

ENGINEERING ANALYSIS

PROJECT DESCRIPTION

On July 30, 2026, the Department received an application from Spectrum Environmental, Inc. on behalf of Atlantic Salvage & Recycling FL LLC. (ASR), proposing to construct two (2) new aluminum sweat furnaces at their new secondary aluminum processing facility, located in Cherokee, Colbert County, Alabama. The facility currently has no operating permits associated with the facility, as such, a greenfield inspection of the proposed site was conducted on August 13, 2026.

PROCESS DESCRIPTION

The proposed operations at the facility will include receiving scrap metal including scrap automobile motors and transmissions. The scrap received will be sorted and cleaned by removing any non-metal components. Once sorted and cleaned, acceptable scrap will be charged into one of the two proposed sweat furnaces' melting chambers.

The proposed sweat furnaces are two (2) previously installed and used furnaces being relocated from another facility. The sweat furnaces are designed to reclaim aluminum from scrap by controlling the operating temperature. The temperature is raised and maintained above the melting temperature of aluminum, but below the melting temperature of iron. This condition causes aluminum to melt, any residuals oils to be burned, and other metals to remain intact. Molten aluminum trickles down into a 6,000-lb capacity holding chamber until released into molds for ingots.

ASR indicated that no fluxing or alloying of the molten aluminum will occur with the proposed process. This product is called "sweated pig" aluminum. The higher-melting materials, including iron, brass, and the oxidation products formed during the sweating process, are periodically removed from the furnace. ASR proposes to recover approximately 6,570 tons/year of aluminum from this process.

Each sweat furnace is equipped with 3 natural gas-fired burners, two (2) 2.5 MMBtu/hr primary melting chamber burners and one (1) 1.5 MMBtu/hr holding chamber burner. Each furnace is also equipped with a 1.5 MMBtu/hr afterburner as an integral part of the furnace operation for emission control. ASR notes that the afterburners are designed with a minimum 0.8 second residence time operating at 1,600°F. ASR also notes that each furnace has a system interlock that will not allow the furnace door to open to introduce material to the furnace if the afterburner temperature is below 1600°F. All emissions from the furnaces are directed to the associated afterburner for control.

Additionally, each furnace is equipped with a data logger monitoring device. The data logger records 15-minute afterburner temperature averages. Collected averages are utilized to determine the 3-hr average temperature for the afterburner.

EMISSIONS

Potential emissions from the facility as proposed include particulate matter (PM), PM less than 10 micrometers (PM₁₀), total PM less than 2.5 micrometers (PM_{2.5}), nitrogen oxide (NO_x), carbon monoxide (CO), sulfur dioxide (SO₂), volatile organic compounds (VOC), hazardous air pollutants (HAPs), and Dioxan/Furans (D/F). Emissions calculations are made on an 8,760 hour/year basis and on 3 TPH max throughput to both furnaces.

ASR estimated PM emission from the furnaces based on AP-42, Ch. 12.8, Table 12.8-2, and conservatively estimated PM₁₀ and PM_{2.5} emissions to equal total PM emissions. ASR also utilized an integral control efficiency of 90% based on EPA literature, Air Pollution Control Technology Fact Sheet for Thermal Incinerator, EPA-452/F-03-022, where PM control ranges from 70-99.9% efficiency. Based on the estimated control efficiency range the Department estimated emission more conservatively utilizing an 80% control efficiency.

HAP emissions from the furnaces, are based on test results found in Table 6 of RTI International's 2014 memo to the EPA, *Development of the RTR Supplemental Proposal Risk Modeling Dataset for the Secondary Aluminum Production Source Category*. D/F emissions were based on the emission limit for sweat furnaces found in 40 CFR 63.1505(f)(2) which states that emissions from a sweat furnace at a major or area source, must not discharge emissions to the atmosphere in excess of D/F TEQ 3.5×10^{-10} gr per dscf at 11% oxygen (O₂).

Non-D/F organic HAP emissions have been estimated using 0.0184 lb/ton-scrap average of thermal chip dryer test results found in Table 6 of RTI International's 2014 memo to the EPA, *Development of the RTR Supplemental Proposal Risk Modeling Dataset for the Secondary Aluminum Production Source Category*. Table 6 of the RTR memo did not contain factors for furnaces, but the thermal chip dryer results, which appear to be post-control, should be conservative for estimating emissions from the sweat furnaces. The stack test results utilized would have necessarily included organic HAP generated from scrap contaminates as well as from the products of combustion. This analysis will conservatively use these results to estimate the scrap-contaminant fraction of organic HAP emissions of the furnace. There are no factors for non-HAP hydrocarbon emissions (assumed to be VOC) from furnaces processing oily scrap; as such, this analysis assumes VOC emissions are an order of magnitude more than organic HAP emissions, or 0.1840 lb-VOC/ton-scrap.

Table 5 of the same 2014 RTI memo compiles the metallic HAP test results of nine to ten stack tests of secondary aluminum furnaces. This analysis uses the maximum of those results which adds up to 524 ppm of metallic HAP species within the PM emissions, or 0.052% by mass.

Emission factors for the products of combustion from the 13 MMBtu/hr total (6.5 MMBtu/hr each) furnace heaters were estimated based on Ap-42 Ch. 1.4, *Natural Gas Combustion*.

Facility-wide PTE is shown in Table 1 below, and the calculations are shown in the attachment. Since the use of the afterburner as a control device for the sweat furnace is required by 40 CFR 63.1505(f)(1), control of emissions (80%) from the sweat furnace are included in the PTE from the existing sources.

	Pollutant	Furnace 1 Emissions (80% Control)	Furnace 2 Emissions (80% Control)	Products of Natural Gas Combustion	Proposed Totals
Criteria Pollutant Emissions (TPY)	PM _f	11.0	11.0	0.1	22.1
	PM ₁₀	11.3	11.3	0.1	22.7
	PM _{2.5}	11.3	11.3	0.1	22.7
	SO ₂	0.1	0.1	0.3	0.5
	NO _x	0.5	0.5	4.7	5.7
	CO	4.8	4.8	4.0	13.6
	VOC	1.2	1.2	0.3	2.7
HAP (TPY)	D/F	4.22E-09	4.22E-09	-	8.44E-09
	oHAP	0.12	0.12	-	0.24
	mHAP	0.01	0.01	-	0.02
	Total HAPS	0.13	0.13	0.3	0.56

GHG	CO _{2e}	-	-	5,642	5,642
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Table 1: Facility-wide PTE

LIMITS

PM

PM emissions from each sweat furnace stack must not exceed $3.59P^{0.62}$ lb/hr (where P is the process weight in TPH), or 4.62 lb/hr at maximum throughput (1.5 tons per hour), per ADEM Admin. Code Rule 335-3-4-.04(2). Additionally, ADEM's opacity rule applies to the afterburner stacks and emissions from the furnace building.

D/F

The sweat furnaces stacks, controlled by their respective afterburners, are subject to D/F limits of $3.5E-10$ gr/dscf at 11% O₂ per NESHAP RRR.

REGULATIONS

STATE REGULATIONS

ADEM Administrative Code Rule 335-3-4-.01 "Visible Emission"

Rule 335-3-4-.01(1)(a) states that no person shall emit to the atmosphere from any source of emissions, particulate matter of an opacity greater than twenty percent (20%) over a six (6) minute period. **Rule 335-3-4-.01(1)(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.

The sweat furnace's afterburner stacks will be subject to this regulation. For ASR to maintain compliance with the Visible Emissions rule, ASR shall perform weekly visible emission checks of each afterburner stack. If well operated, the afterburner stack should have negligible opacity. However, if visible emissions are observed, the opacity should be determined using Method 9 of 40 CFR Part 60 Appendix A-4 and corrected within one hour. If after one hour, the furnace is operating but observed visible emissions have not been eliminated, a visual emissions observation lasting at least 12-minutes in length shall be conducted using Method 9 of 40 CFR Part 60 Appendix A-4. Records of each observation and corrective action shall be kept for a minimum period of five years.

ADEM Administrative Code Rule 335-3-4-.04, "Process Industries - General"

Rule 335-3-4-.04(1) states that no person in a Class 1 County (or Class 2 County per **Rule 335-3-4-.04(5)**) shall emit particulate matter greater than the amount determined by the equations below:

$$\text{When } P < 30, E = 3.59P^{0.62}$$

Where P = Process weight per hour in tons per hour

And E = Emissions in pounds per hour

The estimated maximum feed going through the alloying mixing furnace from any source is 1.5 TPH; therefore, the particulate emission limit for each sweat furnace would be 4.62 lbs/hr.

Based on emission estimates from Table 1, ASR should be able to meet the maximum 4.62 lb PM/hr limit imposed by this rule. PM stack testing will not be required by the Department at

this time, but in the event that the Department does require testing in the future, Method 5 in Part 60 Appendix A-3 will be used to determine filterable PM emissions.

ASR will be required to keep track of production to each furnace on a per operating cycle basis for the Department to ensure that the production throughputs cited in the application are accurate.

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

Secondary metal production facilities are listed as one of 28 source categories listed in 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 1, the ASR facility would not be expected to exceed the 100 TPY threshold of any regulated NSR pollutant as defined in ADEM Admin. Code r 335-3-14-.04(2)(ww). A facility must address PSD regulations for Greenhouse Gases (CO₂, N₂O, and CH₄) only if that facility is major for criteria pollutants. Per Rule 335-3-14-.04(1)(a), no PSD review would be necessary for this project.

ADEM Admin. 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 a minor source of HAP, a 112(g) case by case MACT review would not be necessary.

ADEM Admin. Code r. 335-3-15, “Synthetic Minor Operating Permits (SMOPs)” and 335-3-16, “Major Source Operating Permits (MSOPs)”

“Potential to emit” means 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.”

Given the above, the potential emissions from ASR would not be expected to be greater than the 100 TPY major source threshold for any regulated air pollutant as defined in ADEM Code r. 335-3-16-.01(1)(w). Also, the facility would not have the potential to emit greater than 10 TPY or more of a single HAP or 25 TPY or more of a combination of HAPs as shown in Table 1 of the emissions section. Therefore, the facility would not be classified as a major source with respect to this regulation, nor would it need to take separate limits to avoid being a major source.

Class I Area

The nearest Class 1 area is the Sipsey Wilderness Area, which is located approximately 54 km from ASR. However, emissions from the new equipment would not be expected to impact this area or any other Class I areas.

FEDERAL REGULATIONS

40 CFR 60 “New Source Performance Standards”

No subparts within this part are applicable to the facility.

40 CFR 63 Subpart A, “General Provisions”

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

Per the recordkeeping requirements of Subpart A, ASR must keep any records required by Subpart RRR for at least 5 years, with records for at least the last 2 years kept on the site itself [§63.10(b)(1)]; records of all maintenance on control devices and monitoring equipment [§63.10(b)(2)(iii)]; records of continuous monitoring readings [§63.10(b)(vi) & §63.10(c)(1)]; records of continuous monitor calibrations, evaluations, adjustment, & maintenance [§63.10(b)(vii)-(xi)]; records where monitoring equipment is inoperative or malfunctioning, including the nature and cause of each malfunction and corrective action taken (except during calibration) [§63.10(b)(vi) & §63.10(c)(5-12)]; and records of total process operating time during the reporting period [§63.10(c)(13)].

40 CFR 63 Subpart RRR, “National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production

This subpart, also referred to as the Secondary Aluminum MACT or SMACT, is applicable to each sweat furnace within a secondary aluminum processing unit at area sources of HAP [§63.1500(c)]. The ASR facility is considered a secondary aluminum processing facility as that term is defined in §63.1503.

The sweat furnaces were analyzed as part of this application for the ASR facility. The definition of a sweat furnace is “a furnace used exclusively to reclaim aluminum from scrap that contains substantial quantities of iron by using heat to separate the low-melting point aluminum from the scrap while the higher melting-point iron remains in solid form” [§63.1503 “Sweat furnace”]. Based on the application, the Department considers ASR’s sweat furnaces consistent with the SMACT definition of a sweat furnace and the appropriate emission control scheme for sweat furnaces is the utilization of an afterburner.

Emissions & Operational Standards

Dioxin and furan emissions, as D/F TEQ, from sweat furnaces may not exceed 3.5×10^{-10} gr/dscf at 11% O₂ [§63.1505(f)(2)]. The application assumes the dioxin/furan controlled emission factor to be at the emission standard of 3.5×10^{-10} gr/dscf at 11% O₂. At a flow rate of 321.3 dscfm at 11% O₂, the expected D/F TEQ emissions are 8.44×10^{-9} TPY.

Sweat furnaces are exempt from performance testing if emissions are controlled by an afterburner designed and operated with a residence time of 0.8 seconds or greater and a combustion-zone temperature of 1,600 °F or greater on 3-hour block average basis [§63.1505(f)(1) and §63.1506(h)(1)(ii)]. The afterburner must be operated on furnace start-up [§63.1506(a)(3)]. Each afterburner must be operated in accordance with the OM&M plan [§63.1506(h)(2)]. A capture and control system or fume hood that vents captured emissions from each furnace shall be installed according to ACGIH guidelines [§63.1506(c)(1)] or the sweat furnace may be designed, installed and operated with negative airflow [§63.1506(c)(4)(i)] consistent with good work practice standards [§63.1506(c)(4)(ii)]. The capture and collection system must be operated according to the OM&M plan [§63.1506(c)(3) and §63.1506(c)(4)(iii)].

At all times, the ASR must operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and

good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source [§63.1506(a)(5)].

When a process parameter or add-on air pollution control device operating parameter deviates from the value or range in the OM&M plan, ASR must initiate corrective action. Corrective action must restore operation of the affected source or emission unit (including process or control device) to its normal or usual mode of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. Corrective actions taken must include follow-up actions necessary to return the process or control device parameter level(s) to the value or range of values established and take steps to prevent the likely recurrence of the cause of a deviation [§63.1506(p)].

Monitoring Requirements

For each sweat furnace, ASR must prepare and implement an OM&M plan [§63.1510(b)]. The fume hood over each sweat furnace and associated ductwork leading to the associated afterburner must be inspected annually, and flow rates must be measured per §63.1510(d)(2). Alternatively, ASR may inspect the sweat furnace annually to ensure it is operated with negative air flow (i.e., into the sweat furnace) per §63.1510(d)(3); this alternative visual inspection must be conducted with an artificial smoke source [§63.1510(d)(3)(i)-(iii)].

Each afterburner must be equipped with a continuous temperature monitor installed, calibrated, and maintained in a manner consistent with Part 63 Subpart A [§63.1510(g)(1)]; each device must be installed at the exit of the combustion zone for the after burner [§63.1510(g)(2)(i)]; must record in 15-minute block averages, and must determine and record each 3-hour block average combustion zone temperature [§63.1510(g)(2)(ii)]; must measure from 0 to 2400°F [§63.1510(g)(2)(ii)]; and must be calibrated via NIST reference method appropriate for thermocouple-potentiometers [§63.1510(g)(2)(iv)]. The afterburners must be inspected once per year meeting the requirements of §63.1510(g)(3).

Although no stack testing is required if the afterburner is maintained per §63.1515(f)(1), in the event that the Department requires testing, Method 23 in 40 CFR Part 60 Appendix A-7 will be used to determine D/F emissions.

Recordkeeping and Reporting Requirements

In addition to the recordkeeping required by 40 CFR 63 Subpart A [§63.10(b)], ASR must maintain records of each afterburners 15-minute block average combustion zone temperature, 3-hour block temperature averages, and explanation and corrective actions for each deviation from the 1,600 °F minimum [§63.1517(b)(2)(i)]; records of monitor downtime with explanations [§63.10(c) via §63.1517(b)(6)]; and copies of each afterburner negative air flow test [§63.1517(b)(2)(ii)].

Additionally, ASR must maintain records of annual inspections of emission capture/collection and closed vent systems or, if the alternative to the annual flow rate measurements is used, records of difference pressure; fan RPM or fan motor amperage; static pressure measurements; or duct centerline velocity using a hotwire anemometer, ultrasonic flow meter, cross-duct pressure differential sensor, venturi pressure differential monitoring or orifice plate equipped with an associated thermocouple, as applicable [§63.1517(b)(14)]; the OM&M plan

[§63.1517(b)(16)]; records of the emission unit ID, monitor ID, pollutant or parameter monitored, beginning date and time of the event, end date and time of the event, cause of the deviation or exceedance and corrective action taken [§63.1517(b)(18)(i)]; records of actions taken during periods of malfunction to minimize emissions in accordance with §63.1506(a)(5), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation [§63.1517(b)(18)(ii)].

ASR must submit semiannual excess emissions/summary reports (SEER) within 60 days of each reporting period according to the requirements of §63.10(e)(3) [§63.1516(b)]. Malfunctions must be reported per §63.1516(d).

RECOMMENDATIONS

This analysis indicates that the proposed emission source would meet the requirements of all state and federal rules and regulations. Based on the expected emissions, and information presented in ASR's application, I recommend that ASR be issued Air Permit 701-0066-X001 for both new sweat furnaces.

Claudia Nguyen
Industrial Minerals Section
Energy Branch
Air Division
ADEM

September 30, 2026
Date

ASR Smelting Furnace Emissions (Each) (80% PM control)			Conversion	
1.5 TPH production normalized to prod limit		8760 hr/yr	ACFM to DSCFM	
1.5 TPH production	60 min/hr	8760 hr/yr	8568 acfm	
2000 lb/ton	7000 gr/lb	0 TPY shared	1600 Stack Temp Deg F	
0.062 lb OHAP/ton aluminum (2014 RTI, max delag) ¹		0.40 TPY VHAP	60 Standard Temp Deg F	
3.50E-10 grains DF/dscfm (RRR limit)		4.22E-09 TPY D/F	321.3 dscfm	
12.52 lb PM/hr AP-42 Ch. 12.8, Table 12.8-2 (crucible)		10.97 TPY PM _{filt}		
		10.97 TPY PM _{10, filt}		
Assuming PM _{filt} = PM _{10, filt} = PM _{2.5, fi}		10.97 TPY PM _{2.5, filt}		
0.042906 lb PMcon/ton aluminum (90% UPL) ⁶		0.28 TPY Pmcon		
	TPY PM _{10, fil} + TPY PMcon	11.25 PM ₁₀		
	TPY PM _{2.5, fi} + TPY PMcon	11.25 PM _{2.5}		
0.052% MHAP% to PMfilt (2014 RTI, max furnace) ¹		0.006 TPY mHAP		
0.0184 OHAP (Average OHAPS) ⁷		0.12 TPY OHAP		
0.078817 lb NOX/ton aluminum (90% UPL) ⁶		0.52 TPY NOX		
0.728726 lb CO/ton aluminum (90% UPL) ⁶		4.79 TPY CO		
0.184 lb VOC/ton aluminum (90% UPL)		1.21 TPY VOC		
0.02 lb SO ₂ /ton Aluminum (EPA EF for SCC 3-04-001-		0.13 TPY SO ₂		
0 lb HCl/ton (Afterburner)		0.00 TPY HCl		
0 lb HF/ton (Afterburner)		0.00 TPY HF		

¹Development of the RTR Supplemental Proposal Risk Modeling Dataset for the Secondary Aluminum Production Source Category, RTI International, 12/7/14 (<https://www.regulations.gov/document/EPA-HQ-OAR-2010-0544-0239>) (naphthalene outlier datapoint excluded)

³AP-42, Chapter 12.8 "Secondary Aluminum Operations" (<https://www3.epa.gov/ttnchie1/ap42/ch12/final/c12s08.pdf>)

⁴AP-42, Chapter 12.5.1 "Steel Minimills" (<https://www.epa.gov/sites/default/files/2020-11/documents/c12s0501.pdf>)

⁵AP-42, Chapter 13.2.5 "Industrial Wind Erosion" (https://www.epa.gov/sites/default/files/2020-10/documents/13.2.5_industrial_wind_erosion.pdf)

⁶90% UPL analysis of isolated sidewall stack test results from similar sidewall/reverb type furnaces

⁷OHAP (RTI 2014 RRR memo) Average Thermo Chip Dryer unused, cited for comparison:

²0.2 lb-VOC/ton-aluminum, WebFIRE, Clearinghouse for Inventories & Emission Factors, SCC 30400103 (<https://cfpub.epa.gov/webfire/>)

Data:	ASR Sweat Furnaces			AP-42 EF (NG)		Based on NG with Btu/Content of 1020			
H ₂ S mol%	0.00%	mol%		PM _{fill} =	1.9	Lb/MMScf	(Table C-1 & C-2) 40 CFR Part 98 Sub C GHG Emission Factors for C₁		*Revised 11/29/2013
Op Hours	8760	Hrs	(normalized)	PM _{con} =	5.7	Lb/MMScf			
Heat Content	1,026	Btu/scf (Ind.)		NO _x =	100	Lb/MMScf			
Flowrate	10.721	MScf/Hr (Ind.)		CO=	84	Lb/MMScf	N ₂ O=	0.0001	kg/MMBtu
Heat Input	11,000,000	Btu/hr		VOC=	5.5	Lb/MMScf	CO ₂ =	53.06	kg/MMBtu
Use btu/scf(EPA) for PM, NO _x , CO, VOC. Factors for EPA STP (also ADEM STP). SO ₂ factor already for Industry STP (from AI. Oil & Gas Board)				HAP=	1.89	Lb/MMScf	CH ₄ =	0.001	kg/MMBtu
				SO ₂ =	0.60	Lb/MMScf	(Table C-1 & C-2) 40 CFR Part 98 Sub C GHG Emission Factors for C₃		
Ind. STP:	60 °F	14.696	psia	GWP*		N ₂ O=			
EPA STP:	60 °F	14.696	psia			CO ₂ =	1	0.0006	kg/MMBtu
Heat Content	1,026	Btu/scf (EPA)				CH ₄ =	25	61.46	kg/MMBtu
Fuel HHV Correction Factor	1.006							0.003	kg/MMBtu
Heater Emission Calculations									
PM_{fill}²	1.9 Lb	11.000 MMBtu		Scf (EPA)	8,760 Hr	1 Ton	1.006		0.090 Tons
	MMScf (EPA)	Hr		1,026 Btu	Year	2,000 Lb			Year
PM_{con}	5.7 Lb	11.000 MMBtu		Scf (EPA)	8,760 Hr	1 Ton	1.006		0.269 Tons
	MMScf (EPA)	Hr		1,026 Btu	Year	2,000 Lb			Year
SO₂	0.60 Lb	11.000 MMBtu		Scf (EPA)	8,760 Hr	1 Ton	1.006		0.028 Tons
	MMScf (EPA)	Hr		1,026 Btu	Year	2,000 Lb			Year
NO_x	100 Lb	11.000 MMBtu		Scf (EPA)	8,760 Hr	1 Ton	1.006		4.724 Tons
	MMScf (EPA)	Hr		1,026 Btu	Year	2,000 Lb			Year
CO	84 Lb	11.000 MMBtu		Scf (EPA)	8,760 Hr	1 Ton	1.006		3.968 Tons
	MMScf (EPA)	Hr		1,026 Btu	Year	2,000 Lb			Year
VOC	5.5 Lb	11.000 MMBtu		Scf (EPA)	8,760 Hr	1 Ton	1.006		0.260 Tons
	MMScf (EPA)	Hr		1,026 Btu	Year	2,000 Lb			Year
HAP	0.06 Lb	8,760 Hr		1 Ton					0.265 Tons
	hr	Year		2,000 lb					Year
CO₂	11 MMBtu	53.06 kg		0.001 Metric Ton	8,760 Hr	1.1023 Tons			5635.907 Tons
	Hr	MMBtu		kg	Year	1 Metric Ton			Year
N₂O	11 MMBtu	0.0001 kg		0.001 Metric Ton	8,760 Hr	1.1023 Tons			0.011 Tons
	Hr	MMBtu		kg	Year	1 Metric Ton			Year
CH₄	11	0.001 kg		0.001 Metric Ton	8,760 Hr	1.1023 Tons			0.106 Tons
	Hr	MMBtu		kg	Year	1 Metric Ton			Year
Mass Sum	5,635.91	Tons	+	0.0106	Tons	+	0.1062	Tons	5636.024 Tons
	Year			Year			Year		Year
	CO ₂			N ₂ O			CH ₄		
CO₂e	5,635.91	TPY	X 1	0.0106	TPY	X 298	0.1062	TPY	5641.728 Tons
	5,635.91		+	3.17		+	2.66		Year
	CO ₂			N ₂ O			CH ₄		

¹ AP-42 emission factors taken from Chapter 1.4. Based on natural gas with 1020 btu/scf, and corrected in calculations. From Chapter 1.5, propane emission factors are equivalent on a heat basis to methane factors, except the NO_x factor is 1.5x higher.

²AP-42 Chapter 1.4 PM fill= PM₁₀=PM_{2.5}