

Initial Covered Source Permit Review Summary

Application No.: 0785-01

Permit No.: 0785-01-C

Facility Title: Rengo Packaging, Inc.
One (1) 400 hp boiler
91-170 Malakole Street
Kapolei, Hawaii 96707

Mailing Address: Rengo Packaging, Inc.
99-1230 Waiua Place
Aiea, Hawaii 96701

Responsible Official: Mr. Robert Cundiff
President
Ph: 484-5818

Consultant: Jim Morrow
Ph.: 942-9096

Application Date: April 22, 2013

Proposed Project:

SICC 3554 (Paper Industries Machinery)

This is an application for a 400 hp boiler at a facility that will manufacture corrugated shipping containers. Paper rolls will be supplied to the facility to be corrugated and combined into 3 or 5 facing corrugated sheets. The sheets will be utilized in a converting operation for printing and cutting to specific customer order specifications. The boiler operation is utilized to support the corrugator and the combining of the 3 – 5 facings. The three facings are 2 paper liners and 1 corrugating medium paper, and five facings are 3 paper liners and 2 corrugating medium papers. The boilers is utilized to generate steam to the heated vessels and create steam showers for conditioning and boiling of these papers. A corn starch based adhesive is utilized to bond these papers at a predetermined gel temperature, assisted by predetermined paper temperatures during the process. Steam is also used in conditioning the medium papers for corrugating the forming of the flutes. The boiler operates for the sole purpose of the corrugating process. The corrugator is planned to be a one shift operation, five (5) days per week.

An initial covered source application fee of \$1,000.00 for a non-toxic nonmajor covered source was submitted and processed.

PROPOSED

Equipment Description:

<u>Description</u>	<u>Fuel Used</u>
400 HP Cleaver Brooks steam boiler, model no. CB(LE) 200-400-250ST, serial no. T3647-1-1, 16.5 MMBtu/hr (SNG), design capacity - 13,322 lb/hr of steam	SNG (primary), Fuel Oil No. 2 (S ≤ 0.05% by weight) (backup)

Air Pollution Controls:

1. SO₂ – SNG or very low sulfur content fuel oil no. 2 (≤ 0.05% by weight)
2. NO_x – burner design, maintenance and proper operating conditions
3. PM – low ash(metal) content of low sulfur fuel oil and SNG. Also proper combustion to assure maximum oxidation of fuels to CO₂ and H₂O.
4. CO – proper combustion to assure maximum oxidation of carbon to CO₂.
5. VOC – proper combustion to assure maximum oxidation of carbon and hydrogen to CO₂ and H₂O.

Applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11 Chapter 59 - Ambient Air Quality Standards

Title 11 Chapter 60.1 - Air Pollution Control

Subchapter 1 - General Requirements

Subchapter 2 - General Prohibitions

HAR 11-60.1-31 Applicability

HAR 11-60.1-32 Visible Emissions

HAR 11-60.1-38 Sulfur Oxides From Fuel Combustion

Subchapter 5 – Covered Sources

Subchapter 6 - Fees for Covered Sources, Noncovered Sources & Agricultural Burning

HAR 11-60.1-111 Definitions

HAR §11-60.1-112 General Fee Provisions for Covered Sources

HAR §11-60.1-113 Application Fees for Covered Sources

HAR §11-60.1-114 Annual Fees for Covered Sources

HAR §11-60.1-115 Basis of Annual Fees for Covered Sources

Subchapter 8 – Standards of Performance for Stationary Sources

Federal Requirements

40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS), Subpart Dc – Standards of Performance for Small Industrial – Commercial – Institutional Steam Generating Units

Non-Applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11 Chapter 60.1 - Air Pollution Control

Subchapter 7 – Prevention of Significant Deterioration Review

PROPOSED

Subchapter 9 – Hazardous Air Pollutant Sources

Federal Requirements

40 CFR Part 52.21 - Prevention of Significant Deterioration of Air Quality

40 CFR Part 61 - National Emission Standard for Hazardous Air Pollutants (NESHAPS)

40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT), Subpart JJJJJJ, National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers.

This boiler is not subject to Subpart JJJJJJ since it is classified as a gas-fired boiler. A gas-fired boiler includes any boiler that burns gaseous fuels not combined with any solid fuels, burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year.

Prevention of Significant Deterioration (PSD):

This source is not a major stationary source nor are there modifications proposed that constitute a major stationary source by itself, as defined in HAR §11-60.1-131, definition of a major stationary source. Therefore, a PSD review is not applicable.

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is applicable only to new covered sources or significant modifications to covered sources that have the potential to emit or increase emissions above significant levels as defined in HAR §11-60.1-1. The project emissions for the new boiler are below the significant levels. Therefore, a BACT analysis is not applicable.

Pollutant	Potential Emissions (tpy)	Significant Level (tpy)	Significant ?
NO _x	17.21	40	no
SO _x	3.48	40	no
CO	2.67	100	no
PM	1.22	25	no
PM ₁₀	0.96	15	no
VOC	0.136	40	no
Lead	6.18E-04	0.6	no

Compliance Assurance Monitoring (CAM):

Compliance Assurance Monitoring (CAM) is to provide a reasonable assurance that compliance is being achieved with large emissions units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 CFR Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential precontrol emissions that are greater than the major source level [>100 tpy]; and (5) not otherwise be exempt from CAM. CAM is not applicable to the plant since items 1, 2, 3, 4, and 5 do not apply.

PROPOSED

Air Emissions Reporting Requirements (AERR):

40 CFR Part 51, Subpart A – Air Emissions Reporting Requirements, is based on the emissions of criteria air pollutants from Type B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the AERR triggering levels as shown in the table below.

Pollutant	Type B Triggering Levels ¹ (tpy)	Pollutant	In-house Total Facility Triggering Levels ¹ (tpy)	Potential Emissions (tpy)
NO _x	≥ 100	NO _x	≥ 25	17.21
SO _x	≥ 100	SO _x	≥ 25	3.48
CO	≥ 1000	CO	≥ 250	2.67
PM ₁₀ /PM _{2.5}	≥ 100/100	PM/PM ₁₀	≥ 25/25	PM=1.22, PM ₁₀ =0.96, PM _{2.5} =0.413
VOC	≥ 100	VOC	≥ 25	0.136
		HAPs	≥ 5	1.06

¹ Based on potential emissions

This facility does not emit at the AERR triggering levels. Therefore, AERR is not applicable.

Although AERR for the facility is not triggered, the Clean Air Branch requests annual emissions reporting from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels or is a covered source. Annual emissions reporting for the facility will be required for in-house recordkeeping purposes since this is a covered source.

Synthetic Minor:

This source is not a synthetic minor source since individual air pollutant emissions are less than 100 tpy (major source trigger) if this source was to operate 8,760 hr/yr.

Insignificant Activities:

1. One (1) 2,000 gallon fuel oil tank (boiler back-up), exempt per HAR §11-60.1-82(f)(1)
2. One (1) 157 hp fire pump, exempt per HAR §11-60.1-82(g)(6)
3. One (1) 187 gallon fuel tank for fire pump, exempt per HAR §11-60.1-82(f)(1)

Alternative Operating Scenarios:

None proposed in the application.

PROPOSED

Project Emissions:

Emissions for 400 HP Boiler (Fuel Oil Fired)

Pollutant	Emission Factor (lb/1000 gal)	Fuel Consumption (gal/hr)	Emissions (lb/hr)	Hours of Operation (hrs/yr)	Annual Fuel Consumption (gal/yr)	Annual Emissions (tons/yr)
NO _x	35.09 ¹	112.0	3.930	8760	981,120	17.21
CO	5.44 ¹	112.0	0.609	8760	981,120	2.67
SO ₂	7 ²	112.0	0.795	8760	981,120	3.48
VOC	0.28 ¹	112.0	0.031	8760	981,120	0.136
PM ₁₀	1.96 ¹	112.0	0.220	8760	981,120	0.96
PM _{2.5}	0.84 ¹	112.0	0.094	8760	981,120	0.413
PM	2.49 ¹	112.0	0.278	8760	981,120	1.22
Formaldehyde	6.10E-02 ³	112.0	6.83E-03	8760	981,120	2.99E-02
Arsenic	5.60E-04 ⁴	112.0	6.27E-05	8760	981,120	2.75E-04
Beryllium	4.20E-04 ⁴	112.0	4.70E-05	8760	981,120	2.06E-04
Cadmium	4.20E-04 ⁴	112.0	4.70E-05	8760	981,120	2.06E-04
Chromium	4.20E-04 ⁴	112.0	4.70E-05	8760	981,120	2.06E-04
Mercury	4.20E-04 ⁴	112.0	4.70E-05	8760	981,120	2.06E-04
Manganese	8.40E-04 ⁴	112.0	9.41E-05	8760	981,120	4.12E-04
Nickel	4.20E-04 ⁴	112.0	4.70E-05	8760	981,120	2.06E-04
Lead	1.26E-03 ⁴	112.0	1.41E-04	8760	981,120	6.18E-04
Selenium	2.10E-03 ⁴	112.0	2.35E-01	8760	981,120	1.03
HAPS		112.0		8760	981,120	1.06

¹ Based on manufacturer's emissions data

² Based on AP-42, Table 1.3-1 – Criteria Pollutant Emission Factors for Fuel Oil Combustion (5/10), SO₂ = 142S, S=0.05

³ Based on AP-42, Table 1.3-8 – Emission Factors for Nitrous Oxide (N₂O), Polycyclic Organic Matter (POM), and Formaldehyde (HCOH) from Fuel Oil Combustion (5/10)

⁴ Based on AP-42, Table 1.3-10 – Emission Factors for Trace Elements from Distillate Fuel Oil Combustion Sources (5/10)

Emissions for 400 HP Boiler (SNG Fired)

Pollutant	Emission Factor (lb/MMBtu)	Fuel Consumption (MMBtu/hr)	Emissions (lb/hr)	Hours of Operation (hrs/yr)	Annual Emissions (tons/yr)
NO _x	0.063 ¹	16.5	1.04	8760	4.55
CO	0.036 ¹	16.5	0.6	8760	2.63
SO ₂	0.0006 ¹	16.5	0.0099	8760	0.043
VOC	0.004 ¹	16.5	0.066	8760	0.289
PM ₁₀	0.007 ¹	16.5	0.116	8760	0.508
PM _{2.5}	0.007 ¹	16.5	0.116	8760	0.508
TSP	0.007 ¹	16.5	0.116	8760	0.508

¹ Based on manufacturer's emissions data

Greenhouse Gas Mass & Equivalent Emissions

GHG	Emission Factor Oil (lb/1000 gal)	Fuel Consumption (gal/hr)	GHG Emissions (lb/hr)	GHG Emissions (ton/yr)	GWP	CO ₂ e (ton/yr)
CO ₂	22,300	112.0	2,497.6	10,939	1	10,939
N ₂ O	0.26	112.0	0.03	0.13	310	40
CH ₄	0.052	112.0	0.006	0.026	21	0.5
Total				10,939		10,980

PROPOSED

Ambient Air Quality Assessment (AAQA):

A modeling analysis was performed for the proposed boiler using EPA's AERMOD model (ver. 12345), AERMET (ver. 12345 with Honolulu International Airport data, and AERMAP (ver. 11103) with USGS NED data. The BPIP model was used to generate appropriate building dimensions for input into AERMOD. Five (5) years (2005 – 2009) of meteorological data from Honolulu Airport were used in the one-hour (1-hour) NO₂ and SO₂ analyses. One year (2009) of Honolulu meteorological data were used for the other criteria pollutants and averaging times. The one-hour (1-hour) NO₂ and SO₂ model outputs were divided by 1.88 and 2.616, respectively, to convert from µg/m³ to parts per billion (ppb). The results were combined with CY 2011 DOH monitoring data to produce final estimates for comparison with the ambient air quality standards.

Stack Parameters

Unit	Stack Height (m)	Stack Diameter (m)	Stack Velocity (m/s)	Stack Temperature (K)	Stack Flow (m ³ /s)
Boiler	10.67	0.61	9.03	511	2.58

Comparison of Modeled Impacts with NAAQS/SAAQs

Pollutant	Averaging Period	Model Result	Background Concentration	Total Concentration	SAAQs	Percent of SAAQs
SO ₂	1-hr	17.7	19	36.7	75	48.93
	3-hr	30.8	34	64.8	1,300	4.98
	24-hr	18.6	8	26.6	375	7.09
	Annual	10.9	5	15.9	80	19.87
NO ₂	1-hr	63.0	25	88.0	100	88.00
	Annual	41.7	6	47.7	70	68.14
PM ₁₀	24-hr	5.1	51	56.1	150	37.40
	Annual	3.0	16.3	19.3	50	38.60
PM _{2.5}	24-hr	3.5	12.6	16.1	35	46.00
	Annual	2.1	5.3	7.4	15	49.33
CO	1-hr	40.5	1,373	1,414	10,000	14.14
	8-hr	17.9	1,144	1,162	5,000	23.24

Notes:

1. All concentrations are in µg/m³ except for the 1-hr SO₂ and 1-hr NO₂, which are in ppb.
2. Background data from Kapolei monitoring station (CY 2011). For the 1-hr SO₂, the 1st high maximum value was used versus the 3-year average of the 99th percentile values as a conservative value.
3. Only the State Ambient Air Quality Standards (SAAQs) are shown as they are the same or more restrictive than the National Ambient Air Quality Standards (NAAQS).

Significant New Permit Conditions:

1. The boiler is subject to the provisions of the following federal regulations:
 - a. 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS), Subpart A, General Provisions; and
 - b. 40 CFR Part 60, Standards of Performance for New Stationary Sources (NSPS), Subpart Dc, Standards of Performance for Small Industrial – Commercial – Institutional Steam Generating Units.
2. The boiler shall be fired mainly on synthetic natural gas (SNG). The boiler may be fired on fuel oil no. 2 with a maximum sulfur content not to exceed 0.05% by weight during periods of gas curtailment, gas supply emergencies, or periodic testing of fuel oil no. 2. The periodic testing of fuel oil no. 2 shall not exceed a combined total of 48 hours during

PROPOSED

any calendar year. The fuel oil sulfur limit shall apply at all times, including periods of startup, shutdown, and malfunction.

Conclusion and Recommendation:

Recommend issuing an Initial Covered Source Permit (CSP) No. 0785-01-C since this facility should comply with all State and Federal regulations with regards to air pollution, subject to the significant permit conditions shown above. A thirty-day (30-day) public comment period and forty five-day (45-day) EPA review period is also required.

Reviewer: Darin Lum
Date: 6/2013