

Minor Modification to a Covered Source
Review Summary

Application File No.: 0097-05 (Minor Modification)

Permit No.: 0097-01-C

Applicant: Kauai Island Utility Cooperative (KIUC)

Facility: Port Allen Generating Station
4392 Waialo Road
UTM Coordinates: 2,422,222 N, 439,251.6 E
Eleele, Kauai, Hawaii 96705

Mailing Address: Kauai Island Utility Cooperative
4463 Pahee Street, Suite 1
Lihue, Hawaii 96766-2000

Responsible Official: Mr. Randall Hee
President and Chief Executive Officer
Kauai Island Utility Cooperative
(808) 246-8246

Point of Contact: Russ Santiago
Operations Superintendent
Kauai Island Utility Cooperative
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Nancy Matthews
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1801 J Street
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Application Dates: August 8, 2008

Proposed Project:

The Standard Industrial Classification (SIC) Code is 4911 under *Electric Services*.

This application is for a minor modification of Covered Source Permit (CSP) No. 0097-01-C, issued on September 23, 2005. A check for \$200.00 was submitted by the applicant for a minor modification of a covered source (PSD source) and processed.

Kauai Island Utility Cooperative (KIUC) currently has approval to burn up to 15,000 gallons per month (180,000 gallons per year) of specification used oil, with a maximum sulfur content of 2% by weight, in the steam boiler. Only specification used oil generated at the Port Allen Generating Station is allowed to be burned. The following changes to the permit are proposed:

PROPOSED

- Increase the quantity of specification used oil that can be burned in the boiler by 820,000 gallons per year, to a total of one million gallons per year;
- Reduce the allowable sulfur content of the specification used oil burned in the boiler to 0.5% weight;
- Reduce the allowable lead content of the specification used oil burned in the boiler to 50 ppm;
- Accept specification used oil from an outsider supplier; and
- Require that virgin oil remain a majority of the fuel fired in the boiler.

The additional specification used oil would be provided by Unitek Solvent Systems, Inc. Unitek collects waste oil from facilities in Hawaii, then cleans it using a combination dehydration and filtration process to produce a high quality recycle fuel that meets the State and Federal requirements for specification used oil. Unitek spec used oil has been approved by the Department of Health for use at other facilities in Hawaii.

Alternate Operating Scenarios:

No change from the previous covered source renewal application regarding any alternate operating scenarios.

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 Dioxides from Fuel Combustion
Subchapter 5	Covered Sources
Subchapter 6	Fees for Covered Sources, Noncovered Sources, and 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

Non-applicable Requirements:

Hawaii Administrative Rules (HAR)

Title 11, Chapter 60.1	Air Pollution Control
Subchapter 7	Prevention of Significant Deterioration

PROPOSED

Subchapter 8
Subchapter 9

Standards of Performance for New Stationary Sources (NSPS)
Hazardous Air Pollution Sources

40 CFR Part 61 - National Emission Standards for Hazardous Air Pollutants (NESHAP)

40 CFR Part 63 - National Emission Standards for Hazardous Air Pollutants for Source Categories (Maximum Achievable Control Technologies (MACT) Standards)

Prevention of Significant Deterioration (PSD):

PSD is not applicable because this facility is not a *new* major stationary source nor does this application propose any modifications that by itself constitute a major stationary source that is subject to PSD review. Therefore, PSD is not applicable.

Best Available Control Technology (BACT):

A Best Available Control Technology (BACT) analysis is required for new covered sources or significant modifications to covered sources that have the potential to emit or a net emissions increase above significant levels as defined in HAR §11-60.1-1. Since this is not a new source nor are any modifications proposed that will cause a significant net increase in emissions, a BACT analysis is not required. See the table below.

Pollutant	Net Emissions Increase (tpy)	Significant Level (tpy)	Significant?
NO _x	0	40	no
SO ₂	- 13.8	40	no
CO	0	100	no
PM	0	25	no
PM ₁₀	0	15	no
VOC	0	40	no

Consolidated Emissions Reporting Rule (CERR):

40 CFR Part 51, Subpart A - Emission Inventory Reporting Requirements, determines CER based on the emissions of criteria air pollutants from Type A or Type B point sources (as defined in 40 CFR Part 51, Subpart A), that emit at the CER triggering levels as shown in the table below.

PROPOSED

Pollutant	Type A CER Triggering Levels ¹ (tpy)	Type B CER Triggering Levels ¹ (tpy)	Pollutant	In-house Total Facility Triggering Levels ² (tpy)	Total Facility Emissions (tpy)
NO _x	≥2500	≥100	NO _x	≥25	6240.1
SO ₂	≥2500	≥100	SO ₂	≥25	2092.4
CO	≥2500	≥1000	CO	≥250	1102.3
PM ₁₀ /PM _{2.5}	≥250/≥250	≥100/100	PM/PM ₁₀	≥25/25	PM = 279.8 PM ₁₀ = 269.2 PM _{2.5} = 269.2
VOC	≥250	≥100	VOC	≥25	485.1
			HAPS	≥5	18.67

¹ Based on actual emissions
² Based on potential emissions

This facility emits at the CER triggering levels. Therefore, CER requirements are applicable.

The Clean Air Branch also requests annual emissions reporting from those facilities that have facility-wide emissions of a single air pollutant exceeding in-house triggering levels. Annual emissions reporting is required for this facility for in-house recordkeeping purposes because it is a covered source and facility-wide emissions of NO_x, SO₂, CO, PM/PM₁₀ and VOC are exceeded.

Compliance Assurance Monitoring (CAM):

40 CFR Part 64

Applicability of the CAM rule is determined on a pollutant specific basis for each affected emission unit. Each determination is based upon a series of evaluation criteria. In order for a source to be subject to CAM, each source must:

- Be located at a major source per Title V of the Clean Air Act Amendments of 1990;
- Be subject to federally enforceable applicable requirements;
- Have pre-control device potential emissions that exceed applicable major source thresholds;
- Be fitted with an “active” air pollution control device; and
- Not be subject to certain regulations that specifically exempt it from CAM.

Emission units are any part or activity of a stationary source that emits or has the potential to emit any air pollutant.

There is no change from the previous covered source renewal application regarding CAM requirements.

PROPOSED

Synthetic Minor Source:

Not applicable, this facility is a major source.

Project Emissions:

Table 1 - Criteria Air Pollutants Emission Factors for Specification Used Oil Compared to Fuel Oil No. 2 in Boiler S-1

Fuel	NO _x (lb/1000 gal)	SO ₂ (lb/1000 gal)	CO (lb/1000 gal)	VOC (lb/1000 gal)	PM ₁₀ (lb/1000 gal)
Spec Used Oil Current Permit Limit	19.2 ^{1,2}	294 ^{1,3}	5 ¹	0.76 ¹	2.30 ¹
Spec Used Oil Proposed Permit Limit	19.2 ^{1,2}	73.5 ^{1,4}	5 ¹	0.76 ¹	2.30 ¹
Fuel Oil No. 2	19.2 ^{1,2}	58.8 ^{1,5}	5 ¹	0.76 ¹	2.30 ¹

¹ Based on AP-42 Table 1.3-1 (Fuel Oil No. 2). Because fuel oil no. 2 will still comprise the majority of fuel oil burned in the boilers, criteria emission factors for fuel oil no. 2 are used here in lieu of the waste oil emission factors in AP-42 Section 1.11 because waste oil emission factors provided are for use when waste oil comprises the majority of the fuel burned (p. 1.11-2, paragraph 5: " If virgin oil comprises the majority of the fuel combusted, the emission factors presented in Section 1.3, Fuel Oil Combustion, should be used.")

² 20% control of NO_x emissions due to low-NO_x burners

³ Current sulfur content limit for spec used oil = 2%

⁴ Proposed new sulfur content for spec used oil = 0.50%

⁵ Sulfur content for fuel oil no. 2 = 0.4%

Table 2 - Comparison of Annual Criteria Air Pollutants Emissions Spec Used Oil vs. Fuel Oil No. 2 in Boiler S-1

Fuel	NO _x (tpy)	SO ₂ (tpy)	CO (tpy)	VOC (tpy)	PM ₁₀ (tpy)
A: Spec Used Oil, Current Permit Limit	1.7	26.5	0.5	0.1	0.2
B: Fuel Oil No. 2 to be Displaced by Additional Spec Used Oil	7.9	24.1	2.1	0.3	0.9
C: Total, Spec Used Oil plus Fuel Oil No. 2 to be Displaced by Additional Spec Used Oil (A + B)	9.6	50.6	2.5	0.4	1.2
D: Spec Used Oil, Proposed Permit Limit	9.6	36.8	2.5	0.4	1.2
Expected Change in Annual Emissions (D-C)	0.0	-13.8	0.0	0.0	0.0
Insignificant Emissions Increase (\$ 11-60.1-82(f)(7))	2.0	2.0	5.0	2.0	2.0

Notes:

Current annual limit on spec used oil = 180,000 gal/yr

Proposed annual limit on spec used oil = 1,000,000 gal/yr

Fuel No. 2 displaced by spec used oil = 820,000 gal/yr

PROPOSED**Table 3 - Hazardous Air Pollutants Emission Factors for Specification Used Oil Compared to Fuel Oil No. 2 in Boiler S-1**

Pollutant	Spec Used Oil Current Permit Limit Emission Factor ^{1,2} (lb/1,000 gallons)	Spec Used Oil Proposed Permit Limit Emission Factor ^{1,2} (lb/1,000 gallons)	Fuel Oil No. 2 Emission Factor ¹ (lb/1,000 gallon)
1,3-Butadiene	n/a	n/a	n/a
1,4-Dichlorobenzene	n/a	n/a	n/a
1,1,1-Trichloroethane	2.36 E-04	2.36 E-04	2.36 E-04
Acetaldehyde	n/a	n/a	n/a
Acrolein	n/a	n/a	n/a
Benzene	2.14 E-04	2.14 E-04	2.14 E-04
Carbon Tetrachloride	n/a	n/a	n/a
Chlorobenzene	n/a	n/a	n/a
Chloroform	n/a	n/a	n/a
Ethyl Benzene	6.36 E-05	6.36 E-05	6.36 E-05
Ethylene Dichloride	n/a	n/a	n/a
Formaldehyde	3.30 E-02	3.30 E-02	3.30 E-02
Methylene Chloride	n/a	n/a	n/a
Naphthalene	1.13 E-03	1.13 E-03	1.13 E-03
Other POM (PAHs)	6.06 E-05	6.06 E-05	6.06 E-05
Tetrachloroethylene	n/a	n/a	n/a
Toluene	6.20 E-03	6.20 E-03	6.20 E-03
Trichloroethylene	n/a	n/a	n/a
Vinyl Chloride	n/a	n/a	n/a
Vinylidene Chloride	n/a	n/a	n/a
Xylenes	1.09 E-04	1.09 E-04	1.09 E-04
Arsenic	3.51 E-02	3.51 E-02	1.53 E-03
Beryllium	4.27 E-05	4.27 E-05	4.27 E-05
Cadmium	1.40 E-02	1.40 E-02	5.21 E-04
Chromium	7.01 E-02	7.01 E-02	1.18 E-03
Lead	7.01 E-01	3.51 E-01	1.87 E-03
Manganese	1.10 E-01	1.10 E-01	1.10 E-01
Mercury	1.67 E-04	1.67 E-04	1.67 E-04

PROPOSED

Nickel	2.26 E-03	2.26 E-03	2.26 E-03
Selenium	2.00 E-03	2.00 E-03	2.00 E-03

² Emission factors from AP-42, Section 1.3, Table 1.3-9.
Emission factors for arsenic, cadmium, chromium and lead are based on spec used oil permit limits. Other emission factors are assumed to be same as for fuel oil no. 2.

Table 4 - Comparison of Annual Hazardous Air Pollutants Emissions Spec Used Oil vs. Fuel Oil No. 2 in Boiler S-1

Pollutant	A: Spec Used Oil, Current Permit Limit (tpy)	B: Fuel Oil No. 2 to be Displaced by Additional Spec Used Oil (tpy)	C: Total, Spec Used Oil plus Fuel Oil No. 2 to be Displaced by Additional Spec Used Oil (A + B) (tpy)	D: Spec Used Oil, Proposed Permit Limit (tpy)	Expected Change in Annual Emissions (D-C) (tpy)
1,3-Butadiene	n/a	n/a	n/a	n/a	n/a
1,4-Dichlorobenzene	n/a	n/a	n/a	n/a	n/a
1,1,1-Trichloroethane	2.12 E-05	9.68 E-05	1.18 E-04	1.18 E-04	0
Acetaldehyde	n/a	n/a	n/a	n/a	n/a
Acrolein	n/a	n/a	n/a	n/a	n/a
Benzene	1.93 E-05	8.77 E-05	1.07 E-04	1.07 E-04	0
Carbon Tetrachloride	n/a	n/a	n/a	n/a	n/a
Chlorobenzene	n/a	n/a	n/a	n/a	n/a
Chloroform	n/a	n/a	n/a	n/a	n/a
Ethyl Benzene	5.72 E-06	2.61 E-05	3.18 E-05	3.18 E-05	0
Ethylene Dichloride	n/a	n/a	n/a	n/a	n/a
Formaldehyde	2.97 E-03	1.35 E-02	1.65 E-02	1.65 E-02	0
Methylene Chloride	n/a	n/a	n/a	n/a	n/a
Naphthalene	1.02 E-04	4.63 E-04	5.65 E-04	5.65 E-04	0
Other POM (PAHs)	5.45 E-06	2.48 E-05	3.03 E-05	3.03 E-05	0
Tetrachloroethylene	n/a	n/a	n/a	n/a	n/a
Toluene	5.58 E-04	2.54 E-03	3.10 E-03	3.10 E-03	0
Trichloroethylene	n/a	n/a	n/a	n/a	n/a
Vinyl Chloride	n/a	n/a	n/a	n/a	n/a
Vinylidene Chloride	n/a	n/a	n/a	n/a	n/a
Xylenes	9.81 E-06	4.47 E-05	5.45 E-05	5.45 E-05	0
Arsenic	3.15 E-03	6.27 E-04	3.78 E-03	1.75 E-02	1.37 E-02

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Beryllium	3.84 E-06	1.75 E-05	2.14 E-05	2.14 E-05	0
Cadmium	1.26 E-03	2.14 E-04	1.48 E-03	7.01 E-03	5.54 E-03
Chromium	6.31 E-03	4.84 E-04	6.79 E-03	3.51 E-02	2.83 E-02
Lead	6.31 E-02	7.67 E-04	6.39 E-02	1.75 E-01	1.11 E-01
Manganese	9.90 E-03	4.51 E-02	5.50 E-02	5.50 E-02	0
Mercury	1.50 E-05	6.85 E-05	8.35 E-05	8.35 E-05	0
Nickel	2.03 E-04	9.27 E-04	1.13 E-03	1.13 E-03	0
Selenium	1.80 E-04	8.20 E-04	1.00 E-03	1.00 E-03	0
TOTAL	8.78 E-02	6.58 E-02	1.54 E-01	3.13 E-01	1.59 E-01

Notes:

Current annual limit on spec used oil = 180,000 gal/yr
Proposed annual limit on spec used oil = 1,000,000 gal/yr
Fuel No. 2 displaced by spec used oil = 820,000 gal/yr

Ambient Air Quality Impact Analysis:

An ambient air quality impact analysis (AAQIA) is not required for a minor modification to a covered source.

Significant Permit Conditions and Discussion:

The following permit conditions in the covered source permit were modified. As is custom when modifying regulatory language, new language is underlined, while [deleted language is shown in brackets].

1. Attachment II(D), Special Condition No. B.2

Specification (spec) used oil may be burned in steam boiler S-1 at a maximum rate of 1,000,000 gallons per year and shall not exceed 49% of the heat input to the boiler at any time. [Specification (spec) used oil (including transformer specification used oil with a PCB content of less than 2 ppm) may be burned in steam boiler S-1 at a maximum rate of 20.8 gallons per hour (15,000 gallons per month).] Transformer specification used oil with a PCB content of greater than 2 ppm may be burned in steam boiler S-1 at a maximum rate of 4.5 gallons per hour (gph). The specification used oil or transformer specification used oil shall be blended and burned with fuel oil no. 2, biodiesel, or a combination of fuel oil no. 2 and biodiesel, at all times.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

Reason: This modification increases the quantity of specification used oil that can be burned in the boiler by 820,000 gallons per year to a total of 1,000,000 gallons per year, and requires that virgin oil remain a majority of the fuel fired in the boiler. Also, the requirement for the blending of specification used oil or transformer specification used oil with fuel oil no. 2 and biodiesel is clarified.

PROPOSED

2. Attachment II(D), Special Condition No. B.4

The permittee shall only burn specification used oil that is generated by the permittee, such as crankcase oils, turbine oils and transformer oils that meets the specifications of specification (spec) used oil, or spec used oil that is supplied by Unitek Solvent Services, Inc. Specification used oil from other sources may be burned, provided prior written approval is obtained from the Department of Health. The permittee shall also only burn transformer specification used oil that is generated by the permittee. An analysis must accompany the delivery of each batch of spec used oil that is received from an outside supplier.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

Reason: This modification allows specification used oil from an outside supplier (Unitek Solvent Services, Inc.).

3. Attachment II(D), Special Condition No. B.5

The constituents/properties of the specification used oil or transformer specification used oil burned in steam boiler S-1 shall not exceed the limits specified below:

<u>Constituent/Property</u>	<u>Allowable Limit</u>
Arsenic	5 ppm maximum
Cadmium	2 ppm maximum
Chromium	10 ppm maximum
Lead	50[100] ppm maximum
Sulfur	0.5[2]% maximum by weight
Total Halogens	1000 ppm maximum
Flash point	100°F minimum
Polychlorinated Biphenyls (PCB)*	2 ppm maximum

*applicable to spec used oil only

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90)

Reason: This modification reduces the allowable sulfur content and lead content of the specification used oil burned in the boiler to 0.5% by weight and 50 ppm, respectively.

4. Attachment II(D), Special Condition No. C.2

Fuel Data - Sulfur Content of the Fuel.

- a. The sulfur content of the fuel oil no. 2 fired in steam boiler S-1 shall be tested in accordance with the most current American Society of Testing and Material (ASTM) methods. ASTM method D 4294-08 is a suitable alternative to Method D 129-00 for determining the sulfur content. The fuel oil sulfur content shall be verified by both of the following methods:

PROPOSED

- i. A representative sample of the fuel oil fired shall be collected from the fuel pipeline by drip sampling and analyzed for its sulfur content by weight at least once per month; and
 - ii. A certificate of analysis on the sulfur content shall be obtained for each bulk shipment of fuel oil delivered by the supplier to the tank farm.
- b. The sulfur content of the biodiesel fired in steam boiler S-1 shall be tested in accordance with the most current American Society of Testing and Material (ASTM) methods. ASTM method D 5453-08 shall be used for determining the sulfur content. The biodiesel sulfur content shall be verified by obtaining a certificate of analysis on the sulfur content for each bulk shipment of biodiesel delivered by the supplier to the tank farm.

[Fuel Data

Sulfur content of the fuel. The sulfur content of the fuel oil no. 2 fired in steam boiler S-1 shall be tested in accordance with the most current American Society of Testing and Materials (ASTM) methods. ASTM method D4294-90 is a suitable alternative to Method D129-91 for determining the sulfur content. The fuel oil sulfur content shall be verified by both of the following methods:

- a. A representative sample of the fuel oil fired shall be collected from the fuel pipeline by drip sampling and analyzed for its sulfur content by weight as least once per month; and
- b. A certificate of analysis on the sulfur content shall be obtained for each bulk shipment of fuel oil delivered by the supplier to the tank farm.]

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90)

Reason: The monitoring of the sulfur content of biodiesel is clarified.

5. Attachment II(D), Special Condition No. D.5.c

A summary report of all of the specification used oil and transformer used oil analyses required under Special Condition Nos. C.3 and C.4.c of this Attachment shall be submitted to the Department **within forty-five (45) days after the end of each calendar year**. The report shall be signed and dated by a responsible official[an authorized representative]. The summary report shall include, at a minimum, sampling dates, the amount of specification used oil or transformer used oil sampled, dates the samples were analyzed, the amounts of specification used oil or transformer used oil represented by the samples, and the results of the analyses.

Reason: Used oil is clarified to be specification used oil. Authorized representative is revised to responsible official to be consistent with other parts of the permit.

PROPOSED

Conclusion:

Recommend issuing the minor modification to Covered Source Permit No. 0097-01-C, issued on September 23, 2005. The permit would incorporate the significant permit conditions listed above and be subject to a 45-day EPA review period.

Reviewer: Darin Lum
Date: 10/08