

COVERED SOURCE PERMIT REVIEW 0278-02-C

Application No. 0278-05

APPLICANT: U.S. Dry Cleaning Corporation, DBA Young Laundry

**MAILING ADDRESS/
LOCATION:** 1930 Auiki Street
Honolulu, HI 96819
UTM Coordinates (NAD 83, zone 4)
616,017 m East; 2,342,427 m North

RESPONSIBLE OFFICIAL Mr. Michael E, Drace
General Manager
808-836-1661

OTHER CONTACT Mr. Jim Fox
Chief Engineer
808-836-1661

SIC CODE: 7211 (Power Laundries, Family and Commercial)

Proposed Project:

The subject application seeks to permit two boilers located at U.S. Dry Cleaning Corporation's Young Laundry facility on Auiki Street in Honolulu.. The boilers are fired primarily with yellow grease, with Fuel Oil no. 2 as backup fuel. The primary boiler is rated at 125 hp, and the backup boiler is rated at 300 hp. The boilers are not operated at the same time. Fuel Oil no. 2 used as backup fuel will contain no more than 15 ppm Sulfur (0.0015% by weight). The yellow grease is supplied by Island Commodities. No other operational restrictions have been proposed. The facility was previously permitted as a noncovered source pursuant to Noncovered Source Permit (NSP) No. 0278-01-N.

The applicant is also requesting that an existing covered source general permit CSP 0094-01-CG, which permits a Large Area Source dry cleaning facility, be incorporated with the boilers into a single permit.

The boilers provide hot water and steam for the facility. Due to the size and installation date (1995) of boiler number B-2, it is subject to 40 CFR Part 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. Boiler number B-1 was installed in 2005, but is not subject to subpart Dc due to its rated capacity being less than 10 MMBtu/hr.

Equipment:

The boilers to be permitted consist of the following:

Unit No.	Description	Model No.	Serial No.	Heat Input
B-1	125 hp Johnston Boiler	PFMA-125-3LHP-150S	10431	5.23 MMBtu/hr
B-2	300 hp Johnston Boiler	PFTA-300-4LG-150S	947-01	12.54 MMBtu/hr

Air Pollution Controls:

The boilers are not equipped any air pollution control devices.

Applicable Requirements:

Hawaii Administrative Rules (HAR):

Chapter 11-59, Ambient Air Quality Standards

Chapter 11-60.1 Air Pollution Control

Subchapter 1, General Requirements

Subchapter 2, General Prohibitions

11-60.1-31 Applicability

11-60.1-32 Visible Emissions

11-60.1-38 Sulfur Oxides from Fuel Combustion

Subchapter 5, Covered Sources

Subchapter 6, Fees for Covered Sources, Noncovered Sources, and Agricultural Burning

11-60.1-111 Definitions

11-60.1-112 General Fee Provisions for Covered Sources

11-60.1-113 Application Fees for Covered Sources

11-60.1-114 Annual Fees for Covered Sources

Subchapter 8, Standards of Performance for Stationary Sources

11-60.1-161 New Source Performance Standards

NSPS Applicability:

The facility is subject to the following New Source Performance Standards (NSPS):

- 40 CFR Part 60 Subpart A, *General Requirements*
- 40 CFR Part 60 Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.*

The NSPS subparts are applicable to unit B-2 because its maximum design heat input capacity (12.54 MMBtu/hr) is between 10 and 250 MMBtu/hr, and that construction commenced after June 9, 1989.(commenced May 5, 1995) The subparts do not apply to unit B-1 because the maximum design heat capacity (5.23 MMBtu/hr) is less than 10 MMBtu.

The applicable sections of the CFR are discussed below.

§60.42c(d) (Standard for sulfur dioxide):

“On and after the date on which the initial performance test is completed or required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that combusts oil shall cause to be discharged into the atmosphere from that affected facility any gases that contain SO₂ in excess of 215 ng/J (0.50 lb/MMBtu) heat input; or, as an alternative, no owner or operator of an affected facility that combusts oil shall combust oil in the affected facility that contains greater than 0.5 weight percent sulfur. The percent reduction requirements are not applicable to affected facilities under this paragraph.”

Since the applicant plans to use fuel oil with a sulfur content of 0.0015% by weight, the applicant will comply with the sulfur weight limit in place of the emission limit.

§60.43c(e)(4) (Standard for particulate matter):

“On and after the date on which the initial performance test is completed or is required to be completed under §60.8, whichever date comes first, an owner or operator of an affected facility that commences construction, reconstruction, or modification after February 28, 2005, and that combusts only oil that contains no more than 0.50 weight percent sulfur or a mixture of 0.50 weight percent sulfur oil with other fuels not subject to a PM standard under §60.43c and not using a post-

combustion technology (except a wet scrubber) to reduce PM or SO₂ emissions is not subject to the PM limit in this section.”

The applicant plans to use cooking grease and low sulfur fuel oil to fire the boilers. The sulfur content of both fuels is less than 0.5 weight percent. Therefore the boiler is exempt from the standard for particulate matter.

§60.43c(c) (Standard for opacity):

“On and after the date on which the initial performance test is completed or required to be completed under §60.8, whichever date comes first, no owner or operator of an affected facility that can combust coal, wood, or oil and has a heat input capacity of 8.7 MW (30 MMBtu/hr) or greater shall cause to be discharged into the atmosphere from that affected facility any gases that exhibit greater than twenty (20) percent opacity (6-minute average), except for one 6-minute period per hour of not more than twenty-seven (27) percent opacity. Owners and operators of an affected facility that elect to install, calibrate, maintain, and operate a continuous emissions monitoring system (CEMS) for measuring PM emissions according to the requirements of this subpart and are subject to a federally enforceable PM limit of 0.030 lb/MMBtu or less are exempt from the opacity standard specified in this paragraph.”

The subject boiler is not subject to the Federal opacity requirements because the heat input capacity (12.54 MMBtu/hr) is less than the 30 MMBtu/hr minimum stated in the rule.

§60.48c (Reporting and recordkeeping requirements)

The boiler is subject to the following reporting and recordkeeping requirements:

1. Date of construction and notification of startup
2. visible emission records
3. fuel supplier certification
4. daily use records for each boiler and type of fuel

Non-applicable Requirements:

MACT and NESHAPS Applicability:

The boilers do not exceed major source levels for any Hazardous Air Pollutants (HAPs). Therefore, 40 CFR Part 61 National Emissions Standards for Hazardous Air Pollutants (NESHAPS) and 40 CFR Part 63 National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT) are not applicable requirements.

CAM applicability:

The facility is not subject to Compliance Assurance Monitoring since it is not a major stationary source.

PSD Applicability:

PSD does not apply since this facility is not a major stationary source of air pollution.

BACT Applicability:

A Best Available Control Technology (BACT) analysis is required for new or modified sources if the net increase in pollutant emissions exceeds significant levels as defined in HAR §11-60.1-1.

Comparison of Emissions to Significant Levels		
Pollutant	Significant Level (tpy)	Calculated Emissions (tpy)
Carbon Monoxide	100	40.16
Nitrogen Oxides	40	11.96
Sulfur dioxide	40	2.85
Particulate matter	A total of 25 tpy(PM) or 15 tpy (PM ₁₀)	3.5 (PM ₁₀)
Ozone	40 of VOC	2.47
Lead	0.6	4.94E-04
Asbestos	0.007	0
Beryllium	0.0004	0.000165
Mercury	0.1	0.000165
Vinyl Chloride	1	0
Fluorides	3	0
Sulfuric acid mist	7	0
Total reduced sulfur	10	0
Reduced sulfur compounds	10	0

Applicability of Part 51, Subpart A, Emission Inventory Reporting Requirements - Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines the applicability of compliance emissions reporting (CER) based on the emissions of each air pollutant from the facility that emits at the CER triggering levels show in the table below:

Minimum Point Source Reporting Thresholds by Pollutant

Pollutant	Annual Cycle Type A Sources (tpy)	Three-Year Cycle Type B Sources (tpy)	Facility Emissions (tpy)
SO _x	≥ 2500	≥ 100	2.85
VOC	≥ 250	≥ 100	2.47
NO _x	≥ 2500	≥ 100	11.98
CO	≥ 2500	≥ 1000	40.16
Pb		≥ 5	4.94e-04
PM ₁₀	≥ 250	≥ 100	0.70
PM _{2.5}	≥ 250	≥ 100	0.41

The shows that both the type A and type B triggering levels will not be exceeded. Therefore, the facility is not subject to CER reporting requirements.

Synthetic minor applicability:

A synthetic minor is a facility that without limiting conditions, physical or operational, emits above the “major” source triggering levels as defined by HAR 11-60.1-1 for either criteria pollutant(s) or hazardous air pollutant(s) but is made non-major through the inclusion of limiting conditions in the permit. Although the facility is limited to operating only one boiler at a time, the simultaneous operation of both boilers will not generate emissions that exceed major source levels. Therefore, the facility is not a synthetic major source.

Insignificant Activities:

Insignificant activities identified in the application consists of a 5,000 gallon diesel no. 2 fuel tank and a 5,000 pound yellow grease fuel tank. The activities are deemed insignificant pursuant to HAR 11-60.1-82(f)(1).

Alternate Operating Scenarios:

The applicant does not propose any alternate operating scenarios.

Project Emissions:

To determine worst-case emissions from the facility, the emissions from the 300 hp boiler were calculated. Since the boilers can be fired primarily with either yellow grease or fuel oil no. 2, the emission factors for each fuel type were compared, and the higher emission factor was used. The following table shows the pollutants for which emission rates were compared:

Fuel Oil 2 Heating Value = 137,030 BTU/gal

Pollutant	Yellow Grease Emission Factor (lb/MMBtu)	Fuel Oil No. 2 Emission Factor (lb/1000 gal)	Fuel Oil No. 2 Emission Factor (lb/MMbtu)	Emission Factor used (lb/MMbtu)
NO _x	0.218	20.000	0.1460	0.218
CO	0.731	5.000	0.0365	0.731
PM	0.064	2.000	0.0146	0.064
VOC	0.045	0.340	2.48E-03	0.045

Since the lb/MMBtu emission factors for yellow grease are greater than the emission factors for fuel oil no. 2, yellow grease emission factors will be used to calculate the emissions for NO_x, CO, PM, and VOC. All other emission factors are for fuel oil no. 2 and were obtained from AP-42, section 1.3, Fuel Oil Combustion. Emission calculations are not required for the large area dry cleaning equipment.

The following tables show worst case emissions for the 300 hp boiler firing either yellow grease or fuel oil no. 2.

Worst Case Emissions from Yellow Grease

Pollutant	Emission Factor (lb/MMBtu)	EMISSIONS			
		(lb/hr)	(g/s)	Limited (TPY)	Max (TPY)
NO _x	0.22	2.73	0.34	11.98	11.98
CO	0.73	9.17	1.16	40.16	40.16
PM	0.06	0.80	0.10	3.52	3.52
VOC	0.05	0.56	0.07	2.47	2.47

Worst Case Emissions from Fuel Oil No. 2

Pollutant	Emission Factor (lb/1,000 gal)	EMISSIONS			
		(lb/hr)	(g/s)	Limited (TPY)	Max (TPY)
SO _x	0.00213	1.95E-04	2.46E-05	8.54E-04	8.54E-04
TOC	0.252	0.023	0.003	0.101	0.101
Methane	0.052	0.005	0.001	0.021	0.021
NMTOC	0.2	0.018	0.002	0.080	0.080

HAP Emissions (fuel oil 2)

HAP	Emission Factor (lb/1,000 gal)	EMISSIONS			
		(lb/hr)	(g/s)	Limited (TPY)	Max (TPY)
Benzene	2.14E-04	1.96E-05	2.47E-06	8.58E-05	8.58E-05
Ethylbenzene	6.36E-05	5.82E-06	7.33E-07	2.55E-05	2.55E-05
Formaldehyde	3.30E-02	3.02E-03	3.80E-04	1.32E-02	1.32E-02
Naphthalene	1.13E-03	1.03E-04	1.30E-05	4.53E-04	4.53E-04
1,1,1-Trichloroethane	2.36E-04	2.16E-05	2.72E-06	9.46E-05	9.46E-05
Toluene	6.20E-03	5.67E-04	7.15E-05	2.48E-03	2.48E-03

HAP	Emission Factor (lb/10 ¹² BTU)	EMISSIONS			
		(lb/hr)	(g/s)	Limited (TPY)	Max (TPY)
As	4	5.02E-05	6.32E-06	2.20E-04	2.20E-04
Be	3	3.76E-05	4.74E-06	1.65E-04	1.65E-04
Cd	3	3.76E-05	4.74E-06	1.65E-04	1.65E-04
Cr	3	3.76E-05	4.74E-06	1.65E-04	1.65E-04
Pb	9	1.13E-04	1.42E-05	4.94E-04	4.94E-04
Hg	3	3.76E-05	4.74E-06	1.65E-04	1.65E-04
Mn	6	7.52E-05	9.48E-06	3.30E-04	3.30E-04
Ni	3	3.76E-05	4.74E-06	1.65E-04	1.65E-04
TOTAL HAPS				1.96E-02	1.96E-02

Air Quality Assessment:

To verify that the operation of either boiler with either yellow grease or fuel oil no. 2 will not violate State or Federal ambient air quality standards, an ambient air quality impact analysis using the EPA SCREEN3 model was completed for the operation of each boiler on an individual basis. No modeling is required for the dry cleaning equipment. Each model run used the following assumptions:

- Simple terrain
- Full Meteorology
- Rural option
- 298K ambient temperature
- ARM of 0.8 used for hourly NO to NO₂ conversion.(per 3/1/11 memo from EPA)
- Background concentrations are worst-case values from statewide monitoring stations.

The model run for the 300 HP boiler used the following parameters:

300 hp Boiler Stack Parameters				
Emission Rate (g/s)	Height (m)	Temp. (k)	Velocity (m/s)	Diameter (m)
1.0	10.06	451.95	2.20	0.4572

The model run for the 125 hp boiler used the following parameters:

125 hp Boiler Stack Parameters				
Emission Rate (g/s)	Height (m)	Temp. (k)	Velocity (m/s)	Diameter (m)
1.0	10.65	451.95		0.4572

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Due to the fact that the facility is limited by permit condition to operate only one boiler at a time, each boiler was analyzed individually to determine compliance with State and Federal Ambient Air Quality Standards. The maximum predicted concentrations from each boiler are as follows:

300 hp boiler

Normalized Concentration =			206	$\mu\text{g}/\text{m}^3$ per g/s				
Pollutant	Avg. Period	Emission Rate (g/s)	Time Factor	CONCENTRATION ($\mu\text{g}/\text{m}^3$)				% of std.
				Conc.	Bkgrnd ²	Total	Std	
CO	1-HR	1.155	1	237.97	2,519	2,757	10,000	27.6
	8-HR	1.155	0.7	166.58	1,145	1312	5,000	26.2
NO _x	1-HR ^a	0.345	1	56.77	56.4	113	188	60.2
	Ann.	0.345	0.2	14.19	8	22	70	31.7
PM ₁₀	24-HR	0.101	0.4	8.33	61	69	150	46.2
	Ann.	0.101	0.2	4.17	18	22	50	44.3
PM ₂₅	24-HR	0.101	0.4	8.33	14	22	35	63.8
	Ann.	0.101	0.2	4.17	5.7	10	15	65.8
SO ₂	1-HR	0.002	1	0.51	17	18	75	23.3
	3-HR	0.002	0.9	0.46	24	24	1,300	1.9
	24-HR	0.002	0.4	0.20	13	13	365	3.6
	Ann.	0.002	0.2	0.10	3	3	80	3.9

125 HP Boiler

Normalized Concentration =			929.1	$\mu\text{g}/\text{m}^3$ per g/s				
Pollutant	Avg. Period	Emission Rate (g/s)	Time Factor	CONCENTRATION ($\mu\text{g}/\text{m}^3$)				% of std.
				Conc.	Bkgrnd ²	Total	Std	
CO	1-HR	0.4813	1	447.21	2,519	2,966	10,000	29.7
	8-HR	0.4813	0.7	313.04	1,145	1458	5,000	29.2
NO _x	1-HR ^a	0.1435	1	106.69	56.4	163	188	86.8
	Ann.	0.1435	0.2	20.00	8	28	70	40.0
PM ₁₀	24-HR	0.0421	0.4	15.66	61	77	150	51.1
	Ann.	0.0421	0.2	7.83	18	26	50	51.7
PM ₂₅	24-HR	0.0421	0.4	15.66	14	30	35	84.7
	Ann.	0.0421	0.2	7.83	5.7	14	15	90.2
SO ₂	1-HR	0.0011	1	1.02	17	18	75	24.0
	3-HR	0.0011	0.9	0.92	24	25	1,300	1.9
	24-HR	0.0011	0.4	0.41	13	13	365	3.7
	Ann.	0.0011	0.2	0.20	3	3	80	4.0

The predicted impacts from the operation of the Young Laundry boilers are within State and Federal Ambient Air Quality Standards.

Significant Permit Conditions:

None

Conclusion:

The facility is in compliance with applicable State and Federal regulations. Recommend issuance of permit.

Kevin Kihara
April 19, 2011