

PROPOSED

Application No. 0442-05 Reviewed by: CS

December 6, 2004

Noncovered Source Permit (NSP) No. 0442-02-C Review
Application for Renewal No. 0442-05

Applicant: United Laundry Services, Inc.

Equipment Description:

Two (2) 500 HP (20.925 MMBtu/hr input) synthetic natural gas (SNG) / fuel oil no. 2 fired Cleaver-Brooks steam-generating boilers (model nos. CB-LE-200-500-250)

Boiler No. 1 - serial no. OLO98602; and
Boiler No. 2 - serial no. OLO98601

Equipment Location/Mailing Address: 2291 Alahao Place
Honolulu, Hawaii 96819 (Oahu)

Point of Contact: Howard Najita
Plant Manager
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Proposed Project:

This renewal application is for the continuing operation of two (2) 500 HP boilers that were manufactured in 1997. The purpose of the boilers is to provide steam for the operations of the laundry business (predominantly the cleaning of linen and towels from hospitals and hotels). The steam will be used for the washers as well as the dryers. When sufficient steam is produced and stored, the boilers will switch to low-fire mode. The individual boiler heat input for low-fire mode is 5.23 MMBtu/hr and the high-fire mode is 20.925 MMBtu/hr. Since the boilers are between 10 and 100 MMBtu/hr, they are considered industrial boilers. Initially SNG was the primary fuel, with liquefied petroleum gas (LPG) as back-up. However, following several modifications to the permit, fuel oil no. 2 became the primary fuel with SNG being the back-up. Since the usage of fuel oil no. 2, the boilers became subject to NSPS Subpart Dc and Covered Source Permitting. The **Project Emissions** section will show the total increase in emissions due to the use of fuel oil no. 2 and the worst case total potential emissions.

No change is proposed for this permit renewal.

The Standard Industrial Classification Code (SICC) is 7218 - Industrial Launderers. A similar facility was recently permitted as Noncovered Source Permit No. 0565-01-N for United Laundry Services - Kona, LLC. That facility is not subject to Federal regulations due to the boiler sizes.

This review for a Renewal to a Non-Toxic Covered Source Permit is based on the application dated 6/19/03. The application fee of \$500 will be processed with the issuance of this permit. Also, CSP No. 0442-02-C dated 6/24/99 and its amendments dated 7/24/01 and 8/20/02 will be superseded upon issuance of this permit.

Applicable Requirements:

Hawaii Administrative Rules (HAR) Title 11 Chapter 59

Hawaii Administrative Rules (HAR) Title 11 Chapter 60.1:

Subchapter 1 - General Requirements

Subchapter 2 - General Prohibitions

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, Sections 111-115

Subchapter 8 - New Source Performance Standards

NSPS 40 CFR Part 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units because these boilers were constructed after June 9, 1989, are greater than 10 MMBtu/hr, and will be fired on fuel oil no. 2.

Compliance Data System (CDS) because this is a covered source.

Non-Applicable Requirements:

40 CFR Part 61 and 63 - National Emission Standard for Hazardous Air Pollutants (NESHAPS) and Maximum Achievable Control Technology (MACT) since the facility is not a major source of hazardous air pollutants (HAPS) emissions (10 tpy of individual or 25 tpy of a combination of HAPs).

Prevention of Significant Deterioration (PSD) since this is not a major stationary source.

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 1,3, 4, and 5 do not apply.

Consolidated Emissions Reporting Rule (CERR) since the potential individual criteria pollutant emissions from the facility is less than 100 tpy each when restricted to the operational limits. However, internal annual emissions reporting is required since potential SO₂ emissions is greater than 25 tpy.

A Best Available Control Technology (BACT) analysis is required for new sources or modifications to existing sources that would result in a net significant emissions increase as defined in HAR, Section 11-60.1-1. This is an existing source with no change in emissions. Therefore, a BACT analysis was not performed.

Synthetic Minor since individual air pollutant emissions is less than 100 tpy (Major Source) if this source was to operate 8,760 hr/yr.

Insignificant Activities/Exemptions:

The 3,000 gallon fuel no. 2 storage tank is exempt pursuant to HAR 11-60.1-82(f)(1) for fuel storage tanks less than 40,000 gallons capacity.

The 7,000 gallon NaOH tank and related tanks storing cleaning solutions and hot water are exempt pursuant to HAR 11-60.1-82(f)(7) for insignificant air pollutant emissions.

Alternative Operating Scenarios:

None proposed by the applicant.

Project Emissions:

There is no change in emissions since there are no proposed changes in equipment or operations. The previous permit review for application no. 0442-04 calculated the total increase in emissions for 1 million gal/yr of fuel oil no. 2. Potential emissions for the fuel oil no. 2 were less than significant levels. Therefore, BACT was not triggered. For details, refer to application no. 0442-04. **TABLE 1** shows the total worst case emissions for this facility using fuel oil no. 2 and SNG. The worst case scenario includes using 1 million gallons of fuel oil no. 2 and SNG for the remainder of the year or SNG for the entire year. Both boilers may operate continuously and simultaneously.

Fuel Oil No. 2 Emission Factors

Manufacturer's data was used for criteria pollutants except for SO₂ and PM_{2.5}. AP-42 emission factors section 1.3, 9/98 was used for SO₂, PM_{2.5}, and HAPs. The emission factor from Table No. 1.3-6 was used to calculate PM_{2.5} for industrial boilers. Therefore: 0.25 lb/1,000 gal x 1,000,000 gal/yr x 1 ton/2,000 lbs = 0.13 tpy PM_{2.5}

SNG Emission Factors

Manufacturer's data was used for criteria pollutants except for PM₁₀ and PM_{2.5}. AP-42 emission factors section 1.4, 7/98 was used for HAPs. PM₁₀ and PM_{2.5} were assumed to equal PM since there are no emission factors available.

**TABLE 1
POTENTIAL FACILITY EMISSIONS**

Pollutant	Fuel Oil No. 2¹ (tpy)	SNG² (tpy)	SNG Equivalent to Fuel Oil No. 2³ (tpy)	Worst Case⁴ (tpy)	Significant Levels (tpy)
SO₂	35.50	0.18	0.07	35.61	40
NO_x	17.36	12.96	4.95	25.37	40
CO	4.89	27.51	10.51	27.51	100
PM	1.68	1.83	0.70	2.81	25
PM₁₀	0.84	1.83	0.70	1.97	15
PM_{2.5}	0.13	1.83	0.70	1.83	n/a
VOC	1.75	2.93	1.12	3.56	40
Total HAPs:	0.04	0.34	0.13	0.34	n/a

Note:

1. Includes using 1,000,000 gal/yr of fuel oil no. 2 by any of the 2 boilers.
2. Includes using SNG continuously all year for 2 boilers.
3. Includes using the amount of SNG that would have been used in lieu of 1,000,000 gal/yr of fuel oil no. 2. Factor used is 0.382 of column 3 (continuous SNG).

Sample calc: $0.18 \times 0.382 = 0.07$ tpy of SO₂.

where 0.382 is the ratio of 1,000,000 gallons of fuel oil no. 2 over the maximum potential for 2 boilers.

4. This includes the worst case scenario of using 1,000,000 gallons of fuel oil no. 2 and SNG for all 2 boilers. If col. 2 is greater than col. 4, then col. 2 + col. 3 - col. 4, otherwise col. 3.

Sample calc: 17.36 tpy is greater than 4.95 tpy, therefore $17.36 \text{ tpy} + 12.96 \text{ tpy} - 4.95 \text{ tpy} = 25.37 \text{ tpy NO}_x$.

As shown in **TABLE 1**, the CO, PM_{2.5}, and HAPs emissions for SNG were the worst case scenarios.

Sample calc: 4.89 tpy is less than 10.51 tpy, therefore 27.51 tpy CO.

Ambient Air Quality Assessment (AAQA):

Since there is no change in emissions, a new AAQA was not required for this review. An ISCST3 modeling program was used to determine source compliance with National and State ambient air quality standards (NAAQS and SAAQS). The model, methodology, and assumptions employed in the AAQA have been determined to be consistent with State and Federal guidelines and are discussed in the previous permit review for application no. 0442-04. This review included maximum concentrations using 1,000,000 gallons of fuel oil no. 2 only. Therefore, maximum CO concentrations were calculated by using the CO concentrations for SNG (worst case scenario).

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**TABLE 2
SOURCE EMISSION RATES AND STACK PARAMETERS FOR AIR MODELING**

Source		Emission Rates ¹					Stack Parameters			
Equipment	Stack No.	SO ₂ (g/s)	NO _x (g/s)	CO (g/s)	PM ₁₀ (g/s)	Pb (g/s)	Height ⁴ (m)	Temp. ⁵ (K)	Velocity ⁵ (m/s)	Diameter (m)
500 HP Boiler	1	1.335	0.653	0.395	0.031	--	15.24	505	11.6	0.609
500 HP Boiler	2	1.335	0.653	0.395	0.031	--	15.24	505	11.6	0.609

Note:

1. The CO emission rate is for SNG consumption and all others are for fuel oil no. 2 (worst case scenarios). CO emission rate is 0.183 g/s for fuel oil no. 2.
2. The stack height reflect actual conditions.
3. The stack temperature and velocity are for the combustion of fuel oil no. 2 only.

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TABLE 3
PREDICTED AMBIENT AIR QUALITY IMPACTS

Air Pollutant	Averaging Time	Impact ¹ ($\mu\text{g}/\text{m}^3$)	Background ² ($\mu\text{g}/\text{m}^3$)	Total Impact ($\mu\text{g}/\text{m}^3$)	Air Standard ($\mu\text{g}/\text{m}^3$)	Percent Standard	Impact Location (R) ³
SO ₂	3-Hour	526	65	591	1300	45%	615110,2259030
	24-Hour	228	9	237	365	65%	615050,2258940
	Annual ⁴	42	1	43	80	54%	615050,2258940
NO ₂ ⁵	Annual ⁴	21	9	30	70	43%	615050,2258940
CO ⁶	1-Hour	179	3990	4169	10000	42%	615080,2259000
	8-Hour	127	1753	1880	5000	38%	615080,2259000
PM ₁₀	24-Hour	5.4	65	70	150	47%	615050,2258940
	Annual ⁴	1	15	16	50	32%	615050,2258940
Pb ⁷	Calendar Quarter	--	--	--	1.5	0%	--
H ₂ S ⁷	1-Hour	--	--	--	35	0%	--

Note:

1. The impact concentrations are the maximum emissions for the two (2) boilers operating simultaneously.
2. The background concentrations are average values for CY 2000 at Kapolei for NO₂, Liliha for PM₁₀, and Honolulu for all others.
3. (R) = (meters east, meters north) the UTM coordinates of the receptor locations.
4. The Annual concentrations are based on operating at maximum capacity for 1,000,000 gal/yr of fuel oil no. 2.
5. Assumed all NO_x concentrations = NO₂.
6. CO concentrations were calculated using concentrations from fuel oil no. 2 and factoring the emission rates from SNG/fuel oil no. 2 (0.395/0.183).

Sample calc: $83 \mu\text{g}/\text{m}^3 \times 0.395 \text{ g/s} / 0.183 \text{ g/s} = 179 \mu\text{g}/\text{m}^3$ 1-hr average CO

Sample calc: $59 \mu\text{g}/\text{m}^3 \times 0.395 \text{ g/s} / 0.183 \text{ g/s} = 127 \mu\text{g}/\text{m}^3$ 8-hr average CO

7. Pb and H₂S emissions are assumed to be negligible at this facility.

Other Issues:

See ENCLOSURE 1 for pictures during the 11/19/04 site visit with Howard Najita.

Significant Permit Conditions:

1. The total fuel oil no. 2 consumption by the two (2) boilers shall not exceed 1,000,000 gallons in any rolling twelve (12) month period.
2. Standard boiler conditions.

Conclusion and Recommendation:

In conclusion, it is the Department of Health's preliminary determination that the facility will comply with all State and Federal laws, rules, regulations, and standards with regards to air pollution. Therefore, a renewal for CSP No. 0442-02-C for United Laundry Services, Inc. is recommended based on the information provided in the air permit application and subject to the following:

1. Above special permit conditions;
2. 30-day public review period; and
3. 45-day EPA review period.