Title V Permit Evaluation

Site Number: A2180
Site Name: Gaylord Container Corporation

EMISSION LIMITS AND MONITORING REQUIREMENTS:

PM Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
BOILER: S-1	BAAQMD Regulation 6-301	Ringelmann 1.0	None
	BAAQMD Regulation 6-310	0.15 gr/dscf @ 6% O2	None
	40 CFR 60 Subpart D, 60.42 (a)(1)	0.1 lb/MMBTU	None
	40 CFR 60 Subpart D, 60.42 (a)(2)	20% opacity	None
	BAAQMD Condition #11264, part 5	38,100,000 therms/consecutive 12 months	Fuel meter
LIME STORAGE TANK: S-31	BAAQMD Regulation 6-301	Ringelmann 1.0	Visible Emissions Checks, Records
	BAAQMD Regulation 6-310	0.15 gr/dscf	None
STARCH STORAGE SILOS #1, #2, #3: S-32, S-33, S-34	BAAQMD Regulation 6-301	Ringelmann 1.0	Visible Emissions Checks, Records
	BAAQMD Regulation 6-310	0.15 gr/dscf	None
COMBUSTION TURBINE: S-35	BAAQMD Regulation 6-301	Ringelmann 1.0	None
	BAAQMD Regulation 6-310	0.15 gr/dscf @ 6% O2	None
DUCT BURNER S-36	BAAQMD Regulation 6-301	Ringelmann 1.0	None

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
	BAAQMD Regulation 6-310	0.15 gr/dscf @ 6% O2	None

PM Sources (continued)

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
SANDBLASTING POT: S-46	BAAQMD Regulation 12-4-301	Ringelmann No. 1 <3 min/hr	None
	BAAQMD Regulation 12-4-302	Ringelmann No. 2 <3 min/hr	None

PM Discussion:

S-1: Steam Generator Boiler; 434 MMBTU/hr

Mass Emissions

BAAQMD Regulation 6-310.3 limits filterable PM emissions from "heat transfer operations" to 0.15 gr/dscf @ 6% O_2. This compares to a filterable PM emission factor of 2 lb/MMscf (natural gas fired) for "utility/large industrial boilers (>100 MMBTU/hr)" from EPA AP-42 Table 1.4-1 "Emission Factors For Criteria Pollutants and Greenhouse Gases From Natural Gas Combustion". For a typical natural gas fuel with a gross heating value of 1000 BTU/scf, 0.15 gr/dscf @ 6% O_2 can be converted to lb/MMscf (natural gas fired) as follows:

From 40 CFR 60, Appendix A, Method 19, the stoichiometric dry natural gas combustion factor of 8.710 dscf (combustion products)/scf (natural gas) can be derived from Table 19-1. At 6% excess O_2, this factor becomes:

8.710 x [21%/(21% - 6%)] = 12.194 dscf (c.p.)/scf (n.g.)

Therefore, the conversion of 0.15 gr/dscf @ 6% O_2 to lb/MMscf (n.g.) is:

(12.194 dscf/scf) x (0.15 gr/dscf) x (lb/7000 gr) x (1,000,000 scf/MMscf)

= 261.3 lb/MMscf (n.g.)
= 0.261 lb/MMBTU

Since this factor is so far above the AP-42 factor of 2 lb filterable PM/MMscf (0.002 lb/MMBTU), the addition of periodic monitoring to demonstrate compliance with this limit would not be appropriate.

In addition to the BAAQMD limit, a federal NSPS PM limit of 0.1 lb/MMBTU exists for S-1 *(ref. 40 CFR 60 Subpart D 60.42 (a)(1)).* Applying the same logic as used before, the highest expected PM emission rate from AP-42, 0.002 lb/MMBTU, is only 2% of the limit. Therefore, periodic monitoring for the NSPS standard is not recommended.

Visible Emissions

BAAQMD Regulation 6-301 limits visible particulate emissions to Ringelmann 1.0. In addition, 40 CFR 60 Subpart D 60.42 (a)(2) limits opacity to 20%. Because visible emissions are not normally associated with the proper combustion of natural gas in a boiler and S-1 is required by permit conditions to fire only California PUC standard natural gas, the addition of periodic monitoring for visible emissions limits at S-1 is not recommended.

Note:

Per 40 CFR 60.45 (b)(1), continuous emissions monitoring for PM is not required for fossil fuel fired steam generating units which burn only gaseous fossil fuels.

S-31: Lime Storage Tank; S-32, S-33, and S-34: Starch Storage Silos

These sources are currently subject to a visible emissions limit of Ringelmann 1.0 per Regulation 6-301 and an outlet grain loading limit of 0.15 gr/dscf per Regulation 6-310. They are pneumatically loaded enclosed silos abated by filter baghouses that only have a potential to emit particulate when the silos are being loaded.

The Lime Storage Tank S-31 has a storage capacity of 2090 cubic feet (69 tons of lime). From AP-42 Table 11.12-2, an uncontrolled PM factor of 0.27 lb/ton is given for "cement unloading to elevated storage silo". Assuming a typical (conservative) baghouse abatement efficiency of 98% and that as a worst case the lime tank will be filled and emptied once each day, the highest estimated PM emissions for S-31 will be 136 lb/yr (0.07 tons/yr).

From AP-42 Table 9.9.7-1, a PM emission factor of 0.0014 lb/ton is given for "starch storage bin abated by a fabric filter". The Starch Storage Silos S-32, S-33, and S-34 each have a storage capacity of 74 tons. Assuming as a worst case that each silo is filled and emptied once each day, the total emissions for each silo would be only 38 lb/yr (0.02 tons/yr).

Since the Lime Storage Tank S-31 and the Starch Storage Silos S-32, S-33, and S-34 are expected to have very low mass PM emissions, no periodic monitoring of the Regulation 6-310 grain loading limit is recommended for these sources. However, in order to demonstrate some level of compliance with the Ringelmann #1 limit of Regulation 6-301 it is recommended that permit conditions be added for these sources as follows:

For S-31, Lime Storage Tank

1. Particulate matter emissions during loading operations at the Lime Storage Tank S-31, shall be controlled by the Baghouse A-7. (basis: Regulation 2-1-403)

2. The Baghouse A-7, shall be checked for visible emissions on an annual basis. The visible emissions check shall take place while the equipment is operating and during daylight hours. If any visible emissions are detected, the operator shall take corrective action, and check for visible emissions during the next loading event. If no visible emissions are detected, the operator shall continue to check for visible emissions every year. (basis: Regulation 2-1-403)

3. The operator shall keep records of all visible emissions checks, the person performing

the check, and all maintenance performed on the Baghouse A-7. These records shall be retained for five (5) years and shall be made available to District personnel upon request. (basis: Regulation 2-6-501)

For Sources S-32, S-33, S-34: Starch Storage Silos

1. Particulate matter emissions during loading operations at the Starch Storage Silos S-32, S-33, and S-34, shall be controlled by the Baghouse A-8. (basis: Regulation 2-1-403)

2. The Baghouse A-8, shall be checked for visible emissions on an annual basis. The visible emissions check shall take place while the equipment is operating and during daylight hours. If any visible emissions are detected, the operator shall take corrective action, and check for visible emissions during the next loading event. If no visible emissions are detected, the operator shall continue to check for visible emissions every year. (basis: Regulation 2-1-403)

3. The operator shall keep records of all visible emissions checks, the person performing the check, and all maintenance performed on the Baghouse A-8. These records shall be retained for five (5) years and shall be made available to District personnel upon request. (basis: Regulation 2-6-501)

S-35: Gas Turbine; 37.1 MW, 457 MMBTU/hr

The Gas Turbine S-35 is required by a federally enforceable permit condition to fire only natural gas except during periods of PG&E curtailment. Therefore, because visible emissions are not normally associated with the proper combustion of natural gas, periodic monitoring for Ringelmann limits would not be appropriate for this source. Also, because this is a combustion source, the same Regulation 6-310.3 0.15 gr/dscf @ 6% O_2 limit previously discussed for the Boiler S1 applies here. In like fashion, if the AP-42 PM-10 factors from Table 3.1-2 "Emission Factors For Large Uncontrolled Gas Turbines" (0.042 lb/MMBTU natural gas, 0.061 lb/MMBTU distillate oil) are compared to the converted Regulation 6-310.3 PM limit of 0.261 lb/MMBTU, it is apparent that the Reg 6 limit is far above any expected PM emissions. It would therefore not be appropriate to add periodic monitoring for this standard.

S-36: Duct Burners; 146 MMBTU/hr

The Duct Burners S-36 are required by a federally enforceable permit condition to exclusively fire natural gas. Therefore, visible emissions from this source are not expected. Also, the same issues discussed for the boiler regarding periodic monitoring of PM grain loading (Regulation 6-310.3) exist with the duct burners. Since S-36 has expected PM emissions well below the Regulation 6-310.3 outlet grain loading limit (assuming PM emissions are similar to those of an industrial boiler), no periodic monitoring is recommended.

S-46: Sandblasting Pot

The Sandblasting Pot S-46 is apparently very rarely used (Gaylord reported zero use during the last renewal period). However, because it is subject to Regulation 12, Rule 4 "Sandblasting", it is recommended that the following permit condition be added as an alternative to periodic monitoring of Ringelmann limits:

For S-46, Sandblasting Pot

In order to demonstrate compliance with the "Performance Standards" requirements of Regulation 12-4-304, the operator of the Sandblasting Pot S-46 shall keep records of the performance standard compliance option(s) used. A record shall be made in a District approved log each time S-46 is used at the facility and shall include the following:

a. date and time of sandblasting
b. material or object being sandblasted
c. performance standard(s) used to control particulate emissions

The log shall be kept on site and be available for inspection by District personnel upon request. All records shall be maintained for a period of 5 years from the date on which an entry was made. (basis: Regulation 12-4-304)

VOC Source

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
PAINT SPRAY OPERATION: S-47	BAAQMD Regulation 8-19-302, 312	VOC Limits	Recordkeeping

VOC Discussion:

Recordkeeping required by District regulations is sufficient monitoring for the Paint Spray Operation S-47.

NOx Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
BOILER: S-1	BAAQMD Regulation 9-7-301.1	Gaseous Fuel: 30 ppmv @ 3% O2 (dry)	C.E.M.
	40 CFR 60 Subpart D, 60.44 (a)(1)	0.20 lb/MM BTU, gaseous fossil fuel	C.E.M. (subsumed requirement)
	40 CFR 60 Subpart Db, 60.44b (a)(4)(i)	0.20 lb/MMBTU (HHV) natural gas	C.E.M. (subsumed requirement)
	BAAQMD Condition #11264, part 2	9 ppmv @ 3% O2 (dry) 3 hour rolling average	C.E.M.
	BAAQMD Condition #11264, part 5	38,100,000 therms/consecutive 12 months	Fuel meter
COMBUSTION TURBINE: S-35	BAAQMD Regulation 9-9-301.2	15 ppmv @ 15% O2 (dry)	C.E.M.
	40 CFR 60 Subpart GG 60.332 (a)(1)	90 ppmv @ 15% O2 (dry)	C.E.M. (subsumed requirement)
	BAAQMD Condition #249 part 3	42 ppmv @ 15% O2 (dry) 3 hour rolling average	C.E.M.
	BAAQMD Condition #249 part 5(a)	15 ppmv @15% O_2 (dry) 3 hour rolling average	C.E.M.
	BAAQMD Condition #249 part 5(b)	19 ppmv @15% O_2 (dry) 3 hour rolling average (combined S-35, S-36 limit)	C.E.M.
DUCT BURNER S-36	40 CFR 60 Subpart Db, 60.44b (a)(4)(i)	0.20 lb/MMBTU, natural gas and distillate oil	None
	BAAQMD Condition #249, part 4	30 ppmv @15% O_2 (dry) 3 hour rolling average	C.E.M.

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
	BAAQMD Condition #249 part 5(b)	19 ppmv @15% O_2 (dry) 3 hour rolling average (combined S-35, S-36 limit)	C.E.M.

NOx Discussion:

All NOx sources are subject to continuous emissions monitoring. No additional NOx monitoring is required.

SO2 Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
BOILER: S-1	BAAQMD Regulation 9-301	Ground Level Concentrations: 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, 0.05 ppm averaged over 24 hours	None
	BAAQMD Regulation 9-1-302	300 ppm (dry) general emission limitation	None
COMBUSTION TURBINE: S-35			
	BAAQMD Regulation 9-1-301	Ground Level Concentrations: 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, 0.05 ppm averaged over 24 hours	None
	BAAQMD Regulation 9-1-302	300 ppm (dry) general emission limitation	None
	BAAQMD Regulation 9-1-304	Fuel Sulfur Limit 0.5% (liquid fuels)	Vendor fuel certification
	40 CFR 60 Subpart GG 60.333 (a)	0.015% (vol) @ 15% O2 (dry)	Vendor fuel certification (subsumed requirement)

SO2 Sources (continued)

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
	40 CFR 60 Subpart GG 60.333 (b)	0.8% (wt) fuel sulfur content	Vendor fuel certification (subsumed requirement)
DUCT BURNER S-36	BAAQMD Regulation 9-1-301	Ground Level Concentrations: 0.5 ppm for 3 consecutive minutes, 0.25 ppm averaged over 60 consecutive minutes, 0.05 ppm averaged over 24 hours	None
	BAAQMD Regulation 9-1-302	300 ppm (dry) general emission limitation	None
	BAAQMD Regulation 9-1-304	Fuel Sulfur Limit 0.5% (liquid fuels)	Vendor fuel certification

SO2 Discussion:

Natural gas usage and vendor fuel sulfur content certifications for liquid fuels will provide sufficient assurances of compliance with SO2 emissions limits.

CO Sources

S# & Description	Emission Limit Citation	Federally Enforceable Emission Limit	Monitoring
BOILER: S-1	BAAQMD Regulation 9-7-301.2	Gaseous Fuel: 400 ppmv @ 3% O2 (dry)	C.E.M.
	BAAQMD Condition #11264, part 3	50 ppmv @3% O_2 (dry) 3 hour rolling average	C.E.M.
	BAAQMD Condition #11264, part 5	38,100,000 therms/consecutive 12 months	Fuel meter

CO Discussion:

The Boiler S-1 is currently subject to continuous emission monitoring for CO. No additional CO monitoring is required.

PERMIT SHIELD:

No permit shields were specifically requested by the applicant. However, pursuant to District Regulations 2-6-233 and 2-6-409.12, it has been determined that the following regulations can be subsumed because other applicable requirements in the permit will assure compliance with all applicable emission limits:

Subsumed Requirements

S-1: Boiler

NSPS Subpart D, 40 CFR 60.45 (a) (continuous NOx emissions monitoring)

Continuous NOx monitoring can be superceded by the NOx CEM requirement in BAAQMD Condition 11264, part 9.

NSPS Subpart Db, 40 CFR 60.48b (b) (continuous NOx emissions monitoring)

Continuous NOx monitoring can be superceded by the NOx CEM requirement in BAAQMD Condition 11264, part 9.

- Monitoring for the NSPS Subpart D & Db NOx limit of 0.20 lb/MMBTU is subsumed because of the much lower BACT NOx limit required by BAAQMD Condition #11264 (i.e. 9 ppm @ 3% O2, dry). In order to convert [ppmv at 3% O2 dry] to [lb/MMBTU], the EPA "F Factor" method from 40 CFR 60, Appendix A, Method 19 will is used as follows:

  For measurements on a dry basis for both O2 (% O2 dry) and NOx concentration (Cd), the following equation applies:

  E = CdFd x [20.9/(20.9-%O2 dry)]

  where:

  E = lb/MMBTU
  Cd = lb/scf (ppm NOx) x (1.194E-7; EPA conversion factor)
  Fd = 8,710 scf/MMBTU (EPA factor for natural gas)

Therefore, for a NOx concentration of 9 ppm @ 3% O2 dry, the equivalent emission factor in lb/MMBTU will be:

E = (9 x 1.194E-7)(8,710) x [20.9/(20.9 - 3)]
= 0.011 lb/MMBTU

The NSPS requirements to monitor compliance with NOx limits of 0.20 lb/MMBTU are subsumed by the monitoring for the BACT limit, which is equivalent to 0.011 lb/MMBTU.

S-35: Gas Turbine

NSPS Subpart GG, 40 CFR 60.334(a) (fuel to water monitoring)

Fuel-to-water monitoring can be superceded by the NOx CEM requirement in BAAQMD Condition 249, part 6.

NSPS Subpart GG, 40 CFR 60.334(b)(1) (sulfur monitoring, fuel oil)

Fuel sulfur monitoring can be superceded by BAAQMD Condition 249, part 2, which requires all liquid fuels fired at the turbine to have a sulfur content <0.5% and that the sulfur content be certified by the vendor.

NSPS Subpart GG, 40 CFR 60.334(b)(1) (nitrogen monitoring, fuel oil)

Nitrogen monitoring can be superceded by the NOx CEM requirement in BAAQMD Condition 249, part 6.

NSPS Subpart GG, 40 CFR 60.334(b)(2) (sulfur and nitrogen monitoring, natural gas)

Sulfur and nitrogen monitoring for natural gas can be superceded by BAAQMD Condition 249, part 2 that requires all natural gas fired at the turbine to be PUC quality gas.

NSPS Subpart GG, 40 CFR 60.334(c)(1) (periods of excess emissions, NOX)

Nitrogen monitoring can be superceded by the NOx CEM requirement in BAAQMD Condition 249, part 6.

NSPS Subpart GG, 40 CFR 60.334(c)(2) (periods of excess emissions, SO2, fuel oil)

Fuel sulfur monitoring can be superceded by BAAQMD Condition 249, part 2, which requires all liquid fuels fired at the turbine to have a sulfur content <0.5%.

NSPS Subpart GG, 40 CFR 60.334(c)(2) (periods of excess emissions, SO2, natural gas)

Sulfur and nitrogen monitoring for natural gas can be superceded by BAAQMD Condition 249, part 2 that requires all natural gas fired at the turbine to be PUC quality gas.

ALTERNATE OPERATING SCENARIO:

No alternate operating scenario has been requested for this facility.

COMPLIANCE STATUS:

Gaylord Container has stated that they are in full compliance with all applicable local, state, and federal air quality requirements. The District believes this statement to be accurate.

ALIGNMENT OF INFORMATION IN APPLICATION AND PROPOSED PERMIT:

There are no significant discrepancies in the information provided in the application and that to be used in the proposed Title V Permit.