PROPOSED

COVERED SOURCE PERMIT APPLICATION REVIEW 0638-02-C

Significant Modification Application No. 0638-03

APPLICANT: Honua Power, LLC

LOCATION: Tax Map Key 9-1-1-31:32
Kapolei, HI 96707
UTM Coordinates (NAD 83, zone 4)
593,290 m East, 2,355,739 m North

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Honolulu, HI 96813

RESPONSIBLE OFFICIAL: Mr. Tim Mobley
President/CEO
808-550-2877

SIC CODE: 4939 (Combination utilities, not elsewhere classified)

PROPOSED PROJECT:

The application is for a significant modification to the initial permit for a new facility. The initial permit was issued on December 31, 2010 and granted approval to construct and operate a 230 ton per day gasification plant in the Campbell Industrial Park area. The modification is to increase the steam capacity of the boiler from 82,635 lb/hr to 105,000 lb/hr. In addition, the black-start generator originally rated at 1,474 kW and limited to 500 hours of operation annually, has been revised to a rating of 2,000 kW and 300 hours of operation annually.

In addition to the capacity changes of the equipment, the location and height of both the boiler stack and black-start DRG have been updated from the initial application. The type of air pollution controls to be installed is unchanged.

The current permit for the boiler has the following emission limits:

Pollutant	Existing Emission Rate (lb/hr)	Existing Emission Rate (lb/MMBtu)
PM	2.97	0.03
PM_{10}	2.97	0.03
SO_2	9.05	0.09
NO_x	16.98	0.17
As	0.11	0.0011
Pb	0.47	0.0048
Cd	1.81E-03	1.84E-05
Cr	4.81E-04	4.87E-06
Hg	5.96E-04	6.03E-06
HCl	1.94	0.02
Total Dioxins	4.83E-07	4.89E-09
Dioxin TEQ	8.59E-09	8.69eE-11
Total PCB	6.01E-06	6.08E-08
Assumed 1 lb/hr steam = 0.0012 MMBtu/hr, Boiler Capacity: 98.84 MMBtu/hr		

The proposed boiler emission limits after the modification are:

Pollutant	Proposed Emission Rate (lb/hr)	Proposed Emission Rate (lb/MMBtu)
PM	3.78	0.03
PM_{10}	3.78	0.03
SO_2	13.06	0.10
NO_x	21.49	0.17
As	0.15	0.0012
Pb	6.01E-01	0.0048
Cd	2.32E-03	1.84E-05
Cr	6.14E-04	4.87E-06
Hg	7.60E-04	6.03E-06
HCl	2.13	0.02
Total Dioxins	6.16E-07	4.89E-09
Dioxin TEQ	1.09E-08	6.69E-11
Total PCB	7.66E-06	6.08E-08
Assumed 1 lb/hr steam = 0.0012 MMBtu/hr, Boiler Capacity: 126 MMBtu/hr		

The boiler is to be fired by synthetic gas produced by the facility. The boiler is also permitted to use liquefied petroleum gas (LPG) as an alternate fuel. The steam generated by the boiler is supplied to a turbine generator set for the production of electricity. The maximum production rate of the generator is 6.64 MW/hr. The equipment is to operated on a continuous basis (8,760 hours per year). The types of waste to be gasified includes construction and demolition waste, with the exception of shredded tires.

Proposed Process Changes:
No changes have been proposed to the process.

AIR POLLUTION CONTROL DEVICES:
No changes have been proposed to the air pollution control devices other than updating the control efficiencies.

Compliance Assurance Monitoring (CAM)
Applicability of the CAM Rule (40 CFR, Part 64) 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 stationary 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.

The subject facility is not a major stationary source because criteria pollutant levels do not exceed 100 tons per year, equivalent CO_2 emissions is less than 100,000 tons per year, individual HAP emissions are less than 10 tons per year, and total HAP emissions total less than 25 tons per year.

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
- 11-60.1-33 Fugitive Dust
- 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 7 - Prevention of Significant Deterioration Review
Subchapter 8 - Standards of Performance for Stationary Sources
Subchapter 9 - Hazardous Air Pollutant Sources
Subchapter 10 - Field Citations

NSPS:
After the modification is approved, the facility will be subject to the following Federal Emission Standards:

1. 40 CFR Part 60, Subpart A, *General Requirements;*
2. 40 CFR Part 60, Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units;*
3. 40 CFR Part 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines;*
4. 40 CFR Part 63, Subpart A - *National Emission Standards for Hazardous Air Pollutants for Source Categories, - General Provisions*; and
5. 40 CFR Part 63, Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.*

Discussion:

Prior to the modification, the boiler was subject to 40 CFR 60 Subpart Dc. Due to the increase in the boiler capacity to more than 100 MMBtu/hr, the boiler is now subject to 40 CFR 60, Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units.*

The boiler is subject to 40 CFR Part 60, Subpart Db because it is constructed after June 19, 1984 and has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 megawatts (100 MMBtu/hr). The facility is required under this subpart to comply with visible emission (20%) and particulate matter emission limits. The particulate matter emission rate was calculated as shown in the following:

Boiler Capacity =	105,000	lb/hr steam
1 lb/hr steam =	0.0012	MMBtu/hr
Boiler Capacity =	126	MMbtu/hr
PM emission limit =	0.03	lb/MMbtu
	3.78	lb/hr

Pursuant to the calculations, a particulate matter emission limit of 3.78 pounds per hour will be added as a permit condition. This is identical to the limit established in the initial permit.

40 CFR 63, Subpart ZZZZ is an applicable requirement for the black-start diesel engine generator because it is a stationary reciprocating internal combustion engine (RICE) located at an area source of HAPs. However, pursuant to §63.6590, a new or reconstructed stationary RICE located at an area source will satisfy the requirements of this subpart by meeting the requirements of 40 CFR Subpart IIII for compression ignition engines. No further requirements for such engines are required by 40 CFR 63, Subpart ZZZZ.

Since 40 CFR 60, Subpart IIII is an applicable requirement for the black-start diesel engine generator pursuant to 40 CFR 63, Subpart ZZZZ, §63.6590, the applicable requirements for 40 CFR 60, Subpart IIII require that are as follows:

Pursuant to §60.4204(b), “owners and operators of 2007 model year and later non-emergency stationary compression-ignition internal combustion engine (CI ICE) with a displacement of of less than 30 liters per cylinder must comply with the emission standards for new CI engines in §60.4201 for their 2007 model year and later stationary CI ICE, as applicable.

”§60.4201(a) states: “Stationary CI internal combustion engine manufacturers must certify their 2007 model year and later non-emergency stationary CI ICE with a maximum engine power less than or equal to 2,237 kilowatt (KW) (3,000 horsepower (HP)) and a displacement of less than 10 liters per cylinder to the certification emission standards for new nonroad CI engines in 40 CFR 89.112, 40 CFR 89.113, 40 CFR 1039.101, 40 CFR 1039.102, 40 CFR 1039.104, 40 CFR 1039.105, 40 CFR 1039.107, and 40 CFR 1039.115, as applicable, for all pollutants, for the same model year and maximum engine power.

However, pursuant to §60.4211:

(a) If you are an owner or operator and must comply with the emission standards specified in this subpart, you must operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer. In addition, owners and operators may only change those settings that are permitted by the manufacturer. You must also meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply to you.

(c) If you are an owner or operator of a 2007 model year and later stationary CI internal combustion engine and must comply with the emission standards specified in §60.4204(b) or §60.4205(b), or if you are an owner or operator of a CI fire pump engine that is manufactured during or after the model year that applies to your fire pump engine power rating in table 3 to this subpart and must comply with the emission standards specified in §60.4205(c), you must comply by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) or (c), as applicable, for the same model year and maximum (or in the case of fire pumps, NFPA nameplate) engine power. The engine must be installed and configured according to the manufacturer's specifications.

Since the black-start generator is subject to the emission standards specified in §60.4204(b), conditions will be added to the permit to require that the engine purchased must be certified to the emission standards in §60.4204(b), and that the engine be installed and configured according to the manufacturers specifications.

CONSOLIDATED EMISSIONS REPORTING RULE (CERR):
Consolidated Emissions Reporting Rule (CERR) is not an applicable requirement because annual emissions from the facility do not exceed the minimum than reporting levels for a Type B source pursuant to 40 CFR 51, Subpart A (see following table)

CERR Reporting Requirements

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	1.71	≥ 250	≥ 100	≥ 25
PM_{10}	25.14	≥ 250	≥ 100	≥ 25
$PM_{2.5}$	10.75	≥ 250	≥ 100	≥ 25
NO_x	79.06	≥ 2,500	≥ 100	≥ 25
SO_x	40.94	≥ 2,500	≥ 100	≥ 25
CO	42.94	≥ 2,500	≥ 1,000	≥ 250
HAPs (total)	11.04	n/a	n/a	≥ 5

PREVENTION OF SIGNIFICANT DETERIORATION (PSD):
PSD applies to new stationary sources in an attainment area which emit or have the potential to emit 250 TPY (or 100 TPY for 28 named source categories) of any regulated pollutant, to a major stationary source making a major modification involving a significant net emissions increase (e.g., 15 tons per year PM_{10} [HAR 11-60.1-1]), or to a non-major source undergoing a modification that is major by itself. The proposed facility does not have a pollutant that exceeds 100 tons per year, 10 tons of any individual HAP or 25 tons total HAPs, so PSD does not apply

BEST AVAILABLE CONTROL TECHNOLOGY (BACT):
A BACT analysis is not required for the modification because the pollutant emission increases to not exceed significant levels. The following table exhibits the emissions increases resulting from the modification in comparison to significant levels.

Pollutant	Significant Level (tpy)	Emissions Increase(tpy)
Carbon Monoxide	100	27.04
Nitrogen Oxides	40	20.30
Sulfur dioxide	40	16.27
Particulate matter	A total of 25 tpy(PM) or 15 tpy (PM_{10})	9.26
Ozone	40 of VOC	1.03
Lead	0.6	0.55
Asbestos	0.007	0
Beryllium	0.0004	0
Mercury	0.1	1.16E-03
Vinyl Chloride	1	0
Fluorides	3	0
Sulfuric acid mist	7	0
Total reduced sulfur	10	0
Reduced sulfur compounds	10	0
CO_2 Equivalent (CO_2e)	100,000	70,201

Greenhouse Gas Tailoring Rule (GGTR):
Due to the fact the greenhouse gas emissions is now classified as a regulated pollutant, the GGTR was promulgated. The GGTR "tailors" the applicability threshold for PSD and Title V permit programs to

- ≥ 100,000 short tons/yr of potential CO_2e emissions for the PSD/Title V Major Source level, and
- ≥ 75,000 short tons/yr of potential CO_2e emissions for the PSD/Title V significance level.

The CO_2e emissions from the existing facility before and after the modification is less than 100,000 tons per year. Therefore, the facility is not subject to any regulation resulting from greenhouse gas emissions.

INSIGNIFICANT ACTIVITIES
Insignificant activities at the facility consist of a rental diesel engine generator to be used during annual maintenance. Since the specifics of the rental DEG are not known, the rental DEG will be handled as an alternate operating scenario. In order for the operating scenario to be approved, the permittee will be required to submit emission calculations that verify the emissions of the actual DEG used are insignificant, and that the DEG emissions have been certified by the manufacturer pursuant to Federal New Source Performance Standards.

EMISSION CALCULATIONS
Emissions from the facility originate from the following sources

- Gasifier-Boiler Combustion Unit
- Black Start Diesel Engine Generator
- Baghouses servicing the receiving area

To calculate emissions from the gasifier-boiler, emission factors were derived by using data from a source performance test on a similar but smaller gasification unit and adding a safety factor of twenty percent. The factors derived and used to determine the gasifier-boiler emissions were as follows:

Pollutant	Emission Rate (lb/hr)	Emission Rate (lb/MMBtu)	Reference
PM	3.78	0.03	40 CFR §60.43c(e)(1)
PM_{10}	2.17	0.03	Source Performance Test
SO_2	13.06	0.1	Source Performance Test
NO_x	21.49	0.17	Source Performance Test
As	0.15	0.0012	Source Performance Test
Pb	0.6	0.0048	Source Performance Test
Cd	2.62e-3	2.08e-5	Source Performance Test
Cr	8.10e-4	6.43e-6	Source Performance Test
Hg	8.6e-4	6.83e-6	Source Performance Test
HCl	2.28	1.81e-2	Source Performance Test
Total Dioxins	8.32e-7	6.60e-9	Source Performance Test
Dioxin TEQ	2.12e-8	1.69e-10	Source Performance Test
Total PCB	8.68e-6	6.88e-8	Source Performance Test
Assumed 1 lb/hr steam = 0.0012 MMBtu/hr			

Due to the fact that non-standard emission factors were used in determining project emissions, The aforementioned emission factors will be incorporated into the covered source permit as emission limits. Compliance with the emission limits will be demonstrated by conducting annual performance testing on the gasifier-boiler unit, and with the monitoring of NO_x and SO_2 with a continuous emissions monitoring system (CEMS). It should also be noted that the permittee

has agreed to a permit condition which states that an exceedance of SO_2 limit is also an exceedance or HCl emission limit

Since the permittee is requesting approval to use propane as a backup fuel, the gram per second pollutant emission rates for syngas and propane are compared to determine the worst-case emissions scenario. A comparison of the emission rate is shown in the following table:

Emission Rate Comparison			
Polluant	Syngas Emission Rate (g/s)	Propane Emission Rate (g/s)	Emission Rate Used In Model (g/s)
SO2	1.65	0.10	1.65
NOx	2.71	0.90	2.71
CO	2.01	0.52	2.01
PM10	0.48	0.05	0.48
PM25	0.27	0.05	0.27
Pb	0.06	0	0.06

The comparison of emission rates shows that all of the emission rates when firing syngas are higher than when firing propane. Therefore, to determine worst-case emissions and compliance with ambient air quality standards, it is assumed that boiler will be fired entirely by syngas. Emissions from the gasifier-boiler are shown in the following table:

Gasifier – Boiler Emissions

Process Rate =	331.8	tons/day	105,000	lb steam/hr
	13.8250	tons/hour	126	MMBtu/hr
	121,107	tons/year		

Pollutant	Emission Rate (lb/ton)	Uncontrolled Emissions (tpy)	Control Efficiency (%)	Controlled Emissions (tpy)	Controlled Emission Rate (lb/hr)
PM_{10}	13.16	796.88	97.91	16.65	3.80
$PM_{2.5}$	7.50	454.15	97.91	9.49	2.17
SO_2	6.75	408.74	86	57.22	13.06
NO_x	8.05	487.46	80.7	94.08	21.48
As	0.11	6.66	90	0.67	0.15
Pb	0.66	39.97	93.5	2.60	0.59
Cd	0.0019	0.12	90	0.012	0.0027
Cr	0.0419	2.54	99.86	0.004	0.0009
Hg	0.00062	0.04	90	0.00400	0.00091
HCl	3.11	188.32	94.7	9.98	2.28
Total Dioxins	3.36E-06	0.00020	98.21	0.0000036	0.0000008
Dioxin TEQ	6.40E-08	0.0000039	97.6	0.0000001	0.0000000
Total PCB	2.51E-06	0.000152	75	0.0000380	0.0000087
CO	N/A	N/A	0	42.05	9.6
VOC	3.24E-02	1.96	0	1.96	0.45

Notes:
CO emission rate converted from 100 ppm emission rate guaranteed by vendor.
Assumed PM emissions = PM_{10} emissions.

Emissions from the black start DEG were determined using AP-42, section 3.4, "Large Stationary Diesel and All Stationary Dual-Fuel Engines," with the exception of NO_x, CO, VOC, and PM emission factors, which were obtained from manufacturer's information. The black start DEG emissions are as follows:

Black-start Diesel Engine Generator Emissions

Engine Horsepower	2,639	hp
Max. Fuel Rate	124.1	gal/hr
Operating Hours	300	hr/yr
Fuel Heating Value	140,000	BTU/gal
Maximum Heat Input	0.74	MMBtu/hr

Pollutant	Emission Factor (lb/MMBtu)	Emissions			
		(lb/hr)	(g/s)	Max (tpy)	Limited (tpy)
SO_2	0.0015	0.03	0.00	0.12	3.95E-03
NO_x	2.0092	34.91	4.40	152.89	5.24
CO	0.0335	0.58	0.07	2.55	0.09
TOC	0.3014	5.24	0.66	22.93	0.79
PM_{10}	0.0067	0.12	0.01	0.51	0.02
PM_{25}	0.0060	0.10	0.01	0.46	0.02
HAPs					
Benzene	7.76E-04	1.35E-02	1.70E-03	5.91E-02	2.02E-03
Toluene	2.81E-04	4.88E-03	6.15E-04	2.14E-02	7.32E-04
Xylenes	1.93E-04	3.35E-03	4.22E-04	1.47E-02	5.03E-04
Propylene	2.79E-05	4.85E-02	6.11E-03	2.12E-01	7.27E-03
Formaldehyde	7.89E-05	1.37E-03	1.73E-04	6.00E-03	2.06E-04
Acetaldehyde	2.52E-05	4.38E-04	5.52E-05	1.92E-03	6.57E-05
Acrolein	7.88E-06	1.37E-04	1.73E-05	6.00E-04	2.05E-05
			Total HAPS	**0.32**	**0.01**

Baghouse emissions were calculated using airflow and emission specifications provided by the baghouse manufacturer. Baghouses are located at the feedstock receiving area, char removal area, construction and demolition (C & D) feedstock silo, tire feedstock silo, and char silo. Emissions are summarized in the following table, Refer to attachments for detailed baghouse emission calculations.

Area	Emissions (tpy)	
	PM_{10}	$PM_{2.5}$
Receiving	12.61	1.89
Char Removal	1.53	0.23
C & D Feedstock Silo 1	2.28E-02	3.42E-03
C & D Feedstock Silo	2.28E-02	3.42E-03
Char Silo	2.09E-03	3.14E-04
Total	14.19	2.13

The total emissions from the facility is as follows:

Pollutant	Emissions (TPY)			
	Gasifier	Blackstart DEG	Baghouses	Total
PM_{10}	16.66	0.02	14.19	30.86
PM_{25}	9.49	0.02	2.13	11.63
SO2	57.21	3.95E-03	no data	57.21
NOx	94.12	5.24	no data	99.36
CO	69.90	0.09	no data	69.99
TOC	1.96	0.79	no data	2.75
HAPs				
As	0.66	no data	no data	0.66
Pb	2.62	no data	no data	2.62
Cd	0.01	no data	no data	0.01
Hg	3.77E-03	no data	no data	3.77E-03
HCl	9.99	no data	no data	9.99
Dioxin	3.64E-06	no data	no data	3.64E-06
BENZENE	no data	2.02E-03	no data	2.02E-03
TOLUENE	no data	7.32E-04	no data	7.32E-04
XYLENES	no data	5.03E-04	no data	5.03E-04
PROPYLENE	no data	7.27E-03	no data	7.27E-03
FORMALDEHYDE	no data	2.06E-04	no data	2.06E-04
ACETALDEHYDE	no data	6.57E-05	no data	6.57E-05
ACROLEIN	no data	2.05E-05	no data	2.05E-05
			Total HAPs	13.30

AIR QUALITY ASSESSMENT:
An ambient air quality assessment was performed to demonstrate that the modification is in compliance with State and Federal ambient air quality standards (AAQS).

To demonstrate compliance with State and Federal AAQS, the EPA-approved AERMOD modeling program was used. Two separate sets of runs were done to account for the different fuels that are allowed for use in the boiler. The first set of modeling runs assumes the boiler is fired with syngas, while the second set of runs assumes the boiler is fired with propane. In both sets of modeling runs the diesel engine generator is fired with diesel fuel.

The stack parameters used in both sets of runs are identical and are as follows:

Air Modeling Source Parameters							
Source ID	Location			Stack Parameters			
	Elevation (m)	East (m)	North (m)	Height (1) (m)	Temperature (K)	Diameter(2) (m)	Exit Velocity (2) (m/sec)
Boiler	2	593,211	2,365,730	30.48	419	1.219	21.13
GEN1	2	593,213	2,335,690	3.05	746	0.406	50.14

Meteorological data for one year was obtained from the AES Barbers Point facility, and USGS DEM data for the Ewa quadrangle was used. Due to the proximity of Honua to AES, the met data is considered to be on-site. A total of 1,296 receptors spaced at thirty meter intervals around the plant was used. The program used the following emission rates:

AERMOD Emission Rate Parameters – Boiler w/Syngas (g/s)						
Source	SO_2	NO_x[1]	CO	PM_{10}	$PM_{2.5}$	Pb
BH	1.646	2.708	1.544	0.047	0.273	0.08
GEN1	0.0032	0.151	0.117	0.0147	0.0132	N/A

AERMOD Emission Rate Parameters – Boiler w/Syngas (g/s)						
Source	**SO_2**	**NO_x[1]**	**CO**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
[1] Annual NO_x emission rate of 2.708 (300/8760)= 0.0927 used in model, due to 300 hour annual limit						

The predicted air impacts as determined by AERMOD are:

AMBIENT AIR QUALITY IMPACT ANALYSIS

Pollutant	Averaging Period	CONCENTRATION				% of std.
		Conc.	Background [b]	Total	Std	
NO_x	1-hr (µg/m^3)	25.35	48.88	74.23	188	39.48
	1-hr (ppb)	13.5	26	39.50	100	
	Annual (µg/m^3)	3.76	15.05	18.81	100	18.81
	Annual (ppb)	1.99	8	9.99	53	
SO_2	1-hr (µg/m^3)	17.53	44.37	61.90	195.75	31.60
	1-hr (ppb)	6.70	17	23.70	75	
	24-Hour (µg/m^3)	7.11	29	36.11	365	9.89
	24-hour (ppb)	2.72	11.1	13.82	140	
	Annual (µg/m^3)	1.75	3	4.75	80	5.94
	Annual (ppb)	0.67	1.15	1.82	30	
PM_{10}[a]	24-Hour	8.17	33	41.17	150	27.45
	Annual	0.59	14	14.59	50	29.18
PM_{25}	24-Hour	7.33	13	20.33	65	31.28
	Annual	0.36	4.7	5.06	15	33.73
CO	1-hour (µg/m^3)	105	2404	2509	10,000	25.09
	1-hour (ppm)	0.09	2.1	2.19	9	
	8-hour (µg/m^3)	71.5	1,145	1216.50	5,000	24.33
	8-hour (ppm)	0.06	1.0	1.06	4.4	

[a] assumes all particulate is PM_{10}
[b] Background levels obtained from Kapolei monitoring station, 2008.

Ambient levels for lead were determined by obtaining the monthly lead concentrations, then sorting by receptor, date and monthly concentrations to identify the highest rolling 3-month average.

The annual NO_x ambient air concentration was determined by running AERMOD with the ozone limiting method enabled. An annual background concentration of 0.059 parts per million was used in the ozone limiting method calculations. The 1-hour NO_x ambient air concentration used an in stack NO_2/NO_x ratio of 0.2 pursuant to modeling guidance, and did not include the DEG in the model because it is an intermittent source. To identify the highest of the 8th highest NO_2 value, 1-hour NO_x concentrations were determined for each hour at each receptor. The values were then sorted by receptor and NO_2 value to determine the highest of the 8th highest NO_x value.

Compliance with the one hour SO_2 ambient air concentration is attained when the 3-year average of the 99th-percentile of the annual distribution of the daily maximum 1-hour concentrations does not exceed 75 parts per billion (ppb) at each monitor within an area.. This

is done by determining the fourth highest modeled concentration at each receptor and using the highest value.

To demonstrate that non-carcinogenic HAP emissions will not result in, or contribute to, any significant ambient air concentrations as defined in HAR §11-60.1-179(c), the modeled ambient air concentration for each HAP is compared to 1/100 of its threshold limit value-time weighted average (TLV-TWA) for 8-hour ambient concentrations and 1/420 of its TLV-TWA for annual ambient air concentrations. The results, exhibited in the previous table, demonstrate that each HAP does not exceed the 8-hour or annual standard when compared to their individual adjusted TLV-TWA.

To determine if carcinogenic HAP emissions result in or contribute to any significant ambient air concentration, modeled carcinogenic HAP ambient air concentrations were compared to U.S. EPA Region 9, Regional Screening Levels (RSL) for Residential Air. RSL's are chemical concentrations that correspond to fixed levels of risk, and are extremely conservative. U.S. EPA Region 9, RSL's are chemical concentrations in air that correspond to a one in a million cancer risk or a non-carcinogenic hazard quotient of 1. The PRG's are used to screen out chemicals which are at such low levels that adverse health effects would not be expected even in the most sensitive individuals if they were exposed for a lifetime. Exceeding a screening level does not automatically indicate that a chemical is present at levels that may pose a health risk.

As shown in the following table, no carcinogenic HAP exceeded the residential RSL's for air. The cancer risk from exposure to air emissions from the facility is 9.81×10^{-6}. This does not exceed Hawaii Administrative Rules cancer risk level of 1×10^{-5} for air and is within EPA's acceptable cancer risk range of 10^{-4} to 10^{-6}. These results indicate that exposure to emissions from the facility should not pose a significant health risk even from long-term exposure. For detailed calculations, refer to the attached emission calculations.

CONCLUSION:

The operation of the facility does not violate State or Federal Ambient Air Quality Standards. Recommend approval of permit subject to 30 day public comment period and EPA 45-day review.

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