

**Covered Source Permit Review CSP No. 0239-01-C**  
**Application for Renewal No. 0239-02**

**Facility:** Waiau Generating Station  
Located at: Pearl City, Oahu  
UTM: Zone 4, 607,337m E; 2,365,837m N (Old Hawaiian)

**Applicant:** Hawaiian Electric Company, Inc. (HECO)

**Responsible Official:** Thomas C. Simmons  
Vice President, Power Supply  
(808) 543-4301

**Point of Contact:** Nathan Yuen  
Environmental Department  
(808) 543-4522

**Company's Mailing Address:** Hawaiian Electric Company, Inc.  
Waiau Generating Station  
P.O. Box 2750  
Honolulu, HI 96840-0001

**Equipment:**

HECO

Unit No. Description (power outputs are nominal and the units are situated from west to east)

- |    |   |
|----|---|
| 3  | 49 MW Babcock and Wilcox Boiler (576 MMBtu/hr, serial no. RB-43, built in 1947)                   |
| 4  | 49 MW Babcock and Wilcox Boiler (585 MMBtu/hr, serial no. RB-92, built in 1950)                   |
| 5  | 57 MW Babcock and Wilcox Boiler, 633 MMBtu/hr, (serial no. RB-324, built in 1958)                 |
| 6  | 58 MW Babcock and Wilcox Boiler, 637 MMBtu/hr, (serial no. RB-328, built in 1961)                 |
| 8  | 92 MW Combustion Engineering Boiler (923 MMBtu/hr, serial no. 20694, built in 1967)               |
| 7  | 92 MW Combustion Engineering Boiler (922 MMBtu/hr, serial no. 20177, built in 1965)               |
| 10 | 50 MW General Electric MS7000 Combustion Turbine (682 MMBtu/hr, serial no. 217725, built in 1973) |
| 9  | 52 MW General Electric MS7000 Combustion Turbine (691 MMBtu/hr, serial no. 217724, built in 1973) |

Note: The boilers may be fired on fuel oil nos. 2 and 6, and specification (spec) used oil. For ignition, boiler unit nos. 3 to 6 use propane while unit nos. 7 and 8 use fuel oil no. 2. The combustion turbines (CTs) use fuel oil no. 2 for ignition and regular fuel.

**Proposed Project:**

The Standard Industrial Classification Code (SICC) for this facility is 4911 - Electric Services. The applicant is proposing to renew the CSP with some requested changes. One physical change is to increase the footprint of the air inlets of the CTs. The other changes involve lowering the minimum load and increasing the start-up/shut-down periods of the CTs. All of these proposed changes do not increase any emissions, however a new ambient air quality assessment was required since it may increase air pollutant concentrations.

This facility operates six (6) boilers and two (2) CTs for the production of electricity for sale. The fuel is stored in several on-site petroleum storage tanks. However, the storage tanks are considered an insignificant activity because of size or amount of air emissions due to the fuel's low vapor pressure. The fuel is piped in from Campbell Industrial Park via underground fuel lines.

Although all of the boilers and CTs normally operate intermittently, they will be assumed to operate simultaneously for 8,760 hr/yr at maximum capacity. The boilers and CTs do not have any hour or fuel limitations and the applicant proposed to continue operating without any limitations. None of the combustion units have any air pollution controls.

This facility is located adjacent to Pearl Harbor, on the Island of Oahu, and has a base elevation of approximately 12' above sea level. The terrain is flat in the surrounding area of the facility. However, there is a hill to the north of the facility that has a gradual slope.

This facility is a major covered source based on the annual emissions of criteria pollutants (specifically NO<sub>x</sub>, SO<sub>2</sub>, VOC, and PM) exceeding 100 tons per year for each individual pollutant. This source is also a major HAPs source since cumulative Hazardous Air Pollutant (HAP) emissions are greater than 25 tons per year and nickel compounds is the individual HAP that exceeds 10 tons per year.

This permit review is based on the application dated February 28, 2005 and its revisions dated March 23, August 23, October 19, 2005; and February 7, June 7, 2006. A check for \$3,000.00 has been processed for a Renewal of a Major Covered Source Permit Application. CSP No. 0239-01-C dated April 2, 2001 will be superseded in its entirety upon issuance of this renewal.

**Air Pollution Controls:**

None of the equipment at this facility use "add-on" 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 Opacity Requirements

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 9, Hazardous Air Pollutants

Consolidated Emissions Reporting Rule (CERR) is applicable because PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, and CO emissions from the facility are greater than reporting levels pursuant to 40 CFR 51, Subpart A (see **Table 1**).

**Table 1 - CERR**

Pollutant	Facility Emissions (tpy)	CERR Triggering Levels (tpy)		Internal Reporting Threshold (tpy)
		1-yr Reporting Cycle (Type A Sources)	3-yr Reporting Cycle (Type B Sources)	
VOC	373	≥ 250	≥ 100	≥25
PM	2,662	n/a	n/a	≥25
PM <sub>10</sub> /PM <sub>2.5</sub>	2,662	≥ 250	≥ 100	≥25
NO <sub>x</sub>	29,738	≥ 2,500	≥ 100	≥25
SO <sub>x</sub>	13,042	≥ 2,500	≥ 100	≥25
CO	1,832	≥ 2,500	≥ 1,000	≥250
HAPs (total)	51.2	n/a	n/a	≥5

Note: The facility emissions are taken from **Tables 2 - 7** for the continuous (8,760 hr/yr) operation of the facility.

Also, the DOH's internal policy is to sum the individual emissions sources and if the sum of an individual pollutant exceeds the threshold limits, then annual emissions reporting is required. Internal reporting does also apply as shown in **Table 1**. Furthermore, all covered sources are required to submit annual emissions reports to the DOH.

**Non-Applicable Requirements:**

Code of Federal Regulations (CFR)

40 CFR Part 52.21 - Prevention of Significant Deterioration (PSD) of Air Quality review is not applicable since there is no proposed modification or reconstruction for this existing facility that would increase emissions.

40 CFR Part 61 - National Emission Standard for Hazardous Air Pollutants (NESHAPS) is not applicable since there is no standard for nickel.

40 CFR Part 63 - Maximum Achievable Control Technology (MACT), specifically Subparts DDDDD - NESHAPS for Industrial, Commercial, and Institutional Boilers and Process Heaters; and YYYY - NESHAPS for Stationary Combustion Turbines, are not applicable. Pursuant to 40 CFR §63.7491(c), the boilers are not subject to the subpart because they are electric utility steam generating units (EUSGUs). Pursuant to 40 CFR §63.6090(b)(4), the existing CTs do not have to meet the requirements of the subpart. The boilers will be subject to a proposed MACT in the future.

40 CFR Part 60 - New Source Performance Standards (NSPS) is not applicable since the boilers were installed prior to promulgation of NSPS and the combustion turbines were in service prior to October 3, 1977 (40 CFR 60.330(b)). The tanks are exempt from Subpart K, Ka, and Kb, since all of the petroleum storage tanks store fuel with true vapor pressures less than 3.5 kPa.

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 pre-control emissions that are greater than the major source level [ $>100$  tpy]; and (5) not otherwise be exempt from CAM. CAM is not applicable since item 3 does not apply.

Synthetic Minor is a facility with operational limitations in order to keep potential emissions lower than major source levels ( $\geq 100$  tpy of criteria pollutants or  $\geq 10$  tpy of individual or 25 tpy of a combination of HAPs). This facility is a major source, therefore synthetic minor does not apply.

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 significant increase in emissions, therefore a BACT review does not apply.

**Alternate Operating Scenarios (AOS):**

1. Ability to switch replacement boilers in the event of an emergency or repair.
2. Ability to switch to alternate fuels for the boilers and CTs.

The applicant had proposed six (6) additional alternate operating scenarios (AOS) which were not considered AOS by the Department of Health. Five (5) were considered facility maintenance: 1) “.. unit operation during start-up, shutdown, maintenance and testing..” 2) “.. unpredictable periods of equipment failure, upsets, or emergency conditions..” 3) “.. fuel additives and other products..” 4) “.. boiler soot-blowing..” and 5) “.. replacement of standby generators with permanent emergency standby generators..” The sixth was considered as a normal operation: “.. waste oil ..”

**Insignificant Activities/Exemptions:**

Insignificant activities based on size, emission level, or production rate, are as follows (taken from the initial CSP application and updated with the current application):

**Basis for Exemption Description**

HAR §11-60.1-82(f)(1) Storage tanks are exempt due to the size being less than 40,000 gallons include the following:

4,700 gal fuel oil no. 2 (igniter, fixed roof);  
1,600 gal fuel oil no. 2 (solar diesel engine gen., fixed roof);  
Two (2) 4,700 gal lube oil (Tanks #71 & #72, fixed roof);  
Two (2) 3,750 gal lube oil (Tanks #51 & #52, fixed roof);  
Two (2) 2,370 gal lube oil (Tanks #31 & #32, fixed roof);  
Two (2) 2,227 gal lube oil (Tanks #41 & #42, fixed roof);  
250 gal fuel oil no. 2 (fire pump, horizontal);  
8,000 gal gasoline (underground); and  
three (3) propane (horizontal).

HAR §11-60.1-82(f)(2) There occasionally may be fuel burning equipment with a heat input capacity less than one MMBtu/hr.

HAR §11-60.1-82(f)(5) One (1) 750 kW Solar diesel engine generator (DEG), Saturn Model No. T1020S-33, fired on fuel oil no. 2; and two (2) 115 kW and one (1) 140 kW generators fired on propane for emergency purposes only. See **Enclosure 1 in the initial CSP review** for the maximum air pollutant emissions for the 750 kW DEG if it were to operate 8,760 hr/yr.

HAR §11-60.1-82(f)(7) There are VOC storage tanks which are exempt due to the low vapor pressure of the fuel they store and they individually emit less than 2 tpy of VOC (see 11/23/94 application for calculations). Also, there may be fugitive equipment leaks from valves, flanges, pump seals and oil/water separators. Fugitive solvent and ammonia emissions also occur during cleaning and maintenance. All of these types of fugitive emissions are infrequent and/or insignificant. The storage tanks include the following:

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70,528 bbl fuel oil no. 6 (Tank #1, fixed cone roof);  
29,620 bbl fuel oil no. 6 (Tank #3, fixed cone roof);  
79,000 bbl fuel oil no. 6 (Tank #4, fixed cone roof);  
95,924 bbl fuel oil no. 6 (Tank #5, fixed cone roof);  
two (2) 24,155 bbl fuel oil no. 2 (Tanks #1 & #2, fixed cone roof);

Insignificant activities in addition to those listed in subsection (f) are:

<u>Basis for Exemption</u>	<u>Description</u>
HAR §11-60.1-82(g)(2)	Periodically, there are small hand held equipment used for maintenance and testing throughout the facility.
HAR §11-60.1-82(g)(3)	Periodically, laboratory equipment are used for chemical and physical analyses.
HAR §11-60.1-82(g)(4)	There are solvent tanks and containers used for cleaning and maintenance.
HAR §11-60.1-82(g)(6)	There is a fire pump that is powered by a diesel engine.
HAR §11-60.1-82(g)(7)	Periodically, the smoke generating systems will be used for fire brigade training.
HAR §11-60.1-82(g)(8)	There are gasoline fired portable industrial equipment less than 25 HP used for maintenance.
HAR §11-60.1-82(g)(9)	There are many maintenance equipment and activities that are not related to the primary business activity.
HAR §11-60.1-82(g)(12)	There are stacks and vents to prevent escape of sewer gases through plumbing traps.
HAR §11-60.1-82(g)(13)	There are consumer use of office equipment and products.

**Project Emissions:**

There is no proposed change in air pollutant emissions. Therefore, the calculated potential emissions shown in **Tables 2 to 7** remain unchanged from the previous permit review. The emission rates (except for SO<sub>2</sub>) were calculated using assumed emissions factors (EF) that were based on previous stack test data which are more conservative than US EPA AP-42 for fuel oil no. 6 and 2 (respectively for the boilers and combustion turbine). SO<sub>2</sub> emission rates were based on mass balance using sulfur content and heating value of the fuel. All emission rates are maximum potential and annual emission rates include operating 8,760 hr/yr. For details, refer to HECO Waiiau's letter dated 11/8/96.

**Table 2  
NO<sub>x</sub> Emissions**

Unit No.	AP-42 EF (lb/MMBtu)	Assumed EF <sup>1</sup> (lb/MMBtu)	Heat Input (MMBtu/hr)	Hourly Emission Rate (lb/hr)	Annual Emission Rate (ton/yr)
3	0.449	1.108	576.0	638	2,794
4	0.449	1.108	585.2	648	2,838
5	0.449	1.108	633.0	701	3,070
6	0.449	1.108	637.4	688	3,013
7	0.281	0.719	921.6	663	2,904
8	0.281	0.627	923.2	579	2,536
9	0.698	2.094	690.5	1,446	6,333
10	0.698	2.094	681.5	1,427	6,250
<b>Total:</b>					29,738

1. Assumed EF > AP-42 EF was provided by the applicant; AP-42 may under estimate the emission rate.

**Table 3  
SO<sub>2</sub> Emissions**

Unit No.	Assumed EF <sup>1</sup> (lb/MMBtu)	Heat Input (MMBtu/hr)	Emission Rate (lb/hr)	Emission Rate (ton/yr)
3	0.53	576.0	305	1,336
4	0.53	585.2	310	1,358
5	0.53	633.0	335	1,467
6	0.53	637.4	338	1,480
7	0.53	921.6	488	2,137
8	0.53	923.2	489	2,141
9	0.52	690.5	359	1,572
10	0.52	681.5	354	1,551
<b>Total:</b>				13,042

1. Emission factors based on fuel oil no. 6 and 2 (both with mass sulfur balance of 0.5% by weight) for the boilers and combustion turbines respectively.

**Table 4  
CO Emissions**

Unit No.	AP-42 EF (lb/MMBtu)	Assumed EF <sup>1</sup> (lb/MMBtu)	Heat Input (MMBtu/hr)	Emission Rate (lb/hr)	Emission Rate (ton/yr)
3	0.034	0.067	576.0	38.6	169
4	0.034	0.067	585.2	39.2	172
5	0.034	0.067	633.0	42.4	186
6	0.034	0.067	637.4	42.7	187
7	0.034	0.067	921.6	61.7	270
8	0.034	0.067	923.2	61.9	271
9	0.048	0.096	690.5	66.3	290
10	0.048	0.096	681.5	65.4	287
<b>Total:</b>					1,832

1. Assumed EF > AP-42 EF was provided by the applicant; AP-42 may under estimate the emission rate.

**Table 5  
PM/PM<sub>10</sub> Emissions**

Unit No.	AP-42 EF (lb/MMBtu)	Assumed EF <sup>1</sup> (lb/MMBtu)	Heat Input (MMBtu/hr)	Emission Rate (lb/hr)	Emission Rate (ton/yr)
3	0.052	0.103	576.0	59.3	260
4	0.052	0.103	585.2	60.3	264
5	0.052	0.103	633.0	65.2	286
6	0.052	0.103	637.4	65.7	288
7	0.052	0.103	921.6	94.9	416
8	0.052	0.103	923.2	95.1	417
9	0.061	0.122	690.5	84.2	369
10	0.061	0.122	681.5	83.1	364
<b>Total:</b>					2,662

1. Assumed EF > AP-42 EF was provided by the applicant; AP-42 may under estimate the emission rate.

**Table 6  
VOC Emissions**

Unit No.	AP-42 EF (lb/MMBtu)	Assumed EF <sup>1</sup> (lb/MMBtu)	Heat Input (MMBtu/hr)	Emission Rate (lb/hr)	Emission Rate (ton/yr)
3	0.005	0.0102	576.0	5.9	26
4	0.005	0.0102	585.2	6.0	26
5	0.005	0.0102	633.0	6.5	29
6	0.005	0.0102	637.4	6.5	29
7	0.005	0.0074	921.6	6.8	30
8	0.005	0.0074	923.2	6.8	30
9	0.017	0.034	690.5	23.5	103
10	0.017	0.034	681.5	23.2	102
<b>Total:</b>					373

1. Assumed EF > AP-42 EF was provided by the applicant; AP-42 may underestimate the emission rate.

HAPs emissions were also calculated conservatively since EFs higher than AP-42 were used. The emission factors were taken from US EPA AP-42 Table 3.4-3 and 4, 4/93; Table 3.1-7, 4/93; EPRI PISCES Air Toxic Database; or 1994 Waiiau 7 Test Data. Again, the HAPs emissions were based on operating at maximum potential for 8,760 hr/yr. For details, refer to application for initial CSP dated 11/23/94. A summary of the HAPs emissions is shown in **Table 7**.

**Table 7**  
**HAPs Emissions**

Pollutant	Unit 3 (tpy)	Unit 4 (tpy)	Unit 5 (tpy)	Unit 6 (tpy)	Unit 7 (tpy)	Unit 8 (tpy)	Unit 9 (tpy)	Unit 10 (tpy)	Total (tpy)
Acetaldehyde	0.00550	0.00559	0.00604	0.00609	0.00880	0.00882	0.07621	0.07522	0.19227
Acrolein	--	--	--	--	--	--	0.02383	0.02352	0.04735
Benzene	0.00772	0.00784	0.00848	0.00854	0.01235	0.01237	0.166	0.164	4.72058
Formaldehyde	0.01055	0.01071	0.01159	0.01167	0.01687	0.01690	0.8468	0.836	2.90871
Naphthalene	--	--	--	--	--	--	0.106	0.104	0.78122
Phosphorus	0.00671	0.00682	0.00737	0.00743	0.01074	0.01076	0.90732	0.89549	1.85263
Toluene	0.01549	0.01574	0.01702	0.01714	0.02478	0.02483	0.84985	0.83878	1.80363
Xylene	--	--	--	--	--	--	0.58371	0.57610	1.15981
Antimony	0.01198	0.01218	0.01317	0.01326	0.01917	0.01921	0.06654	0.06567	0.22117
Arsenic	0.00853	0.00866	0.00937	0.00944	0.01364	0.01367	0.0333	0.0328	0.09276
Beryllium	0.00032	0.00033	0.00035	0.00035	0.00051	0.00051	0.000938	0.000925	0.00436
Cadmium	0.00570	0.00579	0.00627	0.00631	0.00912	0.00914	0.0145	0.0143	0.05613
Chromium	0.00103	0.00104	0.00113	0.00114	0.00164	0.00165	0.0333	0.0328	0.29007
Cobalt	0.05449	0.05536	0.05989	0.06030	0.08719	0.08734	--	--	0.45926
Lead	0.01332	0.01353	0.01464	0.01474	0.02131	0.02135	0.0423	0.0418	0.44743
Manganese	0.05904	0.05998	0.06488	0.06533	0.09446	0.09462	2.39	2.36	2.48148
Mercury	0.01256	0.01276	0.01381	0.01390	0.02010	0.02014	0.00363	0.00358	0.09872
Nickel	3.27974	3.33213	3.60430	3.62936	5.24759	5.25670	0.0139	0.0137	31.56104
POM/PAH	0.09082	0.09227	0.09981	0.10051	0.14532	0.14557	0.121	0.119	1.94828
Selenium	0.00454	0.00461	0.00499	0.00503	0.00727	0.00728	0.0756	0.0746	0.06556
1,3-Butadiene							0.0484	0.0478	
<b>Total (tpy)</b>	<b>3.58804</b>	<b>3.64535</b>	<b>3.94311</b>	<b>3.97052</b>	<b>5.74087</b>	<b>5.75085</b>	<b>6.403128</b>	<b>6.320085</b>	<b>51.19245</b>

**Ambient Air Quality Assessment:**

An ambient air quality assessment (AAQA) was conducted using air quality dispersion models ISC\_RTDM and PRIME to determine the change in ambient impacts of the Waiiau Generating Station. The proposed change is for downwash (for the larger air inlets at the CTs) and emission/stack parameters (to operate at lower loads). This AAQA used the same approach and model as the AAQA for the initial CSP review. ISC\_RTDM is a combination of two (2) EPA guideline models, ISCST3 and RTDM. ISC\_RTDM is based on versions of ISCST3 (98356) and RTDM (89226). ISC\_RTDM replicates the ISCST3 in simple terrain and RTDM in complex terrain; and implements the EPA Intermediate Terrain Guidance found in ISCST3.

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Some receptors were evaluated with the EPRI developed PRIME model (which is currently under evaluation by EPA). The model, methodology and assumptions employed in the AAQA have been determined to be consistent with State and Federal guidelines and are discussed below.

A preprocessed meteorological data base was used for input into the model. The data base consisted of one year (June 1, 1996 through May 31, 1997) on site SODAR data collected at a height of 40 m (stack height); 10 m wind/temperature data; and twice daily measured upper air data recorded at the National Weather Service station at Lihue, Kauai ('92). Hourly mixing heights were calculated with the MPRM preprocessor. The meteorological data was processed using Meteorological Preprocessor for Regulatory Models (MRPM).

A Cartesian coordinate system was used in both the coarse grid and refine grid air modeling. A course grid was spaced out at 90 m and a refined grid of 30m was used for simple terrain at the fence line and nearby complex terrain. Receptor elevations were derived from the applicable U.S. Geological Survey (USGS) 30m Digital Elevation Model (DEM) data. All receptors were located in areas defined as "ambient air." The surrounding area was classified as rural for selecting appropriate dispersion coefficients.

A Good Engineering Practice (GEP) stack height analysis was performed using the dimensions of all nearby structures and buildings within the fence line (i.e., height, width, length, and distance to stack). Wake effects are treated in the model by including direction specific building dimensions for each emission source. For this review, the EPA Building Profile Input Program (BPIP) was used to derive the direction specific building dimensions for importing into the model (including the larger air inlets for the CTs). The initial CSP review included a wind tunnel study to calculate the equivalent building dimensions for some of the 10-degree sectors.

**Table 8** presents the worst case emission rates and stack parameters for all of the sources used in the previous review as well as the proposed CTs at low load (5 MW or 10% load). NO<sub>x</sub>, SO<sub>2</sub>, CO, and PM<sub>10</sub> emission rates at 10% load were based on AP-42 emission factors times the change in emissions from a 2nd/3rd generation of a similar CT (see revision to application dated October 19, 2005).

The predicted concentrations presented in **Table 9** assumed maximum potential output, operating 8760 hr/yr. Since on site meteorological data was used, the highest second high SO<sub>2</sub> and CO short term concentrations were allowed for this AAQA. Other pollutant concentrations were the highest high. 75% of NO<sub>x</sub> was assumed to convert to NO<sub>2</sub> concentrations. Based on these assumptions, the facility should comply with State and National ambient air quality standards (SAAQS/NAAQS) for NO<sub>x</sub>, SO<sub>2</sub>, CO, PM<sub>10</sub>, and Pb. Pb and H<sub>2</sub>S were assumed to be negligible.

**Table 8  
Source Emission Rates and Stack Parameters**

SOURCE		EMISSION RATES					STACK PARAMETERS			
Equipment	Unit / Stack No.	SO <sub>2</sub> (g/s)	NO <sub>x</sub> (g/s)	CO (g/s)	PM <sub>10</sub> (g/s)	Pb (g/s)	Height (m)	Temp. (K)	Velocity (m/s)	Diameter (m)
<b>100% Load</b>										
49 MW Boiler	3	38.508	80.414	4.863	7.509	0.00038	42.10	469	12.25	3.05
49 MW Boiler	4	39.123	81.698	4.941	7.629	0.00039	42.10	469	12.25	3.05
57 MW Boiler	5	42.318	88.371	5.345	8.252	0.00042	41.91	414	12.25	2.74
58 MW Boiler	6	42.613	86.737	5.382	8.309	0.00043	41.91	414	12.25	2.74
92 MW Boiler	7	61.613	83.433	7.782	12.015	0.00062	41.91	422	16.12	3.20
92 MW Boiler	8	61.720	72.935	7.795	12.035	0.00062	41.91	429	16.06	3.20
52 MW Comb. Turbine	9	44.912	182.184	8.352	10.614	0.00503	9.68	861	37.3	4.31
50 MW Comb. Turbine	10	44.326	179.810	8.244	10.476	0.00503	9.68	861	37.3	4.31
<b>10% Load</b>										
52 MW Comb. Turbine	9	15.1	10.7	1.34	1.37	n/a	9.68	519	16.9	4.31
50 MW Comb. Turbine	10	15.1	10.7	1.34	1.37	n/a	9.68	519	16.9	4.31

**Table 9**  
**Predicted Ambient Air Quality Impacts**

AIR POLLUTANT	AVERAGING TIME	IMPACT ( $\mu\text{g}/\text{m}^3$ )	BACKGROUND <sup>1</sup> ( $\mu\text{g}/\text{m}^3$ )	TOTAL IMPACT ( $\mu\text{g}/\text{m}^3$ )	AIR STANDARD ( $\mu\text{g}/\text{m}^3$ )	PERCENT STANDARD	IMPACT LOCATION(m,m,m) <sup>2</sup>
SO <sub>2</sub>	3-Hour	1247	--	1247	1300	96%	
	24-Hour	357	--	357	365	98%	
	Annual	61	--	61	80	76%	
NO <sub>2</sub>	Annual <sup>3</sup>	68	--	68	70	97%	
CO	1-Hour	936	--	936	10000	9%	
	8-Hour	437	--	437	5000	9%	
PM <sub>10</sub>	24-Hour	141	--	141	150	94%	
	Annual	12	--	12	50	23%	
Pb	Calendar Quarter <sup>4</sup>	--	--	--	1.5	--	--
H <sub>2</sub> S	1-Hour <sup>4</sup>	--	--	--	35	--	--

Note:

1. Background concentrations are not required for existing, non-modified sources (no increase in emissions).
2. (m,m,m) = Location - UTM coordinates and elevation (meters east, meters north, meters elevation).
3. NO<sub>2</sub> = 75% conversion of NO<sub>x</sub> concentrations.
4. Pb and H<sub>2</sub>S emissions were assumed to be negligible.

**Existing Permit Conditions:**

Boilers

1. 40% opacity (because they were in operation before 3/21/72 - ref. HAR 11-60.1-32).
2. Two (2) alternate operating scenarios (AOS), proposed by the applicant, are the ability to switch fuels; and replace boiler(s) as needed. The other proposed AOS: boiler start-up, shut-down, maintenance, and testing; emergency conditions; waste oil; fuel additives; and soot blowing were not considered AOS by the Department because they were considered normal operations and maintenance; or emergency conditions. The fuel additives are blended with a ratio of 1:4,000 to 1:1,500.
3. Standard conditions to burn 20,000 gal/yr of spec used oil (proposed by the applicant).

Combustion Turbines

1. The CTs shall be fired only on fuel oil no. 2 with a maximum sulfur content not to exceed 0.5% by weight.
2. Maintain records of fuel delivery and operational hours for the CTs.
3. Start-up and shut-down; and minimum operating load conditions so that the CTs operate at normal conditions (the conditions in which they were modeled)
4. 20% opacity (because the CTs started operation after 3/21/72 - ref. HAR 11-60.1-32).
5. One AOS, proposed by the applicant, is the ability to switch fuels. The other proposed AOS were not considered AOS by the Department because they were considered normal operations and maintenance; or emergency conditions.

**New Permit Conditions:**

Boilers

1. Allow used oil collected on site to be tested when sufficient quantities are available (the excess oil drips at a slow rate)

Combustion Turbines

1. Minimal operating load is 10% (lowered from 25%, shown to meet SAAQS)
2. Shut-down period is 30 minutes (increased from 10 minutes because the old CTs may deteriorate by shutting down quickly, and SAAQS should not be affected since the minimal averaging period is 1-hr)
3. AOS to replace CT(s) as needed (proposed by applicant)
4. Allow the CTs to operate below 10% load for maintenance (proposed by applicant and previously approved by DOH).
5. Recordkeeping for CT operating hours and load and reporting if there were any deviations (monitoring conditions are required for operational limitations)

**Other Issues:**

The applicant proposed to increase the dimensions of the CT air inlets in order to increase air filtering efficiency. As shown in the AAQA section (above), this change and the ability to operate the CTs at 10% load will not exceed NAAQS and SAAQS.

**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. This determination is based on the application submitted by HECO. Therefore, a renewal to a covered source permit for HECO subject to the above permit conditions, 30-day public notice period, and 45-day EPA review is recommended.