO emissions while combusting natural gas. A test was conducted on March 23-24, 2014. CO limits were based on the maximum CO test result, with a 20% adjustment factor added. NO<sub>x</sub> limits were based on the average 1<sup>st</sup> Quarter CEMS data (the first full quarter of natural gas-only combustion) plus 3 standard deviations. The following limits were determined, at 3% O<sub>2</sub>:

**Table 4: Boiler Nos. 1, 3 & 4 NO<sub>x</sub> and CO Limits**

	Boiler No. 1	Boiler No. 3	Boiler No. 4
<b>NO<sub>x</sub></b>	108.6 ppm <sub>dv</sub>	86 ppm <sub>dv</sub>	86 ppm <sub>dv</sub>
<b>CO</b>	94.6 ppm <sub>dv</sub>	182.3 ppm <sub>dv</sub>	182.3 ppm <sub>dv</sub>

NO <sub>x</sub> MW:	46 lb/lb·mol (based on 100% NO <sub>2</sub> )
CO MW:	28 lb/lb·mol
F <sub>d</sub> -Factor:	8,710 scf <sub>eg</sub> /MMBtu
Density:	385 scf/lb·mol
Oxygen:	3%

NO<sub>x</sub> Emissions (sample calculation, Boiler No. 1):

$$(108.6 \text{ ppm} \div 10^6) \times 8,710 \text{ scf/MMBtu} \times 75 \text{ MMBtu/hr} \div 385 \text{ scf/lb}\cdot\text{mol} \times 46 \text{ lb/lb}\cdot\text{mol} \times [20.9/(20.9 - 3)] =$$

$$= \mathbf{9.893 \text{ lb/hr NO}_x}$$

CO Emissions (sample calculation, Boiler No. 1):

$$(94.6 \text{ ppm} \div 10^6) \times 8,710 \text{ scf/MMBtu} \times 75 \text{ MMBtu/hr} \div 385 \text{ scf/lb}\cdot\text{mol} \times 28 \text{ lb/lb}\cdot\text{mol} \times [20.9/(20.9 - 3)] =$$

$$= \mathbf{5.248 \text{ lb/hr CO per boiler}}$$

**Table 5: Boiler No. 1 Emission Limits**

Pollutant	Short-Term Emissions (lb/hr)	Long-Term Emissions (tpy)
Particulate Matter	0.600	<b>2.628</b>
PM <sub>10</sub>	0.600	<b>2.628</b>
PM <sub>2.5</sub>	0.600	<b>2.628</b>
Nitrogen Oxides	9.893	<b>43.332</b>
Sulfur Oxides	0.047	<b>0.206</b>
Carbon Monoxide	5.248	<b>22.985</b>
Volatile Organic Compounds	0.432	<b>1.893</b>

**Table 6: Boiler No. 3 & No. 4 Emission Limits**

Pollutant	Short-Term Emissions (lb/hr – per boiler)	Long-Term Emissions (tpy – per boiler)	Total Emissions tons/year
Particulate Matter	0.338	1.479	<b>2.957</b>
PM <sub>10</sub>	0.338	1.479	<b>2.957</b>
PM <sub>2.5</sub>	0.338	1.479	<b>2.957</b>
Nitrogen Oxides	4.406	19.297	<b>38.595</b>
Sulfur Oxides	0.027	0.116	<b>0.232</b>
Carbon Monoxide	5.690	24.922	<b>49.844</b>
Volatile Organic Compounds	0.243	1.065	<b>2.130</b>

GHG Mass and CO<sub>2</sub>e Emissions:

Calculations of greenhouse gases (GHG) and CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) emissions are based on the methodology found in 40 CFR Part 98, Subpart C, §98.33(a)(1), and factors found in Table C-1 and Table C-2 of that subpart.

$$\begin{aligned} \text{Total rated heat input capacity of the boilers} &= (75 + 42.2 + 42.2) \text{ MMBtu/hr} \times 8,760 \text{ hr/yr} \\ &= 1,396,344 \text{ MMBtu/yr} \end{aligned}$$

Emission Factors:

$$\begin{aligned} \text{CO}_2 &= 53.06 \text{ kg/MMBtu} \\ \text{N}_2\text{O} &= 1 \times 10^{-4} \text{ kg/MMBtu} \\ \text{CH}_4 &= 1 \times 10^{-3} \text{ kg/MMBtu} \end{aligned}$$

$$\text{CO}_2: 1,396,344 \text{ MMBtu/yr} \times 53.06 \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 74,090 \text{ metric tons/year}$$

$$\text{NO}_2: 1,396,344 \text{ MMBtu/yr} \times 1 \times 10^{-4} \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 0.140 \text{ metric tons/year}$$

$$\text{CH}_4: 1,396,344 \text{ MMBtu/yr} \times 1 \times 10^{-3} \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 1.396 \text{ metric tons/year}$$

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1, 11/29/13):

$$\begin{aligned} \text{CO}_2 &= 1 \\ \text{N}_2\text{O} &= 298 \\ \text{CH}_4 &= 25 \end{aligned}$$

$$\begin{aligned} \text{CO}_2\text{e} &= (74,090 \times 1) + (0.140 \times 298) + (1.396 \times 25) = \mathbf{74,167 \text{ metric tons/year of CO}_2\text{e}} \\ &= \mathbf{81,755 \text{ tpy of CO}_2\text{e}} \end{aligned}$$

**Boiler No. 2**

**Basis:**

Heating rate: 91 MMBtu/hr  
 Natural gas heating value: 1,050 Btu/scf  
 Operation: 8,760 hrs/yr

Emission calculations for SO<sub>x</sub> and VOC were based on emission factors of 0.6 lb/MMscf and 5.5 lb/MMscf respectively found in U.S. EPA AP-42 Section 1.4: *Natural Gas Combustion (7/98)*; PM emissions were based on Article XXI emission limits (§2104.02) of 0.008 lb/MMBtu. A 10% adjustment was added to all emissions calculated with AP-42 factors to account for operational variability. All PM was assumed to be PM<sub>10</sub>; all PM<sub>10</sub> was assumed to be PM<sub>2.5</sub>. PM emissions represent total particulate (condensable and filterable).

Because of the size and configuration of this boiler, the burner manufacturer would only guarantee emissions of 30 ppm<sub>dv</sub> NO<sub>x</sub> @ 3% O<sub>2</sub> and 200 ppm<sub>dv</sub> of CO @ 3% O<sub>2</sub>. Depending on boiler performance during the required stack test, the Department reserves the right to reduce the CO emission rate to reflect actual burner performance.

NO<sub>x</sub> MW: 46 lb/lb·mol (based on 100% NO<sub>2</sub>)  
 CO MW: 28 lb/lb·mol  
 F<sub>d</sub>-Factor: 8,710 scf<sub>eg</sub>/MMBtu  
 Density: 385 scf/lb·mol  
 Oxygen: 3%

NO<sub>x</sub> Emissions:

$$(30 \text{ ppm} \div 10^6) \times 8,710 \text{ scf/MMBtu} \times 91 \text{ MMBtu/hr} \div 385 \text{ scf/lb}\cdot\text{mol} \times 46 \text{ lb/lb}\cdot\text{mol} \times [20.9/(20.9 - 3)] =$$

$$= \mathbf{3.276 \text{ lb/hr NO}_x}$$

CO Emissions:

$$(200 \text{ ppm} \div 10^6) \times 8,710 \text{ scf/MMBtu} \times 91 \text{ MMBtu/hr} \div 385 \text{ scf/lb}\cdot\text{mol} \times 28 \text{ lb/lb}\cdot\text{mol} \times [20.9/(20.9 - 3)] =$$

$$= \mathbf{13.461 \text{ lb/hr CO per boiler}}$$

**Table 7: Boiler No. 2 Emission Limits**

<b>Pollutant</b>	<b>Short-Term Emissions (lb/hr)</b>	<b>Long-Term Emissions (tpy)</b>
Particulate Matter	0.728	<b>3.189</b>
PM <sub>10</sub>	0.728	<b>3.189</b>
PM <sub>2.5</sub>	0.728	<b>3.189</b>
Nitrogen Oxides	3.276	<b>14.349</b>
Sulfur Oxides	0.057	<b>0.251</b>
Carbon Monoxide	13.461	<b>58.960</b>
Volatile Organic Compounds	0.524	<b>2.297</b>

GHG Mass and CO<sub>2</sub>e Emissions:

Calculations of greenhouse gases (GHG) and CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) emissions are based on the methodology found in 40 CFR Part 98, Subpart C, §98.33(a)(1), and factors found in Table C-1 and Table C-2 of that subpart.

Rated heat input capacity of the boiler = 91 MMBtu/hr × 8,760 hr/yr = 797,160 MMBtu/yr

Emission Factors: CO<sub>2</sub> = 53.06 kg/MMBtu  
 N<sub>2</sub>O = 1×10<sup>-4</sup> kg/MMBtu

$$\text{CH}_4 = 1 \times 10^{-3} \text{ kg/MMBtu}$$

$$\text{CO}_2: 797,160 \text{ MMBtu/yr} \times 53.06 \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 42,297 \text{ metric tons/year}$$

$$\text{NO}_2: 797,160 \text{ MMBtu/yr} \times 1 \times 10^{-4} \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 0.080 \text{ metric tons/year}$$

$$\text{CH}_4: 797,160 \text{ MMBtu/yr} \times 1 \times 10^{-3} \text{ kg/MMBtu} \div 1,000 \text{ kg/metric ton} = 0.797 \text{ metric tons/year}$$

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1, 11/29/13):

$$\text{CO}_2 = 1$$

$$\text{N}_2\text{O} = 298$$

$$\text{CH}_4 = 25$$

$$\text{CO}_2\text{e} = (42,297 \times 1) + (0.080 \times 298) + (0.797 \times 25) = \mathbf{42,341 \text{ metric tons/year of CO}_2\text{e}}$$
$$= \mathbf{46,673 \text{ tpy of CO}_2\text{e}}$$

### **Boiler No. 8 (Zurn)**

Based on the NSR/PSD netting analysis done for Installation Permit #0079-I004, the amount of natural gas combusted in the No. 8 Zurn Boiler is limited to 197,000, scf/hr and 1,272 MMscf/yr.

Basis:

Heating rate: 210 MMBtu/hr

Natural gas heating value: 1,050 Btu/scf

Emissions of NO<sub>x</sub> are based on the manufacturer guarantees of 30 ppm<sub>dv</sub>.

NO<sub>x</sub> MW: 46 lb/lb·mol (based on 100% NO<sub>2</sub>)

F<sub>d</sub>-Factor: 8,710 scf<sub>eg</sub>/MMBtu

Density: 385 scf/lb·mol

Oxygen: 3%

NO<sub>x</sub> Emissions:

$$(30 \text{ ppm} \div 10^6) \times 8,710 \text{ scf/MMBtu} \div 385 \text{ scf/lb·mol} \times 46 \text{ lb/lb·mol} \times [20.9/(20.9 - 3)] = \mathbf{0.036 \text{ lb/MMBtu}}$$

Emissions of PM are based on a limit of 0.008 lb/MMBtu in Article XXI; §2104.02. All PM is assumed to be PM<sub>10</sub>, and all PM<sub>10</sub> is assumed to be PM<sub>2.5</sub>.

Emissions of VOC are based on the allowable emissions of VOC from the original Title V Operating Permit #0079 (as established in Operating Permit #3033609-000-0050) as follows:

$$\text{VOC} = 0.59 \text{ lb/hr} \div 180 \text{ MMBtu/hr} = \mathbf{0.0033 \text{ lb/MMBtu}}$$

(180 MMBtu/hr was the rating of the Zurn Boiler in the original Title V Operating Permit).

Emissions of CO are based on the manufacturer guarantees of 200 ppm<sub>dv</sub>.

CO MW: 28 lb/lb·mol

F<sub>d</sub>-Factor: 8,710 scf<sub>eg</sub>/MMBtu

Density: 385 scf/lb·mol

Oxygen: 3%

CO Emissions:

$$(200 \text{ ppm} \div 10^6) \times 8,710 \text{ scf/MMBtu} \div 385 \text{ scf/lb·mol} \times 28 \text{ lb/lb·mol} \times [20.9/(20.9 - 3)] = \mathbf{0.146 \text{ lb/MMBtu}}$$

Emissions of SO<sub>x</sub> are based on the factor found in U.S. EPA AP-42 Section 1.4: *Natural Gas Combustion (7/98)*. These emissions were more restrictive than those based on the original Title V Operating Permit, so the AP-42 factor was used instead:

$$\text{SO}_x = 0.6 \text{ lb}/10^6 \text{ scf} \div 1,050 \text{ Btu/scf} = \mathbf{0.00057 \text{ lb/MMBtu}}$$

**Table 8: No. 8 Zurn Boiler Emissions**

<b>Pollutant</b>	<b>Emission Factor (lb/MMBtu)</b>	<b>Short-Term Emissions (lb/hr)</b>	<b>Long-Term Emissions (tpy)</b>
Particulate Matter	0.008	1.68	5.42
PM <sub>10</sub>	0.008	1.68	5.42
PM <sub>2.5</sub>	0.008	1.68	5.42
Nitrogen Oxides	0.036	7.56	24.2
Sulfur Oxides	0.00057	0.12	0.39
Carbon Monoxide	0.146	30.7	99.0
Volatile Organic Compounds	0.0033	0.69	2.22

**GHG Mass and CO<sub>2</sub>e Emissions:**

Calculations of greenhouse gases (GHG) and CO<sub>2</sub>-equivalent (CO<sub>2</sub>e) emissions are based on the methodology found in 40 CFR Part 98, Subpart C, §98.33(a)(1), and factors found in Table C-1 and Table C-2 of that subpart.

Rated heat input capacity of the boiler = 210 MMBtu/hr × 8,760 hr/yr = 1,839,600 MMBtu/yr

Rated heat input capacity of the boiler = 1,356,164 MMBtu/yr

Emission Factors: CO<sub>2</sub> = 53.06 kg/MMBtu  
 N<sub>2</sub>O = 1×10<sup>-4</sup> kg/MMBtu  
 CH<sub>4</sub> = 1×10<sup>-3</sup> kg/MMBtu

CO<sub>2</sub>: 1,839,600 MMBtu/yr × 53.06 kg/MMBtu ÷ 1,000 kg/metric ton = 97,609 metric tons/year

NO<sub>2</sub>: 1,839,600 MMBtu/yr × 1×10<sup>-4</sup> kg/MMBtu ÷ 1,000 kg/metric ton = 0.184 metric tons/year

CH<sub>4</sub>: 1,839,600 MMBtu/yr × 1×10<sup>-3</sup> kg/MMBtu ÷ 1,000 kg/metric ton = 1.840 metric tons/year

Global Warming Potential (GWP) Factors (from Part 98, Subpart A, Table A-1):

CO<sub>2</sub> = 1  
 N<sub>2</sub>O = 310  
 CH<sub>4</sub> = 21

CO<sub>2</sub>e = (97,609 × 1) + (0.184 × 298) + (1.840 × 25) = **97,710 metric tons/year of CO<sub>2</sub>e**  
 = **107,708 tpy of CO<sub>2</sub>e**

**Stationary Engines**

Potential emissions from the emergency generators, fire pump, and air compressor were calculated using Tier 1 factors from §89.112(a), AP-42 factors from *Section 3.2 – Natural Gas Fired Reciprocating Engines (07/00)* Table 3.2-2 (4SLB), AP-42 factors from *Section 3.3 – Gasoline and Diesel Industrial Engines (10/96)*, or manufacturer specifications. Yearly usage is limited to 500 hours per year for each unit. All PM was assumed to be PM<sub>10</sub>, and all PM<sub>10</sub> was assumed to be PM<sub>2.5</sub>.

EG001 – Katolight: AP-42, 3.2

EG004 – Spectrum: PM, and CO – Tier 1; NO<sub>x</sub>, SO<sub>x</sub>, & VOC – AP-42, 3.3

EG010 – Patterson: NO<sub>x</sub> – Tier 1; PM, CO, VOC, & SO<sub>x</sub> – AP-42, 3.3

AC-1 – Sullair: PM, NO<sub>x</sub>, CO, & VOC – manufacturer specifications; SO<sub>x</sub> – the following calculation:

$$0.0015 \text{ lb}_S \div 100 \text{ lb}_{\text{fuel}} \times 7.076 \text{ lb}_{\text{fuel}}/\text{gal} \times 23.5 \text{ gal}/\text{hr} \times 2 \text{ lb}_{\text{SO}_2}/\text{lb}_S = 0.005 \text{ lb}/\text{hr SO}_X$$

$$0.005 \text{ tpy} \times 500 \text{ hrs}/\text{yr} \div 2,000 \text{ lb}/\text{ton} = 0.0013 \text{ tpy SO}_X$$



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**Table 9: Stationary Engine Emissions**

EG001 – Katolight 460T			100 kW	LP Gas	Inst. 1991
Pollutant	PM	NO <sub>x</sub>	SO <sub>x</sub>	CO	VOC
<b>Emission Factor</b>	7.71×10 <sup>-5</sup> lb/MMBtu	4.08 lb/MMBtu	5.88×10 <sup>-4</sup> lb/MMBtu	3.17×10 <sup>-1</sup> lb/MMBtu	1.18×10 <sup>-1</sup> lb/MMBtu
<b>lb/hr</b>	2.63×10 <sup>-5</sup>	1.39	0.0002	0.11	0.04
<b>tpy</b>	0.000	0.07	0.0000	0.01	0.002
EG004 – Spectrum 290DSJ			25 kW	Diesel	Inst. 2001
Pollutant	PM	NO <sub>x</sub>	SO <sub>x</sub>	CO	VOC
<b>Emission Factor</b>	1.32×10 <sup>-3</sup> lb/hp·hr	3.10×10 <sup>-2</sup> lb/hp·hr	2.05×10 <sup>-3</sup> lb/hp·hr	9.04×10 <sup>-3</sup> lb/hp·hr	2.51×10 <sup>-3</sup> lb/hp·hr
<b>lb/hr</b>	0.04	1.04	0.07	0.30	0.08
<b>tpy</b>	0.01	0.26	0.02	0.08	0.02
EG010 – Patterson Fire Pump Engine			54 kW	Diesel	Inst. 2010
Pollutant	PM	NO <sub>x</sub>	SO <sub>x</sub>	CO	VOC
<b>Emission Factor</b>	2.20×10 <sup>-3</sup> lb/hp·hr	1.51×10 <sup>-2</sup> lb/hp·hr	2.05×10 <sup>-3</sup> lb/hp·hr	6.68×10 <sup>-3</sup> lb/hp·hr	2.51×10 <sup>-3</sup> lb/hp·hr
<b>lb/hr</b>	0.16	1.10	0.15	0.49	0.18
<b>tpy</b>	0.04	0.28	0.04	0.12	0.05
AC-1 – Sullair/Caterpillar 3408 DITA Air Compressor			135 kW	Diesel	Inst. 2010
Pollutant	PM	NO <sub>x</sub>	SO <sub>x</sub>	CO	VOC
<b>Emission Factor</b>	250 g/hr	3,626 g/hr	--	1,090 g/hr	37 g/hr
<b>lb/hr</b>	0.6	8.0	0.005	2.4	0.1
<b>tpy</b>	0.14	2.0	0.0013	0.6	0.02

**Sources of Minor Significance**

**D001 & D006 – Diesel Fuel Tanks**

Emissions from the tanks were estimated using the USEPA Tanks 4.0.9d program for each storage tank.

D001 throughput in 2014: 1,000 gallons  
 Total VOC emissions: 0.15 lb/yr

D006 throughput in 2014: 924 gallons  
 Total VOC emissions: 0.13 lb/yr

**E002 – Bulk Flour Silo**

Tons used in 2014: 1,230 tons/yr  
 2,460,000 lbs/yr  
 Hours of operation: 8,760 hrs/yr  
 Flour density: 48 lb/ft<sup>3</sup>  
 Flour volume: 51,250 ft<sup>3</sup>/yr = 5.85 ft<sup>3</sup>/hr

Emission factor: 0.01 gr/dscf  
 PM emission rate: 512.5 gr/yr = 0.07 lb/hr = 0.00004 tpy

**F001 – Roads and Vehicles**

Emissions from parking lots and roadways were calculated using the methodology and factors in AP-42, Section 13.2.1 – Paved Roads (01/11).

$$E_{ext} \text{ (lb/VMT)} = k[SL/2]^{0.91} \times [(w/3)^{1.02}] \times [1-(P/4N)]$$

**Table 10: Roads & Vehicles Emission Factors**

AP-42 Variables (Chapter 13.2.1)					
		TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	
Base Factor, lb/VMT	k=	0.082	0.016	0.0004	
Silt Loading, g/m <sup>2</sup>	sL=	0.5	0.5	0.5	
Average Weight of Vehicles, tons	W=	4.2	4.2	4.2	
Average days of precipitation during period	P=	150	150	150	
Number of days in period	N=	365	365	365	
Vehicle Miles Traveled (VMT)					
	Vehicles per week	feet per vehicle	ft/wk	mi/wk	mi/yr
LDGV	6000	100	600,000	114	5,909
HDTV	30	750	22,500	4.26	222
HDDV	300	750	225,000	43	2,216
Total Miles					<b>8,347</b>

TSP = 0.0294 lb/VMT = 0.12 tpy  
 PM<sub>10</sub> = 0.0057 lb/VMT = 0.02 tpy  
 PM<sub>2.5</sub> = 0.0001 lb/VMT = 0.001 tpy

**G001 – Glue**

Tons used in 2014: 57 tons/yr  
 VOC content: 0.10%  
 VOC emission rate: 0.057 tpy

**G001 – Ink**

**Table 11: Ink Usage**

Ink Type	2014 Usage	Quant. Used	Case Wt.	VOC Content (g/liter)	Gallons Used	Liters used	lb/yr	tpy
Matthews non-porous ink	27		5 gallon	864	135	511.03	972.53	0.486
JAM-7500 Cleaner	0	6	1 liter	902	0	0.00	0.00	0.000
JAM-7500 Cleaner	4		5 gallon	902	20	75.71	150.42	0.075
Cleaner 16-3401 Video Jet	5	9	1 quart	691	11.25	42.59	64.82	0.032
Make-up Fluid (VJ)	1	9	1 quart	600	2.25	8.52	11.26	0.006
Porous VJ Ink (Marsh)	1		5 gallon	0	5	18.93	0.00	0.000
Imaje Make-up / Additive	214	4	1 liter	600	226.1	855.88	1131.12	0.566

Ink Type	2014 Usage	Quant. Used	Case Wt.	VOC Content (g/liter)	Gallons Used	Liters used	lb/yr	tpy
Imaje Ink/ Black to Red	32	4	1 liter	600	33.8	127.95	169.09	0.085
Marsh Ink, Aerosol cans	90	4	0.19 qt.	0	16.74	63.37	0.00	0.000
Ink, Aerosol spray, Red	5	12	16 oz.	600	7.5	28.39	37.52	0.019
Ink f/Imaje Printers	65	4	1 liter	600	68.69	260.02	343.64	0.172
Spray Stencil Ink	2	12	11 oz.	600	2	7.57	10.01	0.005
<b>Total</b>					<b>528.33</b>	<b>1999.95</b>	<b>2890.40</b>	<b>1.45</b>

Total VOC emissions = 0.33 lb/hr = 1.45 tpy

**REGULATORY APPLICABILITY:**

**1. Article XXI Requirements for Issuance:**

See Permit Application No. 0079, Section 5. The requirements of Article XXI, Parts B and C for the issuance of operating permits have been met for this facility. Article XXI, Part D, Part E & Part H will have the necessary sections addressed individually.

**2. Testing Requirements:**

Testing for NO<sub>x</sub> and CO is required on all five boilers at least once every two (2) years. The Department reserves the right to require additional testing if necessary in the future to assure compliance with the terms and conditions of this Title V Operating Permit.

**3. Applicable New Source Performance Standards (NSPS):**

The No. 8 Zurn Boiler is subject to 40 CFR Part 60, Subpart Db – *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units*. The following sections of Subpart Db do not apply:

- **40 CFR §60.42b:** Standard for sulfur dioxide (SO<sub>2</sub>)
- **40 CFR §60.43b:** Standard for particulate matter (PM)
- **40 CFR §60.45b:** Compliance and performance test methods and procedures for sulfur dioxide
- Individual sections pertaining to coal-fired or oil-fired units, or units with a heat capacity greater than 250 MMBtu/hr

The following sections are streamlined by other applicable regulations:

- **40 CFR §60.44b(a)(1)** is subsumed by RACT Order #211, §1.1 and the NO<sub>x</sub> limit of 30 ppm.
- **40 CFR §60.48b(j)(2)** is subsumed by the BACT requirement to use only utility-grade natural gas, which would ensure the sulfur limits of this condition are met, thus eliminating the requirement for a continuous opacity monitor (COM).
- **40 CFR §60.49b(o)** is subsumed by §2103.12.j.2 (maintenance of records by the facility).

The Fire Pump Engine is subject to 40 CFR Part 60, Subpart IIII – *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*. This includes, but is not limited to the following sections:

- **§60.4207(b)** – Combustion of low-sulfur diesel fuel
- **§60.4211(a)** – Work practice standards

**4. Non-Applicable New Source Performance Standards (NSPS):**

Boilers No. 1-4 are not subject to any NSPS. The boilers are not subject to 40 CFR Part 60, Subpart Dc – *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, per §60.40c(a). All four boilers were constructed before June 9, 1989, and the changes permitted under IP

#0079-I005 did not result in an increase of PM or SO<sub>x</sub>, and therefore did not meet the definition of a modification per 40 CFR Part 60, Subpart A

**5. Applicable NESHAP and MACT Standards:**

The Emergency Generators and Fire Pump Engine are subject to 40 CFR Part 63, Subpart ZZZZ – *National Emissions Standards for Stationary Reciprocating Internal Combustion Engines*. The following sections apply:

- §63.6590(c) – Combustion of low-sulfur diesel fuel
- §63.6603(a) – Work practice standards
- §63.6625(e)(3) – Proper operation and maintenance
- §63.6625(f) – Records of hours of operation

Per §63.6590(c), the Fire Pump Engine meets the requirements of this subpart by meeting the requirements of 60 CFR Part 60, Subpart III.

**6. Non-Applicable NESHAP and MACT Standards:**

Boilers No. 1-4 and Boiler No. 8 are not subject to any NESHAP or MACT standards.

The boilers are not subject to 40 CFR Part 63, Subpart DDDDD – *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*. The compliance date for this subpart is January 31, 2016, per §63.7495(b). In an inspection of the facility by the Department on March 19, 2014, it was observed that the facility no longer has the equipment needed for the processing of coal as fuel. The facility's major HAP source status was due to emissions of hydrochloric acid (HCl) from coal combustion, therefore the facility is a minor source of HAP.

The US EPA memo, "Potential-to-Emit for MACT Standards – Guidance on Timing Issues" (John S. Seitz, May 16, 1996) states that "facilities may switch to area source status at any time until the 'first compliance date' of the standard". Since the facility became a minor source of HAP before the compliance deadline in §63.7495(b), it is not subject to this Subpart.

Boilers No. 1 through No. 4 were previously subject to the MACT Hammer provisions of Section 112(j) of the Clean Air Act. These provisions were permitted under Installation Permit #0079-I003, issued October 10, 2008. Because the facility no longer combusts coal and is no longer a major source, these conditions also no longer apply.

The boilers are not subject to 40 CFR Part 63, Subpart JJJJJ – *National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*. The boilers are gas-fired boilers, and are not capable of combusting any other type of fuel. They are exempt under §63.11195(e).

**7. New Source Review/Prevention of Significant Deterioration (NSR/PSD):**

NSR/PSD analyses were performed as part of Installation Permit #0079-I004 and #0079-I005. In each case, there was no net increase above the NSR/PSD thresholds. Under IP #0079-I004, the rating of the No. 8 Zurn Boiler was increased from 180 MMBtu/hr to 210 MMBtu/hr and the capacity factor was removed. This resulted in an increase of NO<sub>x</sub> above the NSR threshold. The facility elected to take a limit on total natural gas consumption to stay below the limit. Due to the removal of all coal combustion, the net increase of all other NSR and PSD pollutants was below the thresholds of §52.21(b)(23).

Under IP #0079-I005, the burners in Boiler No. 2 were converted to natural gas combustion, and the capacity was increased from 75 MMBtu/hr to 91 MMBtu/hr. (Boilers No. 1 and No. 2 were always intended to operate at 75 MMBtu/hr with natural gas, but 91 MMBtu/hr with coal. This distinction was not included in the original Title V Operating Permit). The NSR and PSD netting analyses resulted in no net increase of any NSR or PSD pollutants above the thresholds of §52.21(b)(23).

The full netting analyses may be found in the Technical Support Documents for Installation Permits #0079-I004 and #0079-I005.

**8. Emission Inventory:**

This facility is required to provide annual Emission Inventory reports per §2108.01.e of Article XXI because this facility has the potential to emit more than 25 tpy of NO<sub>x</sub> and CO.

**9. Risk Management Plan; CAA Section 112(r):**

The facility is not required to have a risk management plan at this time because none of the regulated chemicals exceed the thresholds in the regulation.

**10. Greenhouse Gas Reporting (40 CFR Part 98):**

There are presently no Title V applicable requirements for greenhouse gases. Should the facility exceed 25,000 metric tons of CO<sub>2</sub>e in any 12-month period, the facility would have to submit reports in accordance with 40 CFR Part 98.

**11. Compliance Assurance Monitoring (40 CFR Part 64):**

The Compliance Assurance Monitoring (CAM) rule found in 40 CFR 64 is not applicable to the facility pursuant to §64.2(a)(2), which states “the CAM requirements apply to unit that uses control device to achieve compliance with any such emission limitation or standard”. The low-NO<sub>x</sub> burners in the No. 2 Boiler are not considered a control device under §64.1. Therefore, since none of the boilers have any control device, they are exempt from the CAM requirement.

**EMISSIONS SUMMARY:**

**Table 12: Emissions Summary for Bay Valley Foods**

<b>Pollutant</b>	<b>Total (tpy*)</b>
Particulate Matter	<b>14.60</b>
Particulate Matter <10 µm (PM <sub>10</sub> )	<b>14.43</b>
Particulate Matter <2.5 µm (PM <sub>2.5</sub> )	<b>14.39</b>
Nitrogen Oxides (NO <sub>x</sub> )	<b>123.12</b>
Sulfur Oxides (SO <sub>x</sub> )	<b>1.14</b>
Carbon Monoxide (CO)	<b>231.60</b>
Volatile Organic Compounds (VOC)	<b>10.14</b>
Greenhouse Gases (CO <sub>2</sub> e)	<b>236,134</b>

\* A year is defined as any consecutive 12-month period.

**RECOMMENDATION:**

All applicable Federal, State, and County regulations have been addressed in the permit application, and the facility is not in violation of the provisions of Article XXI, §2102.04.k. The Title V Operating Permit renewal for Bay Valley Foods LLC should be approved with the emission limitations, terms and conditions in Permit No. 0079.