



Lane Regional Air Protection Agency
Simple Air Contaminant Discharge Permit

Review Report

Arcimoto, Inc.
311 Chambers Street
Eugene, OR 97402
Website: <http://www.arcimoto.com>

Source Information:

Primary SIC	3751 – Motorcycles, Bicycles, and Parts
Secondary SIC	--
Primary NAICS	336991 – Motorcycle, Bicycle, and Parts Manufacturing
Secondary NAICS	--
Public Notice Category	II

Source Category (LRAPA Title 37, Table 1)	Part B: 69. Surface coating operations: coating operations whose actual or expected usage of coating materials is greater than 250 gallons per month, excluding sources that exclusively use non-VOC and non-HAP containing coatings
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Compliance and Emissions Monitoring Requirements:

Unassigned Emissions	NA
Emission Credits	NA
Compliance Schedule	NA
Source Test [date(s)]	NA

COMS	NA
CEMS	NA
Ambient monitoring	NA

Reporting Requirements

Annual Report (due date)	February 15
Semiannual Report (due date)	February 15, August 15
GHG Report (due date)	NA

Monthly Report (due date)	NA
Quarterly Report (due date)	As applicable
Excess Emissions Report	Y
Other Reports (due date)	NA

Air Programs

NSPS (list subparts)	MMa
NESHAP (list subparts)	WWWWWW
CAM	NA
Regional Haze (RH)	NA
Synthetic Minor (SM)	NA
SM-80	NA
Title V	NA
Part 68 Risk Management	NA
ACDP (SIP)	NA
Major FHAP Source	NA
Federal Major Source	NA
NA New Source Review (NSR)	NA
Prevention of Significant Deterioration (PSD)	NA
Acid Rain	NA

Clean Air Mercury Rule (CAMR)	NA
TACT	NA
>20 Megawatts	NA

Permittee Identification

1. Arcimoto, Inc. ('Arcimoto' and/or 'the facility') is proposing to build a manufacturing facility for electric vehicles at 311 Chambers Street in Eugene, Oregon.

General Background

2. The facility will manufacture and assemble electric vehicles. The significant emission units at the facility include an electrostatic deposition process (EDP) line for the coating of vehicle parts that includes natural gas combustion for heating tanks on the EDP line and a 4.0 MMBtu per hour natural gas-fired coating oven, fiber laser cutting that vents to a filtration system exhausting into the building, and gas metal arc welding (GMAW) activities that vent to a filtration system exhausting into the building.

Reasons for Permit Action and Fee Basis

3. This permit action is for the initial issuance of a Simple Air Contaminant Discharge Permit (Simple ACDP). The facility submitted their initial permit application on November 5, 2021. Because this is an initial application, the permittee must pay the High Annual Fee under LRAPA 37-8020, Table 2, pursuant to LRAPA 37-0064(2).

Attainment Status

4. The facility is located inside the Eugene/Springfield Air Quality Management Area. The facility is located in an area that has been designated an attainment area for PM_{2.5}, NO₂, SO₂, Ozone, and Pb and a maintenance area for CO and PM₁₀.

Permitting History

5. Because this is an initial application, LRAPA has not reviewed or issued any previous permitting actions related to this facility:

Date(s) Approved/Valid	Permit Action Type	Description
Not Applicable	Not Applicable	Not Applicable

Compliance History

6. Because this is an initial application, LRAPA has not conducted any previous inspections of this facility or initiated any enforcement actions against this facility.

Source Testing

7. The facility is not required to conduct any source testing at this time.

Significant Emission Unit Description

8. The significant emission units regulated by this permit include the following:

Emission Unit	EU ID	Control Device	CD ID	EP ID
EDP Stage 2 0.9 MMBtu/hr natural gas-fired burner	H2	None	None	EX3
EDP line tanks	CL1	None	None	EX1
EDP line coating oven	CO1	None	None	EX5, EX6
EDP line 4.0 MMBtu/hr natural gas-fired coating oven burner	H3	None	None	EX4
Welding Activities	W1	Filter Bank	FB	W1
Three (3) Fiber Laser Cutters	L1	Filter Bank	FB	L1

- 8a. The EDP line consists of up to 12 tanks. Depending on the treatment process, parts move through a series of rinse, cleaning, and conditioning stages. Electrodeposition occurs in one tank where a primer is applied. Some of the tanks are heated with natural gas burners. Following the definition of categorically insignificant activities in LRAPA title 12, only the Stage 2 0.9 natural gas-fired burner is considered a significant emission unit among natural gas-fired emission units with maximum heat input ratings no greater than 2 MMBtu per hour. After the EDP line, parts enter a coating oven for curing. The coating oven has a 4.0 MMBtu per hour natural gas-fired burner. The facility calculations assume gaseous emissions occurring from both the EDP line and the coating oven, resulting in some minor double counting. Each natural gas-fired burner on the EDP line is exhausted through a stack. The gaseous emissions from the EDP line are exhausted in an enclosed room through a single stack (EX1). The coating oven has three exhaust stacks (EX4, EX5, EX6).
- 8b. The facility will perform GMAW under hoods that vent welding fumes (particulate matter) to a filter bank equipped with MERV 16 filters. While some of this activity is robotic welding performed in total enclosures, the rest of the welding will be performed within enclosures under fume hoods. The facility assumes a 95% capture efficiency for all welding activities. The facility assumes the filter bank will achieve at least 95% removal efficiency. The air from the filter bank is exhausted into the building along with any uncaptured emissions. A settling factor of 50% is assumed for these remaining welding fume emissions. According to the facility, they will only use E70S welding rod/wire for this activity.
- 8c. The facility will perform cutting of mild steel, copper and aluminum with fiber lasers within total enclosures. The particulate matter emissions generated by metal cutting will be controlled by a filter bank equipped with MERV 16 filters. The facility assumes the filter bank will achieve at least 95% removal efficiency. The air from the filter bank is exhausted into the building. A settling factor of 50% is assumed for these remaining metal cutting emissions. Due to the nature of fiber lasers, no significant NO_x emissions are expected from this process.

Insignificant Activities

9. The following emission units or processes are considered insignificant activities because they are listed as categorically insignificant activities under LRAPA title 12:

Emission Unit	EU ID	CD ID	EP ID
1.6 MMBtu/hr natural gas-fired boiler in Bldg. C	B1	None	B1
Two (2) 0.16 MMBtu/hr natural gas-fired water heaters in Bldg. F	B2	None	B2
EDP Stage 1 0.9 MMBtu/hr natural gas-fired heater	H1	None	EX2
Twenty-seven 0.2 MMBtu/hr natural gas-fired space heaters	H4	None	H4A, H4B, H4C, H4F

Specific Emission Limitations

10. All emission units are subject to the visible emission limitations under LRAPA 32-010(3). Each emission unit may not have visible emissions equal to or greater than 20% opacity for a period or periods aggregating more than three (3) minutes in any one (1) hour.
11. The fuel burning emission units at this facility are subject to the particulate matter emission limitations under LRAPA 32-030(2). For fuel burning emission units installed, constructed or modified after April 16, 2015, the particulate matter emission limit from any source is 0.10 grains per dry standard cubic foot. For fuel burning equipment that burns fuels other than wood, the emission results are corrected to 50% excess air.

12. The non-fuel burning emission units at this facility are subject to particulate matter emission limitations under LRAPA 32-015(2)(c). For non-fuel burning emission units installed, constructed or modified after April 16, 2015, the particulate matter emission limit from any source is 0.10 grains per dry standard cubic foot.
13. The emission units at this facility that do not combust natural gas are subject to the process weight rate emission limitation under LRAPA 32-045. Particulate matter emissions in any one hour may not exceed the amount shown in LRAPA 32-8010 for the process weight allocated to the process.

Typically Achievable Control Technology (TACT)

14. LRAPA title 32-008 requires that a new emission unit at a source to meet TACT if the emissions unit meets the following criteria: the emissions of criteria pollutants are equal to or greater than one (1) ton per year or equal to or greater than 500 pounds PM₁₀ per year in a PM₁₀ nonattainment area, the emissions unit is not subject to the emissions standards under LRAPA Title 32, Title 33, Title 38, Title 39, or Title 46 for the pollutants emitted, and the source is required to have a permit. The significant emission units at the facility which have criteria pollutant emissions above one (1) ton per year include the NO_x and CO emissions from the EDP line 4.0 MMBtu/hr natural gas-fired coating oven burner (EU: H3), the VOC emissions from the EDP line coating oven (EU: CO1), and the particulate matter emissions from fiber laser cutting (EU: L1).
- 14a. LRAPA believes that the EDP line 4.0 MMBtu/hr coating oven burner represents TACT for this unit for NO_x and CO as additional controls are not typically applied to small burners with a maximum heat input capacity under 10 MMBtu per hour.
- 14b. TACT is not applicable to the VOC emissions from the EDP line and coating oven because these VOC emissions are subject to an emission standard under Title 46 (40 CFR 60 subpart MM)
- 14c. LRAPA believes that operating the three fiber laser cutters in total enclosures and exhausting the operations to filter banks to control particulate matter emissions represents TACT for fiber laser cutting.

Plant Site Emission Limits (PSELs)

15. Provided below is a summary of the baseline emissions rate, netting basis, and PSELs for this facility.

Pollutant	Baseline Emission Rate (TPY)	Netting Basis	Plant Site Emission Limit (PSEL)	PSEL Increase Over Netting Basis (TPY)	Significant Emission Rate (TPY)
		Proposed (TPY)	Proposed PSEL (TPY)		
PM	NA	NA	24	24	25
PM ₁₀	NA	NA	14	14	15
PM _{2.5}	NA	NA	9	9	10
CO	NA	NA	99	99	100
NO _x	NA	NA	39	39	40
VOC	NA	NA	39	39	40
SO ₂	NA	NA	De minimis	De minimis	40
GHG	NA	NA	De minimis	De minimis	75,000

- 15a. Because this facility is subject to a Simple ACDP, the facility has no baseline emission rate or netting basis as required under LRAPA 42-0046(2)(c)(B).
- 15b. The PSELs for PM, PM₁₀, PM_{2.5}, CO, NO_x, and VOC are set at the generic PSEL level in accordance with LRAPA 37-0064(3)(b) for a Simple ACDP. No PSELs are set for SO₂ or GHGs in accordance with LRAPA 42-0020(3)(a) because these pollutants are emitted

facility-wide below the de minimis, as defined in LRAPA title 12, after excluding categorically insignificant activities.

Federal Hazardous Air Pollutants

16. The facility does not have potential emissions of federal HAPs (FHAPs) exceeding the major source thresholds of 10 tons per year for an individual federal HAP and 25 tons per year for the aggregate of all federal HAP. Therefore, the facility is considered a minor or area source of federal HAPs.
17. Provided below is a summary of the potential emissions of FHAP based on the permit application and the emission inventory of toxic air contaminants (TAC) submitted as part of the Cleaner Air Oregon (CAO) analysis. This analysis excludes FHAP emissions from categorically insignificant activities. The individual FHAP with the highest potential emissions are manganese compounds at 1.37E-02 TPY. The aggregate of all potential emissions of FHAPs is 1.73E-02 TPY.

Chemical Name (CAS Number)	FHAP	CAO TAC	Potential Emissions (TPY)
Acetaldehyde (75-07-0)	Yes	Yes	9.05E-05
1-methoxy-2-propanol (107-98-2)	No	Yes	8.50E+00
2-butoxyethanol (111-76-2)	No	Yes	3.12E+00
Acrolein (107-02-8)	Yes	Yes	5.68E-05
Aluminum (7429-90-5)	No	Yes	2.27E-02
Ammonia (7664-41-7)	No	Yes	6.73E-02
Ammonium nitrate (6482-52-2)	No	Yes	3.31E-04
Arsenic and compounds (7440-38-2)	Yes	Yes	4.21E-06
Barium and compounds (7440-39-3)	No	Yes	9.26E-05
Benzene (71-43-2)	Yes	Yes	1.68E-04
Benzo[a]pyrene (50-32-8)	Yes	Yes	2.52E-08
Beryllium and compounds (7440-41-7)	Yes	Yes	2.52E-07
Butan-2-ol (78-92-2)	No	Yes	8.90E+00
Cadmium and compounds (7440-43-9)	Yes	Yes	2.31E-05
Chromium VI, chromate and dichromate compounds (18540-29-9)	Yes	Yes	3.30E-05
Cobalt and compounds (7440-48-4)	Yes	Yes	5.28E-06
Copper and compounds (7440-50-8)	No	Yes	2.02E-01
Ethyl benzene (100-41-4)	Yes	Yes	2.00E-04
Formaldehyde (50-00-0)	Yes	Yes	3.58E-04
Hexane (110-54-3)	Yes	Yes	1.33E-04
Hydrogen fluoride (7664-39-3)	Yes	Yes	3.87E-04
Lead and compounds (7439-92-1)	Yes	Yes	1.05E-05
Manganese and compounds (7439-96-5)	Yes	Yes	1.37E-02
Mercury and compounds (7439-97-6)	Yes	Yes	5.47E-06
Molybdenum trioxide (1313-27-5)	No	Yes	3.47E-05
Naphthalene (91-20-3)	Yes	Yes	6.31E-06
Nickel compounds, insoluble (7440-02-0 / 365)	Yes	Yes	4.77E-05

Chemical Name (CAS Number)	FHAP	CAO TAC	Potential Emissions (TPY)
Nickel compounds, soluble (7440-02-0 / 365)	Yes	Yes	7.80E-04
Nitric acid (7697-37-2)	No	Yes	8.61E-04
Phosphoric acid (7664-38-2)	No	Yes	1.93E-03
Polycyclic Aromatic Hydrocarbons (PAHs) (-- / 401)	Yes	Yes	2.10E-06
Selenium and compounds (7782-49-2)	Yes	Yes	5.05E-07
Toluene (108-88-3)	Yes	Yes	7.70E-04
Vanadium (fume or dust) (7440-62-2)	No	Yes	4.84E-05
Xylene (mixture) (1330-20-7)	Yes	Yes	5.72E-04
Zinc and compounds (7440-66-6)	No	Yes	3.39E-03
Total Aggregate FHAP =			1.73E-02

Toxics Release Inventory

18. The Toxics Release Inventory (TRI) is federal program that tracks the management of certain toxic chemicals that may pose a threat to human health and the environment, over which LRAPA has no regulatory authority. It is a resource for learning about toxic chemical releases and pollution prevention activities reported by certain industrial facilities. Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI Program. In general, chemicals covered by the TRI Program are those that cause:
- Cancer or other chronic human health effects;
 - Significant adverse acute human health effects; or
 - Significant adverse environmental effects.

There are currently over 650 chemicals covered by the TRI Program. Facilities that manufacture, process or otherwise use these chemicals in amounts above established levels must submit annual TRI reports on each chemical. NOTE: The TRI Program is a federal program over which LRAPA has no regulatory authority. LRAPA does not guarantee the accuracy of any information copied from EPA's TRI website.

Because this facility has not begun operation, this facility has never reported any emissions to the TRI program.

Cleaner Air Oregon

19. Arcimoto proposes to manufacture ultra-efficient vehicles at this location. Production activities will primarily consist of fabrication, welding, coating, and assembly. The primary sources of Toxic Air Contaminants (TACs) from the facility include particulate TACs from the welding activities and fiber laser cutting and organic TACs from the electrodeposition line. The TACs resulting from natural gas combustion activities at the facility are excluded from the total risk for the purpose of determining compliance with Risk Action Levels as allowed under OAR 340-245-0050(5). Arcimoto conducted a Level 1 Risk Assessment to determine cancer and noncancer risk from facility TAC emissions. Both annual and short-term (24-hour) activities were used to estimate TAC emission rates, and air concentrations were calculated using dispersion factors available in OAR 340-245-8010, Table 3. Cancer and noncancer risk were determined based on the distance to the closest residential, worker, child, and acute exposure locations. Based on the results of the Level 1 Risk Assessment for this facility as summarized below, Arcimoto exceeds the Source Permit Level and is required to have source risk limits in the draft Simple ACDP to maintain facility risk at or below the Excess Cancer Risk per Million of 5 and the Noncancer Hazard Index of 1. The primary risk drivers for the Noncancer Risk are emissions of manganese and aluminum from welding activities and fiber laser cutting.

Risk Type	Calculated Risk	Facility Risk*	Risk Action Level	
			Source Permit Level	Community Engagement Level
Cancer Risk – added cancer risk per million with 70 years of exposure				
Residential (e.g. homes near facility)	0.50	1	0.5	5
Non-Residential Child (e.g. school near facility)	8.0E-4	0		
Non-Residential Worker (e.g. office near facility)	1.6E-2	0		
Noncancer Risk – Hazard Index (less than or equal to 1 is considered safe)				
Annual Exposure – Residential (e.g. home)	0.89	1	0.5	1
Annual Exposure – Non-Residential Child (e.g. school)	6.0E-3	0		
Annual Non-Residential Worker (e.g. office)	0.19	0		
24-Hour Exposure (acute)	0.58	1		

* Risk values rounded in accordance with OAR 340-245-0200(4)(a) for comparison to the Risk Action Levels. Facility risk rounded as compared to the Community Engagement Level.

20.
- The permit will include daily and monthly limits on the amount of welding wire/rod consumed and the amount of pigment, resin, and flow additive coating materials used on the EDP line. Fiber laser cutting TAC emissions were calculated at capacity for three machines. As the permit limits the facility to three (3) fiber laser cutters, no further limitations are required on these processes to limit risk. Similarly, the emissions from the EDP line tanks other than the coating operation were calculated at capacity. The permit will include a requirement to notify and review the risk from any changes in the coating types or contents of the EDP line tanks other than the coating operation.

New Source Performance Standards

21.
- LRAPA reviewed the following NSPSs to determine their applicability to this facility:
- 21a.
- 40 CFR Part 60, Subpart MM – Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations appears to be applicable to this facility. Under 40 CFR 60.390(a), this NSPS applies to each prime coat operation, each guide coat operation, and each topcoat operation at an automobile or light duty truck assembly plant that was constructed, modified, or reconstructed after October 5, 1979, and on or before May 18, 2022. This facility will begin construction of the prime coating operation after this time period and is not subject to this NSPS.
- 21b.
- 40 CFR Part 60, Subpart MMA – Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations appears to be applicable to this facility. Under the pre-publication version of the proposed rule, this NSPS applies to each prime coat operation, each guide coat operation, and each topcoat operation at an automobile or light duty truck assembly plant for which construction, modification or reconstruction occurred after May 18, 2022. The coating operations must occur on ‘automobile and light-duty truck bodies’ which are defined as the exterior surface of an automobile or light-duty truck including hoods, fenders, cargo boxes, doors, and grill opening panels. An ‘automobile’ is defined as a motor vehicle capable of carrying no more than 12 passengers. A ‘light-duty truck’ is defined as any motor vehicle rated at 3,850 kilograms gross vehicle weight or less, designed mainly to transport property. Per the requirements under LRAPA 37-0064(3)(a), the Simple ACDP will not include any federal requirements that have not been adopted by the Board. The permit will be modified once the Board adopts this federal requirement.

National Emission Standards for Hazardous Air Pollutants (NESHAPs)

22. LRAPA reviewed the following NESHAPs to determine their applicability to this facility:
- 22a. 40 CFR Part 63, Subpart IIII (4I) - National Emission Standards for Hazardous Air Pollutants: Surface Coating of Automobiles and Light-Duty Trucks is not applicable to the facility because the facility is not a major source of FHAPs.
 - 22b. 40 CFR Part 63, Subpart MMMM (4M) - National Emission Standards for Hazardous Air Pollutants for Surface Coating of miscellaneous Metal Parts and Products is not applicable to the facility because the facility is not a major source of FHAPs.
 - 22c. 40 CFR Part 63, Subpart HHHHHH (6H) - National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources is not applicable to the facility because the facility does not use methylene chloride for paint stripping, it is not an autobody refinishing operation, and the facility does not use spray coating to apply the surface coatings to be used at the facility.
 - 22d. 40 CFR Part 63, Subpart XXXXXX (6X) - National Emission Standards for Hazardous Air Pollutants: Nine Metal Fabrication and Finishing Source Categories is not applicable to the source because the facility is not primarily engaged in the operations in one of the nine source categories listed in 40 CFR 63.11514(a)
 - 22e. 40 CFR Part 63, Subpart WWWWWW (6W) – National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Plating and Polishing Operations is considered applicable to the source. The facility intends to use a product that contains nickel acetate which may have bath concentrations that exceed 0.1 percent by weight of nickel (as the metal). Based on a conversation with the consultant for this facility, the vendor of this coating indicates that the use of this coating would be considered a form of electroless or non-electrolytic plating. Electroless or non-electrolytic plating is defined as “a process that uses or emits any of the plating and polishing metal HAP [as defined in 40 CFR 63 Subpart 6W] in which metallic ions in a plating bath or solution are reduced to form a metal coating at the surface of a catalytic substrate without the use of external electrical energy. Examples include, but are not limited to, chromate conversion coating, nickel acetate sealing, sodium dichromate sealing, and manganese phosphate coating.” The permit will include the applicable requirements from this area source NESHAP. Under the authority granted in 40 CFR 63.10(a)(5), the annual report will be due on February 15 of the year immediately following the reporting period rather than January 31 as required under 40 CFR 63.11509(c)(7).

Recordkeeping Requirements

23. The facility is required to keep and maintain a record of the following information for a period of five (5) years.
- 23a. VOC-containing materials include, but are not limited to, coatings, lacquers, thinners, stains, topcoats, solvents, adhesives, cleaning, and wash-off materials.
 - 23b. The density and VOC content information must be supplied from CPDS or SDS provided by the manufacturer/supplier of the VOC containing material.

24.

Activity	Parameter	Units	Minimum Recording Frequency
PSEL Recordkeeping			
VOC-containing material	Material name and usage	Gallons	Monthly
VOC-containing material	Density of material	Pounds per gallon	Each coating and additive

Activity	Parameter	Units	Minimum Recording Frequency
VOC-containing material	VOC content	% by weight	Each coating and additive
Welding rod/wire	Rod/wire type and usage	Pounds	Monthly
Fiber laser cutting	Cutting usage by metal type	Hours	Monthly
Natural gas	Usage	MMcf or therms	Monthly
Filter bank particulate matter control efficiency	Specification	NA	Maintain documentation from each filter manufacturer
Capture or filtration system maintenance or inspections	Occurrence	NA	Quarterly
Filter bank filter replacement	Occurrence	NA	Upon Replacement
Visible emissions survey	NA	NA	Quarterly
Modified EPA Method 9	NA	NA	Each occurrence
NESHAP 40 CFR 63 subpart 6W Recordkeeping			
Initial notification	Upon startup	NA	One-time
Notification of compliance status	Upon startup	NA	One-time unless modified
Annual compliance certification	NA	NA	Annual
Cleaner Air Oregon Recordkeeping			
Welding rod/wire	Usage by type	1,000 Pounds	Daily and monthly
EDP line resin, pigment, and flow additive	Usage of each component	Gallons	Daily and monthly
General Recordkeeping			
Complaints from the public	Log each complaint and the resolution	NA	Upon receipt
Upset log of all planned and unplanned excess emissions	See G15	NA	Per occurrence

Reporting Requirements

25. For each year the permit is in effect, the permittee must submit to LRAPA the following information by the dates indicated in the table below:

Report	Reporting Period	Due Date
PSEL pollutant emissions, including the supporting process parameter and emission factor information. The summary must include VOC and HAP emission calculations corresponding to each 12-month rolling period in the previous calendar year.	Annual	February 15
Certification of compliance report and deviation report for 40 CFR 63 subpart 6W if deviations occurred during the reporting year.	Annual	February 15
A list of permanent changes made in facility processes, production levels, and pollution control equipment including any new SDS or CPDS	Annual	February 15
A summary of maintenance performed on pollution control equipment.	Annual	February 15

Report	Reporting Period	Due Date
A summary of complaints from the public and the resolution, as applicable.	Annual	February 15
The excess emission log information required by Condition G13 of the permit.	Annual	February 15

26. The permittee is not subject to greenhouse gas reporting under OAR 340 Division 215 because actual greenhouse gas emissions are expected to be less than 2,500 metric tons (2,756 short tons) of CO₂ equivalents per year. If the source ever emits more than this amount, they will be required to report greenhouse gas emissions.

Public Notice

27. The permit was on public notice from Wednesday, May 25, 2022 at 8:00am to Friday, June 24, 2022 at 5:00pm. Written comments were submitted during the 35-day comment period. After the comment period, LRAPA responded to the comments received and has taken final action to issue the permit. No public hearing was requested during the public comment period.

Public Notice Comments

LRAPA received and responded to the following comments at the close of the public comment period:

[All public comments that were received for this project are a public record and are retained with the public permit review files. For purposes of this summary document, the public comments may have been edited to reduce length or consolidated with similar comments. Public comments that are not related to the review report or draft permit, such as those comments that are statements of fact or express an opinion, are not presented in this document, and do not require a response from LRAPA.]

Comment 1: The general CAO conditions used by both LRAPA and Oregon DEQ have been revised during the public comment period. LRAPA proposes to replace the existing general CAO conditions contained in the permit on public notice with the revised general CAO conditions.

Response 1: LRAPA provided a copy of the revised general CAO conditions to the permittee for review. The permittee expressed no concerns with replacing the existing general CAO conditions contained in the permit on public notice with the revised general CAO conditions. The final permit will contain the revised general CAO conditions.

JJW/rr
07/01/2022

The following calculations are taken from the Arcimoto permit application supplement dated April 25, 2022 as modified by LRAPA.

Table 3-10: Plant Site Emission Summary

Pollutant		Emission Sources						
		Pretreatment Heater Stage 2 (H2)	Coating Oven- Bumer (H3)	Coating Oven (CO1)	Coating Line Baths (CL1)*	Welding (W1)	Laser (L1)	Emission Total
NOx	Tons/yr	0.386	1.72					2.10
CO	Tons/yr	0.325	1.44					1.77
VOC	Tons/yr	0.021	0.09	19.92				20.03
PM/PM10/PM2.5	Tons/yr	0.010	0.04			0.018	5.64	5.71
SO2	Tons/yr	0.010	0.04					0.05
CO2e	Tons/yr	461.60	2,051.56					2,513
Hazardous Air Pollutants	lb/yr	0.91	4.06	0.00	2.33	2.25	25.12	34.67
Toxic Air Contaminants	lb/yr	25.94	115.30	41,045.85	4,601.59	2.25	475.37	46,266

* 100% VOC in coating calculated as being emitted from Coating Oven

Table 3-11: Emission Summary for Natural Gas-Fired Categorically Insignificant Activities

Pollutant		Natural Gas-Fired Categorically Insignificant Activities (CIA)				
		Back-up Condensing Boiler (B1)	Building F Domestic Hot Water Heaters (B2)	Pretreatment Heater Stage 1 (H1)	Infrared Radiant Heating Units (H4)	CIA Emissions Total
NOx	Tons/yr	0.027	0.008	0.386	0.301	0.72
CO	Tons/yr	0.023	0.007	0.325	0.253	0.61
VOC	Tons/yr	0.002	0.0005	0.021	0.017	0.04
PM/PM10/PM2.5	Tons/yr	0.001	0.0002	0.010	0.008	0.02
SO2	Tons/yr	0.001	0.0002	0.010	0.008	0.02
CO2e	Tons/yr	32.82	9.85	461.60	360.05	864.32

Table 3-1: Emissions from Pretreatment Heater Stage 2 (H2)

Number of units	1
Rating	0.9 MMBtu/hr
HHV Natural Gas	1,020 Btu/ft3
Max. Daily Operating Hours	24
Max. Annual Operating Hours	8760
Expected Max. Annual Operating Ca	100%
Max. Annual Natural Gas Usage	7884.0 MMBtu/yr
Max. Annual Natural Gas Usage	7.7 MMCF/yr

Total Fuel Usage

Annual Natural Gas Usage	7884.0 MMBtu/yr
Annual Natural Gas Usage	7.7 MMCF/yr
Daily Natural Gas Usage	0.02 MMCF/day

Criteria Pollutants(1)		
Pollutant	Emission Factor (lb/MMCF)	Emission Rate (tpy)
NOx	100	0.386
CO	84	0.325
VOC	5.5	0.0213
PM/PM10/PM2.5	2.5	0.0097
SO2	2.6	0.0100

(1) Emission factor from ODEQ, AQ-EF05

Greenhouse Gases(2)		
Pollutant	Emission Factor (kg/MMBtu)	Emission Rate (tpy)
CO2e	53.1148	461.60

(2) Emission factor from EPA, 40 CFR Part 98, Subpart C

Toxic Air Contaminants (TACs)(3)					Single Unit	
Pollutant	CAS	Emission Factor (lb/MMCF)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Benzene	71-43-2	0.008	0.00017	0.062	1.69E-04	6.18E-02
Formaldehyde	50-00-0	0.017	0.00036	0.131	3.60E-04	1.31E-01
Polycyclic aromatic hydrocarbons (PAHs)	401	0.0001	0.00000	0.001	2.12E-06	7.73E-04
Benzo[a]pyrene	50-32-8	0.0000012	0.00000	0.000	2.54E-08	9.28E-06
Naphthalene	91-20-3	0.0003	0.00001	0.002	6.35E-06	2.32E-03
Acetaldehyde	75-07-0	0.0043	0.00009	0.033	9.11E-05	3.32E-02
Acrolein	107-02-8	0.0027	0.00006	0.021	5.72E-05	2.09E-02
Ammonia	7664-41-7	3.2	0.06776	24.734	6.78E-02	2.47E+01
Arsenic and compounds	7440-38-2	0.0002	0.00000	0.002	4.24E-06	1.55E-03
Barium and compounds	7440-39-3	0.0044	0.00009	0.034	9.32E-05	3.40E-02
Beryllium and compounds	7440-41-7	0.000012	0.00000	0.000	2.54E-07	9.28E-05
Cadmium and compounds	7440-43-9	0.0011	0.00002	0.009	2.33E-05	8.50E-03
Chromium VI, chromate and dichromate particulate	18540-29-9	0.0014	0.00003	0.011	2.96E-05	1.08E-02
Cobalt and compounds	7440-48-4	0.000084	0.00000	0.001	1.78E-06	6.49E-04
Copper and compounds	7440-50-8	0.00085	0.00002	0.007	1.80E-05	6.57E-03
Ethyl benzene	100-41-4	0.0095	0.00020	0.073	2.01E-04	7.34E-02
Hexane	110-54-3	0.0063	0.00013	0.049	1.33E-04	4.87E-02
Lead and compounds	7439-92-1	0.0005	0.00001	0.004	1.06E-05	3.86E-03
Manganese and compounds	7439-96-5	0.00038	0.00001	0.003	8.05E-06	2.94E-03
Mercury and compounds	7439-97-6	0.00026	0.00001	0.002	5.51E-06	2.01E-03
Molybdenum trioxide	1313-27-5	0.00165	0.00003	0.013	3.49E-05	1.28E-02
Nickel compounds, insoluble	365	0.0021	0.00004	0.016	4.45E-05	1.62E-02
Selenium and compounds	7782-49-2	0.000024	0.00000	0.000	5.08E-07	1.86E-04
Toluene	108-88-3	0.0366	0.00078	0.283	7.75E-04	2.83E-01
Vanadium (fume or dust)	7440-62-2	0.0023	0.00005	0.018	4.87E-05	1.78E-02
Xylene (mixture), including m-xylene, o-xylene, p-xylene	1330-20-7	0.0272	0.00058	0.210	5.76E-04	2.10E-01
Zinc and compounds	7440-66-6	0.029	0.00061	0.224	6.14E-04	2.24E-01
Total TACs			0.07	25.94	0.07	25.94

(3) TAC Emission Factors from ODEQ ATEI Combustion Emission Factor Tool: WebFIRE/ AP-42 Section 1.4 (metals); SCAQMD AB2588 - Default Emission Factors for Fuel Combustion, Table B-1

Table 3-2: Emissions from Coating Oven Burner (H3)

Number of units	1
Rating	4.0 MMBtu/hr
HHV Natural Gas	1,020 Btu/ft3
Max. Daily Operating Hours	24
Max. Annual Operating Hours	8760
Expected Max. Annual Operating Capacity	100%
Max. Annual Natural Gas Usage	35040.0 MMBtu/yr
Max. Annual Natural Gas Usage	34.4 MMCF/yr

Total Fuel Usage	
Annual Natural Gas Usage	35040.0 MMBtu/yr
Annual Natural Gas Usage	34.4 MMCF/yr
Daily Natural Gas Usage	0.09 MMCF/day

Criteria Pollutants(1)		
Pollutant	Emission Factor (lb/MMCF)	Emission Rate (tpy)
NOx	100	1.718
CO	84	1.443
VOC	5.5	0.0945
PM/PM10/PM2.5	2.5	0.0429
SO2	2.6	0.0447

(1) Emission factor from ODEQ, AQ-EF05

Greenhouse Gases(2)		
Pollutant	Emission Factor (kg/MMBtu)	Emission Rate (tpy)
CO2e	53.1148	2051.56

(2) Emission factor from EPA, 40 CFR Part 98, Subpart C

Toxic Air Contaminants (TACs)(3)					Single Unit	
Pollutant	CAS	Emission Factor (lb/MMCF)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Benzene	71-43-2	0.008	0.00075	0.275	7.53E-04	2.75E-01
Formaldehyde	50-00-0	0.017	0.00160	0.584	1.60E-03	5.84E-01
Polycyclic aromatic hydrocarbons (PAHs)	401	0.0001	0.00001	0.003	9.41E-06	3.44E-03
Benzo[a]pyrene	50-32-8	0.0000012	0.00000	0.000	1.13E-07	4.12E-05
Naphthalene	91-20-3	0.0003	0.00003	0.010	2.82E-05	1.03E-02
Acetaldehyde	75-07-0	0.0043	0.00040	0.148	4.05E-04	1.48E-01
Acrolein	107-02-8	0.0027	0.00025	0.093	2.54E-04	9.28E-02
Ammonia	7664-41-7	3.2	0.30118	109.929	3.01E-01	1.10E+02
Arsenic and compounds	7440-38-2	0.0002	0.00002	0.007	1.88E-05	6.87E-03
Barium and compounds	7440-39-3	0.0044	0.00041	0.151	4.14E-04	1.51E-01
Beryllium and compounds	7440-41-7	0.000012	0.00000	0.000	1.13E-06	4.12E-04
Cadmium and compounds	7440-43-9	0.0011	0.00010	0.038	1.04E-04	3.78E-02
Chromium VI, chromate and dichromate particulate	18540-29-9	0.0014	0.00013	0.048	1.32E-04	4.81E-02
Cobalt and compounds	7440-48-4	0.000084	0.00001	0.003	7.91E-06	2.89E-03
Copper and compounds	7440-50-8	0.00085	0.00008	0.029	8.00E-05	2.92E-02
Ethyl benzene	100-41-4	0.0095	0.00089	0.326	8.94E-04	3.26E-01
Hexane	110-54-3	0.0063	0.00059	0.216	5.93E-04	2.16E-01
Lead and compounds	7439-92-1	0.0005	0.00005	0.017	4.71E-05	1.72E-02
Manganese and compounds	7439-96-5	0.00038	0.00004	0.013	3.58E-05	1.31E-02
Mercury and compounds	7439-97-6	0.00026	0.00002	0.009	2.45E-05	8.93E-03
Molybdenum trioxide	1313-27-5	0.00165	0.00016	0.057	1.55E-04	5.67E-02
Nickel compounds, insoluble	365	0.0021	0.00020	0.072	1.98E-04	7.21E-02
Selenium and compounds	7782-49-2	0.000024	0.00000	0.001	2.26E-06	8.24E-04
Toluene	108-88-3	0.0366	0.00344	1.257	3.44E-03	1.26E+00
Vanadium (fume or dust)	7440-62-2	0.0023	0.00022	0.079	2.16E-04	7.90E-02
Xylene (mixture), including m-xylene, o-xylene, p-xylene	1330-20-7	0.0272	0.00256	0.934	2.56E-03	9.34E-01
Zinc and compounds	7440-66-6	0.029	0.00273	0.996	2.73E-03	9.96E-01
Total TACs			0.32	115.30	0.32	115.30

(3) TAC Emission Factors from ODEQ ATEI Combustion Emission Factor
Tool: WebFIRE/ AP-42 Section 1.4 (metals); SCAQMD AB2588 - Default
Emission Factors for Fuel Combustion, Table B-1

Table 3-4: Emissions from Coating Line Baths (CL1)

Pretreatment Baths

Emission estimates are based on EPA's AP-42 (Chapter 12.20.2) equation 4 as follows (See Note 1):

$$E = \frac{1.9 \sigma}{R_b} \left[\frac{(1 - 2a + 9a^2)^{0.5} + (a - 1)}{(1 + 3a) - (1 - 2a + 9a^2)^{0.5}} \right]^{0.5}$$

where:
E = Emission factor in grains/cubic foot of aeration air;
σ = Surface tension of bath, in pounds force per foot (lb/ft);
R_b = Average bubble radius, in inches;
a = 0.072 *R_b*²/*σ*

Operating Hrs	8760 hrs/yr
	24 hr/day

Toxic Air Contaminants (TACs)

Pretreat Option	Tank Process Name	Tank #	Additive	Additive Concentration in Bath (gal/100 gal)	Additive Density (lb/gal)	Chemical/ TAC Pollutant	CAS (See Note 2)	Chemical Weight % In Additive	Chemical Concentration (lb/gal)	Surface Tension, σ (lb/ft)	Average Bubble Radius, R _b (Inches)	Factor, a (0.072 R _b ² /σ)	Tank Liquid Emission Rate (grains/ft ³ -aeration air)	Aeration Rate (cfm/ft ²)	Tank Surface Area (ft ²)	Tank Liquid Emission Rate (lb/hr)	MWAF (see Note 3)	Chemical Emission Rate (lb/hr)	Chemical Emission Rate (lb/day)	Chemical Emission Rate (lb/yr)
Zinc Option	Alkaline Clean	Stage 2	Bonderite NP-2	3		no TACs	--											0	0	0
	Conditioner	Stage 5	Prepalene X	0.26	10.51	zinc orthophosphate	7440-66-6	30%	0.0082	0.0048	0.05	0.0375	0.0367	10	59	0.1854	0.5080	0.00009	0.0022	0.81
	Zinc Pretreat	Stage 6	Bonderite 3410	3.4	11.68	zinc dihydrogen phosphate	7440-66-6	20%	0.0794	0.0048	0.05	0.0375	0.0367	10	59	0.1854	0.2520	0.00044	0.0107	3.90
	Zinc Pretreat	Stage 6	Bonderite 3410	3.4	11.68	nickel nitrate	7440-02-0	10%	0.0397	0.0048	0.05	0.0375	0.0367	10	59	0.1854	0.2018	0.00018	0.0043	1.56
	Zinc Pretreat	Stage 6	Bonderite 3410	3.4	11.68	phosphoric acid	7664-38-2	5%	0.0198	0.0048	0.05	0.0375	0.0367	10	59	0.1854	1	0.00044	0.0106	3.87
	Zinc Pretreat	Stage 6	Bonderite 3410	3.4	11.68	zinc nitrate	7440-66-6	5%	0.0198	0.0048	0.05	0.0375	0.0367	10	59	0.1854	0.2198	0.00010	0.0023	0.85
	Zinc Pretreat	Stage 6	Bonderite 3410	3.4	11.68	hydrogen fluoride	7664-39-3	1%	0.0040	0.0048	0.05	0.0375	0.0367	10	59	0.1854	1	0.00009	0.0021	0.77
	Zinc Pretreat	Stage 6	Bonderite M-AD 131	0.042		no TACs	--											0	0	0
	Zinc Pretreat	Stage 6	Bonderite M-AD 700	0.042		no TACs	--											0	0	0
	Zinc Pretreat	Stage 6	Bonderite C-IC 2520	1	8.84	nitric acid	7697-37-2	10%	0.0088	0.0048	0.05	0.0375	0.0367	10	59	0.1854	1	0.00020	0.0047	1.72
Zinc Pretreat Option Total TACs																		0.00134	0.0322	11.76

Pretreat Option	Tank Process Name	Tank #	Additive	Additive Concentration in Bath (gal/100 gal)	Additive Density (lb/gal)	Chemical/ TAC Pollutant	CAS (See Note 2)	Chemical Weight % In Additive	Chemical Concentration (lb/gal)	Surface Tension, σ (lb/ft)	Average Bubble Radius, R _b (Inches)	Factor, a (0.072 R _b ² /σ)	Tank Liquid Emission Rate (grains/ft ³ -aeration air)	Aeration Rate (cfm/ft ²)	Tank Surface Area (ft ²)	Tank Liquid Emission Rate (lb/hr)		Chemical Emission Rate (lb/hr)	Chemical Emission Rate (lb/day)	Chemical Emission Rate (lb/yr)
Nano Option	Alkaline Clean	Stage 2	Bonderite NP-2	3		no TACs	--											0	0	0
	Nano Pretreat	Stage 5	Bonderite M-NT2	4	8.51	ammonium nitrate	6482-52-2	1%	0.0034	0.0048	0.05	0.0375	0.0367	10	59	0.1854		0.00008	0.0018	0.66

Notes

Note 1: Non aerated, non electrolytic tanks not containing volatile organic solvents are assumed to have negligible emissions as indicated in EPA's "The Metal Finishing Facility Risk Screening Tool (MFFRST): Technical Documentation and User's Guide" (EPA/600/R-01/057), July, 2001, pg 2-33. To be conservative, emissions from the pretreatment immersion bath tanks were estimated using the EPA equation for electroplating emissions even though emissions should be negligible. Default parameters for surface tension, average bubble radius and aeration rate are taken from the MFFRST document page 2-36.

Note 2: Where additives contained zinc- or nickel- based chemicals, the chemicals were assumed to fall under the CAS for zinc or nickel compounds if the CAS for the chemical was not on the DEQ list of air toxics.

Electrocoating Stage (Stage 8 or Stage 9 in coating line depending on Pretreatment option used)

Operating Hour:	8760 hr/yr
	24 hr/day

Using EPA emission equation from EIIIP Volume II, Chapter 6- Semiconductor MFG, Equation 6.5-5, page 6.5-6 and -7:

$W_x = (MW_x * K * A * P_{vapx}) / (R * T)$

where:

W_x = Evaporation rate of pollutant x (lb/sec)
MW_x = molecular weight of pollutant x (lb/lb-mole)
K = gas phase mass transfer coefficient (ft/sec)= 0.00438 * U^{0.78} * (18/MW_x)^{1/3}
U = wind speed (mph)
A - surface area (square ft)
P_{vapx} - vapor pressure of pollutant x (psia)
R = ideal gas constant= 10.73
T = Temperature (oR)

Toxic Air Contaminants (TACs)

AquaEC 5100 Coating Component	Chemical/TAC Pollutant	CAS	Chemical Weight % in component	Chemical Molecular Weight (MW)	U-Wind Speed (mph)	K (ft/sec)	A-Surface Area (ft2)	P vapx (psia)	R (psia-ft3/oR-lb-mole)	T- Temperature (oR)	W (lb/sec)	Chemical Emission (lb/hr)	Chemical Emission (lb/day)	Chemical Emission (lb/yr)
Resin	1-methoxy-2-propanol	107-98-2	3.0%	90.12	1.7	0.00388	65	0.242	10.73	544.67	2.81976E-05	0.10	2.44	889.24
Pigment paste	2-butanol	78-92-2	6.4%	74.12	1.7	0.00414	65	0.354	10.73	544.67	7.72397E-05	0.28	6.67	2,435.83
Pigment paste	2-butoxyethanol	111-76-2	1.8%	118.17	1.7	0.00354	65	0.017	10.73	544.67	1.42395E-06	0.0051	0.12	44.91
Flow additive	2-butoxyethanol	111-76-2	55.0%	Assume all TAC in flow additive comes off in coating bath									32.84	1,231.61
Total TACs from Ecoat bath													42.08	4,601.59

Vapor Pressure Documentation:

1-methoxy-2-propanol	https://pubchem.ncbi.nlm.nih.gov/compound/1-Methoxy-2-propanol#section=Vapor-Pressure	(12.5 mm Hg @ 25C)
2-butanol	https://pubchem.ncbi.nlm.nih.gov/compound/6568#section=Vapor-Pressure	(18.3 mm Hg @ 25C)
2-butoxyethanol	https://pubchem.ncbi.nlm.nih.gov/compound/8133#section=Vapor-Pressure	(0.88 mm Hg @ 25C)

Arcimoto
Emission Detail Sheets
Fiber Laser Cutters (L1)

PM/PM ₁₀ /PM _{2.5} Emissions																	
Unit Identification	Cutting Technique	Metal Type	Metal Thickness (Inches)	Kerf (Inches)	Metal Cutting Speed (IPM)	Control Device Type	% Control Efficiency	% Settling Factor	Density (g/cm ³)	Density Conversion (lb/in ³)	Fume Generated (% of Particulate Generated)	PM/PM _{2.5} /PM ₁₀ Emission Factor (lb/inch)	Metal Feed Rate (IPH)	Uncontrolled Emissions (lb/hr)	Potential Emissions (lb/hr)	Uncontrolled Emissions (TPY)	Potential Emissions (TPY)
L1-Steel	Dry	Steel	0.75	0.039	2000	Filter	95%	50%	7.83	0.28	5	4.18E-04	120000	50.12	1.25	219.51	5.49
L1-Copper	Dry	Copper	0.1875	0.016	400	Filter	95%	50%	8.96	0.32	5	4.78E-05	24000	1.15	2.9E-02	5.02	0.126
L1- Aluminum	Dry	Aluminum	0.09	0.008	1000	Filter	95%	50%	2.7	0.10	5	3.46E-06	60000	0.21	5.2E-03	0.91	0.023
Total =														51.47	1.29	225.44	5.64

Notes:
Steel metal thickness range is 1/16 - 3/4", kerf width range is 0.2-1 mm, cutting speed range is 20-2000 in./min.
Copper metal thickness range is 1/8 - 3/16", kerf width is 0.4 mm, cutting speed range is 50-400 in./min.

HAP/TAC Emissions								
Pollutant	CAS No.	Fume Percent	Uncontrolled Emissions (lb/hr)	Potential Emissions (lb/hr)	Uncontrolled Emissions (TPY)	Potential Emissions (TPY)		
Copper and Compounds - Mild Steel	7440-50-8	1.4%	7.02E-01	1.75E-02	3.07E+00	7.68E-02	CAO PTE (lb/day)	CAO PTE (lb/yr)
Copper and Compounds - Copper	7440-50-8	100.0%	1.15E+00	2.87E-02	5.02E+00	1.26E-01		
Copper and Compounds - Total			1.85E+00	4.62E-02	8.10E+00	2.02E-01	1.11	405
Manganese and Compounds	7439-96-5	10%	1.15E-01	2.87E-03	5.02E-01	1.26E-02	6.9E-02	25.1
Aluminum and Compounds	7429-90-5	100%	2.07E-01	5.18E-03	9.08E-01	2.27E-02	0.12	45
Total CAO =							475	

Fume Generation Rate/Specific Gravity Table				
Metal	Dry	Semidry	Wet	Specific Gravity
Mild Steel, 8mm	5	0.5	0.05	7.83

Notes:
Emissions are based on "Emission of Fume, Nitrogen Oxides and Noise in Plasma Cutting of Stainless and Mild Steel" by Bromsen B. et al. (1994)
Study referenced above did not evaluate fiber laser cutting or cutting of copper and aluminum.
Fume generation rate of copper and aluminum assumed to be the same as mild steel.
This assumption is reasonable because a fiber optic laser is expected to generate lower emissions than the high energy and high heat plasma type cutting system evaluated in the study.
Mild steel fume is 67-73% iron, 2-10% manganese, and ND-1.4% copper.
310 stainless steel fume is 25.4% iron, 4.4% manganese, 10.3% nickel, and 20.2% chromium(VI).
Potential emissions assume 24 hours per day and 8760 hours per year of operation. Typical maximum operating hours will be 8 hrs/day and 2000 hours per year.

Table 3-5: Emissions from Welding (W1)

Operating Information

Type of Welding Process	GMAW (Gas Metal Arc Welding)
Electrode Type	E70S
Annual Electrode Consumption	144,000 lb/yr
Daily Electrode Consumption	864 lb/day
Hood Capture Efficiency	95%
Filter Removal Efficiency	95%
Settling Factor	50%
Overall Control Efficiency	90% (95% capture, 99% control)

Criteria Pollutants			
Pollutant	Emission Factor(1) (lb/1000 lb electrode)	Controlled lb/1000 lb electrode	Emission Rate (tpy)
PM10	5.2	0.507	0.018

(1) AP-42 Table 12.19-1

Toxic Air Contaminants (TACs)					
Pollutant	CAS	lb/1000 lb electrode (2)	Controlled lb/1000 lb electrode	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Chromium VI, chromate and dichromate particulate	18540-29-9	0.001	9.75E-05	4.21E-05	7.02E-03
Cobalt and compounds	7440-48-4	0.001	9.75E-05	4.21E-05	7.02E-03
Manganese and compounds	7439-96-5	0.318	0.031005	1.34E-02	2.23E+00
Nickel and compounds, insoluble	365	0.001	9.75E-05	4.21E-05	7.02E-03
Total TACs				0.014	2.25

(2) AP-42 Table 12.19-2 (converted from units of 0.1 lb/1000 lb electrode)

Note: Chromium compounds are HAPs but not TACs. AP-42 emission factor for Cr(VI), and ODEQ TAC is "ND"

Table 3-6: Emissions from Backup Condensing Boiler (B1)

Number of units	1
Rating	1.6 MMBtu/hr
HHV Natural Gas	1,020 Btu/ft3
Max. Daily Operating Hours	24
Max. Annual Operating Hours	8760
Expected Max. Annual Operating Capacity	4%
Max. Annual Natural Gas Usage	560.6 MMBtu/yr
Max. Annual Natural Gas Usage	0.550 MMCF/yr
Total Fuel Usage	
Annual Natural Gas Usage	560.6 MMBtu/yr
Annual Natural Gas Usage	0.5 MMCF/yr
Daily Natural Gas Usage	0.0376 MMCF/day

Criteria Pollutants(1)		
Pollutant	Emission Factor (lb/MMCF)	Emission Rate (tpy)
NOx	100	0.027
CO	84	0.023
VOC	5.5	0.0015
PM/PM10/PM2.5	2.5	0.0007
SO2	2.6	0.0007

(1) Emission factor from ODEQ, AQ-EF05

Greenhouse Gases(2)		
Pollutant	Emission Factor (kg/MMBtu)	Emission Rate (tpy)
CO2e	53.1148	32.82

(2) Emission factor from EPA, 40 CFR Part 98, Subpart C

Toxic Air Contaminants (TACs)(3)					Single Unit	
Pollutant	CAS	Emission Factor (lb/MMCF)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Benzene	71-43-2	0.008	0.00030	0.004	3.01E-04	4.40E-03
Formaldehyde	50-00-0	0.017	0.00064	0.009	6.40E-04	9.34E-03
Polycyclic aromatic hydrocarbons (PAHs)	401	0.0001	0.00000	0.000	3.76E-06	5.50E-05
Benzo[a]pyrene	50-32-8	0.0000012	0.00000	0.000	4.52E-08	6.60E-07
Naphthalene	91-20-3	0.0003	0.00001	0.000	1.13E-05	1.65E-04
Acetaldehyde	75-07-0	0.0043	0.00016	0.002	1.62E-04	2.36E-03
Acrolein	107-02-8	0.0027	0.00010	0.001	1.02E-04	1.48E-03
Ammonia	7664-41-7	3.2	0.12047	1.759	1.20E-01	1.76E+00
Arsenic and compounds	7440-38-2	0.0002	0.00001	0.000	7.53E-06	1.10E-04
Barium and compounds	7440-39-3	0.0044	0.00017	0.002	1.66E-04	2.42E-03
Beryllium and compounds	7440-41-7	0.000012	0.00000	0.000	4.52E-07	6.60E-06
Cadmium and compounds	7440-43-9	0.0011	0.00004	0.001	4.14E-05	6.05E-04
Chromium VI, chromate and dichromate par	18540-29-9	0.0014	0.00005	0.001	5.27E-05	7.70E-04
Cobalt and compounds	7440-48-4	0.000084	0.00000	0.000	3.16E-06	4.62E-05
Copper and compounds	7440-50-8	0.00085	0.00003	0.000	3.20E-05	4.67E-04
Ethyl benzene	100-41-4	0.0095	0.00036	0.005	3.58E-04	5.22E-03
Hexane	110-54-3	0.0063	0.00024	0.003	2.37E-04	3.46E-03
Lead and compounds	7439-92-1	0.0005	0.00002	0.000	1.88E-05	2.75E-04
Manganese and compounds	7439-96-5	0.00038	0.00001	0.000	1.43E-05	2.09E-04
Mercury and compounds	7439-97-6	0.00026	0.00001	0.000	9.79E-06	1.43E-04
Molybdenum trioxide	1313-27-5	0.00165	0.00006	0.001	6.21E-05	9.07E-04
Nickel compounds, insoluble	365	0.0021	0.00008	0.001	7.91E-05	1.15E-03
Selenium and compounds	7782-49-2	0.000024	0.00000	0.000	9.04E-07	1.32E-05
Toluene	108-88-3	0.0366	0.00138	0.020	1.38E-03	2.01E-02
Vanadium (fume or dust)	7440-62-2	0.0023	0.00009	0.001	8.66E-05	1.26E-03
Xylene (mixture), including m-xylene, o-xyle	1330-20-7	0.0272	0.00102	0.015	1.02E-03	1.50E-02
Zinc and compounds	7440-66-6	0.029	0.00109	0.016	1.09E-03	1.59E-02
Total TACs			0.13	1.84	0.13	1.84

(3) TAC Emission Factors from ODEQ ATEI Combustion Emission Factor Tool: WebFIRE/ AP-42 Section 1.4 (metals); SCAQMD AB2588 - Default Emission Factors for Fuel Combustion, Table B-1

De minimis emission levels are 1.0 tpy for each criteria pollutant and 2,756 tpy for greenhouse gases per OAR 340-200-0020(39). Aggregate expected actual annual emissions from these units are below these levels and the equipment is categorically insignificant per LRAPA 12-005.

Table 3-7: Emissions from Building F Hot Water Heaters (B2)

# of units	2
Rating	0.16 MMBtu/hr
HHV Natural Gas	1,020 Btu/ft3
Max. Daily Operating Hours	24
Max. Annual Operating Hours	8760
Expected Max. Annual Operating Capacit	6%
Max. Annual Natural Gas Usage	168.2 MMBtu/yr
Max. Annual Natural Gas Usage	0.16 MMCF/yr
Total Fuel Usage	
Annual Natural Gas Usage	168.2 MMBtu/yr
Annual Natural Gas Usage	0.2 MMCF/yr
Daily Natural Gas Usage	0.0075 MMCF/day

Criteria Pollutants(1)		
Pollutant	Emission Factor (lb/MMCF)	Emission Rate (tpy)
NOx	100	0.0082
CO	84	0.0069
VOC	5.5	0.00045
PM/PM10/PM2.5	2.5	0.00021
SO2	2.6	0.00021

(1) Emission factor from ODEQ, AQ-EF05

Greenhouse Gases(2)		
Pollutant	Emission Factor (kg/MMBtu)	Emission Rate (tpy)
CO2e	53.1148	9.85

(2) Emission factor from EPA, 40 CFR Part 98, Subpart C

Toxic Air Contaminants (TACs)(3)					Single Unit	
Pollutant	CAS	Emission Factor (lb/MMCF)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Benzene	71-43-2	0.008	0.00006	0.001	3.01E-05	6.60E-04
Formaldehyde	50-00-0	0.017	0.00013	0.003	6.40E-05	1.40E-03
Polycyclic aromatic hydrocarbons (PAHs)	401	0.0001	0.00000	0.000	3.76E-07	8.24E-06
Benzo[a]pyrene	50-32-8	0.0000012	0.00000	0.000	4.52E-09	9.89E-08
Naphthalene	91-20-3	0.0003	0.00000	0.000	1.13E-06	2.47E-05
Acetaldehyde	75-07-0	0.0043	0.00003	0.001	1.62E-05	3.55E-04
Acrolein	107-02-8	0.0027	0.00002	0.000	1.02E-05	2.23E-04
Ammonia	7664-41-7	3.2	0.02409	0.528	1.20E-02	2.64E-01
Arsenic and compounds	7440-38-2	0.0002	0.00000	0.000	7.53E-07	1.65E-05
Barium and compounds	7440-39-3	0.0044	0.00003	0.001	1.66E-05	3.63E-04
Beryllium and compounds	7440-41-7	0.000012	0.00000	0.000	4.52E-08	9.89E-07
Cadmium and compounds	7440-43-9	0.0011	0.00001	0.000	4.14E-06	9.07E-05
Chromium VI, chromate and dichromate	18540-29-9	0.0014	0.00001	0.000	5.27E-06	1.15E-04
Cobalt and compounds	7440-48-4	0.000084	0.00000	0.000	3.16E-07	6.93E-06
Copper and compounds	7440-50-8	0.00085	0.00001	0.000	3.20E-06	7.01E-05
Ethyl benzene	100-41-4	0.0095	0.00007	0.002	3.58E-05	7.83E-04
Hexane	110-54-3	0.0063	0.00005	0.001	2.37E-05	5.19E-04
Lead and compounds	7439-92-1	0.0005	0.00000	0.000	1.88E-06	4.12E-05
Manganese and compounds	7439-96-5	0.00038	0.00000	0.000	1.43E-06	3.13E-05
Mercury and compounds	7439-97-6	0.00026	0.00000	0.000	9.79E-07	2.14E-05
Molybdenum trioxide	1313-27-5	0.00165	0.00001	0.000	6.21E-06	1.36E-04
Nickel compounds, insoluble	365	0.0021	0.00002	0.000	7.91E-06	1.73E-04
Selenium and compounds	7782-49-2	0.000024	0.00000	0.000	9.04E-08	1.98E-06
Toluene	108-88-3	0.0366	0.00028	0.006	1.38E-04	3.02E-03
Vanadium (fume or dust)	7440-62-2	0.0023	0.00002	0.000	8.66E-06	1.90E-04
Xylene (mixture), including m-xylene, o-xylene	1330-20-7	0.0272	0.00020	0.004	1.02E-04	2.24E-03
Zinc and compounds	7440-66-6	0.029	0.00022	0.005	1.09E-04	2.39E-03
Total TACs			0.03	0.55	0.01	0.28

(3) TAC Emission Factors from ODEQ ATEI Combustion Emission Factor Tool: WebFIRE/ AP-42 Section 1.4 (metals); SCAQMD AB2588 - Default Emission Factors for Fuel Combustion, Table B-1

De minimis emission levels are 1.0 tpy for each criteria pollutant and 2,756 tpy for greenhouse gases per OAR 340-200-0020(39). Aggregate expected actual annual emissions from these units are below these levels and the equipment is categorically insignificant per LRAPA 12-005.

Table 3-8: Emissions from Pretreatment Heater Stage 1 (H1)

Number of units	1
Rating	0.9 MMBtu/hr
HHV Natural Gas	1,020 Btu/ft3
Max. Daily Operating Hours	24
Max. Annual Operating Hours	8760
Expected Max. Annual Operating Capacity	100%
Max. Annual Natural Gas Usage	7884.0 MMBtu/yr
Max. Annual Natural Gas Usage	7.7 MMCF/yr
Total Fuel Usage	
Annual Natural Gas Usage	7884.0 MMBtu/yr
Annual Natural Gas Usage	7.7 MMCF/yr
Daily Natural Gas Usage	0.0212 MMCF/day

Criteria Pollutants(1)		
Pollutant	Emission Factor (lb/MMCF)	Emission Rate (tpy)
NOx	100	0.386
CO	84	0.325
VOC	5.5	0.0213
PM/PM10/PM2.5	2.5	0.0097
SO2	2.6	0.0100

(1) Emission factor from ODEQ, AQ-EF05

Greenhouse Gases(2)		
Pollutant	Emission Factor (kg/MMBtu)	Emission Rate (tpy)
CO2e	53.1148	461.60

(2) Emission factor from EPA, 40 CFR Part 98, Subpart C

Toxic Air Contaminants (TACs)(3)					Single Unit	
Pollutant	CAS	Emission Factor (lb/MMCF)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Benzene	71-43-2	0.008	0.00017	0.062	1.69E-04	6.18E-02
Formaldehyde	50-00-0	0.017	0.00036	0.131	3.60E-04	1.31E-01
Polycyclic aromatic hydrocarbons (PAHs)	401	0.0001	0.00000	0.001	2.12E-06	7.73E-04
Benzo[a]pyrene	50-32-8	0.0000012	0.00000	0.000	2.54E-08	9.28E-06
Naphthalene	91-20-3	0.0003	0.00001	0.002	6.35E-06	2.32E-03
Acetaldehyde	75-07-0	0.0043	0.00009	0.033	9.11E-05	3.32E-02
Acrolein	107-02-8	0.0027	0.00006	0.021	5.72E-05	2.09E-02
Ammonia	7664-41-7	3.2	0.06776	24.734	6.78E-02	2.47E+01
Arsenic and compounds	7440-38-2	0.0002	0.00000	0.002	4.24E-06	1.55E-03
Barium and compounds	7440-39-3	0.0044	0.00009	0.034	9.32E-05	3.40E-02
Beryllium and compounds	7440-41-7	0.000012	0.00000	0.000	2.54E-07	9.28E-05
Cadmium and compounds	7440-43-9	0.0011	0.00002	0.009	2.33E-05	8.50E-03
Chromium VI, chromate and dichromate pa	18540-29-9	0.0014	0.00003	0.011	2.96E-05	1.08E-02
Cobalt and compounds	7440-48-4	0.000084	0.00000	0.001	1.78E-06	6.49E-04
Copper and compounds	7440-50-8	0.00085	0.00002	0.007	1.80E-05	6.57E-03
Ethyl benzene	100-41-4	0.0095	0.00020	0.073	2.01E-04	7.34E-02
Hexane	110-54-3	0.0063	0.00013	0.049	1.33E-04	4.87E-02
Lead and compounds	7439-92-1	0.0005	0.00001	0.004	1.06E-05	3.86E-03
Manganese and compounds	7439-96-5	0.00038	0.00001	0.003	8.05E-06	2.94E-03
Mercury and compounds	7439-97-6	0.00026	0.00001	0.002	5.51E-06	2.01E-03
Molybdenum trioxide	1313-27-5	0.00165	0.00003	0.013	3.49E-05	1.28E-02
Nickel compounds, insoluble	365	0.0021	0.00004	0.016	4.45E-05	1.62E-02
Selenium and compounds	7782-49-2	0.000024	0.00000	0.000	5.08E-07	1.86E-04
Toluene	108-88-3	0.0366	0.00078	0.283	7.75E-04	2.83E-01
Vanadium (fume or dust)	7440-62-2	0.0023	0.00005	0.018	4.87E-05	1.78E-02
Xylene (mixture), including m-xylene, o-xyle	1330-20-7	0.0272	0.00058	0.210	5.76E-04	2.10E-01
Zinc and compounds	7440-66-6	0.029	0.00061	0.224	6.14E-04	2.24E-01
Total TACs			0.07	25.94	0.07	25.94

(3) TAC Emission Factors from ODEQ ATEI Combustion Emission Factor Tool: WebFIRE/ AP-42 Section 1.4 (metals); SCAQMD AB2588 - Default Emission Factors for Fuel Combustion, Table B-1

De minimis emission levels are 1.0 tpy for each criteria pollutant and 2,756 tpy for greenhouse gases per OAR 340-200-0020(39). Aggregate expected actual annual emissions from these units are below these levels and the equipment is categorically insignificant per LRAPA 12-005.

Table 3-9: Emissions from Infrared Heaters (H4)

Number of units	27
Rating	0.2 MMBtu/hr
HHV Natural Gas	1,020 Btu/ft3
Max. Daily Operating Hours	24
Max. Annual Operating Hours	8760
Expected Max. Annual Operating Capacit	13%
Max. Annual Natural Gas Usage	6149.5 MMBtu/yr
Max. Annual Natural Gas Usage	6.0 MMCF/yr

Total Fuel Usage	
Annual Natural Gas Usage	6149.5 MMBtu/yr
Annual Natural Gas Usage	6.0 MMCF/yr
Daily Natural Gas Usage	0.13 MMCF/day

Criteria Pollutants(1)		
Pollutant	Emission Factor (lb/MMCF)	Emission Rate (tpy)
NOx	100	0.3
CO	84	0.3
VOC	5.5	0.02
PM/PM10/PM2.5	2.5	0.008
SO2	2.6	0.01

(1) Emission factor from ODEQ, AQ-EF05

Greenhouse Gases(2)		
Pollutant	Emission Factor (kg/MMBtu)	Emission Rate (tpy)
CO2e	53.1148	360.05

(2) Emission factor from EPA, 40 CFR Part 98, Subpart C

Toxic Air Contaminants (TACs)(3)					Single Unit	
Pollutant	CAS	Emission Factor (lb/MMCF)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)	Daily Emissions (lb/day)	Annual Emissions (lb/yr)
Benzene	71-43-2	0.008	0.00102	0.048	3.76E-05	1.79E-03
Formaldehyde	50-00-0	0.017	0.00216	0.102	8.00E-05	3.80E-03
Polycyclic aromatic hydrocarbons (PAHs)	401	0.0001	0.00001	0.001	4.71E-07	2.23E-05
Benzo[a]pyrene	50-32-8	0.0000012	0.00000	0.000	5.65E-09	2.68E-07
Naphthalene	91-20-3	0.0003	0.00004	0.002	1.41E-06	6.70E-05
Acetaldehyde	75-07-0	0.0043	0.00055	0.026	2.02E-05	9.60E-04
Acrolein	107-02-8	0.0027	0.00034	0.016	1.27E-05	6.03E-04
Ammonia	7664-41-7	3.2	0.40659	19.293	1.51E-02	7.15E-01
Arsenic and compounds	7440-38-2	0.0002	0.00003	0.001	9.41E-07	4.47E-05
Barium and compounds	7440-39-3	0.0044	0.00056	0.027	2.07E-05	9.82E-04
Beryllium and compounds	7440-41-7	0.000012	0.00000	0.000	5.65E-08	2.68E-06
Cadmium and compounds	7440-43-9	0.0011	0.00014	0.007	5.18E-06	2.46E-04
Chromium VI, chromate and dichromate	18540-29-9	0.0014	0.00018	0.008	6.59E-06	3.13E-04
Cobalt and compounds	7440-48-4	0.000084	0.00001	0.001	3.95E-07	1.88E-05
Copper and compounds	7440-50-8	0.00085	0.00011	0.005	4.00E-06	1.90E-04
Ethyl benzene	100-41-4	0.0095	0.00121	0.057	4.47E-05	2.12E-03
Hexane	110-54-3	0.0063	0.00080	0.038	2.96E-05	1.41E-03
Lead and compounds	7439-92-1	0.0005	0.00006	0.003	2.35E-06	1.12E-04
Manganese and compounds	7439-96-5	0.00038	0.00005	0.002	1.79E-06	8.49E-05
Mercury and compounds	7439-97-6	0.00026	0.00003	0.002	1.22E-06	5.81E-05
Molybdenum trioxide	1313-27-5	0.00165	0.00021	0.010	7.76E-06	3.68E-04
Nickel compounds, insoluble	365	0.0021	0.00027	0.013	9.88E-06	4.69E-04
Selenium and compounds	7782-49-2	0.000024	0.00000	0.000	1.13E-07	5.36E-06
Toluene	108-88-3	0.0366	0.00465	0.221	1.72E-04	8.17E-03
Vanadium (fume or dust)	7440-62-2	0.0023	0.00029	0.014	1.08E-05	5.14E-04
Xylene (mixture), including m-xylene, o-xylene	1330-20-7	0.0272	0.00346	0.164	1.28E-04	6.07E-03
Zinc and compounds	7440-66-6	0.029	0.00368	0.175	1.36E-04	6.48E-03
Total TACs			0.43	20.23	0.02	0.75

(3) TAC Emission Factors from ODEQ ATEI Combustion Emission Factor Tool: WebFIRE/ AP-42 Section 1.4 (metals); SCAQMD AB2588 - Default Emission Factors for Fuel Combustion, Table B-1

De minimis emission levels are 1.0 tpy for each criteria pollutant and 2,756 tpy for greenhouse gases per OAR 340-200-0020(39). Aggregate expected actual annual emissions from these units are below these levels and the equipment is categorically insignificant per LRAPA 12-005.