

## **ENGINEERING ANALYSIS**

### **PROJECT DESCRIPTION**

On April 16, 2026, as amended on April 24, 2026, Hikae Aluminum Processing, L.L.C. (Hikae) submitted an air permit application for the operation of a mobile Hammer Mill shredder, at their secondary aluminum processing facility in Ashville, Alabama. Hikae currently operates a 25-ton rotary melting furnace and associated aluminum shredder, crushers and screeners, under Synthetic Minor Operating Permits (SMOPs) 410-0041-X003 issued on November 12, 2025, and X002, issued on June 27, 2025, respectively.

Hikae plans to utilize a mobile, 760 HP diesel fired, model VB950 DK, Hammer Mill shredder, to shred spent salt cake from the existing aluminum melting furnace, which will eventually be reintroduced to the aluminum melting furnace or disposed of off-site. In addition, the shredder will occasionally be utilized to shred wood pallets.

The melting of Aluminum scrap in the melting furnace is typically carried out under a layer of salt which absorbs oxides and other unwanted contaminants and protects the molten aluminum from oxidization loss. The salt cake (dross) formed is skimmed from the molten aluminum and disposed of. Hikae proposes to reintroduce the dross into the scrap melting process to recover aluminum in the salt cake and utilize the salt in the dross to flux the molten aluminum.

The 760 HP diesel fired, model VB950 DK, Hammer Mill shredder is a self-propelled processing unit equipped with tracks. Therefore, these engines are not subject to the stationary source engine requirements of NSPS or NESHAP. The emissions generated from combustion associated with the diesel engine have been included in the analysis for facility wide emission totals.

### **EMISSIONS**

Per ADEM Admin. Code r. 335-3-14-.04, Potential to Emit shall mean the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable.

The Potential to Emit (PTE) from the proposed unit is calculated using the maximum capacity of the emissions unit under its physical and operational design for 8,760 hrs per year unless the owner or operator is willing to accept a federally enforceable limitation to lower its PTE. In order to maintain the facility's Synthetic Minor Operating Permits (SMOP), Hikae requested to limit the operation of the proposed Hammer Mill shredder to no more than 2,000 hours per year, and limit material processed through the Hammer Mill Shredder to 40 tons per hour and 80,000 tons per year.

Emissions from the stockpiled salt cake were previously included in the facility wide emissions from the dross handling associated with emission calculations from the rotary furnace and as such are not included here.

In Hikae's application, they suggested utilizing wet suppression to control emissions from the salt cake shredding process, however the emissions generated from the introduction of water to

the salt cake can emit ammonia and nitrogen which may be flammable, as such the Department has not included wet suppression as an alternative control device for the shredding operation. Instead, should particulate matter emissions become excessive, the Department proposes reducing throughput to the shredder as an alternative to wet suppression.

Hikae currently has operational hour limits and throughput limits associated with the existing operations at the facility. The maximum rated capacities and potential annual throughputs for the emissions units associated with this project are shown below in Table 1.

Emission Unit	Description	Rated Capacity			Maximum Operating Hours
		Natural Gas	Aluminum		
		MMBtu/hr	TPH	TPY	HPY
FSS	Shear Shredder	-	10.0	54,330	5,433
AC	Crushing and Screening	-	7.39	40,166	5,433
RF	Furnace Heater	20.0	-	-	8,760
RF	Furnace Melt/Charge	-	6.83	37,110	5,433
RF	Furnace melt/Production	-	6.50	33,956	5,433
F-SH	Mobile Hammer Mill Shredder		40	80,000	2,000

Table 1: Emission Units and Throughputs

The emission factors utilized for calculating of PTE were developed or adapted from the following sources:

- PM emissions from dross shredding were derived from a similar facility provided by Hikae “Schnitzer Steel Industries, Inc., “Supplemental Information for NOC 11986- General Metals of Tacoma, Washington, date June 28, 2023”.
- Emissions of regulated air pollutants from the 760 BHP Hp Diesel engine are based on:
  - “South Coast AQMD Default Emission Factors, 2022;
  - AP-42, Table 3-4.2
  - Tier 4 standards in 40 CFR part 1042
- GHG emissions were obtained from 40 CFR Part 98, Subpart C, Tables C-1 and C-2.

Pollutant (TPY)	Furnace Heater	Furnace Fug + Controlled	Fugitives <sup>1</sup>	Salt Cake processing w/Hammer Mill	720 HP Diesel Hammer Mill Shredder	Total Emissions
<b>PM<sub>filt</sub></b>	0.16	4.08	45.60	10.76	0.371	60.97
<b>PM<sub>10</sub></b>	0.16	3.37	4.92	4.73	0.412	13.59
<b>PM<sub>2.5</sub></b>	0.16	3.89	4.82	4.73	0.412	14.02
<b>PM<sub>con</sub></b>	0.49	0.80	-	-	0.041	1.33
<b>SO<sub>2</sub></b>	0.05	0.05	-	-	0.008	0.11

<b>NO<sub>x</sub></b>	8.59	1.49	-	-	17.02	27.09
<b>CO</b>	7.21	13.52	-	-	6.17	26.91
<b>VOC</b>	0.47	42.45	3.83	-	0.436	47.21
<b>Total HAPs</b>	0.16	10.67	1.02	-	0.031	11.88
<b>M-HAPs</b>	-	1.89E-03	0.23	-	-	0.23
<b>O-HAPS</b>	-	1.14	0.79	-	-	1.93
<b>HCL</b>	-	9.53	-	-	-	9.53
<b>D/F</b>	-	5.57E-07	-	-	-	5.57E-07
<b>CO<sub>2</sub></b>	10247.10	-	-	-	880.11	11127.2
<b>N<sub>2</sub>O</b>	0.02	-	-	-	0.01	0.03
<b>CH<sub>4</sub></b>	0.19	-	-	-	0.04	0.23
<b>Mass Sum</b>	10247.32	-	-	-	880.16	11127.5
<b>CO<sub>2e</sub></b>	10257.69	-	-	-	883.09	11140.8

<sup>1</sup> Includes emissions from shred/crush/screen, material handling, pouring and cooling.

Table 2: Potential Emissions

## EXISTING LIMITS

In addition to the D/F limit required by 40 CFR Part 63 Subpart RRR (2.10 gr-DF/ton-charge), Hikae will have the following SMOP Limits:

Throughput:

- 37,110 TPY for aluminum scrap melting;
- 54,330 TPY from shredding (existing shredder);
- 40,116 TPY for crushing and screening;

Emission Rates:

- 6.0 lb/hr PM and 3.50 lb/hr HCl from the melting furnace; and 4.28 lb/hr of PM from crushing and screening operations.

Hour Limits:

- Shred/crush/screen limited to 5,433 hours per year.

## REGULATIONS

### ***ADEM Administrative Code Rule 335-3-4-.01(1)(a and b), “Visible Emission”***

**ADEM 335-3-4-.01(a)** states that no person shall emit to the atmosphere particulate of an opacity of greater than twenty percent (20%) over a six (6) minute period. **ADEM 335-3-4-.01(b)** states that during one six-minute period in any sixty-minute period a person may discharge into the atmosphere from any source of emissions, particulate of an opacity not greater than that designated as forty percent (40%) opacity. All sources, including both baghouses, the meltshop roof vents, and any other openings in the building or sources located outside are subject to this rule.

For Hikae to maintain compliance with these rules, Hikae shall perform daily visible emission checks of the mobile Hammer Mill shredder when operating. If visible emissions are noted, Hikae shall perform a visible emissions observation in accordance with Method 9 and take appropriate

actions necessary to eliminate the observed emissions immediately, followed by an additional observation to confirm that emissions are reduced to normal. Records of emissions observations, Method 9 observations conducted, including results and any repairs or observed problems, should be noted in a form suitable for inspection.

***ADEM Administrative Code Rule 335-3-4-.02, “Fugitive Dust and Fugitive Emissions”***

**ADEM 335-3-4-.02(3)** states that No person shall cause, suffer, allow, or permit any materials to be handled, transported, or stored; or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne. When dust, fumes, gases, mist, odorous matter, vapors, or any combination thereof escape from a building or equipment in such a manner and amount as to cause a nuisance or to violate any rule or regulation, the Director may order that the building or equipment in which processing, handling and storage are done be tightly closed and ventilated in such a way that all air and gases and air or gas-borne material leaving the building or equipment are treated by removal or destruction of air contaminants before discharge to the open air.

***ADEM Administrative Code Rule 335-3-14-.04, “Prevention of Significant Deterioration (PSD) Permitting”***

Secondary Metal Production facilities are one of the 28 source categories listed in ADEM Admin Code r. 335-3-14-.04(2)(a)1 as having a 100 TPY major source threshold for criteria pollutants. Based on the emissions found in Table 2, the facility would not be expected to exceed the 100 TPY threshold. A facility must address PSD regulations for greenhouse gases only if that facility is major for criteria pollutants. Per ADEM Code r. 335-3-14(2)(a)1(i)&(ii), no PSD review would be necessary for this facility.

***ADEM Administrative Code, Rule 335-3-14-.06, “Determinations for Major Sources in Accordance with Clean Air Act Section 112(g)”***

This regulation applies to major sources of hazardous air pollutants (HAPs) constructed after March 27, 1998. Since this facility is not a major source of HAPs, a 112(g) case by case MACT review would not be necessary.

***ADEM Administrative Code, Rule 335-3-15, “Synthetic Minor Source Operating Permits (SMOPs)” and 335-3-16, “Major Source Operating Permits (MSOPs)”***

Hikae shall not shred/crush more than 80,000 tons of salt cake during any consecutive 12-month period and Hikae shall not operate the mobile Hammer Mill shredder more than 2000 hours during any consecutive (rolling) 12-month period.

After considering the existing SMOP limits on the sources at the Hikae facility and the overall PTE considering pollution controls when appropriate, the facility does not have the potential to emit greater than 100 TPY of any single regulated air pollutant. As such, the facility will be considered a synthetic minor source for both regulated air pollutants and HAPs.

**Monitoring Requirements**

Hikae shall conduct daily visible emissions observations of the mobile Hammer Mill shredder. Observations shall be conducted by a person familiar with EPA Method 9, as described in Appendix A of 40 CFR Part 60.

In order to ensure compliance with the above SMOP limits, Hikae shall install and operate a device to record the hours of operation of the mobile Hammer Mill shredder and record the daily hours of operation. Records shall be kept in a form suitable for inspection. The records shall be retained for at least five (5) years and made available upon request.

The facility OM&M plan shall be updated to include the operation and maintenance plan for the mobile Hammer Mill shredder. Each measurement system and/or procedure shall be operated in accordance with the facility OM&M plan.

### **Notifications, Reports and Record Keeping Requirements**

Hikae must record and maintain records of the following for the mobile Hammer Mill shredder, for a minimum of five years from the date of occurrence. All records must be readily available for inspection.

- Records of daily visible emissions observations, and
- Records of the daily operating hours.

### ***Class I Area***

The nearest Class I Area to Hikae, the Sipsey Wilderness Area, is greater than 100 km from the facility. Emissions from the proposed project are not expected to have a significant impact on this area.

### **FEDERAL REGULATIONS**

#### ***40 CFR 60 “New Source Performance Standards”***

No subparts within this part are applicable to the Hikae facility.

#### ***40 CFR 63 “General Provisions”***

This subpart is applicable provided that the facility is subject to one of the applicable subparts found under 40 CFR Part 63 “National Emission Standards for Hazardous Air Pollutants for Source Categories”.

#### ***40 CFR 63 Subpart RRR – NESHAP for Secondary Aluminum Production***

This regulation is applicable to each secondary aluminum production facility as defined in §63.1503, at both major and area sources. This includes any establishment using clean charge, aluminum scrap, or dross from aluminum production, as the raw material and performing one or more of the following processes: scrap shredding, scrap drying/delacquering/decoating, thermal chip drying, furnace operations (i.e., melting, holding, sweating, refining, fluxing, or alloying), recovery of aluminum from dross, in-line fluxing, or dross cooling.

However, due to the existing SMOP limits on HCL and the TPY of charge limit to the furnace, the facility is considered an area source under this subpart. Therefore, the mobile Hammer Mill shredder is not subject to this rule.

### **RECOMMENDATIONS**

The facility, as proposed, should be able to meet all state and federal regulations, if operated properly. As such, I recommend Hikae be issued Synthetic Minor Operating Permit Nos. 410-

0041-X004 for the mobile Hammer Mill shredder emission unit at the Hikaе facility pending fee payment.



---

David DiFante  
Industrial Minerals Section  
Energy Branch  
Air Division

May 28, 2026  
Date

HIKAE ALUMINUM PROCESSING, L.L.C.  
 ASHVILLE, ALABAMA  
 SMOP: 410-0041-X004 MOBILE SHREDDER

DATA: Hikaе 760 HP Diesel			AP-42 Emission Factors (lb/MMBtu)										
ENGINE TYPE	=	Engine											
FUEL HEAT CONTENT	=	19,300 Btu/lb	Type	PM <sub>filr</sub>	PM <sub>con</sub> <sup>2</sup>	SO <sub>2</sub> <sup>1</sup>	NO <sub>x</sub>	CO	VOC	CH <sub>2</sub> O	Other HAPs		
FUEL S CONTENT	=	15.00 ppm	Diesel	6.97E-2	7.70E-3	[By Mass]	3.20E+0	1.16E+0	8.19E-2	1.18E-3	4.58E-3		
MAXIMUM ENGINE HP	=	760 HP	2SLB	3.84E-2	9.91E-3	5.88E-4	3.17E+0	3.86E-1	1.20E-1	5.52E-2	2.53E-2		
ENGINE OP HOURS	=	2,000 Hr	4SLB	7.71E-5	9.91E-3	5.88E-4	4.08E+0	3.17E-1	1.18E-1	5.28E-2	2.10E-2		
ENGINE RATING	=	5.32 MMBtu/hr	4SRB	9.50E-3	9.91E-3	5.88E-4	2.27E+0	3.72E+0	2.96E-2	2.05E-2	1.20E-2		
BRAKE-SPECIFIC FUEL CONSUMPTION	=	7,000 Btu/ HP-hr	40 CFR Part 98 Subpart C Greenhouse Gas Emission Factors										
CALCULATION BASIS	=	Uncontrolled	Tables C-1 & C-2 (kg/MMBtu)										
EMISSION FACTORS (EF)		MANUFACTURER'S EF											
		Uncontrolled	Controlled										
NO <sub>x</sub>	=	g/HP-hr	g/HP-hr	N <sub>2</sub> O		CO <sub>2</sub>		CH <sub>4</sub>		GWP			
CO	=	g/HP-hr	g/HP-hr	Diesel	0.0006	75.04	0.003	N <sub>2</sub> O= 298					
VOC	=	g/HP-hr	g/HP-hr	NG	0.0001	53.06	0.001	CO <sub>2</sub> = 1					
CH <sub>2</sub> O	=	g/HP-hr	g/HP-hr	LPG	0.0006	62.72	0.003	CH <sub>4</sub> = 25					
PM	=	g/HP-hr	g/HP-hr	Propane	0.0006	61.46	0.003	PM <sub>10</sub> 4.96E-2					
CH <sub>4</sub>	=	g/HP-hr	g/HP-hr	PM <sub>2.5</sub> 4.79E-2									

Uncontrolled 760 HP Engine Emissions Calculations

													Uncontrolled
PM <sub>1,filr</sub>	6.97E-2 lb	5.32 MMBtu		2,000 Hr	1 Ton								3.71E-01 Tons
	MMBtu	hr		Year	2000 Lb								Year
PM <sub>10</sub>	4.96E-2 lb	5.32 MMBtu		2,000 Hr	1 Ton								2.64E-01 Tons
	MMBtu	hr		Year	2000 Lb								Year
PM <sub>2.5</sub>	4.79E-2 lb	5.32 MMBtu		2,000 Hr	1 Ton								2.55E-01 Tons
	MMBtu	hr		Year	2000 Lb								Year
PM <sub>con</sub>	7.70E-3 lb	5.32 MMBtu		2,000 Hr	1 Ton								4.10E-02 Tons
	MMBtu	hr		Year	2000 Lb								Year
SO <sub>2</sub>	51.8135 lb fuel	5.32 MMBtu	2000 Hrs	1 Ton	64.08 lb SO <sub>2</sub>	15 ppmv S							8.26E-03 Tons
	MMBtu	Hr	Year	2000 Lb	32.06 lb S	100000 n total ppm							Year
NO <sub>x</sub>	3.20E+0 lb	5.32 MMBtu		2,000 Hr	1 Ton		S.F.						17.024 Tons
	MMBtu	hr		Year	2000 Lb								Year
CO	1.16E+0 lb	5.32 MMBtu		2,000 Hr	1 Ton		S.F.						6.17 Tons
	MMBtu	hr		Year	2000 Lb								Year
VOC	0.08 lb	5.32 MMBtu		2,000 Hr	1 Ton		S.F.						4.36E-01 Tons
	MMBtu	hr		Year	2000 Lb								Year
CH <sub>2</sub> O	0.0012 lb	5.32 MMBtu		2,000 Hr	1 Ton		S.F.						0.01 Tons
	MMBtu	hr		Year	2000 Lb								Year
non-CH <sub>2</sub> O HAPs	0.0046 lb	5.32 MMBtu		2,000 Hr	1 Ton		S.F.						0.02 Tons
	MMBtu	Hr		Year	2000 Lb								Year
CO <sub>2</sub>	5.32 MMBtu	75.04 kg	0.001 Metric Ton	2,000 Hr	1.1023 Tons								880.11 Tons
	Hr	MMBtu	kg	Year	1 M Ton								Year
N <sub>2</sub> O	5.32 MMBtu	0.0006 kg	0.001 Metric Ton	2,000 Hr	1.1023 Tons								7.04E-03 Tons
	Hr	MMBtu	kg	Year	1 M Ton								Year
CH <sub>4</sub>	5.32 MMBtu	0.003 kg	0.001 Metric Ton	2,000 Hr	1.1023 Tons								3.52E-02 Tons
	Hr	MMBtu	kg	Year	1 M Ton								Year
Mass Sum	880.11 Tons	+	0.0070 Tons	+	0.0352 Tons								880.16 Tons
	Year		Year		Year								Year
CO <sub>2e</sub>	880.11 TPY*1	+	0.0070 TPY*298	+	0.035 TPY*25								883.09 Tons
	Year		Year		Year								Year

<sup>1</sup> EPA AP-42 factors assume gas to have 2000 gr S/MMScf (at EPA STP). This equates to 3.44 ppmv S, assuming ideal gas. AP-42 factor can be corrected to sulfur value of facility gas by comparing actual sulfur values to EPA reference point. Assume ppmv H<sub>2</sub>S = ppmv S (true if H<sub>2</sub>S = TRS and TRS is entirely monosulfur compounds).

<sup>2</sup> EPA AP-42 Ch. 3.3 & 3.4 factors account only for filterable particulate matter. In absence of PMcon factors for engines, applying ratio of PMfilr to PMcon factors from AP-42 Ch. 1.3 (for diesel) to PMfilr factors from Ch. 3.3 & 3.4