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& Associates, Inc.

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January 27, 2020

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Mr. Bob Bernoteit
Illinois Environmental Protection Agency - Bureau of Air
1021 North Grand Avenue East
Springfield, IL 62702

Updated Emission Estimates
Construction Permit Application 19090021 for a
New Scrap Metal Recycling Facility
General III, LLC – 11600 South Burley - Chicago, Illinois
Site ID No. 031600SFX

Dear Mr. Bernoteit:

Please find attached an updated copy of facility emission estimates for the above referenced construction permit application. This updated Section 3.0 Facility Emissions Estimates of the original GIII construction permit application has been prepared to include the following updates.

- Incorporation of the November 2019 RTO/Scrubber Emissions Test results documented in the January 16, 2020 RTO/Scrubber Emissions Test report (provided as Appendix D, attached to these updated emission estimates).
- Addition of six supplemental conveyors for the Ferrous material handling system and six supplemental conveyors for the Non-Ferrous material handling system. These supplemental conveyors have been added to meet the potential need for a limited number of additional conveyors beyond the number of conveyors identified in the original system designs.
- Incorporation of updated metal emission rates identified in a recent air dispersion modeling assessment provided to IEPA. These updated values are used to update facility-wide metal HAP emissions.

If you have any questions or need any additional information, please don't hesitate to contact us at 630-393-9000.

Yours very truly,
RK & Associates

IEPA - DIVISION OF RECORDS MANAGEMENT
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MAR 18 2020
REVIEWER: JMR

cc: Mr. Jim Kallas – General III, LLC – Chicago, Illinois (via e-mail)

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Updated Emission Estimates
Construction Permit Application 19090021 for a
New Scrap Metal Recycling Facility
General III, LLC - Chicago, Illinois

January 27, 2020

R17421-7

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RK & Associates, Inc.

3.0 FACILITY EMISSIONS ESTIMATES – Updated January 22, 2020

Updated Information

This updated Section 3.0 Facility Emissions Estimates of the original GIII construction permit application has been prepared to include the following updates.

- Incorporation of the November 2019 RTO/Scrubber Emissions Test results documented in the January 16, 2020 RTO/Scrubber Emissions Test report (provided as Appendix D, attached to these updated emission estimates).
- Addition of six supplemental conveyors for the Ferrous material handling system and six supplemental conveyors for the Non-Ferrous material handling system. These supplemental conveyors have been added to meet the potential need for a limited number of additional conveyors beyond the number of conveyors identified in the original system designs.
- Incorporation of updated metal emission rates identified in a recent air dispersion modeling assessment provided to IEPA. These updated values are used to estimate of facility-wide metal HAP emissions.

As described in this application, GIII will install a state-of-the-art emissions control system on the hammermill shredder. The shredder will be located inside of a partial enclosure with walls and a vented metal roof to help contain debris and particulate matter (PM) generated during the shredding process. The shredder will be equipped with an integral water injection system to minimize the potential for fires and deflagrations inside the shredder. As established in previous permits, the water injection system is integral to the process and is not a pollution control device for the purposes of this permit application.

GIII has taken other significant measures to limit emissions, and potential impacts, from this facility, including:

- GIII's proposed facility will be a state-of-the-art recycling facility located in the heart of an industrial district well-buffered from residential properties with at least 1,500 feet between the facility property line and the nearest residential area.
- Approximately 95% of interior plant roadways are paved with concrete or asphalt. The remaining approximately 5% of interior plant roadways consist of crushed slag or similar materials and are only lightly traveled.
- The shredder will be one of the first shredders in the nation to install a comprehensive emissions capture and control system to control VOM, PM, and HAPs.

- Many of the conveyors in the Non-Ferrous Material Processing System will be equipped with covers to prevent windblown emissions.
- The majority of the fines processing equipment is located within a building and controlled with dust collectors.
- GIII will implement a fugitive operating program that will require periodic watering and sweeping of traffic areas to minimize fugitive particulate emissions.
- GIII will use a network of dust boss water atomizing cannons to apply water into the ambient air to wet suspended particulate to increase settling.
- The facility has received all necessary zoning approvals from the City of Chicago.

Emission units identified in the application include:

- Shredder controlled by cyclone, roll-media filter, RTO, and packed tower scrubber;
- Ferrous Material Processing System;
- Non-Ferrous Material Processing System;
    - Dust Collector for control of select exhaust streams from the fines handling building;
- Stockpiles (fugitive emissions);
- Paved and Unpaved Roads (fugitive emissions); and
- Miscellaneous Natural Gas Fired Environmental Heaters (exempt from permitting).

Each of the above emission units are discussed in the sections below and emissions for each are summarized in Tables 3-1A through 3-1E and Tables 3-2 through 3-6. Facility-wide criteria and HAP pollutant emissions are summarized in Tables 3-7 and 3-8. The emissions estimates presented in this application demonstrate that the proposed Facility is a minor source with respect to new source review, and Title V permitting requirements and is also a minor source of HAP emissions.

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3.1 Shredder Emissions Controlled by Cyclone, Roll-Media Filter, Regenerative Thermal Oxidizer, and Packed Tower Scrubber

Updated Information

As described herein, emission estimates for the proposed Shredder have been updated to incorporate the results from the November 2019 emissions testing performed on the RTO/Scrubber at GII that will be relocated to GIII as part of this project.

This section provides shredder emissions estimates for captured/controlled emissions routed through the proposed emission control system consisting of a cyclone, roll-media filter, RTO, and packed tower scrubber.

GIII will install a new shredder at the proposed facility and will relocate the existing cyclone, roll-media filter, RTO and packed tower scrubber from the existing GII facility to the proposed facility. The raw scrap feed stream received at the existing GII facility is essentially the same feed stream that will be received at GIII's proposed facility. For these reasons, for the purposes of this application, the emission data from the existing shredder and emission control system at the GII facility is assumed to reasonably represent the anticipated emissions from GIII's new shredder at the proposed facility.

The shredder will be located inside of a partial enclosure with walls and a vented metal roof to help contain debris and particulate matter (PM) generated during the shredding process. The shredder will be equipped with an integral water injection system to minimize the potential for fires and deflagrations inside the shredder.

VOM emission estimates presented herein assume an RTO control efficiency of 98% based on the design of the RTO. The RTO/Scrubber currently in use at GII, will be moved to GIII. Compliance demonstration testing of the existing RTO/Scrubber at GII was completed on November 14, 15, and 18, 2019.

The captured shredder emissions identified in this application are based on demonstrated emission factors in units of pounds-of-emissions per ton of gross feed to the shredder derived from November 2019 emissions testing of the existing GII RTO/Scrubber.

The emissions estimates presented in this updated section are calculated using demonstrated emission factors and proposed maximum monthly and annual material throughput rates. This construction permit application does not rely on operating hours to estimate monthly or annual emissions; therefore, no operating hour limits are requested.

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This construction permit application requests an annual shredder throughput limit of 1,000,000 tons/year and a monthly throughput limit of 10% of the annual, or 100,000 tons/month.

Visual observations of the shredder capture hood by USEPA representatives during the November 2019 emissions testing indicated that the hood over the shredder achieved an estimated capture efficiency of greater than >90%. The nature of the shredding operation and related safety concerns prevents a direct measurement of emissions capture efficiency using a permanent or temporary total enclosure; therefore, the GII RTO/Scrubber compliance demonstration testing did not require capture efficiency testing.

The Shredder PM/PM_{10}, metals, HCl , HF and total HAPs in this application includes a safety factor applied to the product of November 2019 emission factors multiplied by the maximum projected monthly and annual material throughputs. No safety factor is applied to VOM because permitted emissions are calculated using 98% VOM removal efficiency whereas the demonstrated VOM removal efficiency was 99%.

3.1.1 Shredder VOM and CO Emissions

For the purposes of these emission calculations, it is assumed that THC, as referenced in November 2019 RTO/Scrubber emissions testing report (see Appendix D) is equivalent to VOM.

The proposed VOM and CO emission limits for the proposed Shredder, controlled by a cyclone, roll-media filter, RTO and packed tower scrubber, are presented in Table 3-1A.

The uncontrolled VOM emission factor, was adjusted to subtract methane and ethane pursuant to USEPA Method 25A. It should be noted that the November 2019 VOM emissions testing was performed at a significantly elevated shredder feed rate (444 tph) and End of Live Vehicle (ELV) feed rate (50.9%) in order to maximize VOM loading to the RTO. These operating rates yielded an uncontrolled VOM emission factor of 0.5119 pounds of VOM per ton of gross shredder feed (see test report in Appendix D).

The monthly Shredder RTO/Scrubber VOM emissions rate is calculated using the following equation:

$$100{,}000\frac{ton}{month}\ x\ 0.5119\frac{lb\ VOM}{ton\ shredder\ feed}\ x\ \frac{1\ ton}{2{,}000\ lbs}\ x\ (1-0.98)\ =\ 0.51\frac{ton}{month}$$

maximum monthly shredder throughput	adjusted VOM emission factor (captured emissions) November 2019	convert lb/ton	minimum VOM removal efficiency	monthly VOM emissions

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The annual Shredder RTO/Scrubber VOM emissions rate is calculated using the following equation:

$$1{,}000{,}000\frac{ton}{year} \quad x \quad 0.5119\frac{lb\ VOM}{ton\ shredder feed} \quad x \quad \frac{1\ ton}{2{,}000\ lbs} \quad x \quad (1-0.98) = 5.12\frac{tons}{year}$$

maximum annual shredder throughput	adjusted VOM emission factor (captured emissions) November 2019	convert lbs to tons	minimum RTO VOM removal efficiency	annual VOM emissions

CO emissions are estimated by multiplying the proposed monthly and annual shredder material throughput rates by the CO emission factor measured during the November 2019 RTO/Shredder Emissions Test and the application of a safety factor.

The monthly Shredder RTO/Shredder CO emissions rate is calculated using the following equation:

$$100{,}000\frac{ton}{month} \quad x \quad 0.0219\frac{lb\ CO}{ton\ shredder\ feed} \quad x \quad \frac{1\ ton}{2{,}000\ lbs} \quad x \quad 2.00 \quad = \quad 1.29\frac{ton}{month}$$

maximum monthly shredder throughput	CO emission factor (captured emissions) November 2019	convert lb to tons	Safety Factor	monthly CO emissions

The annual Shredder RTO/Scrubber CO emissions rate is calculated using the following equation:

$$1{,}000{,}000\frac{ton}{year} \quad x \quad 0.0219\frac{lb\ CO}{ton\ shredder feed} \quad x \quad \frac{1\ ton}{2{,}000\ lbs} \quad x \quad 2.0 \quad = \quad 12.86\frac{tons}{year}$$

maximum annual shredder throughput	CO emission factor (captured emissions) November 2019	convert lbs to tons	safety factor	annual CO emissions

3.1.2 Shredder Particulate Emissions

The estimated shredder PM/PM_{10} emissions are presented in Table 3-1B. A PM/PM_{10} emission factor was developed from filterable PM emissions testing conducted on November 18, 2019, performed in the scrubber exhaust stack. The emissions test report for this testing event is presented in Appendix D of this application.

The demonstrated PM/PM_{10} emission factor from the November 18, 2019, emissions test was 0.0032 lb/ton of gross shredder feed (see Appendix D).

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For the purposes of this permit application, the filterable PM/PM_{10} emission factor of 0.0047 lb/ton from the original application is used herein to conservatively calculate the proposed filterable PM/PM_{10} emissions limits. For the purposes of this application, filterable PM is conservatively assumed to be PM_{10}.

A safety factor of 4.0 (consistent with the original permit application) has also been included in the estimated PM/PM_{10} emission calculations below.

$$100{,}000\frac{ton}{month} \quad x \quad 0.0047\frac{lb\ filterable\ PM/PM10}{ton\ shredder\ feed} \quad x \quad \frac{1\ ton}{2{,}000\ lbs} \quad x \quad 4.00 \quad = \quad 0.94\frac{tons}{month}$$

maximum monthly shredder throughput	filterable PM/PM_{10} emission factor (captured emissions) from original application	Convert lbs to tons	safety factor	monthly filterable PM/PM_{10} emissions

The annual shredder PM/PM_{10} emissions limit (measured in the scrubber discharge stack) is calculated using the following equation:

$$1{,}000{,}000\frac{ton}{year} \quad x \quad 0.0047\frac{lb\ filterable\ PM/PM10}{ton\ shredder\ feed} \quad x \quad \frac{1\ ton}{2000\ lbs} \quad x \quad 4.00 \quad = \quad 9.40\frac{tons}{year}$$

maximum annual shredder throughput	filterable PM/PM_{10} emission factor (captured emissions) from original application	convert lbs to tons	safety factor	annual filterable PM/PM_{10} emissions

3.1.3 Shredder Hazardous Air Pollutant Emissions

Shredder HAP emissions are summarized in Table 3-1C below. HAP emissions estimates are provided for captured HAP emissions emitted through the RTO/Scrubber stack. Proposed metal HAP and inorganic acid HAPs are based on metals and HCl/HF emission testing performed on November 14, 2019. Organic HAP emissions are estimated based on uncontrolled organic compound emission rates, identified in the Institute of Scrap Recycling Industry, Inc. (ISRI) Title V Applicability Workbook, Table D-11F (Appendix C of the original construction permit application) and adjusted for 98% removal efficiency in the RTO.

For the purposes of this permit application, a safety factor of 4.0 has been applied to the November 2019 measured emission factors for metal HAPs, HCl and HF (consistent with the PM/PM_{10} safety factor) and a safety factor of 2.0 been applied to organic HAPs.

Shredder metal HAP, organic HAP, and inorganic acid HAP emissions are summarized in Table 3-1C.

3.1.4 Shredder RTO Natural Gas Combustion Emissions

The estimated shredder RTO natural gas combustion emissions are presented in Table 3-1D. Emissions are calculated using a maximum RTO natural gas firing rate of 15 MMBtu/hr, a natural gas higher heating value (HHV) of 1,020 Btu/scf, and standard USEPA natural gas emission factors from AP-42; Chapter 1.4; Tables 1.4-1 and 1.4-2.

Natural gas combustion emission estimates are presented for criteria pollutants, Greenhouse Gases (GHG), and metal and organic HAPs.

3.1.5 Shredder Emissions Summary

Table 3-1E presents a summary of total estimated shredder emissions controlled by the cyclone, roll-media filter, RTO and packed tower scrubber. The values identified in Table 3-1E identify the updated emissions limits and shredder throughput limits requested in this permit application. The proposed emission limits are in units of tons/month and tons/year and correspond to shredder gross feed rates of 100,000 tons/month and 1,000,000 tons/year.

The updated emissions information in this submittal is limited to the addition of six supplemental conveyor transfer points so up to six additional transfer points can be added during construction without requiring revision of the construction permit.

3.2 Ferrous Material Processing System Emissions

Emissions from the Ferrous Material Processing System include PM, PM_{10}, $PM_{2.5}$ and metal HAPs. There is no combustion or high temperature processing performed, so emissions of VOM and other products of combustion are not anticipated.

Updated Information

As described herein, particulate emissions from the Ferrous Material Processing System have been increased slightly by the addition of six supplemental material transfer points. Including these 'extra' material transfer points will allow the addition of up to six additional transfer points (as may be needed) during construction of this system without requiring a modification of the construction permit issued for this project.

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Updated estimates of metal HAP emissions from the Ferrous Material Processing System are also incorporated herein.

3.2.1 Particulate Emissions

A review of AP-42 emission factors did not identify any published emission factors for processing shredded scrap metal or ASR using feed hoppers, conveyors, magnetic separators, screens, vibratory feed tables, eddy current separators, wind sifters, induction sorters, polishers, Air Vibe separators, or material transfer to stockpiles or storage containers. RKA is also not aware of any other source of published emission factors for this equipment processing shredded scrap metal or ASR.

In the *Institute of Scrap Recycling Industries (ISRI) Title V Applicability Workbook (1996)*, Footnote 1 on Table D-9, states that;

> *"Emission factors applicable to conveyor transfer points for scrap in feed material or products are not available. A conservative estimate of PM_{10} emission scan be made using emission factors derived from the handling of crushed stone products. The factors in this table were adapted from AP-42, Crushed Stone Processing, Section 11.19.2, Table 11.19.2-2 for uncontrolled and controlled transfer points."*

The AP-42 emission factors for crushed stone (Section 11.19.2; Table 11.19.2.2) have been uniformly adopted by the metal recycling industry as evidenced by their use in numerous permit applications for metal recycling facilities and have been accepted by IEPA and other state regulatory agencies throughout the United States.

ASR separation processes include only one small low speed high torque shredder used for size reduction of clean metal. All other ASR equipment is designed for material separation. This fact limits the potential generation of total suspended particulate matter (TSP) to only the fines present in the ASR being processed. Based on the above, the application of AP-42 particulate matter emission factors for crushed stone processing to ASR processing is likely to result in estimated emissions that are greater than actual emissions from ASR separation processes.

The following table identifies emission factors from AP-42, Table 11.19.2-2 that are typically used in metal recycling emission calculations. The identifiers in the first column of the table are used in Tables 3-2 and 3-3 to document the specific emission factors used to estimate emissions for each piece of equipment or operation.

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Particulate Emission Factors from AP 42; Table 11.19.2-2 Crushed Stone Processing (8/2004) Used in Estimating PM Emissions in Scrap Metal Material Handling and ASR Separation Operations.

Identifer Used in Tables 2 & 3	Equipment	Material	Uncontrolled			Controlled[1]		
			PM lb/ton	PM10 lb/ton	PM2.5 lb/ton	PM lb/ton	PM10 lb/ton	PM2.5 lb/ton
A	Conveyor Transfer Point	Crushed Stone	0.0030	0.0011	0.000167 [2]	0.00014	0.000046	0.000013
B	Screening	Crushed Stone	0.0250	0.0087	0.001317 [2]	0.00220	0.000740	0.000050
C	Truck loading	Fragmented Stone	0.000033 [3]	0.000016	0.000002 [2]			
D	Truck Loading	Crushed Stone	0.000204 [3]	0.00010	0.000015 [2]			

1. Use controlled emission factors when the moisture content of the materials being processed are greater than 1.5% by weight.
2. Where PM2.5 emission factors are not provided in AP-42, 11-19.2-2, a ratio of aerodynamic particle size multipliers from AP-42, 13.2.4 are used to estimate PM2.5 emission factors. PM2.5 EF = (PM10 EF/.035) x .0053.

Aerodynamic Particle sizes from AP-42, 13.2.4				
<30 um	<15 um	<10 um	<5 um	<2.5 um
0.74	0.48	0.35	0.2	0.053

3. PM emissions estimated as % of PM10 pursuant to Appendix A of *SCAQMD Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds*, October 2006.

Particulate emissions from the Ferrous Material Processing System are generated from material transfer points and material drops (dropping materials onto stockpiles).

Material transfer emissions are calculated by applying selected PM, PM_{10} and $PM_{2.5}$ emission factors, in units of pounds of particulate matter per ton of material processed, to the projected material throughput rates (tons per hour and tons per year) at each material transfer point. Material transfer points include the points at which material is transferred from one device to another, such as conveyor to conveyer transfers, conveyor to equipment transfers, and equipment to conveyor transfers. Material throughput rates at each transfer point have been estimated by the equipment supplier.

Material drop emissions are calculated using the material drop equation from AP-42 Section 13.2.4.3 for all locations where material is dropped from a conveyor onto a stockpile or into a container.

$$E = k\,(0.0032) \times \frac{(U/5)^{1.3}}{(M/2)^{1.4}}$$

E = emission factor (lb/ton of material dropped)
k = particle size multiplier (dimensionless)
U = mean wind speed
https://www.timeanddate.com/weather/usa/chicago/climate
M = material moisture content (%)

U =	9.0	mph - annual average wind speed for Chicago (Midway Airport)
K =	0.74	PM - AP-42, Section 13.2.4, for particle size < 30 um
	0.35	PM - AP-42, Section 13.2.4, for particle size < 10 um
	0.053	PM - AP-42, Section 13.2.4, for particle size < 2.5 um

M = 1.5 % for light materials - AP-42, Table 13.2.4-1 for crushed limestone - (conservative)

The mean wind speed is annual average wind speed recorded at Midway Airport in Chicago, Illinois. Material discharged from the shredder is sprayed by water due the water injection system. The moisture content of material is conservatively assumed to be 1.5% for most applications (unless otherwise specified in table footnotes) because this is the moisture content that triggers the use of controlled emission factors for material transfer points in AP-42, Section 11.19.2 (Crushed Stone Processing).

Table 3-2 presents a summary of estimated $PM/PM_{10}/PM_{2.5}$ from the Ferrous Material Processing System and has been updated to has six supplemental material transfer points.

3.2.2 Metal HAP Emissions

Detailed metal and metal HAP emissions from the Ferrous Material Processing, Non-Ferrous Material Processing, Stockpile operations, and fugitive road dust were estimated using metals analyses data from samples of material deposition collected from GII. The results of the GII metals analyses were applied to emission units and activities at GIII that correspond to the location of the GII samples. The following table summarizes the results of the metals analyses from GII samples and describes how these results were applied to GIII emission units and activities.

For the purpose of modeling potential off site metal impacts, the Ferrous Material Processing System was divided into several volume sources. Particulate emissions from each volume source were assigned sample results from the GII material deposition sample that represents the emission unit or activity in each volume source.

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Summary of Metal Concentrations in Material Deposition[1] at GII

HAP	Metals (Method 29)	Materal Deposition Samples Collected from GII				
		Ferrous Roadway mg/kg	ASR Roadway mg/kg	General Roadway mg/kg	Ferrous Transfer mg/kg	Non-Ferrous Transfer mg/kg
Y	Lead	763	1,610	525	4,230	4,720
Y	Manganese	960	1,030	729	2,210	1,760
Y	Mercury	1.77	6.95	2.22	18.8	9.34
Y	Nickel	125	463	106	304	311
Y	Antimony	< 1.23	< 1.22	< 1.16	< 1.17	< 1.21
Y	Arsenic	2.28	1.75	2.70	2.75	4.51
Y	Beryllium	< 5.90	< 1.30	< 5.50	< 1.17	< 1.21
Y	Cadmium	9.63	18.4	5.42	47.6	34.6
Y	Chromium	220	991	173	402	425
Y	Cobalt	15.7	38.5	10.7	52.0	55.8
Y	Phosphorus	598	561	270	833	934
Y	Selenium	< 1.23	< 1.22	< 1.16	< 1.17	< 1.21
N	Zinc	5,470	13,300	3,080	37,300	34,000
N	Barium	388	673	232	984	684
N	Copper	1,110	1,080	841	2,100	1,650
N	Silver	< 12.3	< 12.2	< 11.6	< 11.7	< 12.1
N	Thallium	< 1.23	< 1.22	< 1.16	< 1.17	< 1.21

1. Bulk material samples from designated areas were transported to Environmental Monitoring and Technologies, Inc. (EMT) and sieved to remove oversized material. The resulting materials were analyzed for metals using the analytical methods identified in USEPA Method 29 (Metals Emissions from Stationary Sources).

GII Material Deposition Sample Name	Sample Description and Application of Results to GIII Emission Units and Activities
Ferrous Roadway	Sample collected at GII from the vehicle roadway adjacent to the shredded ferrous metal stockpile. Sample results represent anticipated metals content of fugitive particulate emissions from vehicular traffic near the shredded ferrous material stockpiles at GIII.
ASR Roadway	Sample collected at GII from the vehicle roadway adjacent to the ASR handling and stockpile area. Sample results represent anticipated metals content of fugitive particulate emissions from vehicular traffic near the bulk ASR handling and ASR stockpile areas at GIII.

GII Material Deposition Sample Name	Sample Description and Application of Results to GIII Emission Units and Activities
General Roadway	Sample collected from the entrance to GII. Sample results represent anticipated metals content of fugitive particulate emissions from vehicular traffic between the facility entrance gate and the raw scrap unloading area at GIII.
Ferrous Transfer	Sample collected at GII from the pavement adjacent to ferrous material transfer conveyors. Sample results represent anticipated metals content of particulate emissions from the Ferrous Material Processing System from the outlet of the shredder to the ferrous material stockpiles and barge loading area at GIII.
Non-Ferrous Transfer	Sample collected at GII from fines deposited on horizontal surfaces (i.e. beams, pipes, etc.) inside the ASR processing building. Sample results represent anticipated metals content of particulate emissions from the Non-Ferrous Processing System at GIII.

The summary of facility-wide HAP emissions presented in Table 3-8 identifies total metal HAP emissions from the Ferrous Material Processing System.

3.3 Non-Ferrous Material Processing System Emissions

Updated Information

Particulate emissions from the Non-Ferrous Material Processing System have been increased slightly by the addition of six supplemental material transfer points. Including these 'extra' material transfer points will allow the addition of up to six additional transfer points (as may be needed) during construction of this system without requiring a modification of the construction permit issued for this project.

Updated estimates of metal HAP emissions from the Ferrous Material Processing System are also incorporated herein.

Emissions from the Non-Ferrous Material Processing System include PM, PM_{10}, $PM_{2.5}$ and metal HAPs. There is no combustion or high temperature processing performed, so emissions of VOM and other products of combustion are not anticipated.

3.3.1 Particulate Emissions

Particulate emissions from the Non-Ferrous Material Processing System are generated from material transfer points, screening, truck loading, and material drops.

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Material transfer emissions are calculated by applying selected PM, PM_{10} and $PM_{2.5}$ emission factors in units of pounds of particulate matter per ton of material processed, to the projected material throughput rates (tons per hour and tons per year) at each material transfer point. Material transfer points include the points at which material is transferred from one device to another, such as conveyor to conveyer transfers, conveyor to equipment transfers and equipment to conveyor transfers. Material throughput rates at each transfer point have been estimated by the applicant and the supplier.

Truck loading emissions are calculated by applying selected PM, PM_{10} and $PM_{2.5}$ emission factors in units of pounds of particulate matter per ton of material loaded, to the projected truck loading rates (tons per hour and tons per year).

Material drop emissions are calculated using the material drop equation from AP-42 Section 13.2.4.3 (see Section 3.2 above) for all locations where material is dropped from a conveyor onto a stockpile or into a container.

Equipment located in the Fines Building are controlled by one of four identical dust collectors. Each dust collector has a design flow rate of 12,000 cfm. Three of the dust collectors (DC-02, DC-03 and DC-04) will discharge treated air back into the building and therefore, have no emissions and are not emission units with respect to permitting requirements.

One of the dust collectors (DC-01) does vent to the outside atmosphere and its emissions represent emissions from all of the equipment located inside of the fines processing building. Particulate emissions from the dust collector are calculated by multiplying the design air flow rate by a clean side particulate concentration of 0.005 gr/dscf. The result of this calculation is shown on Table 3-3.

Table 3-3 presents a summary of estimated $PM/PM_{10}/PM_{2.5}$ from the Non-Ferrous Material Processing System. This table has been updated to include six supplemental material transfer points.

3.3.2 Metal HAP Emissions

As described in Section 3.2.2 above, detailed metal and metal HAP emissions from the Ferrous Material Processing, Non-Ferrous Material Processing, Stockpile operations, and fugitive road dust were estimated using metals analyses data from samples of material deposition collected from GII. The results of the GII metals analyses were applied to emission units and activities at GIII that correspond to the location of the GII samples. Section 3.2.2 above summarizes the results of the metals analyses from GII samples and describes how these results were applied to GIII emission units and activities.

For the purpose of modeling potential off site metal impacts, the Non-Ferrous Material Processing System was divided into several volume sources. Particulate emissions from each volume source were assigned

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sample results from the GII material deposition sample that represents the emission unit or activity in each volume source.

The summary of facility-wide HAP emissions presented in Table 3-8 identifies total metal HAP emissions from the Non-Ferrous Material Processing System.

3.4 Stockpile Fugitive Emissions

Updated Information

Estimates of metal HAP emissions associated with fugitive stockpile particulate emissions were updated by using the results of metal analyses from samples of material deposition at GII (see Section 3.2.2 above).

Fugitive emissions from stockpiles include particulate matter and metal HAPs.

3.4.1 Particulate Emissions

Fugitive particulate emissions from stockpiles are estimated in accordance with procedures recommended by the Texas Commission on Environmental Quality (TCEQ) for calculation of emissions from crushed stone processing. Fugitive emissions from stockpiles are calculated using the following equation:

$$\text{PM Emission Rate (tpy)} = [(\text{inactive day PM EF} \times \text{No. of inactive days}) \times (\text{stockpile area}/2000) \times \text{control factor}] + [(\text{active day PM EF} \times \text{No. of active days}) \times (\text{stockpile area}/2000) \times \text{control factor}]$$

Stockpile control factors are identified as follows:

Stockpile Control Method	Control Eff. (%)	Control Factor (1 - ctrl eff)
None	0	1
Wet material	50	0.5
Water	70	0.3
Chemicals/foam	80	0.2
Partial enclosure	50-85	0.5-0.15
Full enclosure	90	0.1
Enclosed by building	90	0.1
Washed sand/gravel	95	0.05
Washed sand/gravel with water spray	98.5	0.015
Manufacturer rating	0	0

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A summary of stockpile fugitive particulate emissions is presented in Table 3-4.

3.4.2 Metal HAP Emissions

As described in Section 3.2.2 above, detailed metal and metal HAP emissions from the Ferrous Material Processing, Non-Ferrous Material Processing, Stockpile operations, and fugitive road dust were estimated using metals analyses data from samples of material deposition collected from GII. The results of the GII metals analyses were applied to emission units and activities at GIII that correspond to the location of the GII samples. Section 3.2.2 above summarizes the results of the metals analyses from GII samples and describes how these results were applied to GIII emission units and activities.

For the purpose of modeling potential off site metal impacts, the various material stockpiles were designated as volume sources associated with either the Ferrous or Non-Ferrous Material Processing Systems. Estimated fugitive particulate emissions from each stockpile were assigned sample results from the GII material deposition sample that represents the material managed in each stockpile.

The summary of facility-wide HAP emissions presented in Table 3-8 identifies total metal HAP emissions from stockpile fugitive emissions.

3.5 Fugitive Emissions from Paved and Unpaved Roads

Updated Information

Estimates of metal HAP emissions included in fugitive particulate emissions from paved and unpaved roads were updated by using the results of metal analyses of samples of material deposition at GII.

Fugitive emissions from paved and unpaved roads include particulate and metal HAPs.

3.5.1 Particulate Emissions

Facility roadways were divided into segments based on the type(s) of materials being transported for the purposes of estimating segment-specific particulate emissions to support an air dispersion modeling assessment of off-site metals impacts. The particulate emissions estimates described herein are greater than the estimated emissions included in the original application and have been updated to be consistent with emissions data used in the modeling assessment.

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Fugitive emissions from vehicular traffic on paved and unpaved roadways were estimated by identifying the material streams delivered to the site, transferred internally, and transported from the site. These material streams consist of :

- Peddler Scrap Deliveries;
- Truck Scrap Delivery to the North Scrap Stockpile;
- Truck Scrap Delivery to the South Scrap Stockpile;
- Ferrous Scrap Shipment from the North Ferrous Stockpile;
- Ferrous Scrap Shipments from the South Ferrous Stockpile;
- Ferrous Waste Shipped Off-Site;
- Non-Ferrous Products Shipped Off-Site;
- Non-Ferrous Waste Shipped Off-Site; and,
- Internal Material Transfer by Facility End Loaders.

Facility roadways were divided into segments representing the primary routes taken by vehicles hauling each material stream identified above as shown in Figure 3-1. The number of trips over each segment for each material were estimated by dividing the estimated daily quantity of each material stream handled (tons/day) by the average weight of vehicles used (average of loaded and unloaded weight). The results of this analysis provided an estimate of daily miles traveled for vehicles hauling each material stream.

As described in Tables 3-5A and 3-5B (particulate emissions from paved and unpaved roadways respectively), the average vehicle weights were combined with site-specific parameters to estimate the uncontrolled particulate emissions in units of lb of particulate/vehicle mile traveled. A control efficiency (also identified in Tables 3-5A and 3-5B) was then applied to identify a controlled emission factor (lbs/vehicle mile traveled) for paved and unpaved roads. The facility will employ a program of sweeping and watering described in the facility's Fugitive Particulate Operating Program to minimize generation of fugitive emissions from facility roadways.

The controlled particulate emission factors were then combined with the estimated daily miles traveled for each material/vehicle type to calculate daily emissions of PM, PM_{10} and $PM_{2.5}$. Daily emissions were multiplied by annual operating days (6 days per week and 52 weeks per year) to estimate annual emissions. Monthly emissions were assumed to be 10% of annual emissions.

The estimated number and weight of vehicles required to operate the facility at its maximum throughput was calculated, and the mean vehicle weight was used in the fugitive particulate calculations for both paved and unpaved roads. The total daily vehicle miles traveled on-site for each type of vehicle was provided by facility personnel.

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Approximately 95% of interior plant roadways will be paved with concrete or asphalt. The remaining approximately 5% of interior plant roadways, consisting of compacted crushed slag or similar materials, will be lightly traveled.

Fugitive particulate emissions from vehicular traffic on paved roadways are calculated pursuant to AP-42, Section 13.2.1 Paved Roads, using the following equation:

$E_{ext} = (k * (sL)^{0.91} * (W)^{1.02}) * (1 - (P/(4N))$ Equation 2, AP42, Section 13.2.1 Paved Roads (Jan 2011)

E_{ext} =		Size specific annual average particulate emission factor (lb/VMT)
K =	0.011 PM 0.0022 PM_{10} 0.0054 $PM_{2.5}$	Particle size multiplier lb/VMT (AP-42 Table 13.2.1-1)
sL =	9.7	Mean controlled silt content, % (AP42 Table 13.2.1-3 Jan 2011 - Iron & Steel Range: 0.09 to 79; mean 9.7-g/m2)
W =		Mean vehicle weight , tons (use weighted average where available)
P =	120	Number of precipitation days (>0.01 in) per year (AP42 Fig 13.2.1.2 Jan 2011 - Chicago, IL)
N =	365	Averaging Period, annual
Control Efficiency =	%	Estimated Control Efficiency for periodic sweeping and watering

Table 3-5A presents a summary of the estimated fugitive particulate emissions from paved roadways.

Fugitive particulate emissions from vehicular traffic on unpaved roadways are calculated pursuant to AP-42, Section 13.2.2 Unpaved Roads, using the following equation:

$E_{ext} = (k * (s/12)^{a} * (W/3)^{b}) * ((N-P)/P)$ Equation 1a & 2, AP42, Section 13.2.2 Paved Roads (Nov 2006)

E_{ext} =		Size specific annual average particulate emission factor (lb/VMT)
K =	4.9 PM 1.5 PM_{10} 0.15 $PM_{2.5}$	Particle size multiplier lb/VMT (AP-42 Table 13.2.2-2)
s =	6	Mean controlled silt content, % (AP42 Table 13.2.2-2 Nov 2006 - Iron & Steel Production (%)
W =		Mean vehicle weight, tons (use weighted average where available)
P =	120	Number of precipitation days (>0.01 in) per year – Chicago, IL (AP42 Fig 13.2.2-2 Nov 2006)
N =	365	Averaging Period, annual
Control Efficiency =	%	Estimated Control Efficiency for periodic watering or chemical treatment

Table 3-5B presents a summary of the estimated fugitive particulate emissions from unpaved roadways.

3.5.2 Metal HAP Emissions

As described in Section 3.2.2 above, detailed metal and metal HAP emissions from the Ferrous Material Processing, Non-Ferrous Material Processing, Stockpile operations, and fugitive road dust were estimated using metals analyses data from samples of material deposition collected from GII. The results of the GII metals analyses were applied to emission units and activities at GIII that correspond to the location of the GII samples. Section 3.2.2 above summarizes the results of the metals analyses from GII samples and describes how these results were applied to GIII emission units and activities.

For the purpose of modeling potential off site metal impacts, each identified roadway segment was assigned representative sample results from the GII material deposition samples.

The summary of facility-wide HAP emissions presented in Table 3-8 identifies total metal HAP emissions from roadway fugitive emissions.

3.6 Miscellaneous Natural Gas Combustion

Updated Information

There are no updates to estimated emissions from miscellaneous natural gas combustion.

Miscellaneous natural gas combustion sources will consist of environmental heaters.

The estimated miscellaneous natural gas combustion emissions are presented in Table 3-6. Emissions are calculated using a maximum natural gas firing rate of 10 MMBtu/hr, a natural gas higher heating value (HHV) of 1,020 Btu/scf, and standard USEPA natural gas emission factors from AP-42; Chapter 1.4; Tables 1.4-1 and 1.4-2.

Emission estimates are presented for criteria pollutants, greenhouse gas (GHG), and metal and organic HAPs.

3.7 Facility-Wide Criteria Pollutant Emissions

An updated summary of facility-wide criteria pollutant emissions is presented in Table 3-7.

3.8 Facility-Wide HAP Emissions

An updated summary of facility-wide HAP emissions is presented in Table 3-8.

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RK & Associates, Inc.

Updated Emission Estimates
Construction Permit Application 19090021 for a New Scrap Metal Recycling Facility

General III, LLC
11600 South Burley
Chicago, Illinois 60614

Updated Emission Estimates
January 27, 2020

FIGURES

Figure 3-1 – Facility Roadways

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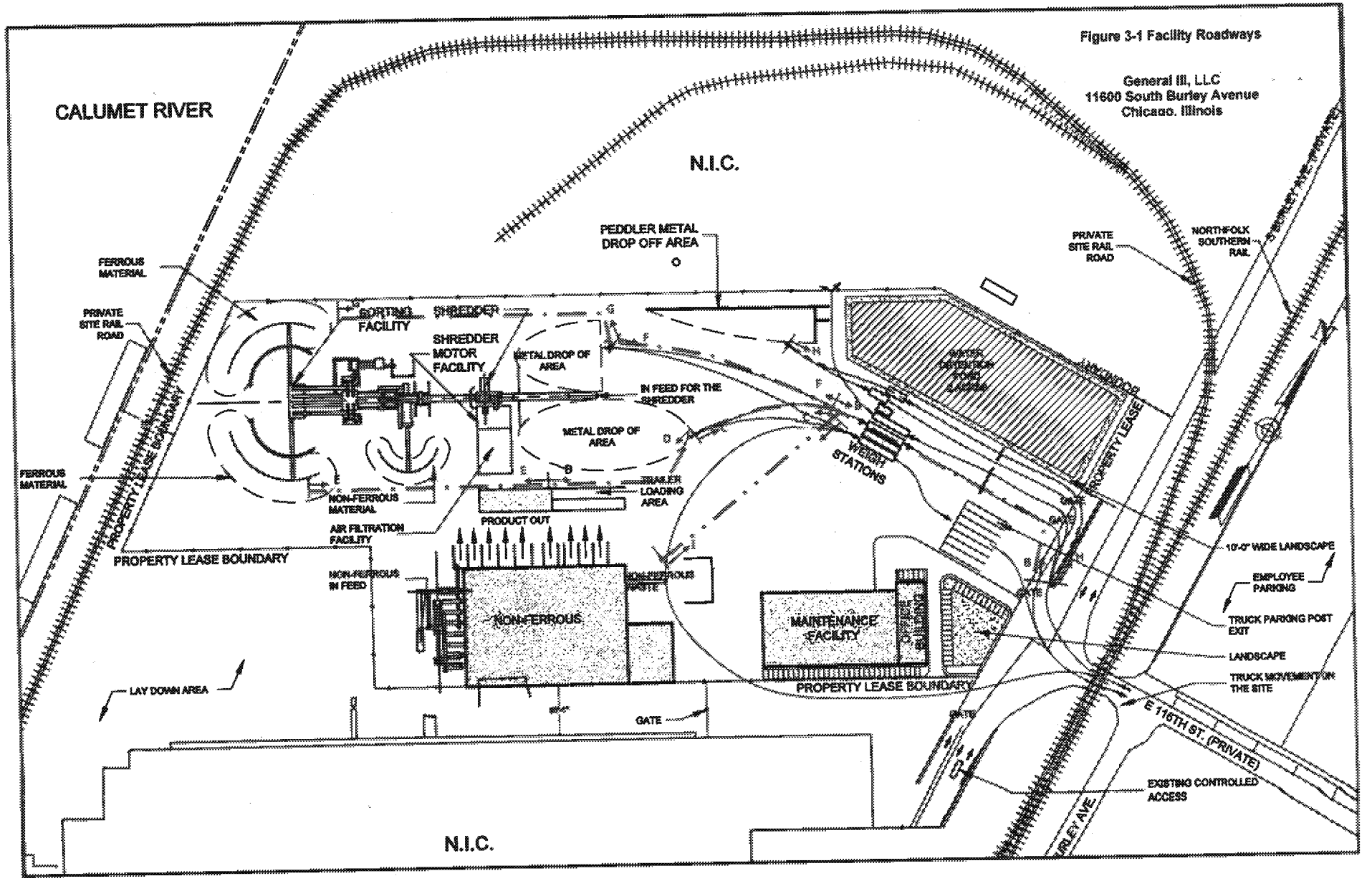
Figure 3-1 Facility Roadways
General III, LLC
11600 South Burley Avenue
Chicago, Illinois
CALUMET RIVER
N.I.C.
PEDDLER METAL DROP OFF AREA
PRIVATE SITE RAIL ROAD
NORTHFOLK SOUTHERN RAIL
FERROUS MATERIAL
PRIVATE SITE RAIL ROAD
SORTING FACILITY
SHREDDER
SHREDDER MOTOR FACILITY
METAL DROP OF AREA
IN FEED FOR THE SHREDDER
METAL DROP OF AREA
WEIGHT STATIONS
PROPERTY LEASE
FERROUS MATERIAL
NON-FERROUS MATERIAL
TRAILER LOADING AREA
PRODUCT OUT
AIR FILTRATION FACILITY
PROPERTY LEASE BOUNDARY
PROPERTY LEASE BOUNDARY
NON-FERROUS IN FEED
NON-FERROUS
MAINTENANCE FACILITY
10'-0" WIDE LANDSCAPE
EMPLOYEE PARKING
TRUCK PARKING POST EXIT
LANDSCAPE
TRUCK MOVEMENT ON THE SITE
PROPERTY LEASE BOUNDARY
LAY DOWN AREA
GATE
E 116TH ST. (PRIVATE)
EXISTING CONTROLLED ACCESS
N.I.C.

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RK
& Associates, Inc.

Updated Emission Estimates
Construction Permit Application 19090021 for a
New Scrap Metal Recycling Facility

General III, LLC
11600 South Burley
Chicago, Illinois 60614

Updated Emission Estimates
January 27, 2020

TABLES

Table 3-1A Summary of Controlled Shredder VOM and CO Emissions

General III, LLC - Chicago, Illinois

Parameter	Units	Values	Comment
Captured VOC Emissions Controlled by RTO and Emitted Through the RTO/Scrubber Stack			
Demonstrated Captured Shredder VOM Emission Factor [a]	lbs of VOM / ton of gross shredder feed	0.5119	Worst case value with 51% ELFs from November 18, 2019 testing by Method 25A (as propane). (Assume VOM = THC)
Maximum Gross Shredder Feed Rate	tons/month	100,000	Permitted maximum shredder feed rates requested in shredder RTO construction permit.
Maximum Annual Shredder Throughput [b]	tons/year	1,000,000	
RTO VOM Control Eff.	%	98.0%	RTO manufacturer's guarantee. The November 2019 testing demonstrated a VOM control efficiency of 99%. Using 98% to calculate permit limits results in incorporating a safety factor of 2.0.
VOM emission safety factor		1.00	Safety factor used to establish permitted shredder VOM emission limit.
Shredder VOM Emissions [a]	tons/month	0.51	Maximum VOM emission rates requested in construction permit application.
	tons/year	5.12	

Parameter	Units	Units	Comment
CO Emissions (from combustion of natural gas and VOM)			
CO emission factor measured at scrubber stack	lb/ton	0.0129	CO Emission Factor measured from November 14, 2019 emission testing
CO emissions safety factor		1.00	Safety factor applied to establish permitted shredder CO emission limits.
Total Shredder CO Emissions	tons/month	1.29	Maximum CO emission rates requested in construction permit application.
	tons/year	12.86	

a. VOM emissions measured by USEPA Method 25A minus methane, ethane, and compounds exempt from the federal definition of VOC and reported as propane.

b. Maximum annual shredder throughput requested in shredder RTO construction permit application based on recent operating data.

Table 3-1B Summary of Controlled Shredder Filterable Particulate Emissions

General III, LLC - Chicago, Illinois

Parameter	Units	Values	Comment
Captured PM/PM_{10} Emissions Controlled by Cyclone and Roll Media Filter and Emitted Through the RTO/Scrubber Stack			
Demonstrated Filterable PM Emission Factor [a]	lbs of filterable PM / ton of gross shredder feed	0.0047	Measured value from November 18, 2019 emission testing.
Maximum Annual Shredder Throughput [b]	tons/month	100,000	Permitted maximum shredder feed rates requested in shredder RTO construction permit.
	tons/year	1,000,000	
Filterable PM Emissions Safety Factor		4.00	Safety factor used to establish permitted shredder PM emission rates.
Controlled Shredder Filterable PM Emission Rates	tons/month	0.94	Permitted filterable PM/PM_{10} emission rates requested in shredder RTO/Scrubber construction permit.
	tons/year	9.40	
Controlled Shredder Filterable PM_{10} Emission Rates	tons/month	0.94	Assumes that all PM is PM10. Estimates assume no PM/PM10 emission reductions in RTO/Scrubber.
	tons/year	9.40	

a. Filterable PM emission rate measured by USEPA Methods 1 through 4 and Method 29.

b. Maximum annual shredder throughput requested in shredder RTO construction permit application based on recent operating data.

Table 3-1C Summary of November 2019 Shredder RTO/Scrubber HAP Emissions

General III, LLC - Chicago, Illinois

Pollutant	Emission Factor Nov 2019 RTO/ Scrubber Emis Testing lb/ton	Permitted Shredder Thruput Rates 100,000 ton/mo Maximum Hourly Emissions ton/month	1,000,000 tpy Maximum Annual Emissions tpy
Metal HAPs[1]			
Lead [3]	1.38E-06 [1]	2.77E-04	2.77E-03
Manganese	1.99E-06 [1]	3.98E-04	3.98E-03
Mercury	≤ 4.46E-05 [1]	≤ 8.93E-03	≤ 8.93E-02
Nickel	3.30E-06 [1]	6.59E-04	6.59E-03
Antimony	≤ 1.12E-06 [1]	≤ 2.25E-04	≤ 2.25E-03
Arsenic	≤ 3.97E-07 [1]	≤ 7.94E-05	≤ 7.94E-04
Beryllium	≤ 8.90E-08 [1]	≤ 1.78E-05	≤ 1.78E-04
Cadmium	≤ 4.26E-07 [1]	≤ 8.51E-05	≤ 8.51E-04
Chromium [3]	≤ 3.45E-06 [1]	≤ 6.90E-04	≤ 6.90E-03
Cobalt	≤ 1.06E-07 [1]	≤ 2.13E-05	≤ 2.13E-04
Phosphorus	≤ 1.21E-04 [1]	≤ 2.43E-02	≤ 2.43E-01
Selenium	≤ 6.05E-06 [1]	≤ 1.21E-03	≤ 1.21E-02
Volatile HAPs[2]			
Ethylbenzene	6.67E-05 [2]	1.33E-04	1.33E-03
Styrene	1.33E-05 [2]	2.66E-05	2.66E-04
Toluene	3.33E-04 [2]	6.66E-04	6.66E-03
Tetrachloroethane (PCE)	2.67E-06 [2]	5.34E-06	5.34E-05
m,p-Xylene	1.33E-05 [2]	2.66E-05	2.66E-04
Benzene	4.00E-04 [2]	8.00E-04	8.00E-03
1,1,1-Trichloroethane	2.00E-04 [2]	4.00E-04	4.00E-03
Methylene Chloride	6.00E-05 [2]	1.20E-04	1.20E-03
Trichloroethene (TCE)	6.67E-05 [2]	1.33E-04	1.33E-03
o-Xylene	6.67E-05 [2]	1.33E-04	1.33E-03
Acid HAPs			
Hydrochloric Acid	7.72E-04 [1]	1.54E-01	1.54E+00
Hydrofluoric Acid	3.18E-04 [1]	6.36E-02	6.36E-01

Total Metal HAPs	≤ 4.40E-02	≤ 4.40E-01
Total Organic HAPs	2.44E-03	2.44E-02
Total Acid HAPs	2.18E-01	2.18E+00
Total HAPs	≤ 2.64E-01	≤ 2.64E+00

Maximum Individual HAP	Hydrochloric Acid	1.54E-01	1.54E+00

1. Measured metal emission rates from hammermill shredder controlled by RTO/Scrubber from November 2019.
2. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.
3. Chromium (metal) and compounds other than Chromium VI

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Table 3-1D Shredder RTO Natural Gas Combustion Emissions
General III, LLC - Chicago, Illinois

Pollutant	Pollutant Emission Factor [a] lb/MMscf	RTO Max Firing Rate 15.0 MMBtu/hr NG HHV = 1,020-Btu/scf Annual Gas Consumption 52,500 MMBtu/yr	
		ton/month[b]	tpy
Nitrogen Oxide (NOx)	100	0.26	2.57
Carbon Monoxide (CO)	84	0.22	2.16
Total Filterable PM	1.9	0.00	0.05
Total Condensable PM	5.7	0.01	0.15
Total Particulate Matter	7.6	0.02	0.20
Sulfur Dioxide (SO_2)	0.6	0.00	0.02
Volatile Organic Compounds (VOC)	5.5	0.01	0.14
Greenhouse Gas Emissions			
Carbon Dioxide (CO_2)	120,174	309.27	3,092.72
Methane (CH_4)	2.2649	0.0058	0.06
Nitrous Oxide (N_2O)	0.2265	0.0006	0.01
Carbon Dioxide Equivalents (CO_2e) [c]		**309.59**	**3,095.91**

a. AP-42 Emission factors from Tables 1.4-1 and 1.4-2.

b. Monthly emissions are assumed to be 10% of annual emissions.

c. Global Warming Potentials (GWPs) for CO_2, CH_4 and N_2O are 1, 25, and 298 respectively (40 CFR 98 Subpart A).

Table 3-1D Shredder RTO Natural Gas Combustion Emissions
General III, LLC - Chicago, Illinois

Summary of HAP Emissions from Natural Gas Combustion

HAP[b] Y/N	Pollutant	Emission Factor[a] (lb/10[6] scf)	ton/month[e]	tpy
	Metal HAPs[c]			
Y	Lead	0.0005	1.29E-06	1.29E-05
Y	Manganese	3.80E-04	9.78E-07	9.78E-06
Y	Mercury	2.60E-04	6.69E-07	6.69E-06
Y	Nickel	2.10E-03	5.40E-06	5.40E-05
Y	Arsenic	2.00E-04	5.15E-07	5.15E-06
Y	Beryllium	< 1.20E-05	3.09E-08	3.09E-07
Y	Cadmium	1.10E-03	2.83E-06	2.83E-05
Y	Chromium	1.40E-03	3.60E-06	3.60E-05
Y	Cobalt	8.40E-05	2.16E-07	2.16E-06
Y	Selenium	< 2.40E-05	6.18E-08	6.18E-07
	Volatile HAPs[d]			
Y	Toluene	3.40E-03	8.75E-06	8.75E-05
Y	Hexane	< 1.80E+00	< 4.63E-03	< 4.63E-02
Y	Anthracene	< 2.40E-06	< 6.18E-09	< 6.18E-08
Y	Pyrene	5.00E-06	1.29E-08	1.29E-07
Y	Benzo(g,h,i)perylene	< 1.20E-06	< 3.09E-09	< 3.09E-08
Y	Indeno(1,2,3-cd)pyrene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	Acenaphthylene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	Benzo(b)fluoranthene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	Fluoranthene	3.00E-06	7.72E-09	7.72E-08
Y	Benzo(k)fluoranthene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	Chrysene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	Dichlorobenzene	1.20E-03	3.09E-06	3.09E-05
Y	Formaldehyde	7.50E-02	1.93E-04	1.93E-03
Y	Benzo(a)pyrene	< 1.20E-06	< 3.09E-09	< 3.09E-08
Y	Dibenzo(a,h)anthracene	< 1.20E-06	< 3.09E-09	< 3.09E-08
Y	3-Methylcholanthrene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	Benz(a)anthracene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	7,12-Dimethylbenz(a)anthracene	< 1.60E-05	< 4.12E-08	< 4.12E-07
Y	Benzene	< 2.10E-03	< 5.40E-06	< 5.40E-05
Y	Acenaphthene	< 1.80E-06	< 4.63E-09	< 4.63E-08
Y	Phenanathrene	1.70E-05	4.38E-08	4.38E-07
Y	Fluorene	2.80E-06	7.21E-09	7.21E-08
Y	Naphthalene	6.10E-04	1.57E-06	1.57E-05
Y	2-Methylnaphthalene	2.40E-05	6.18E-08	6.18E-07
	Total HAPs		**4.86E-03**	**4.86E-02**
	Maximum Individual HAP	**Hexane**	**4.63E-03**	**4.63E-02**

a. Criteria pollutant emission factors for natural gas combustion - AP-42 Tables 1.4-1 and 1.4-2.

b. Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.

c. Metal HAP emission factors from natural gas combustion - AP-42 Emission factors from Tables 1.4-4.

d. Organic HAP emission factors from natural gas combustion - AP-42 Emission factors from Tables 1.4-3.

e. Monthly emissions are assumed to be 10% of annual emissions.

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Table 3-1E Summary of Controlled Shredder Emissions
General Iron Industries, Inc. - Chicago, Illinois

Pollutant	Shredder RTO/Scrubber Stack Emissions [c]		Shredder RTO Natural Gas Combustion Emissions [c,d]		Total Shredder RTO/Scrubber Stack Emissions	
	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr
NOx	-	-	0.26	2.57	0.26	2.57
CO[e]	1.29	12.86	0.22	2.16	1.50	15.02
PM [a]	0.94	9.40	0.02	0.20	0.96	9.60
PM10 [a]	0.94	9.40	0.02	0.20	0.96	9.60
SO2	-	-	0.00	0.02	0.00	0.02
VOM[a,b]	0.51	5.12	0.01	0.14	0.53	5.26
Total HAPs	0.26	2.64	0.00	0.05	0.27	2.69
Max Single HAP (HCl)	0.15	1.54			0.15	1.54
GHG (CO_2e)	309.6	3,095.9	309.6	3,095.9	619.2	6,191.8

a. VOM and PM/PM_{10} emission rates in the above table are based on a maximum monthly feed rate of 100,000 tons/month and a maximum annual feed rate of 1,000,000 tons/year.

b. VOM emissions are based on Method 25A testing performed in November 2019.

c. See Table 1A for VOM emission estimates, Table 1B for PM/PM10 emission estimates, Table 1C for HAP emission estimates, and Table 1D for RTO natural gas combustion emission estimates.

d. Natural gas emissions are based on a maximum RTO firing rate of 15.00 MMBtu/hr.

e. CO emissions are based on a measured November 2019 emission factor and an applied safety factor.

Table 3-2 - Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput
100,000 tpm
Annual Throughput
1,000,000 tpy

A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	X	S	T	V	W	R	Y	AA
Row	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source			PM Emissions			PM10 Emissions			PM2.5 Emissions		
#	ID #	Description		Y / N							tpm	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
1	Barge 1	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	73,400	734,000	0.00014 [c]	0.0051	0.0514	0.000046 [c]	0.0017	0.0169	0.000013 [c]	0.0005	0.0048
2	Barge 2	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	73,400	734,000	0.00014 [d]	0.0051	0.0514	0.000046 [e]	0.0017	0.0169	0.000013 [g]	0.0005	0.0048
3	Barge 3	Ferrous Transfer Conveyor	Shred	5.4% [a2]	Outside	N				Drop	73,400	734,000	0.00127 [c]	0.0465	0.4645	0.00060 [c]	0.0220	0.2197	0.00009 [c]	0.0033	0.0333
4	C-001	Shredded Material Transfer Conveyor	Shred	Y	Outside	N		NA		A	100,000	1,000,000	0.00014 [c]	0.0070	0.0700	0.000046 [c]	0.0023	0.0230	0.000013 [c]	0.0007	0.0065
5	C-002	Shredded Material Transfer Conveyor	Shred	Y	Outside	N		NA		A	200.0	2,000	0.00014 [c]	0.0000	0.0001	0.000046 [c]	0.0000	0.0000	0.000013 [c]	0.0000	0.0000
6	C-002	Mat'l Not Removed by Poker Picker	Shred	Y	Outside	N		NA		A	99,800	998,000	0.00014 [d]	0.0070	0.0699	0.000046 [e]	0.0023	0.0230	0.000013 [d]	0.0006	0.0065
7	C-003	Ferrous Transfer Conveyor	Residue	Y	Outside	N		NA		A	36,000	360,000	0.00014 [d]	0.0018	0.0182	0.000046 [g]	0.0006	0.0060	0.000013 [d]	0.0002	0.0017
8	C-003	Ferrous Transfer Conveyor	Ferrous	Y	Outside	N		NA		A	73,800	738,000	0.00014 [d]	0.0052	0.0517	0.000046 [g]	0.0017	0.0170	0.000013 [d]	0.0005	0.0048
9	C-006	Ferrous Transfer Conveyor	Shred	Y	Outside	Y	Z-Box Air Loop	100%	100%	A	36,600	366,000	0.00014 [d]	0.0026	0.0000	0.000046 [g]	0.0008	0.0000	0.000013 [d]	0.0002	0.0000
10	C-007	Ferrous Transfer Conveyor	Shred	Y	Outside	Y	Z-Box Air Loop	100%	100%	A	36,600	366,000	0.00014 [d]	0.0026	0.0000	0.000046 [g]	0.0008	0.0000	0.000013 [d]	0.0002	0.0000
11	C-008	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	11,200	112,000	0.00014 [d]	0.0008	0.0078	0.000046 [g]	0.0003	0.0026	0.000013 [d]	0.0001	0.0007
12	C-009	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179	0.000046 [g]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
13	C-010	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179	0.000046 [g]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
14	C-011	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	11,000	110,000	0.00014 [d]	0.0008	0.0077	0.000046 [g]	0.0003	0.0025	0.000013 [d]	0.0001	0.0007
15	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	11,200	112,000	0.00014 [d]	0.0008	0.0078	0.000046 [g]	0.0003	0.0026	0.000013 [d]	0.0001	0.0007
16	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179	0.000046 [g]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
17	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179	0.000046 [g]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
18	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	11,000	110,000	0.00014 [d]	0.0008	0.0077	0.000046 [g]	0.0003	0.0025	0.000013 [d]	0.0001	0.0007
19	C-016	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	73,400	734,000	0.00014 [d]	0.0051	0.0514	0.000046 [g]	0.0017	0.0169	0.000013 [d]	0.0005	0.0048
20	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	73,400	734,000	0.00014 [d]	0.0051	0.0514	0.000046 [g]	0.0017	0.0169	0.000013 [d]	0.0005	0.0048
21	C-022	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	11,000	110,000	0.00014 [d]	0.0008	0.0077	0.000046 [g]	0.0003	0.0025	0.000013 [d]	0.0001	0.0007
22	C-023	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	11,000	110,000	0.00014 [d]	0.0008	0.0077	0.000046 [g]	0.0003	0.0025	0.000013 [d]	0.0001	0.0007
23	C-024	Non-metallic transfer conveyor	Ferrous	Y	Outside	N		NA		A	800	8,000	0.00014 [d]	0.0001	0.0006	0.000046 [g]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
24	C-025	Non-metallic not removed by magnet &	Ferrous	Y	Outside	N		NA		A	400	4,000	0.00014 [d]	0.0000	0.0003	0.000046 [g]	0.0000	0.0001	0.000013 [d]	0.0000	0.0000
25	C-025	material removed by first magnet to second	Ferrous	Y [a2]	Outside	N		NA		A	200	2,000	0.00014 [d]	0.0000	0.0001	0.000046 [g]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000

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Table 3-2 - Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput
100,000 tpm
Annual Throughput
1,000,000 tpy

A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	R	S	T	V	W	X	Y	AA
Row	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source			PM Emissions				PM10 Emissions			PM2.5 Emissions		
#	ID #	Description		Y / N							tpm	tpy	lb/ton	ton/mo	tpy		lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
26	C-026	Ferrous Transfer Conveyor	Ferrous	Y [a2]						A	200	2,000	0.00014 [d]	0.0000	0.0001		0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
27	C-027	Ferrous Transfer Conveyor	Ferrous	Y [a2]	Outside	N		NA		A	200	2,000	0.00014 [d]	0.0000	0.0001		0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
28	C-028	Non-metallic Transfer Conveyor	Ferrous	Y	Outside	N		NA		A	200	2,000	0.00014 [d]	0.0000	0.0001		0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
29	C-029	Non-metallic Transfer Conveyor	Ferrous	Y						A	200	2,000	0.00014 [d]	0.0000	0.0001		0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
30	C-031	ASR Transfer Conveyor	Residue	Y	Outside	N		NA		A	800	8,000	0.00014 [d]	0.0001	0.0006		0.000046 [d]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
31	C-032	ASR Transfer Conveyor	Residue	Y	Outside	N		NA		A	800	8,000	0.00014 [d]	0.0001	0.0006		0.000046 [d]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
32	C-033	Magnetic Material	Shred	Y	Outside	N		NA		A	1,000	10,000	0.00014 [d]	0.0001	0.0007		0.000046 [d]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
33	C-033	ASR Not Removed by Magnet E-12	Residue	Y	Outside	N		NA		A	25,800	258,000	0.00014 [d]	0.0018	0.0181		0.000046 [d]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
34	C-034	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	1,000	10,000	0.00014 [d]	0.0001	0.0007		0.000046 [d]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
35	C-035	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	1,000	10,000	0.00014 [d]	0.0001	0.0007		0.000046 [d]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
36	C-036	ASR Transfer Conveyor	Residue	Y	Outside	N		NA		A	25,800	258,000	0.00014 [d]	0.0018	0.0181		0.000046 [d]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
37	E-01	Drop Raw Scrap onto Shredder Feed Chute	Unprepared	Y [a4]	Outside	N		NA		A	100,000	1,000,000	0.00014 [d]	0.0070	0.0700		0.000046 [d]	0.0023	0.0230	0.000013 [d]	0.0007	0.0065
38	E-015	Z-Box Separator Cyclone	Ferrous	Y	Outside	N		NA		A	400	4,000	0.00014 [d]	0.0000	0.0003		0.000046 [d]	0.0000	0.0001	0.000013 [d]	0.0000	0.0000
39	E-016	Z-Box Separator Cyclone	Ferrous	Y	Outside	N		NA		A	400	4,000	0.00014 [d]	0.0000	0.0003		0.000046 [d]	0.0000	0.0001	0.000013 [d]	0.0000	0.0000
40	E-05	Shredder Under Mill Vibratory Conveyor	Shred	Y	Inside	N		NA		A	100,000	1,000,000	0.00014 [d]	0.0070	0.0700		0.000046 [d]	0.0023	0.0230	0.000013 [d]	0.0007	0.0065
41	E-07	Magnet Discharge to Chute	Shred	Y	Outside	N		NA		A	37,400	374,000	0.00014 [d]	0.0026	0.0262		0.000046 [d]	0.0009	0.0086	0.000013 [d]	0.0002	0.0024
42	E-07	Magnet Discharge to Chute	Shred	Y	Outside	N		NA		A	37,400	374,000	0.00014 [d]	0.0026	0.0262		0.000046 [d]	0.0009	0.0086	0.000013 [d]	0.0002	0.0024
43	E-08	ASR Not Removed by Magnet	Shred	Y	Outside	N		NA		A	400	4,000	0.00014 [d]	0.0000	0.0003		0.000046 [d]	0.0000	0.0001	0.000013 [d]	0.0000	0.0000
44	E-08	Ferrous Removed by Magnet E-7	Residue	Y	Outside	N		NA		A	37,000	370,000	0.00014 [d]	0.0026	0.0259		0.000046 [d]	0.0009	0.0085	0.000013 [d]	0.0002	0.0024
45	E-10	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179		0.000046 [d]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
46	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179		0.000046 [d]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
47	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	11,000	110,000	0.00014 [d]	0.0008	0.0077		0.000046 [d]	0.0003	0.0025	0.000013 [d]	0.0001	0.0007
48	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	11,000	110,000	0.00014 [d]	0.0008	0.0077		0.000046 [d]	0.0003	0.0025	0.000013 [d]	0.0001	0.0007
49	E-12	Ferrous Removed by Magnet	Ferrous	Y	Outside	N		NA		A	1,000	10,000	0.00014 [d]	0.0001	0.0007		0.000046 [d]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
50	E-13	Ferrous Removed by E-13	Ferrous	Y [a2]	Outside	N		NA		A	100	2,000	0.00014 [d]	0.0000	0.0001		0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000

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Table 3-2 - Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput
100,000 tpm
Annual Throughput
1,000,000 tpy

Row #	Equipment Generating Emissions: ID #	Equipment Generating Emissions: Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	tpm	tpy	PM Emissions lb/ton	PM Emissions ton/mo	PM Emissions tpy	PM10 Emissions lb/ton	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
51	E-13	Ferrous Removed by E-13	Ferrous	Y	Outside	N		NA		A	200	2,000	0.00014 [d]	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.000013 [e]	0.0000	0.0000
52	E-14	Mat'l Not removed by Separator	Ferrous	Y	Outside	N		NA		A	50.00	500	0.00014 [d]	0.0000	0.0000	0.000046 [e]	0.0000	0.0000	0.000013 [e]	0.0000	0.0000
53	E-7	ASR Not Removed by Magnet	Shred	Y [1]	Outside	N		NA		A	400	4,000	0.00014 [d]	0.0000	0.0003	0.000046 [e]	0.0000	0.0001	0.000013 [e]	0.0000	0.0000
54	E-7	Ferrous Removed by Magnet E-7	Residue	Y	Outside	N		NA		A	37,000	370,000	0.00014 [d]	0.0026	0.0259	0.000046 [e]	0.0009	0.0085	0.000013 [e]	0.0002	0.0024
55		Truck Dumping of Raw Feed	Unprepared	5.4 [1]	Outside	N				Drop	100,000	1,000,000	0.00127 [c]	0.0633	0.6328	0.00060 [c]	0.0299	0.2993	0.00009 [c]	0.0045	0.0453
56		Raw Feed from Ground after Truck Dumping	Unprepared	5.4 [1]	Outside	N				Drop	100,000	1,000,000	0.00127 [c]	0.0633	0.6328	0.00060 [c]	0.0299	0.2993	0.00009 [c]	0.0045	0.0453
57		Non-metallic Loadout	Non-metallic	N	Outside	N				☼	37,400	374,000	0.000204 [f]	0.0038	0.0382	0.000100 [f]	0.0019	0.0187	0.000015 [f]	0.0003	0.0028
58		Poker Loadout	Pokers	N	Outside	N				☼	200	2,000	0.000204 [f]	0.0000	0.0002	0.000100 [f]	0.0000	0.0001	0.000015 [f]	0.0000	0.0000
59	Magnet/ Clam	Drop Raw Scrap to Infeed Conveyor	Unprepared	N [4]	Outside	N		NA		☼	100,000	1,000,000	0.000204 [f]	0.0102	0.1022	0.000100 [f]	0.0050	0.0500	0.000015 [f]	0.0008	0.0076
60	C-030	Mat'l not Removed by Separator	Ferrous	1.5% [1]	Outside	Y	Cover	0%		Drop	450.00	4,500	0.00761 [c]	0.0017	0.0171	0.00360 [c]	0.0008	0.0081	0.00054 [c]	0.0001	0.0013
61	C-037	ASR Transfer Conveyor to Stockpile	Residue	10.0% [4]	Outside	N		0%		Drop	25,800	258,000	0.00053 [c]	0.0069	0.0689	0.00025 [c]	0.0033	0.0326	0.00004 [c]	0.0005	0.0049
62	E-06	Poker Picker Chute to Stockpile	Shred	1.5% [1]	Outside	N		0%		Drop	200	2,000	0.00761 [c]	0.0008	0.0076	0.00360 [c]	0.0004	0.0036	0.00054 [c]	0.0001	0.0005
63	E-14	Final Discharge from Mat'l Separator	Ferrous	1.5% [1]	Outside	N		0%		Drop	150.00	1,500	0.00761 [c]	0.0006	0.0057	0.00360 [c]	0.0003	0.0027	0.00054 [c]	0.0000	0.0004
64	SC-001	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	36,600	366,000	0.00014 [d]	0.0026	0.0256	0.000046 [e]	0.0008	0.0084	0.000013 [e]	0.0002	0.0024
65	SC-009	Supplemental Conveyor	Ferrous	Y	Outside	N		NA		A	400	4,000	0.00014 [d]	0.0000	0.0003	0.000046 [e]	0.0000	0.0001	0.000013 [e]	0.0000	0.0000
66	SC-002	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	36,600	366,000	0.00014 [d]	0.0026	0.0256	0.000046 [e]	0.0008	0.0084	0.000013 [e]	0.0002	0.0024
67	SC-010	Supplemental Conveyor	Ferrous	Y	Outside	N		NA		A	400	4,000	0.00014 [d]	0.0000	0.0003	0.000046 [e]	0.0000	0.0001	0.000013 [e]	0.0000	0.0000
68	SC-005	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179	0.000046 [e]	0.0006	0.0059	0.000013 [e]	0.0002	0.0017
69	SC-008	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	25,600	256,000	0.00014 [d]	0.0018	0.0179	0.000046 [e]	0.0006	0.0059	0.000013 [e]	0.0002	0.0017
70	C-004	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	37,000	370,000	Emissions captured by inward air flow at inlet to Z-Box separator								
71	C-014	Ferrous Transfer Conveyor	Shred	Y [1]	Outside	N		NA		A	73,400	734,000	Alternate to C-014 to C-016. Emissions from 100% of material throughput assigned to C-014 to C-016.								
72	C-005	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	37,000	370,000	Emissions captured by inward air flow at inlet to Z-Box separator								
73	C-012	Ferrous Transfer Conveyor	Shred	Y [1]	Outside	N		NA		A	73,400	734,000	Alternate to C-012 to C-016. Emissions from 100% of material throughput assigned to C-012 to C-016.								
74	C-015	Ferrous Transfer Conveyor	Shred	Y [1]	Outside	N		NA		A	73,400	734,000	Alternate to C-015 to C-016. Emissions from 100% of material throughput assigned to C-015 to C-016.								
75	C-016	Ferrous Transfer Conveyor	Shred	Y [1]	Outside	N		NA		A	73,400	734,000	Alternate to C-016 top C-017. Emissions from 100% of material throughput assigned to C-016 to C-017.								

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Table 3-2 - Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput
100,000 tpm
Annual Throughput
1,000,000 tpy

Row #	Equipment Generating Emissions ID #	Equipment Generating Emissions Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	tpm	tpy	PM Emissions lb/ton	PM Emissions ton/mo	PM Emissions tpy	PM10 Emissions lb/ton	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
76	C-015	Ferrous Transfer Conveyor	Shred	Y [a4]	Outside	N		NA		A	73,400	734,000	Alternate to C-013 to C-016. Emissions from 100% of material throughput assigned to C-013 to C-015.								
77	C-017	Ferrous Transfer Conveyor	Shred	Y [a4]	Outside	N		NA		A	73,400	734,000	Alternate to C-020/C-021 or C-017/C-018. Emissions from 100% of material throughput assigned to C-017 to Barge 1.								
78	C-023	Ferrous Transfer Conveyor	Shred	Y [a4]	Outside	N		NA		A	73,400	734,000	Alternate to C-017 to C-023. Emissions from 100% of material throughput assigned to C-017 to C-018.								
79	E-02	Shredder Bottom Discharge	Shred	Y	shredder emissions captured by shredder hood and controlled by RTO/Scrubber					A	100,000	1,000,000	Emissions captured and controlled by shredder emission control system								
80	C-22	Ferrous Transfer Conveyor	Shred	5.4% [a4]	Outside	N		NA		Drop	73,400	734,000	Alternate to C-018 to N Ferrous Stockpile or Barge 2 to Barge. Emissions from 100% of material throughput assigned to Barge 2 to Barge.								
81	E-02	Shredder Chute	Unprepared	Y	shredder emissions captured by shredder hood and controlled by RTO/Scrubber					A	100,000	1,000,000	Emissions captured and controlled by shredder emission control system								
82	C-018	Ferrous Transfer Conveyor	Shred	5.4% [a4]	Outside	N		NA		Drop	73,400	734,000	Alternate to C-023 to S Ferrous Stockpile or Barge 2 to Barge. Emissions from 100% of material throughput assigned to Barge 2 to Barge.								
													Totals Ferrous Plant Material Handling PM Emissions		0.30	2.93		0.13	1.25		0.02	0.23
													Totals Ferrous Plant Material Handling HAP Metal Emissions	0.49% [h]	0.0000	0.0143	Ratio of HAP metal to total PM from June 2018 emission test of existing roll media filter at GII.					

a1 Controlled particulate matter emission factors from AP-42, Table 11.19.2-2 for conveying used based on conservative assumption that moisture content is greater than 1.5% due to water added in the shredder.

a2 Material moisture was assumed to be the mean of material moisture contents identified in AP42, Table 13.2.4-1.

a3 Northern Metals (Minneapolis, MN) found moisture content of ASR in the range of 20 to 30%; from MPCA Construction Permit Technical Support Document for Northern Metals in Becker MN, Stream COMG-2. Calculations for the ASR stacking conveyor drop point conservatively assumes 10% moistur

a4 Moisture content of raw materials is assumed to be >1.5% based on application of water from water atomization cannons used for fugitive dust control.

b Uncontrolled emission factor calculated according to material drop equation in AP-42, Section 13.2.4.3. Emissions calculated with control Eff. factor included for source being inside of a building.

c Uncontrolled emission factor calculated according to material drop equation in AP-42, Section 13.2.4.3.

d Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for conveying. If moisture content is greater than 1.5% by weight, controlled emission factors are used.

e Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for screening. If moisture content is greater than 1.5% by weight, controlled emission factors are used.

f Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for truck loading of curshed stone. Use uncontrolled emisson factor to be conservative.

g Particulate matter emission factors from AP-42, Table 11.19.2-2 for conveying. For sources controlled by a dust collector the emission factor is multiplied by the identified capture Eff. and then by the quantity of 1-control Eff.. Dust collectors vent back into to the building. These emission

h Modeled total metal HAPs emission rate expressed as as percent of estimated PM from Ferrous material handling.

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Table 3-2 - Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput
300,000 tpm
Annual Throughput
1,800,000 tpy

A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	R	S	T	V	W	X	Y	AA
Row	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source			PM Emissions			PM10 Emissions			PM2.5 Emissions		
#	ID #	Description		Y / N							tpm	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy

Material Drop PM Equations (AP-42, Section 13.2.4.3)

$$E = k\,(0.0032) \times \frac{(U/5)^{1.3}}{(M/2)^{1.4}}$$

E = emission factor (lb/ton of material dropped)
k = particle size multiplier (dimensionless)
U = mean wind speed
https://www.timeanddate.com/weather/usa/chicago/climate
M = material moisture content (%)

U =	9.0	mph - annual average wind speed for Chicago (Midway Airport)
k =	0.74	PM - AP-42, Section 13.2.4, for particle size < 30 um
	0.35	PM - AP-42, Section 13.2.4, for particle size < 10 um
	0.053	PM - AP-42, Section 13.2.4, for particle size < 2.5 um
M =	1.5	Moisture content for use of controlled emission factors for crushed stone processing - Conveyor Transfer Points - AP-42, Table 11.19.2-2.
		The material moisture content for stockpile drop emission calculations varies by material - see Column E above.

Summary of Ferrous Material Processing System Emission Points and Emissions by Emission Factor Type

# of Pts	Ferrous Material Processing System Emission Points	Process Rate		PM Emissions			PM10 Emissions			PM2.5 Emissions		
		tpm	tpy	Factor lb/ton	tpm	tpy	Factor lb/ton	tpm	tpy	Factor lb/ton	tpm	tpy
59	Conveyor Transfer Points	1,444,050	14,440,500	0.000014	0.10	0.96	0.000046	0.03	0.31	0.000013	0.01	0.09
3	Truck/Barge Loadout	137,600	1,376,000	0.000204	0.01	0.14	0.0001	0.01	0.07	0.000015	0.00	0.01
7	Stockpile Drops	300,000	3,000,000	Varies	0.18	1.83	Varies	0.09	0.87	Varies	0.01	0.13
			Total Emissions		0.30	2.93		0.13	1.25		0.02	0.23

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Throput 25,886 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.90%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	98.00%

Row	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates		PM Emissions				PM10 Emissions			PM2.5 Emissions		
#	ID #	Description		Y / N								ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
1	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	92.1	921	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
2	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	92.1	921	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
3	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	368.6	3,686	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
4	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	368.6	3,686	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
5	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
6	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
7	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
8	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	0.000050	Note f	Note f
9	E-19	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	2,152.5	21,525	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
10	E-19	Induction Sorter	Wire Fuzz	N	Inside		Y	Dust Collector	100%	DC Eff.	A	552.9	5,529	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
11	E-20	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	368.6	3,686	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
12	E-20	Induction Sorter	Wire	N	Inside		Y	Dust Collector	100%	DC Eff.	A	184.3	1,843	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
13	E-25	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	2,152.5	21,525	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
14	E-25	Induction Sorter	Wire Fuzz	N	Inside		Y	Dust Collector	100%	DC Eff.	A	552.9	5,529	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
15	E-26	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	368.6	3,686	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
16	E-26	Induction Sorter	Wire	N	Inside		Y	Dust Collector	100%	DC Eff.	A	184.3	1,843	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
17	E-30	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	2,395.7	23,957	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
18	E-30	Induction Sorter	Zuric	N	Inside		Y	Dust Collector	100%	DC Eff.	A	239.6	2,396	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
19	E-31	Induction Sorter	Zuric	N	Inside		Y	Dust Collector	100%	DC Eff.	A	239.6	2,396	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
20	E-37	Induction Sorter	Zone	N	Inside		Y	Dust Collector	100%	DC Eff.	A	552.9	5,529	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
21	E-37	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	1,308.4	13,084	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
22	E-39	Induction Sorter	Drops Zuric Recov Feeder	N	Inside		Y	Dust Collector	100%	DC Eff.	A	110.6	1,106	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
23	E-39	Induction Sorter	Zone	N	Inside		Y	Dust Collector	100%	DC Eff.	A	442.3	4,423	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
24	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	81.1	811	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
25	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	81.1	811	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
26	Material Separator	Drop to container	Residue	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	11.1	111	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
27	Material Separator	Drop to container	Residue	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	11.1	111	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Throughput 25,000 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.90%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	98.00%

Row #	Equipment Generating Emissions: ID #	Equipment Generating Emissions: Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates: tons/mo	Material Throughput Rates: tpy	PM Emissions: lb/ton	PM Emissions: lb/hr	PM Emissions: tons/mo	PM Emissions: tpy	PM10 Emissions: lb/ton	PM10 Emissions: tons/mo	PM10 Emissions: tpy	PM2.5 Emissions: lb/ton	PM2.5 Emissions: tons/mo	PM2.5 Emissions: tpy
28	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	346.5	3,465	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
29	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	346.5	3,465	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
30	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	22.1	221	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
31	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	22.1	221	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
32	Shaker Fines		Zorba	N	Inside		Y	Dust Collector	100%	DC Eff.	A	70.0	700	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
33	Shaker Mids		Zorba	N	Inside		Y	Dust Collector	100%	DC Eff.	A	44.2	442	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
34	Shaker Mids		Zorba	N	Inside		Y	Dust Collector	100%	DC Eff.	A	44.2	442	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
35	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	7.4	74	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
36	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	7.4	74	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
37	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	36.9	369	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
38	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	36.9	369	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
39	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	18.4	184	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
40	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
41	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
42	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
43	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
44	Material Separator	Drop to container	Zorba	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	51.6	516	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
45	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	3.1	31	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
46	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	3.1	31	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
47	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	3.1	31	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	0.000013	Note f	Note f
48	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	3.1	31	0.000140	Note f	Note f	Note f.	0.000046 [illegible]	Note f	Note f	0.000013 [illegible]	Note f	Note f
49	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	516.0	5,160	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f
50	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	516.0	5,160	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f
51	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f
52	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f
53	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f
54	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput 25,800 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.00%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	98.00%

Row #	Equipment Generating Emissions: ID #	Equipment Generating Emissions: Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates: ton/mo	Material Throughput Rates: tpy	PM Emissions: lb/ton	PM Emissions: lb/hr	PM Emissions: ton/mo	PM Emissions: tpy	PM10 Emissions: lb/ton	PM10 Emissions: ton/mo	PM10 Emissions: tpy	PM2.5 Emissions: lb/ton	PM2.5 Emissions: ton/mo	PM2.5 Emissions: tpy
55	Shaker	Drop to container	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	36.9	369	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
56	Shaker	Drop to container	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	36.9	369	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
57	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	154.8	1,548	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
58	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	154.8	1,548	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
59	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	154.8	1,548	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
60	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	154.8	1,548	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
61	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	77.4	774	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
62	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	77.4	774	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
63	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	77.4	774	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
64	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	77.4	774	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
65	C-031	Conveyor	Wire	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	368.6	3,686	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
66	C-025	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	2,635.3	26,353	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
67	C-026	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	1,861.3	18,613	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
68	C-027	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	2,705.3	27,053	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
69	C-028	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	2,705.3	27,053	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
70	C-032	Conveyor	Zorac	N	Inside		N	Dust Collector	100%	DC Eff.	A	552.9	5,529	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
71	C-053	Conveyor	Wire	N	Inside		N	Dust Collector	100%	DC Eff.	A	368.6	3,686	0.003000 *	Note f	Note f	Note f.	0.001100 *	Note f	Note f	0.000167 *	Note f	Note f
72	C-069	Conveyor	Lights Zorac	N	Inside		N	Dust Collector	100%	DC Eff.	A	129.0	1,290	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
73	E-18	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	2,705.3	27,053	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
74	E-24	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	2,705.3	27,053	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
75	E-29	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	2,635.3	26,353	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
76	E-36	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,861.3	18,613	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
77	E-38	Vibratory Feeder	Zorac	N	Inside		N	Dust Collector	100%	DC Eff.	A	552.9	5,529	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
78	E-51	Separator	Heavies Zorac	N	Inside		N	Dust Collector	100%	DC Eff.	B	110.6	1,106	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f
79	E-51	Separator	Lights Zorac	N	Inside		N	Dust Collector	100%	DC Eff.	B	129.0	1,290	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	0.001317	Note f	Note f
80	ECS	Eddy Current Separator	Residue/Drops	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,231.0	12,310	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
81	ECS	Eddy Current Separator	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	147.4	1,474	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput 25,845 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.90%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	98.00%

Row #	Equipment Generating Emissions ID #	Equipment Generating Emissions Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates ton/mo	Material Throughput Rates tpy	PM Emissions lb/ton	PM Emissions lb/hr	PM Emissions ton/mo	PM Emissions tpy	PM10 Emissions lb/ton	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
82	Elevator	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	162.2	1,622	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
83	Elevator	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,297.4	12,974	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
84	FC-01	Conveyor	Zorba	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	184.3	1,843	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
85	FC-02	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	1,032.0	10,320	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
86	FC-03	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	692.9	6,929	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
87	FC-04	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	162.2	1,622	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
88	FC-05	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	692.9	6,929	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
89	FC-06	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,297.4	12,974	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
90	FC-07	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	1,548.0	15,480	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
91	FC-08	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,548.0	15,480	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
92	FC-09	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	619.2	6,192	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
93	FC-10	Conveyor drop to stockpile	Residue	1.5% *	Inside		N	Dust Collector	100%	DC Eff.	Drop	154.8	1,548	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
94	FC-11	Conveyor drop to stockpile	Residue	1.5% *	Inside		N	Dust Collector	100%	DC Eff.	Drop	154.8	1,548	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
95	FC-12	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	6.2	62	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
96	FC-13	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	6.2	62	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
97	FC-14	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	12.4	124	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
98	FC-15	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	12.4	124	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
99	FC-16	Conveyor drop to container	Product	1.5% *	Inside		N	Dust Collector	100%	DC Eff.	Drop	12.4	124	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
100	FC-17	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	604.5	6,045	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
101	FC-18	Conveyor transfer to shaker	Residue/ Drops	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,231.0	12,310	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
102	FC-20	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,231.0	12,310	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
103	FC-21	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	840.3	8,403	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
104	FC-22	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	420.2	4,202	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
105	FC-23	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	420.2	4,202	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
106	Feeder	Discharge to conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	3,350.3	33,503	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
107	Feeder	Transfer to Eddy Current Separator	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	162.2	1,622	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
108	Feeder	Transfer to Eddy Current Separator	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,297.4	12,974	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Throput 25,800 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	
Annual Throughput 258,000 tpy	DC PM Control Eff	99.00%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	99.00%	

Row #	Equipment Generating Emissions ID #	Equipment Generating Emissions Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates ton/mo	Material Throughput Rates tpy	PM Emissions lb/ton	PM Emissions lb/hr	PM Emissions ton/mo	PM Emissions tpy	PM10 Emissions lb/ton	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
109	Shaker Fines	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1,083.6	10,836	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
110	Shaker Overs	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	147.4	1,474	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	0.000167	Note f	Note f
111	Shaker Overs	Drop to container	Zorba	1.5% *	Inside		N	Dust Collector	100%	DC Eff.	Drop	25.8	258	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	0.00050	Note f	Note f
112	Total Emissions for Sources Inside Building														0.5143	0.1444	1.4441		0.1444	1.4441		0.1444	1.4441
113	C-001	Conveyor	Residue	Y	Outside	Y	N	NA			A	25,800.0	258,000	0.000140 *	0.0098	0.0018	0.0181	0.000046 *	0.0006	0.0059	0.000013 *	0.0002	0.0017
114	C-002	Conveyor	Residue	N	Outside	Y	N	NA			A	25,026.0	250,260	0.003000 *	0.2037	0.0375	0.3754	0.001100 *	0.0138	0.1376	0.000167 *	0.0021	0.0208
115	C-002	Conveyor	Ferrous	N	Outside	Y	N	NA			A	774.0	7,740	0.003000 *	0.0063	0.0012	0.0116	0.001100 *	0.0004	0.0043	0.000167 *	0.0001	0.0006
116	C-003	Conveyor	Residue	N	Outside	Y	N	NA			A	25,026.0	250,260	0.003000 *	0.2037	0.0375	0.3754	0.001100 *	0.0138	0.1376	0.000167 *	0.0021	0.0208
117	C-004	Conveyor	Residue	N	Outside	Y	N	NA			A	22,446.0	224,460	0.003000 *	0.1827	0.0337	0.3367	0.001100 *	0.0123	0.1235	0.000167 *	0.0019	0.0187
118	C-005	Conveyor	Residue	N	Outside	Y	N	NA			A	11,223.0	112,230	0.003000 *	0.0914	0.0168	0.1683	0.001100 *	0.0062	0.0617	0.000167 *	0.0009	0.0093
119	C-006	Conveyor	Residue	N	Outside		N	NA			A	11,223.0	112,230	0.003000 *	0.0914	0.0168	0.1683	0.001100 *	0.0062	0.0617	0.000167 *	0.0009	0.0093
120	C-007	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	5,805.0	58,050	0.003000 *	0.0095	0.0017	0.0174	0.001100 *	0.0006	0.0064	0.000167 *	0.0001	0.0010
121	C-008	Conveyor	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	5,805.0	58,050	0.003000 *	0.0095	0.0017	0.0174	0.001100 *	0.0006	0.0064	0.000167 *	0.0001	0.0010
122	C-009	Conveyor	Residue	N	Outside		N	NA			A	3,368.7	33,687	0.003000 *	0.0274	0.0051	0.0505	0.001100 *	0.0019	0.0185	0.000167 *	0.0003	0.0028
123	C-010	Conveyor	Residue	N	Outside		N	NA			A	3,368.7	33,687	0.003000 *	0.0274	0.0051	0.0505	0.001100 *	0.0019	0.0185	0.000167 *	0.0003	0.0028
124	C-011	Conveyor	Residue	N	Outside	Y	N	NA			A	3,096.0	30,960	0.003000 *	0.0252	0.0046	0.0464	0.001100 *	0.0017	0.0170	0.000167 *	0.0003	0.0026
125	C-012	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	3,368.7	33,687	0.003000 *	0.0055	0.0010	0.0101	0.001100 *	0.0004	0.0037	0.000167 *	0.0001	0.0006
126	C-013	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	3,368.7	33,687	0.003000 *	0.0055	0.0010	0.0101	0.001100 *	0.0004	0.0037	0.000167 *	0.0001	0.0006
127	C-014	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	3,096.0	30,960	0.003000 *	0.0050	0.0009	0.0093	0.001100 *	0.0003	0.0034	0.000167 *	0.0001	0.0005
128	C-015	Conveyor	Ferrous	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	92.1	921	0.003000 *	0.0002	0.0000	0.0003	0.001100 *	0.0000	0.0001	0.000167 *	0.0000	0.0000
129	C-016	Conveyor	Residue	N	Outside	Y	N	NA			A	995.1	9,951	0.003000 *	0.0081	0.0015	0.0148	0.001100 *	0.0005	0.0055	0.000167 *	0.0001	0.0008
130	C-017	Conveyor	Ferrous	N	Outside		N	NA			A	645.0	6,450	0.003000 *	0.0053	0.0010	0.0097	0.001100 *	0.0004	0.0035	0.000167 *	0.0001	0.0005
131	C-018	Conveyor	Ferrous	N	Outside	Y	N	NA			A	645.0	6,450	0.003000 *	0.0053	0.0010	0.0097	0.001100 *	0.0004	0.0035	0.000167 *	0.0001	0.0005
132	C-019	Conveyor	Lights	N	Outside	Y	N	NA			A	92.1	921	0.003000 *	0.0008	0.0001	0.0014	0.001100 *	0.0001	0.0005	0.000167 *	0.0000	0.0001
133	C-020	Conveyor	Residue	N	Outside	Y	N	NA			A	4,098.5	40,985	0.003000 *	0.0334	0.0061	0.0615	0.001100 *	0.0023	0.0225	0.000167 *	0.0003	0.0034
134	C-021	Conveyor	Residue	N	Outside	Y	N	NA			A	4,098.5	40,985	0.003000 *	0.0334	0.0061	0.0615	0.001100 *	0.0023	0.0225	0.000167 *	0.0003	0.0034
135	C-022	Conveyor to Wind Sifter	Mixed Non-Ferrous	N	Outside	Y	Y	Wind Sifter	100%	100%	A	294.9	2,949	0.003000 *	0.0024	0.0004	0.0000	0.001100 *	0.0002	0.0000	0.000167 *	0.0000	0.0000

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput 25,800 tpm/mo	ECS Enc. PM Control Eff	99.00%	ECS Enc. PM Control Eff	99.00%	ECS Enc. PM Control Eff	99.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.90%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	99.00%

Row #	Equipment Generating Emissions: ID #	Equipment Generating Emissions: Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates: ton/mo	Material Throughput Rates: tpy	PM Emissions: lb/ton	PM Emissions: lb/hr	PM Emissions: ton/mo	PM Emissions: tpy	PM10 Emissions: lb/ton	PM10 Emissions: ton/mo	PM10 Emissions: tpy	PM2.5 Emissions: lb/ton	PM2.5 Emissions: ton/mo	PM2.5 Emissions: tpy
136	C-023	Conveyor to Wind Sifter	Residue	N	Outside	Y	Y	Wind Sifter	100%	100%	A	2,686.9	26,869	0.000140 [a]	0.0010	0.0002	0.0000	0.000046 [a]	0.0001	0.0000	0.000013 [a]	0.0000	0.0000
137	C-024	Conveyor to Wind Sifter	Residue	N	Outside	Y	Y	Wind Sifter	100%	100%	A	2,686.9	26,869	0.000140 [a]	0.0010	0.0002	0.0000	0.000046 [a]	0.0001	0.0000	0.000013 [a]	0.0000	0.0000
138	C-034	Conveyor	Material Separator	N	Outside	Y	N	NA			A	202.7	2,027	0.003000 [a]	0.0017	0.0003	0.0030	0.001100 [a]	0.0001	0.0011	0.000167 [a]	0.0000	0.0002
139	C-035	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	995.1	9,951	0.003000 [a]	0.0016	0.0003	0.0030	0.001100 [a]	0.0003	0.0011	0.000167 [a]	0.0000	0.0002
140	C-039	Conveyor	Mixed Non-Ferrous	N	Outside		N	NA			A	294.9	2,949	0.003000 [a]	0.0024	0.0004	0.0044	0.001100 [a]	0.0002	0.0016	0.000167 [a]	0.0000	0.0002
141	C-040	Conveyor	Residue	N	Outside		N	NA			A	1,032.0	10,320	0.003000 [a]	0.0084	0.0015	0.0155	0.001100 [a]	0.0006	0.0057	0.000167 [a]	0.0001	0.0009
142	C-040	Conveyor	Mids	N	Outside		N	NA			A	2,580.0	25,800	0.003000 [a]	0.0210	0.0039	0.0387	0.001100 [a]	0.0014	0.0142	0.000167 [a]	0.0002	0.0021
143	C-040	Conveyor	Residue	N	Outside		N	NA			A	1,548.0	15,480	0.003000 [a]	0.0126	0.0023	0.0232	0.001100 [a]	0.0009	0.0085	0.000167 [a]	0.0001	0.0013
144	C-041	Conveyor	Zorba	N	Outside		N	NA			A	184.3	1,843	0.003000 [a]	0.0015	0.0003	0.0028	0.001100 [a]	0.0001	0.0010	0.000167 [a]	0.0000	0.0002
145	C-042	Conveyor	Zorba	N	Outside		N	NA			A	552.9	5,529	0.003000 [a]	0.0045	0.0008	0.0083	0.001100 [a]	0.0003	0.0030	0.000167 [a]	0.0000	0.0008
146	C-043	Conveyor	Zorba	N	Outside		N	NA			A	1,105.7	11,057	0.003000 [a]	0.0090	0.0017	0.0166	0.001100 [a]	0.0006	0.0061	0.000167 [a]	0.0001	0.0009
147	C-044	Conveyor	Residue	N	Outside	Y	N	NA			A	9,166.4	91,664	0.003000 [a]	0.0746	0.0137	0.1375	0.001100 [a]	0.0050	0.0504	0.000167 [a]	0.0008	0.0076
148	C-044	Conveyor	Lights Zoric	N	Outside	Y	N	NA			A	110.6	1,106	0.003000 [a]	0.0009	0.0002	0.0017	0.001100 [a]	0.0001	0.0006	0.000167 [a]	0.0000	0.0001
149	C-045	Conveyor	Residue	N	Outside	Y	N	NA			A	9,166.4	91,664	0.003000 [a]	0.0746	0.0137	0.1375	0.001100 [a]	0.0050	0.0504	0.000167 [a]	0.0008	0.0076
150	C-047	Conveyor	To SSI	N	Outside		N	NA			A	202.7	2,027	0.003000 [a]	0.0017	0.0003	0.0030	0.001100 [a]	0.0001	0.0011	0.000167 [a]	0.0000	0.0002
151	C-048	Conveyor	Out of SSI	N	Outside		N	NA			A	202.7	2,027	0.003000 [a]	0.0017	0.0003	0.0030	0.001100 [a]	0.0001	0.0011	0.000167 [a]	0.0000	0.0002
152	C-050	Conveyor	Residue	N	Outside	Y	N	NA			A	9,240.1	92,401	0.003000 [a]	0.0752	0.0139	0.1386	0.001100 [a]	0.0051	0.0508	0.000167 [a]	0.0008	0.0077
153	C-052	Conveyor	Residue	N	Outside		N	NA			A	828.3	8,283	0.003000 [a]	0.0068	0.0012	0.0124	0.001100 [a]	0.0005	0.0046	0.000167 [a]	0.0001	0.0007
154	C-055	Conveyor	Wire	N	Outside	Y	N	NA			A	368.6	3,686	0.003000 [a]	0.0030	0.0006	0.0055	0.001100 [a]	0.0002	0.0020	0.000167 [a]	0.0000	0.0003
155	C-058	Conveyor	Zoric drops	N	Outside	Y	N	NA			A	110.6	1,106	0.003000 [a]	0.0009	0.0002	0.0017	0.001100 [a]	0.0001	0.0006	0.000167 [a]	0.0000	0.0001
156	C-060	Conveyor	Zorba	N	Outside	Y	N	NA			A	442.3	4,423	0.003000 [a]	0.0036	0.0007	0.0066	0.001100 [a]	0.0002	0.0024	0.000167 [a]	0.0000	0.0004
157	C-061	Conveyor drop to stockpile	Heavies Zoric	1.5% [c]	Outside		N	NA			Drop	353.8	3,538	0.00761 [c]	0.0073	0.0013	0.0133	0.00360 [c]	0.0006	0.0064	0.00054 [c]	0.0001	0.0010
158	C-061	Conveyor drop to stockpile	Heavies Zoric	1.5% [c]	Outside		N	NA			Drop	110.6	1,106	0.00761 [c]	0.0023	0.0004	0.0042	0.00360 [c]	0.0002	0.0020	0.00054 [c]	0.0000	0.0003
159	C-062	Conveyor	Heavier Zorba	N	Outside		N	NA			A	460.7	4,607	0.003000 [a]	0.0038	0.0007	0.0069	0.001100 [a]	0.0003	0.0025	0.000167 [a]	0.0000	0.0004
160	C-063	Conveyor drop to stockpile	Zorba	1.5% [c]	Outside		N	NA			Drop	995.1	9,951	0.00761 [c]	0.0205	0.0038	0.0378	0.00360 [c]	0.0018	0.0179	0.00054 [c]	0.0003	0.0027
161	C-063	Conveyor drop to stockpile	Heavies Zorba	1.5% [c]	Outside		N	NA			Drop	313.3	3,133	0.00761 [c]	0.0065	0.0012	0.0119	0.00360 [c]	0.0006	0.0056	0.00054 [c]	0.0001	0.0009
162	C-064	Conveyor drop to container	Zorba	1.5% [c]	Outside		N	NA			Drop	258.0	2,580	0.00761 [c]	0.0053	0.0010	0.0098	0.00360 [c]	0.0005	0.0046	0.00054 [c]	0.0001	0.0007

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput 25,800 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.90%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	98.00%

Row #	Equipment Generating Emissions ID #	Equipment Generating Emissions Description	Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates ton/mo	Material Throughput Rates tpy	PM Emissions lb/ton	PM Emissions lb/hr	PM Emissions ton/mo	PM Emissions tpy	PM10 Emissions lb/ton	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
163	C-065	Conveyor	Residue	N	Outside	Y	N	NA			A	810.9	8,109	0.003000 [a]	0.0066	0.0012	0.0122	0.001100 [d]	0.0004	0.0045	0.000167 [d]	0.0001	0.0007
164	C-066	Conveyor	Residue	N	Outside	Y	N	NA			A	20,046.6	200,466	0.003000 [a]	0.1632	0.0301	0.3007	0.001100 [d]	0.0110	0.1103	0.000167 [d]	0.0017	0.0167
165	C-067	Conveyor	Residue	N	Outside	Y	N	NA			A	20,046.6	200,466	0.003000 [a]	0.1632	0.0301	0.3007	0.001100 [d]	0.0110	0.1103	0.000167 [d]	0.0017	0.0167
166	C-068	Conveyor drop to stockpile	Residue	1.5% [c]	Outside	Y	N	NA			Drop	20,046.6	200,466	0.00761 [c]	0.4137	0.0762	0.7624	0.00360 [c]	0.0361	0.3606	0.00054 [c]	0.0055	0.0546
167	C-070	Conveyor drop to stockpile	Waste to Stockpile	1.5% [c]	Outside		N	NA			Drop	202.7	2,027	0.00761 [c]	0.0042	0.0008	0.0077	0.00360 [c]	0.0004	0.0036	0.00054 [c]	0.0001	0.0006
168	C-071	Conveyor	Lights	N	Outside	Y	Y	Cover			A	11.1	111	0.000140 [c]	0.0000	0.0000	0.0000	0.000046 [c]	0.0000	0.0000	0.000013 [c]	0.0000	0.0000
169	C-072	Conveyor	Lights	N	Outside	Y	Y	Cover			A	11.1	111	0.000140 [c]	0.0000	0.0000	0.0000	0.000046 [c]	0.0000	0.0000	0.000013 [c]	0.0000	0.0000
170	DC-01 Cyc	DC-01 fines discharge to covered conveyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [c]	0.0000	0.0000	0.0000	0.000046 [c]	0.0000	0.0000	0.000013 [c]	0.0000	0.0000
171	DC-02 Cyc	DC-02 fines discharge to covered conveyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [c]	0.0000	0.0000	0.0000	0.000046 [c]	0.0000	0.0000	0.000013 [c]	0.0000	0.0000
172	DC-03 Cyc	DC-03 fines discharge to covered conveyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [c]	0.0000	0.0000	0.0000	0.000046 [c]	0.0000	0.0000	0.000013 [c]	0.0000	0.0000
173	DC-04 Cyc	DC-04 fines discharge to covered conveyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [c]	0.0000	0.0000	0.0000	0.000046 [c]	0.0000	0.0000	0.000013 [c]	0.0000	0.0000
174	E-01	Vibratory Batch Feeder	Residue	Y	Outside		N	NA			A	25,800.0	258,000	0.000140 [c]	0.0098	0.0018	0.0181	0.000046 [c]	0.0006	0.0059	0.000013 [c]	0.0002	0.0017
175	E-03	Screener	Residue	Y	Outside		N	NA			B	22,446.0	224,460	0.002200 [e]	0.1340	0.0247	0.2469	0.000740 [e]	0.0083	0.0831	0.000050 [e]	0.0006	0.0056
176	E-03	Screener	Residue	Y	Outside		N	NA			B	2,506.3	25,063	0.002200 [e]	0.0150	0.0028	0.0276	0.000740 [e]	0.0009	0.0093	0.000050 [e]	0.0001	0.0006
177	E-03	Screener	Residue	Y	Outside		N	NA			B	995.1	9,951	0.002200 [e]	0.0059	0.0011	0.0109	0.000740 [e]	0.0004	0.0037	0.000050 [e]	0.0000	0.0002
178	E-04	Screener	Residue	Y	Outside		N	NA			B	5,805.0	58,050	0.002200 [e]	0.0347	0.0064	0.0639	0.000740 [e]	0.0021	0.0215	0.000050 [e]	0.0001	0.0015
179	E-04	Screener	Residue	Y	Outside		N	NA			B	3,368.7	33,687	0.002200 [e]	0.0201	0.0037	0.0371	0.000740 [e]	0.0012	0.0125	0.000050 [e]	0.0001	0.0008
180	E-04	Screener	Residue	Y	Outside		N	NA			B	1,548.0	15,480	0.002200 [e]	0.0092	0.0017	0.0170	0.000740 [e]	0.0006	0.0057	0.000050 [e]	0.0000	0.0004
181	E-05	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	5,480.7	54,807	0.003000	0.0183	0.0016	0.0164	0.001100	0.0006	0.0060	0.000167	0.0001	0.0009
182	E-05	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,637.8	36,378	0.003000	0.0059	0.0011	0.0109	0.001100	0.0004	0.0040	0.000167	0.0001	0.0006
183	E-05	Magnetic Separation	Ferrous	N	Inside		N	NA			A	324.3	3,243	0.003000	0.0026	0.0005	0.0049	0.001100	0.0002	0.0018	0.000167	0.0000	0.0003
184	E-05	Magnetic Separation	Ferrous	N	Inside		N	NA			A	1,842.9	18,429	0.003000	0.0150	0.0028	0.0276	0.001100	0.0010	0.0101	0.000167	0.0002	0.0015
185	E-06	Eddy Current Separator	Residue	N	Outside		N	NA			A	2,255.7	22,557	0.003000 [d]	0.0184	0.0034	0.0338	0.001100 [d]	0.0012	0.0124	0.000167 [d]	0.0002	0.0019
186	E-06	Eddy Current Separator	Meds	N	Outside		N	NA			A	1,290.0	12,900	0.003000 [d]	0.0105	0.0019	0.0194	0.001100 [d]	0.0007	0.0071	0.000167 [d]	0.0001	0.0011
187	E-06	Eddy Current Separator	Zorba	N	Outside		N	NA			A	92.1	921	0.003000 [d]	0.0008	0.0001	0.0014	0.001100 [d]	0.0001	0.0005	0.000167 [d]	0.0000	0.0001
188	E-07	Wind Sifter	Lights	N	Outside		Y	Cover			B	92.1	921	0.002200 [d]	0.0006	0.0001	0.0010	0.000740 [d]	0.0000	0.0003	0.000050 [d]	0.0000	0.0000
189	E-07	Wind Sifter	Heavies	1.5% [c]	Outside		Y	Wind Sifter	90%	100%	Drop	552.9	5,529	0.00761 [c]	0.0103	0.0021	0.0000	0.00360 [c]	0.0019	0.0000	0.00054 [c]	0.0002	0.0000

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput	25,800 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput	258,000 tpy	DC PM Control Eff	99.00%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	99.00%

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AA
Row #	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates		PM Emissions				PM10 Emissions			PM2.5 Emissions		
	ID #	Description		Y / N								ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
190	E-11	Screener	Residue	N	Outside		N	NA			B	5,805.0	58,050	0.025000 [d]	0.3938	0.0716	0.7256	0.008700 [d]	0.0253	0.2525	0.001317 [d]	0.0038	0.0382
191	E-11	Screener	Residue	N	Outside		N	NA			B	3,368.7	33,687	0.025000 [d]	0.2285	0.0421	0.4211	0.008700 [d]	0.0147	0.1465	0.001317 [d]	0.0022	0.0222
192	E-11	Screener	Residue	N	Outside		N	NA			B	1,548.0	15,480	0.025000 [d]	0.1050	0.0194	0.1935	0.008700 [d]	0.0067	0.0673	0.001317 [d]	0.0010	0.0102
193	E-12	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,480.7	34,807	0.003000	0.0083	0.0016	0.0164	0.001100	0.0006	0.0060	0.000167	0.0001	0.0009
194	E-12	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,637.8	36,378	0.003000	0.0059	0.0011	0.0109	0.001100	0.0004	0.0040	0.000167	0.0001	0.0006
195	E-12	Magnetic Separation	Ferrous	N	Inside		N	NA			A	324.3	3,243	0.003000	0.0026	0.0005	0.0049	0.001100	0.0002	0.0018	0.000167	0.0000	0.0003
196	E-12	Magnetic Separation	Ferrous	N	Inside		N	NA			A	1,842.9	18,429	0.003000	0.0130	0.0028	0.0276	0.001100	0.0010	0.0101	0.000167	0.0002	0.0015
197	E-12	Magnetic Separation	Zorba	N	Outside		N	NA			A	92.1	921	0.003000 [d]	0.0008	0.0001	0.0014	0.001100 [d]	0.0001	0.0005	0.000167 [d]	0.0000	0.0001
198	E-13	Eddy Current Separator	Residue	N	Outside		N	NA			A	2,255.7	22,557	0.003000 [d]	0.0184	0.0034	0.0338	0.001100 [d]	0.0012	0.0124	0.000167 [d]	0.0002	0.0019
199	E-13	Eddy Current Separator	Mids	N	Outside		N	NA			A	1,290.0	12,900	0.003000 [d]	0.0105	0.0019	0.0194	0.001100 [d]	0.0007	0.0071	0.000167 [d]	0.0001	0.0011
200	E-14	Wind Sifter	Lights	N	Outside		Y	Cover			B	73.7	737	0.002200 [d]	0.0004	0.0001	0.0008	0.000740 [d]	0.0000	0.0003	0.000050 [d]	0.0000	0.0000
201	E-14	Wind Sifter	Heavies	1.5% [a]	Outside		Y	Wind Sifter	100%	100%	Drop	221.1	2,211	0.00761 [c]	0.0046	0.0008	0.0000	0.00360 [c]	0.0004	0.0000	0.00054 [c]	0.0001	0.0000
202	E-15	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,350.3	33,503	0.003000	0.0055	0.0010	0.0101	0.001100	0.0004	0.0037	0.000167	0.0001	0.0006
203	E-15	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,055.5	30,555	0.003000	0.0050	0.0009	0.0092	0.001100	0.0003	0.0034	0.000167	0.0001	0.0005
204	E-15	Magnetic Separation	Ferrous	N	Outside		N	NA			A	18.4	184	0.003000 [d]	0.0001	0.0000	0.0003	0.001100 [d]	0.0000	0.0001	0.000167 [d]	0.0000	0.0000
205	E-15	Magnetic Separation	Mixed Non-Ferrous	N	Outside		N	NA			A	147.4	1,474	0.003000 [d]	0.0012	0.0002	0.0022	0.001100 [d]	0.0001	0.0008	0.000167 [d]	0.0000	0.0001
206	E-16	Eddy Current Separator	Residue	N	Outside		N	NA			A	2,686.9	26,869	0.003000 [d]	0.0219	0.0040	0.0403	0.001100 [d]	0.0015	0.0148	0.000167 [d]	0.0002	0.0022
207	E-16	Eddy Current Separator	Zorba	N	Outside		N	NA			A	368.6	3,686	0.003000 [d]	0.0030	0.0006	0.0055	0.001100 [d]	0.0002	0.0020	0.000167 [d]	0.0000	0.0003
208	E-17	Wind Sifter	Lights	N	Outside		Y	Cover			B	401.7	4,017	0.002200 [d]	0.0024	0.0004	0.0044	0.000740 [d]	0.0001	0.0015	0.000050 [d]	0.0000	0.0001
209	E-17	Wind Sifter	Residue	N	Outside		Y	Wind Sifter	100%	100%	B	2,285.1	22,851	0.002200 [d]	0.0136	0.0025	0.0000	0.000740 [d]	0.0008	0.0000	0.000050 [d]	0.0001	0.0000
210	E-21	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,055.5	30,555	0.003000	0.0050	0.0009	0.0092	0.001100	0.0003	0.0034	0.000167	0.0001	0.0005
211	E-21	Magnetic Separation	Ferrous	N	Outside		N	NA			A	18.4	184	0.003000 [d]	0.0001	0.0000	0.0003	0.001100 [d]	0.0000	0.0001	0.000167 [d]	0.0000	0.0000
212	E-21	Magnetic Separation	Mixed Non-Ferrous	N	Outside		N	NA			A	147.4	1,474	0.003000 [d]	0.0012	0.0002	0.0022	0.001100 [d]	0.0001	0.0008	0.000167 [d]	0.0000	0.0001
213	E-22	Eddy Current Separator	Zorba	N	Outside		N	NA			A	368.6	3,686	0.003000 [d]	0.0030	0.0006	0.0055	0.001100 [d]	0.0002	0.0020	0.000167 [d]	0.0000	0.0003
214	E-22	Eddy Current Separator	Residue	N	Outside		N	NA			A	2,686.9	26,869	0.003000 [d]	0.0219	0.0040	0.0403	0.001100 [d]	0.0015	0.0148	0.000167 [d]	0.0002	0.0022
215	E-23	Wind Sifter	Lights	N	Outside		Y	Cover			B	401.7	4,017	0.002200 [d]	0.0024	0.0004	0.0044	0.000740 [d]	0.0001	0.0015	0.000050 [d]	0.0000	0.0001
216	E-23	Wind Sifter	Residue	N	Outside		Y	Wind Sifter	100%	100%	B	2,285.1	22,851	0.002200 [d]	0.0136	0.0025	0.0000	0.000740 [d]	0.0008	0.0000	0.000050 [d]	0.0001	0.0000

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput 25,800 ton/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.00%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	99.00%

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AA
Row #	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5% Y / N	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates		PM Emissions				PM10 Emissions			PM2.5 Emissions		
	ID #	Description										ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
217	E-27	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,003.9	30,039	0.003000	0.0049	0.0009	0.0090	0.001100	0.0003	0.0033	0.000167	0.0001	0.0005
218	E-27	Magnetic Separation	Ferrous	N	Outside		N	NA			A	92.1	921	0.003000 [d]	0.0008	0.0001	0.0014	0.001100 [d]	0.0001	0.0005	0.000167 [d]	0.0000	0.0001
219	E-28	Eddy Current Separator	Residue	N	Outside		N	NA			A	2,635.3	26,353	0.003000 [d]	0.0215	0.0040	0.0395	0.001100 [d]	0.0014	0.0145	0.000167 [d]	0.0002	0.0022
220	E-28	Eddy Current Separator	Zorba	N	Outside		N	NA			A	368.6	3,686	0.003000 [d]	0.0030	0.0006	0.0055	0.001100 [d]	0.0002	0.0020	0.000167 [d]	0.0000	0.0003
221	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	2,414.1	24,141	0.003000	0.0039	0.0007	0.0072	0.001100	0.0003	0.0027	0.000167	0.0000	0.0004
222	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	2,414.1	24,141	0.003000	0.0039	0.0007	0.0072	0.001100	0.0003	0.0027	0.000167	0.0000	0.0004
223	E-35	Eddy Current Separator	Zorba	N	Outside		N	NA			A	552.9	5,529	0.003000 [d]	0.0045	0.0008	0.0083	0.001100 [d]	0.0003	0.0030	0.000167 [d]	0.0000	0.0005
224	E-35	Eddy Current Separator	Residue	N	Outside		N	NA			A	1,861.3	18,613	0.003000 [d]	0.0152	0.0028	0.0279	0.001100 [d]	0.0010	0.0102	0.000167 [d]	0.0002	0.0016
225	E-40	Separator	Lights Zurlic	N	Outside		N	NA			B	88.5	885	0.025000 [c]	0.0060	0.0011	0.0113	0.008700 [d]	0.0004	0.0038	0.001317 [d]	0.0001	0.0006
226	E-40	Separator	Heavies Zurlic	N	Outside		N	NA			B	353.8	3,538	0.025000 [d]	0.0240	0.0044	0.0442	0.008700 [d]	0.0015	0.0154	0.001317 [d]	0.0002	0.0023
227	E-40	Separator	Lights Zurlic	N	Outside		N	NA			B	129.0	1,290	0.025000 [d]	0.0088	0.0016	0.0161	0.008700 [d]	0.0006	0.0056	0.001317 [d]	0.0001	0.0008
228	E-41	Separator	Lights	N	Outside		N	NA			B	350.1	3,501	0.025000 [d]	0.0238	0.0044	0.0438	0.008700 [d]	0.0015	0.0152	0.001317 [d]	0.0002	0.0023
229	E-41	Separator drop to container	Heavies	1.5% [a]	Outside		N	NA			Drop	18.4	184	0.00761 [c]	0.0004	0.0001	0.0007	0.00360 [f]	0.0000	0.0003	0.00054 [f]	0.0000	0.0001
230	E-42	Low speed shredder for size reduction	Out of SSI	N	Outside		N	NA			A	202.7	2,027	0.003000 [d]	0.0017	0.0003	0.0030	0.001100 [d]	0.0001	0.0011	0.000167 [d]	0.0000	0.0002
231	E-43	Vibratory Feeder	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	995.1	9,951	0.003000	0.0016	0.0003	0.0030	0.001100 [f]	0.0001	0.0013	0.000167 [f]	0.0000	0.0002
232	E-44	Eddy Current Separator drop to stockpile	Zorba	1.5% [a]	Inside		N	NA			Drop	184.3	1,843	0.00760	0.0038	0.0007	0.0070	0.00360	0.0003	0.0033	0.00050	0.0000	0.0005
233	E-44	Eddy Current Separator	Residue	N	Outside		N	NA			A	810.9	8,109	0.003000 [d]	0.0066	0.0012	0.0122	0.001100 [d]	0.0004	0.0045	0.000167 [d]	0.0001	0.0007
234	E-46	Separator	Heavier Zorba	N	Outside		N	NA			B	460.7	4,607	0.025000 [d]	0.0313	0.0058	0.0576	0.008700 [d]	0.0020	0.0200	0.001317 [d]	0.0003	0.0030
235	E-46	Separator	Lights Zorba	N	Outside		N	NA			B	92.1	921	0.025000 [d]	0.0063	0.0012	0.0115	0.008700 [d]	0.0004	0.0040	0.001317 [d]	0.0001	0.0006
236	E-47	Separator	Zorba	N	Outside		N	NA			B	995.1	9,951	0.025000 [d]	0.0675	0.0124	0.1244	0.008700 [d]	0.0043	0.0433	0.001317 [d]	0.0007	0.0066
237	E-47	Separator	Heavies Zorba	N	Outside		N	NA			B	313.3	3,133	0.025000 [d]	0.0213	0.0039	0.0392	0.008700 [d]	0.0014	0.0136	0.001317 [d]	0.0002	0.0021
238	E-47	Separator	Lights Zorba	N	Outside		N	NA			B	55.3	553	0.025000 [d]	0.0038	0.0007	0.0069	0.008700 [d]	0.0002	0.0024	0.001317 [d]	0.0000	0.0004
239	E-47	Separator	Light Zorba	N	Outside		N	NA			B	110.6	1,106	0.025000 [d]	0.0075	0.0014	0.0138	0.008700 [d]	0.0005	0.0048	0.001317 [d]	0.0001	0.0007
240	E-49	Transfer Conveyor	Residue onto ECS	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	3,003.9	30,039	0.003000	0.0049	0.0009	0.0090	0.001100	0.0003	0.0033	0.000167	0.0001	0.0005
241	E-50	Air Vibe	To Infeed SSI	N	Outside		Y	Cover			A	202.7	2,027	0.000140 [d]	0.0001	0.0000	0.0001	0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
242	ECS	Eddy Current Separator drop to container	Zorba	1.5% [a]	Inside		N	NA			Drop	14.7	147	0.00760	0.0003	0.0001	0.0006	0.00360	0.0000	0.0003	0.00050	0.0000	0.0000
243	ECS	Eddy Current Separator drop to container	Zorba	1.5% [a]	Inside		N	NA			Drop	66.3	663	0.00760	0.0014	0.0003	0.0025	0.00360	0.0001	0.0012	0.00050	0.0000	0.0002

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.99%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	98.00%

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
Row #	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates		PM Emissions				PM10 Emissions			PM2.5 Emissions		
	ID #	Description		Y / N								ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
244	End Loader	Drop ASR into feed hopper	Residue into Hopper	N	Outside		Y	Cover			D	25,800.0	258,000	0.000204 [e]	0.0143	0.0026	0.0264	0.000100 [d]	0.0013	0.0129	0.000015 [d]	0.0002	0.0020
245	End Loader	load waste to truck	Waste	N	Outside		N	NA			D	20,046.6	200,466	0.000204	0.0111	0.0020	0.0205	0.000100	0.0010	0.0100	0.000015	0.0002	0.0015
246	SC-001	Supplemental Conveyor	Residue								A	5,805.0	58,050	0.003000	0.0473	0.0087	0.0871	0.001100	0.0032	0.0319	0.000167	0.0005	0.0048
247	SC-002	Supplemental Conveyor	Residue								A	5,805.0	58,050	0.003000	0.0473	0.0087	0.0871	0.001100	0.0032	0.0319	0.000167	0.0005	0.0048
248	SC-003	Supplemental Conveyor	Residue								A	2,705.3	27,053	0.003000	0.0226	0.0041	0.0406	0.001100	0.0015	0.0149	0.000167	0.0002	0.0023
249	SC-004	Supplemental Conveyor	Residue								A	2,705.3	27,053	0.003000	0.0226	0.0041	0.0406	0.001100	0.0015	0.0149	0.000167	0.0002	0.0023
250	SC-005	Supplemental Conveyor	Residue								A	20,046.6	200,466	0.003000	0.1632	0.0301	0.3007	0.001100	0.0110	0.1103	0.000167	0.0017	0.0167
251	SC-006	Supplemental Conveyor	Residue								A	20,046.6	200,466	0.003000	0.1632	0.0301	0.3007	0.001100	0.0110	0.1103	0.000167	0.0017	0.0167
								Totals Nonferrous Plant Material Handling PM Emissions							4.58	0.89	8.84		0.42	4.11		0.19	1.85
								Totals Nonferrous Plant Material Handling HAP Metal Emissions						0.83% [g]	0.04	0.01	0.07	Ratio of HAP metal to total PM from June 2018 emission test of roll media filter applied to nonferrous plant PM emissions.					

a Material moisture content (%) for light materials - AP-42, Table 13.2.4-1 for crushed limestone - (conservative).

b Uncontrolled emission factor calculated according to material drop equation in AP-42, Section 13.2.4.3. Emissions calculated with control Eff. factor included for source being inside of a building.

c Uncontrolled emission factor calculated according to material drop equation in AP-42, Section 13.2.4.3.

d Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for conveying. If moisture is greater than 1.5% by weight, use controlled emission factors.

e Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for screening. If moisture is greater than 1.5% by weight, use controlled emission factors.

f Sources located inside the Fines Building emit to atmosphere through Dust Collection DC-01. Emissions are estimated by multiplying the DC air flow rate of 12,000 cfm by a grain loading of 0.005 gr/dscf.

g Modeled total metal HAPs emissions rate expressed as as percent of estimated PM emissions from Non-Ferrous material handling.

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Table 3-3 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Max Monthly Thruput 25,000 tons/mo	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%	ECS Enc. PM Control Eff	80.00%
Annual Throughput 258,000 tpy	DC PM Control Eff	99.90%	DC PM_{10} Control Eff	98.00%	DC $PM_{2.5}$ Control Eff	98.00%

A	B	C	D	E	F	G	H	I	J	K	L	N	O	P	Q	R	S	T	V	W	X	Z	AA
Row	Equipment Generating Emissions		Material Conveyed	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Conveyor	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Emission Factor Source	Material Throughput Rates		PM Emissions				PM10 Emissions			PM2.5 Emissions		
#	ID #	Description		Y / N		Covered						ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy

Material Drop PM Equations (AP-42, Section 13.

$$E = k\,(0.0032) \times \frac{(U/S)^{1.3}}{(M/2)^{1.4}}$$

E = emission factor (lb/ton of material dropped)
k = particle size multiplier (dimensionless)
U = mean wind speed
https://www.timeanddate.com/weather/usa/chicago/climate
M = material moisture content (%)

U =	9.0	mph - annual average wind speed for Chicago (Midway Airport)
k =	0.74	PM - AP-42, Section 13.2.4, for particle size < 30 um
	0.35	PM - AP-42, Section 13.2.4, for particle size < 10 um
	0.053	PM - AP-42, Section 13.2.4, for particle size < 2.5 um
M =	1.5	% for light materials - AP-42, Table 13.2.4-1 for crushed limestone - (conservative)

The material moisture content for stockpile drop emission calculations varies by material - see Column E above.

Summary of Non-Ferrous Material Processing System Emission Points and Emissions by Emission Factor Type

# of Pts	Non-Ferrous Processing System Emission Points	Process Rate		PM Emissions			PM10 Emissions			PM2.5 Emissions		
		tpm	tpy	Factor lb/ton	tpm	tpy	Factor lb/ton	tpm	tpm	Factor lb/ton	tpm	tpy
88	Conveyor Transfer Points Uncontrolled	338,876	3,388,757	0.0030	0.4334	4.3339	0.0011	0.1589	1.5888	0.000167	0.0241	0.2408
11	Conveyor Transfer Points Controlled	57,218	572,183	0.00014	0.0036	0.0363	0.000046	0.0012	0.0118	0.000013	0.0003	0.0034
13	Screening - Uncontrolled	13,670	136,702	0.0250	0.1709	1.7088	0.0087	0.0594	0.5944	0.001317	0.0090	0.0900
12	Screening Controlled	42,209	422,085	0.0022	0.0414	0.4140	0.00074	0.0139	0.1394	0.00005	0.0009	0.0093
2	Truck Loadout	45,847	458,466	0.000204	0.0047	0.0469	0.0001	0.0023	0.0229	0.000015	0.0004	0.0035
13	Stockpile Drops	23,338	233,378	Varies	0.0858	0.8581	Varies	0.0406	0.4058	Varies	0.0062	0.0616
			Total Emissions		0.75	7.40		0.28	2.76		0.04	0.41

Non-Ferrous Processing Building # of Pts	Dust Collector Emissions PM/PM10/PM2.5	
51	All emissions controlled by dust collector and vented to atmosphere. Assume all PM is PM10.	
30		
8		
8		
0		
14		
	0.14	1.44

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Table 3-4 - Summary of Estimated Fugitive Particulate Emissions from Stockpile Operations[a]
General III, LLC - Chicago, Illinois

Plant	Stock Pile	Stock Pile Area Acres	Control Factor[b]	No of Active Days day/yr[c]	Inactive Emissions PM tpy[d,h]	Inactive Emissions PM10 tpy[e,h]	Inactive Emissions PM2.5 tpy[f,h]	Active Emissions PM tpy[d,h]	Active Emissions PM10 tpy[e,h]	Active Emissions PM2.5 tpy[f,h]	Total PM Emissions PM tpy[g,h]	Total PM Emissions PM10 tpy[g,h]	Total PM Emissions PM2.5 tpy[g,h]
Ferrous Plant	Poker North	0.0115	0.33	312	0.0004	0.0002	0.0000	0.0078	0.0039	0.0006	0.0082	0.0041	0.0006
	Poker South	0.0115	0.33	312	0.0004	0.0002	0.0000	0.0078	0.0039	0.0006	0.0082	0.0041	0.0006
	ASR	0.2541	1.00	312	0.0236	0.0118	0.0018	0.5232	0.2616	0.0396	0.5468	0.2734	0.0414
	Ferrous North	0.3630	1.00	312	0.0337	0.0169	0.0026	0.7475	0.3738	0.0566	0.7812	0.3907	0.0592
	Ferrous South	0.3630	1.00	312	0.0337	0.0169	0.0026	0.7475	0.3738	0.0566	0.7812	0.3907	0.0592
	Fluff (Bin)	0.0161	0.33	312	0.0005	0.0003	0.0000	0.0109	0.0055	0.0008	0.0114	0.0058	0.0008
	Raw Material Truck Dumping (Drop 1)	0.3630	1.00	312	0.0337	0.0169	0.0026	0.7475	0.3738	0.0566	0.7812	0.3907	0.0592
	Raw Material Movement from Truck Dumping Area to Stockpile (Drop 2)	0.1815	1.00	312	0.0168	0.0084	0.0013	0.3737	0.1869	0.0283	0.3905	0.1953	0.0296
Nonferrous Plant	FE from E-02	0.0047	0.33	312	0.0001	0.0001	0.0000	0.0032	0.0016	0.0002	0.0033	0.0017	0.0002
	5" + Zorba	0.0189	0.33	312	0.0006	0.0003	0.0000	0.0128	0.0064	0.0010	0.0134	0.0067	0.0010
	2-1/2" - 5" Zorba	0.0189	0.33	312	0.0006	0.0003	0.0000	0.0128	0.0064	0.0010	0.0134	0.0067	0.0010
	5/8" - 2-1/2" Zorba	0.0189	0.33	312	0.0006	0.0003	0.0000	0.0128	0.0064	0.0010	0.0134	0.0067	0.0010
	Tailings	0.0195	0.33	312	0.0006	0.0003	0.0000	0.0133	0.0067	0.0010	0.0139	0.0070	0.0010
	Open	0.0195	0.33	312	0.0006	0.0003	0.0000	0.0133	0.0067	0.0010	0.0139	0.0070	0.0010
	Wire	0.0195	0.33	312	0.0006	0.0003	0.0000	0.0133	0.0067	0.0010	0.0139	0.0070	0.0010
	Wire Rich Solids	0.0195	0.33	312	0.0006	0.0003	0.0000	0.0133	0.0067	0.0010	0.0139	0.0070	0.0010
	Zurick	0.0195	0.33	312	0.0006	0.0003	0.0000	0.0133	0.0067	0.0010	0.0139	0.0070	0.0010
	Waste	0.0868	0.33	312	0.0027	0.0014	0.0002	0.0590	0.0295	0.0045	0.0617	0.0309	0.0047
				Totals							3.4834	1.7425	0.2635

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/guidance/newsourcereview/forms-calc-rock11.xlsx 3.3087

b. Control Factor of 0.33 (67.5% control) for partial enclosure consisting of walls on three sides of bin. Control Factor of 1.0 for no control. 0.1747

c. Assume number of active days to be 6 days per week and 52 weeks per year and inactive days to be 1 day per week and 52 weeks per year. 3.4834

d. From TCEQ Guidance

Stockpile emission calculation:

PM Emission Rate (tpy) = [(inactive day PM EF x No. of inactive days) x stockpile area/2000 x control factor) + [(active day PM EF x No. of active days) x (stockpile area/2000) x control factor]

Inactive Day PM Emission Factor = 3.50 lb-PM/acre-day from TCEQ rock crushing emission calculation spreadsheet.

Active Day PM Emission Factor = 13.20 lb-PM/acre-day from TCEQ rock crushing emission calculation spreadsheet.

e. PM10 emissions are half of PM emission per TCEQ Air Permits Division, Rock Crushing Emission Calculation spreadsheet.

f. Where PM2.5 emission factors are not provided in AP-42, 11.19.2-2, a ratio of aerodynamic particle size multipliers from AP-42, 13.2.45 is used to estimate PM2.5 emission factors. PM2.5 EF = (PM10 EF/.035) x .0053.

g. Total particulate emissions is the sum of inactive day emissions plus active day emissions.

h. Hourly emissions, if required, would be based on 8,760 hr/yr.

Control Method	Control Eff. (%)	Control Factor (1 - ctrl eff)
None	0	1
Wet material	50	0.5
Water	70	0.3
Chemicals/foam	80	0.2
Partial Enclosure*	50-85 = average of 67.5	0.5-0.15 = average of 0.33
Full enclosure*	90	0.1
Enclosed by building*	90	0.1
Washed Sand/gravel	95	0.05
Washed Sand/gravel with water spray	98.5	0.015
Manufacturer Rating	0	0

Table 3-5A - Fugitive PM Emissions - Paved Roads
General III, LLC - Chicago, Illinois

Paved Road Fugitive Emission Calculation Procedure

$$E_{ext} = (k * (sL)^{0.91} * (W)^{1.02}) * (1 - (P/(4N)))$$

equation does not include brake and tire wear.

where:

E_{ext} =		Size specific annual average particulate emission factor (lb/VMT)
k =	See Below	Particle size multiplier lb/VMT (AP-42 Table 13.2.1-1)
sL=	9.7	mean controlled silt content, % (AP42 Table 13.2.1-3 Jan 2011 - Iron & Steel Range: 0.09 to 79; mean 9.7-g/m2)
W =	See Below	Mean vehicle weight , tons (use weighted average where available)
P =	120	Number of precipitation days (>0.01 in) per year (AP42 Fig 13.2.1.2 Jan 2011 - Chicago, IL)
N =	365	Averaging Period, annual
Control Eff % =	75.00%	Emission Control Efficiency for sweeping or watering
Daily Operating Hours	18	Hours per Year
Weekly Operating Days	6	Days /Week
Annual Operating Weeks =	52	Weeks/Year
Annual Operating hours =	5,616	Hours per Year

Material Hauling

				PM Particle size multiplier (k) =			0.011
Vehicle Type	Mean Vehicle Weight (tons)	Miles Traveled per Day	Uncontrolled lb/VMT	Controlled lb/VMT	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM Emissions tpy
Peddler Scrap Deliveries	3.45	133.23	0.2823	0.0706	9.406	0.147	1.47
Truck Scrap Delivery to North Scrap Stockpile	24.50	23.24	2.0848	0.5212	12.113	0.189	1.89
Truck Scrap Delivery to South Scrap Stockpile	24.50	39.99	2.0848	0.5212	20.844	0.325	3.25
Ferrous Scrap Shipment from North Stockpile	26.75	14.34	2.2802	0.5701	8.173	0.128	1.28
Ferrous Scrap Shipment from South Stockpile	26.75	21.20	2.2802	0.5701	12.089	0.189	1.89
Ferrous Waste Shipped Off Site by Truck	27.75	0.29	2.3672	0.5918	0.170	0.003	0.03
Non Ferrous Products Shipped Off Site by Truck	26.75	1.25	2.2802	0.5701	0.714	0.011	0.11
Non Ferrous Waste Shipped Off Site by Truck	27.75	9.72	2.3672	0.5918	5.752	0.090	0.90
WA500 Loaders	36.49	10.45	3.1302	0.7826	8.178	0.128	1.28
WA300 Loaders	16.60	4.75	1.4015	0.3504	1.664	0.026	0.26
Weighted Average Weight:	14.44	Subtotals:			79.104	1.234	12.34

Material Hauling

				PM_{10} Particle size multiplier (k) =			0.0022
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Uncontrolled lb/VMT	Controlled lb/VMT	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM_{10} Emissions tpy
Peddler Scrap Deliveries	3.45	133.23	0.0565	0.0141	1.879	0.029	0.29
Truck Scrap Delivery to North Scrap Stockpile	24.50	23.24	0.4170	0.1043	2.424	0.038	0.38
Truck Scrap Delivery to South Scrap Stockpile	24.50	39.99	0.4170	0.1043	4.171	0.065	0.65
Ferrous Scrap Shipment from North Stockpile	26.75	14.34	0.4560	0.1140	1.634	0.026	0.26
Ferrous Scrap Shipment from South Stockpile	26.75	21.20	0.4560	0.1140	2.417	0.038	0.38
Ferrous Waste Shipped Off Site by Truck	27.75	0.29	0.4734	0.1184	0.034	0.001	0.01
Non Ferrous Products Shipped Off Site by Truck	26.75	1.25	0.4560	0.1140	0.143	0.002	0.02
Non Ferrous Waste Shipped Off Site by Truck	27.75	9.72	0.4734	0.1184	1.151	0.018	0.18
WA500 Loaders	36.49	10.45	0.6260	0.1565	1.635	0.026	0.26
WA300 Loaders	16.60	4.75	0.2803	0.0701	0.333	0.005	0.05
Weighted Average Weight:	14.44	Subtotals:			15.821	0.247	2.47

Material Hauling

				$PM_{2.5}$ Particle size multiplier (k) =			0.00054
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Uncontrolled lb/VMT	Controlled lb/VMT	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual $PM_{2.5}$ Emissions tpy
Peddler Scrap Deliveries	3.45	133.23	0.0139	0.0035	0.466	0.007	0.07
Truck Scrap Delivery to North Scrap Stockpile	24.50	23.24	0.1023	0.0256	0.595	0.009	0.09
Truck Scrap Delivery to South Scrap Stockpile	24.50	39.99	0.1023	0.0256	1.024	0.016	0.16
Ferrous Scrap Shipment from North Stockpile	26.75	14.34	0.1119	0.0280	0.401	0.006	0.06
Ferrous Scrap Shipment from South Stockpile	26.75	21.20	0.1119	0.0280	0.594	0.009	0.09
Ferrous Waste Shipped Off Site by Truck	27.75	0.29	0.1162	0.0291	0.008	0.000	0.00
Non Ferrous Products Shipped Off Site by Truck	26.75	1.25	0.1119	0.0280	0.035	0.001	0.01
Non Ferrous Waste Shipped Off Site by Truck	27.75	9.72	0.1162	0.0291	0.283	0.004	0.04
WA500 Loaders	36.49	10.45	0.1537	0.0384	0.401	0.006	0.06
WA300 Loaders	16.60	4.75	0.0688	0.0172	0.082	0.001	0.01
Weighted Average Weight:	14.44	Subtotals:			3.889	0.061	0.61

Table 3-5B - Fugitive PM Emissions - Unpaved Roads
General III, LLC - Chicago, Illinois

Unpaved Industrial Road Fugitive Emission Calculation Procedure

5% of loader miles are assumed to be on unpaved roads

$$E_{ext} = [(k * (s/12)^a * (W/3)^b] * [(N-P)/N]$$

Equation 1a & 2, AP-42 13.2.2-2 (Nov 2006)

where:

E_{ext} =		Size specific annual average particulate emission factor (lb/VMT)
k =	See Below	Particle size multiplier lb/VMT (AP-42 Table 13.2.2-2)
s=	6	mean material silt content (%) (AP42 Table 13.2.2-1 Nov 2006 - Iron & Steel Production: mean = 6.0%)
W =	See Below	Mean vehicle weight , tons (use weighted average where available)
P =	120	Number of precipitation days (>0.01 in) per year (AP42 Fig 13.2.1.2 Jan 2011 - Chicago, IL)
N =	365	Averaging Period, annual
Control Eff % =	50.00%	Emission Control Efficiency for watering
Daily Operating Hours	18	Hours per Year
Weekly Operating Days	6	Days /Week
Annual Operating Weeks =	52	Weeks/Year
Annual Operating hours =	5,616	Hours per Year

(AP42 Table 13.2.2-2 Nov 2006 - Industrial Roads (Eq. 1a)			
EQ 1a Constants	PM	PM10	PM2.5
a =	0.7	0.9	0.9
b =	0.45	0.45	0.45

Material Hauling

				PM Particle size multiplier (k) =			4.9
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Uncontrolled lb/VMT	Controlled lb/VMT	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM Emissions tpy
WA500 Loaders	36.49	0.55	6.2323	3.1162	1.714	0.027	0.27
WA300 Loaders	16.60	0.25	4.3721	2.1861	0.547	0.009	0.09
Weighted Average Weight:	30.28	Subtotals:			2.260	0.035	0.35

Material Hauling

				PM_{10} Particle size multiplier (k) =			1.5
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Uncontrolled lb/VMT	Controlled lb/VMT	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM_{10} Emissions tpy
WA500 Loaders	36.49	0.55	1.6609	0.8305	0.457	0.007	0.07
WA300 Loaders	16.60	0.25	1.1651	0.5826	0.146	0.002	0.02
Weighted Average Weight:	30.28	Subtotals:			0.602	0.009	0.09

Material Hauling

				$PM_{2.5}$ Particle size multiplier (k) =			0.15
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Uncontrolled lb/VMT	Controlled lb/VMT	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual $PM_{2.5}$ Emissions tpy
WA500 Loaders	36.49	0.55	0.1661	0.0831	0.046	0.001	0.01
WA300 Loaders	16.60	0.25	0.1165	0.0583	0.015	0.000	0.00
Weighted Average Weight:	30.28	Subtotals:			0.060	0.001	0.01

Table 3-6 Miscellaneous Natural Gas Fired Environmental Heaters
General III, LLC - Chicago, Illinois

Pollutant	Pollutant Emission Factor [a] lb/MMscf	10 Total Max Firing Rate 10.0 MMBtu/hr NG HHV = 1,020-Btu/scf Annual Gas Consumption 65,700 MMBtu/yr ton/mo[b]	tpy
Nitrogen Oxide (NOx)	100	0.32	3.22
Carbon Monoxide (CO)	84	0.27	2.71
Total Filterable PM	1.9	0.01	0.06
Total Condensable PM	5.7	0.02	0.18
Total Particulate Matter	7.6	0.02	0.24
Sulfur Dioxide (SO_2)	0.6	0.00	0.02
Volatile Organic Compounds (VOC)	5.5	0.02	0.18
Greenhouse Gas Emissions			
Carbon Dioxide (CO_2)	120,174	387.03	3,870.31
Methane (CH_4)	2.2649	0.0073	0.07
Nitrous Oxide (N_2O)	0.2265	0.0007	0.01
Carbon Dioxide Equivalents (CO_2e) [c]		**387.43**	**3,874.31**

a. AP-42 Emission factors from Tables 1.4-1 and 1.4-2.

b. Unit heaters are estimated to operate 6,570 hr/year.

c. Global Warming Potentials (GWPs) for CO_2, CH_4 and N_2O are 1, 25, and 298 respectively (40 CFR 98 Subpart A).

Table 3-6 Miscellaneous Natural Gas Fired Environmental Heaters
General III, LLC - Chicago, Illinois

Summary of HAP Emissions from Natural Gas Combustion

HAP[b] Y/N	Pollutant	Emission Factor[a] ($lb/10^6$ scf)	ton/mo	tpy
	Metal HAPs[c]			
Y	Lead	0.0005	1.61E-06	1.61E-05
Y	Manganese	3.80E-04	1.22E-06	1.22E-05
Y	Mercury	2.60E-04	8.37E-07	8.37E-06
Y	Nickel	2.10E-03	6.76E-06	6.76E-05
Y	Arsenic	2.00E-04	6.44E-07	6.44E-06
Y	Beryllium	< 1.20E-05	3.86E-08	3.86E-07
Y	Cadmium	1.10E-03	3.54E-06	3.54E-05
Y	Chromium	1.40E-03	4.51E-06	4.51E-05
Y	Cobalt	8.40E-05	2.71E-07	2.71E-06
Y	Selenium	< 2.40E-05	7.73E-08	7.73E-07
	Volatile HAPs[d]			
Y	Toluene	3.40E-03	1.10E-05	1.10E-04
Y	Hexane	< 1.80E+00	< 5.80E-03	< 5.80E-02
Y	Anthracene	< 2.40E-06	< 7.73E-09	< 7.73E-08
Y	Pyrene	5.00E-06	1.61E-08	1.61E-07
Y	Benzo(g,h,i)perylene	< 1.20E-06	< 3.86E-09	< 3.86E-08
Y	Indeno(1,2,3-cd)pyrene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	Acenaphthylene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	Benzo(b)fluoranthene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	Fluoranthene	3.00E-06	9.66E-09	9.66E-08
Y	Benzo(k)fluoranthene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	Chrysene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	Dichlorobenzene	1.20E-03	3.86E-06	3.86E-05
Y	Formaldehyde	7.50E-02	2.42E-04	2.42E-03
Y	Benzo(a)pyrene	< 1.20E-06	< 3.86E-09	< 3.86E-08
Y	Dibenzo(a,h)anthracene	< 1.20E-06	< 3.86E-09	< 3.86E-08
Y	3-Methylcholanthrene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	Benz(a)anthracene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	7,12-Dimethylbenz(a)anthracene	< 1.60E-05	< 5.15E-08	< 5.15E-07
Y	Benzene	< 2.10E-03	< 6.76E-06	< 6.76E-05
Y	Acenaphthene	< 1.80E-06	< 5.80E-09	< 5.80E-08
Y	Phenanathrene	1.70E-05	5.48E-08	5.48E-07
Y	Fluorene	2.80E-06	9.02E-09	9.02E-08
Y	Naphthalene	6.10E-04	1.96E-06	1.96E-05
Y	2-Methylnaphthalene	2.40E-05	7.73E-08	7.73E-07
	Total HAPs		**6.08E-03**	**6.08E-02**
	Maximum Individual HAP	**Hexane**	**5.80E-03**	**5.80E-02**

a. AP-42 Emission factors from Tables 1.4-1 and 1.4-2.

b. Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.

c. Metal HAP emission factors from natural gas combustion - AP-42 Emission factors from Tables 1.4-4.

d. Organic HAP emission factors from natural gas combustion - AP-42 Emission factors from Tables 1.4-3.

e. Monthly emissions are assumed to be 10% of annual emissions.

Table 3-7 - Summary of Facility Wide Criteria Pollutant Emissions
General III, LLC - Chicago, Illinois

Pollutant	RTO[a]		RTO Natural Gas[b]		Ferrous Plant[c]		Nonferrous Plant[d]		Misc Natural Gas[e]		Facility Wide Potential[h]	Fugitive Emissions From Stockpile Operations[g]		Fugitive Emissions from Paved/ Unpaved Roads[f]		Facility Wide Emissions with Fugitivies
	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	tpy	ton/mo	tpy	ton/mo	tpy	tpy
Oxides of Nitrogen - NOx			0.26	2.57					0.32	3.22	5.79					5.79
Carbon Monoxide - CO	1.29	12.86	0.22	2.16					0.32	2.71	17.72					17.72
Total Particulate Matter - PM	0.94	9.40	0.02	0.20	0.30	2.93	0.89	8.84		0.24	21.61	0.35	3.48	1.27	12.69	37.79
filterable PM less than 10 microns in diameter - PM_{10}	0.94	9.40	0.02	0.20	0.13	1.25	0.42	4.21	0.00	0.24	15.30	0.17	1.74	0.26	2.56	19.60
Filterable PM less than 2.5 microns in diameter - $PM_{2.5}$			0.02	0.20	0.02	0.23	0.19	1.85	0.00	0.24	2.52	0.03	0.26	0.06	0.62	3.40
Sulfur Dioxide - SO_2				0.02					0.00	0.02	0.03					0.03
Volatile Organic Material - VOM	0.51	5.12		0.14					0.02	0.18	5.44					5.44
Total - HAPs	0.2573	2.5733	0.0049	0.0486	0.0015	0.0143	0.0074	0.0730	0.0061	0.0608	2.7700	0.0021	0.0210	0.0028	0.0281	2.8191
Max Individual HAP		1.5442		0.0463		0.0069		0.0417		0.0580			0.0108		0.0098	
HAP		HCl		Hexane		Lead		Lead		Hexane			Mercury		Mercury	
Hexane				0.0463					0.0000	0.0580	0.1043					0.1043
Greenhouse Gas Emissions											0.00					0.00
Carbon Dioxide - CO_2		3,095.91		3,092.72						3,870.31	10,058.94					10,058.94
Methane - CH_4		0.0583		0.0583						0.0729	0.1895					0.1895
Nitrous Oxide - N_2O		0.0058		0.0058						0.0073	0.0190					0.0190
Carbon Dioxide Equivalents - CO_2e		3,099.10		3,095.91						3,874.31	10,069.33					10,069.33

a. See Tables 3-1A (VOM and CO), Table 3-1B (PM), and Table 3-1C (HAPs). For the purposes of this application, GHG from combustion of VOM in the RTO is assumed to be equal to GHG from maximum natural gas combustion in RTO.
b. See Table 3-1D.
c. See Table 3-2.
d. See Table 3-3.
e. See Table 3-4.
f. See Table 3-5.
g. See Table 3-6.
h. Scrap metal recycling is not one included in one of the 28 industrial quantities identifed in PSD rules, there for purposes of PSD, fugitive emissions are not included in PTE.

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Table 3-8 - Summary of Facility Wide HAP Emissions
General III, LLC - Chicago, Illinois

Hazardous Air Pollutant	RTO[a]		RTO Natural Gas[b]		Ferrous Plant[c]		Nonferrous Plant[c]		Stockpile Operations[c]		Paved + Unpaved Fugitive Road[c]		Misc Natural Gas[b]		Facility Wide Total HAP	
	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	ton/mo	tpy	Ton/mo	tpy
Volatile HAPs																
Ethylbenzene	1.33E-04	1.33E-03													1.33E-04	1.33E-03
Styrene	2.66E-05	2.66E-04													2.66E-05	2.66E-04
Toluene	6.66E-04	6.66E-03	8.75E-06	8.75E-05									1.10E-05	1.10E-04	6.86E-04	6.86E-03
Hexane			4.63E-03	4.63E-02									5.80E-03	5.80E-02	1.04E-02	1.04E-01
Anthracene			6.18E-09	6.18E-08									7.73E-09	7.73E-08	1.39E-08	1.39E-07
Tetrachloroethane (PCE)	5.34E-06	5.34E-05													5.34E-06	5.34E-05
Pyrene			1.29E-08	1.29E-07									1.61E-08	1.61E-07	2.90E-08	2.90E-07
m,p-Xylene	2.66E-05	2.66E-04													2.66E-05	2.66E-04
Benzo(g,h,i)perylene			3.09E-09	3.09E-08									3.86E-09	3.86E-08	6.95E-09	6.95E-08
Indeno(1,2,3-cd)pyrene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
Acenaphthene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
Benzo(b)fluoranthene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
Fluoranthene			7.72E-09	7.72E-08									9.66E-09	9.66E-08	1.74E-08	1.74E-07
Benzo(k)fluoranthene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
Chrysene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
Dichlorobenzene			3.09E-06	3.09E-05									3.86E-06	3.86E-05	6.95E-06	6.95E-05
Formaldehyde			1.93E-04	1.93E-03									2.42E-04	2.42E-03	4.35E-04	4.35E-03
Benzo(a)pyrene			3.09E-09	3.09E-08									3.86E-09	3.86E-08	6.95E-09	6.95E-08
Dibenzo(a,h)anthracene			3.09E-09	3.09E-08									3.86E-09	3.86E-08	6.95E-09	6.95E-08
3-Methylcholanthrene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
Benz(a)anthracene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
7,12-Dimethylbenzene(a)anthracene			4.12E-08	4.12E-07									5.15E-08	5.15E-07	9.27E-08	9.27E-07
Benzene	8.00E-04	8.00E-03	5.40E-06	5.40E-05									6.76E-06	6.76E-05	8.12E-04	8.12E-03
1,1,1-Trichloroethane	4.00E-04	4.00E-03													4.00E-04	4.00E-03
Methylene Chloride	1.20E-04	1.20E-03													1.20E-04	1.20E-03
Trichloroethene (TCE)	1.33E-04	1.33E-03													1.33E-04	1.33E-03
Acenaphthylene			4.63E-09	4.63E-08									5.80E-09	5.80E-08	1.04E-08	1.04E-07
Phenanthrene			4.38E-08	4.38E-07									5.48E-08	5.48E-07	9.85E-08	9.85E-07
Fluorene			7.21E-09	7.21E-08									9.02E-09	9.02E-08	1.62E-08	1.62E-07
Naphthalene			1.57E-06	1.57E-05									1.96E-06	1.96E-05	3.53E-06	3.53E-05
2-Methylnaphthalene			6.18E-08	6.18E-07									7.73E-08	7.73E-07	1.39E-07	1.39E-06
o-Xylene	1.33E-04	1.33E-03													1.33E-04	1.33E-03
Metal HAPs																
Lead	2.77E-04	2.77E-03	1.29E-06	1.29E-05	7.09E-04	6.86E-03	4.22E-03	4.17E-02	1.08E-03	1.08E-02	8.42E-04	8.42E-03	1.61E-06	1.61E-05	7.12E-03	7.06E-02
Manganese	3.98E-04	3.98E-03	9.78E-07	9.78E-06	4.31E-04	4.19E-03	1.57E-03	1.56E-02	5.63E-04	5.63E-03	9.79E-04	9.79E-03	1.22E-06	1.22E-05	3.95E-03	3.92E-02
Mercury	8.93E-03	8.93E-02	6.69E-07	6.69E-06	3.01E-06	2.91E-05	8.34E-06	8.26E-05	3.91E-06	3.91E-05	3.40E-06	3.40E-05	8.37E-07	8.37E-06	8.95E-03	8.95E-02
Nickel	6.59E-04	6.59E-03	5.40E-06	5.40E-05	6.09E-05	5.93E-04	2.78E-04	2.75E-03	8.32E-05	8.32E-04	1.87E-04	1.87E-03	6.76E-06	6.76E-05	1.28E-03	1.28E-02
Antimony	2.25E-04	2.25E-03			3.48E-07	3.42E-06	1.08E-06	1.07E-05	4.09E-07	4.09E-06	1.46E-06	1.46E-05			2.28E-04	2.28E-03
Arsenic	7.94E-05	7.94E-04	5.15E-07	5.15E-06	8.32E-07	8.17E-06	4.03E-06	3.99E-05	1.08E-06	1.08E-05	3.16E-06	3.16E-05	6.44E-07	6.44E-06	8.97E-05	8.96E-04
Beryllium	1.78E-05	1.78E-04	3.09E-08	3.09E-07	1.00E-06	9.96E-06	1.08E-06	1.07E-05	9.18E-07	9.18E-06	6.26E-06	6.26E-05	3.86E-08	3.86E-07	2.71E-05	2.71E-04
Cadmium	8.51E-05	8.51E-04	2.83E-06	2.83E-05	7.70E-06	7.45E-05	3.09E-05	3.06E-04	1.07E-05	1.07E-04	9.17E-06	9.17E-05	3.54E-06	3.54E-05	1.50E-04	1.49E-03
Chromium	6.90E-04	6.90E-03	3.60E-06	3.60E-05	8.57E-05	8.35E-04	3.80E-04	3.76E-03	1.15E-04	1.15E-03	3.42E-04	3.42E-03	4.51E-06	4.51E-05	1.62E-03	1.61E-02
Cobalt	2.13E-05	2.13E-04	2.16E-07	2.16E-06	9.33E-06	9.05E-05	4.98E-05	4.93E-04	1.36E-05	1.36E-04	1.80E-05	1.80E-04	2.71E-07	2.71E-06	1.12E-04	1.12E-03
Phosphorus	2.43E-02	2.43E-01			1.65E-04	1.60E-03	8.34E-04	8.26E-03	2.32E-04	2.32E-03	4.19E-04	4.19E-03			2.59E-02	2.59E-01
Selenium	1.21E-03	1.21E-02	6.18E-08	6.18E-07	3.48E-07	3.42E-06	1.08E-06	1.07E-05	4.09E-07	4.09E-06	1.46E-06	1.46E-05	7.73E-08	7.73E-07	1.21E-03	1.21E-02
Inorganic Acid HAPs																
Hydrochloric Acid	1.54E-01	1.54E+00													1.54E-01	1.54E+00
Hydrofluoric Acid	6.36E-02	6.36E-01													6.36E-02	6.36E-01
Total HAPs	2.57E-01	2.57E+00	4.86E-03	4.86E-02	1.47E-03	1.43E-02	7.37E-03	7.30E-02	2.30E-03	2.30E-02	2.81E-03	2.81E-02	6.08E-03	6.08E-02	2.82E-01	2.82E+00
											Maximum Individual HAP			Phosphorus	2.59E-02	2.59E-01

a. Uncontrolled organic compound emission factors (lb/ton), as presented in ISRI Title V Applicability Workbook, Table D-11F, were multiplied by proposed permit throughput limits, adjusted for for 98% control by the RTO. Metal HAP emission factors were taken from the November 2018 emission testing of the RTO at GII, LLC in Chicago, Illinois.

b. HAP emissions from natural gas combustion as identified in AP-42, Tables 1.4-3 and 1.4-4.

c. Metal HAP emissions calculated by multiplying the weight % of metal HAP in RTO particulate emission by the total PM emissions from identified emission unit..

d. HAP emission factors from natural gas combustion from AP-42, Tables 1.4-3 and 1.4-4 adjusted to propane on the basis of 1,020 Btu/cf (see footnotes on Table 5).

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RK
& Associates, Inc.

Updated Emission Estimates
Construction Permit Application 19090021 for a
New Scrap Metal Recycling Facility

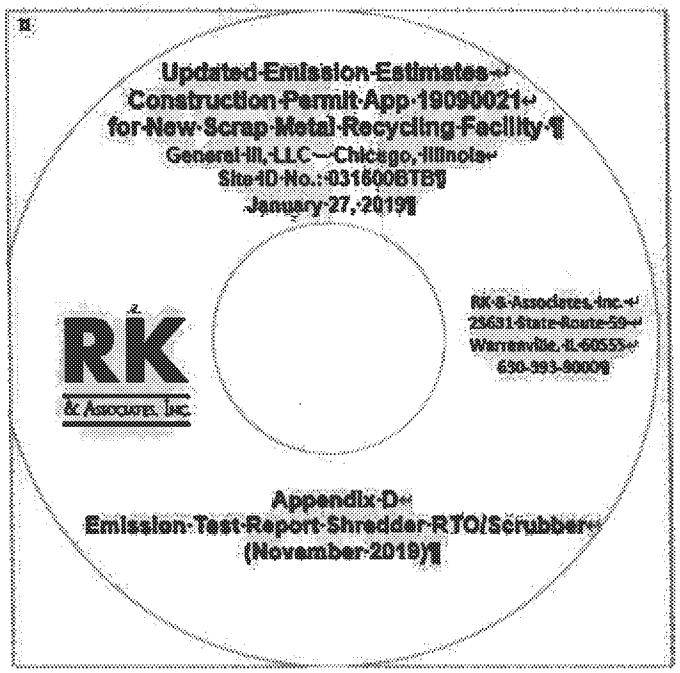
General III, LLC
11600 South Burley
Chicago, Illinois 60614

January 27, 2020

APPENDIX D

SHREDDER RTO/SCRUBBER EMISSIONS TEST REPORT
(TESTING PERFORMED NOVEMBER 2019)

HARD COPY of This Document Contains a CD ROM with the above referenced test report.



RK
& Associates, Inc.

Updated Emission Estimates
Construction Permit Application 19090021 for a
New Scrap Metal Recycling Facility

General III, LLC
11600 South Burley
Chicago, Illinois 60614

January 27, 2020

APPENDIX E

PROPOSED CHANGES TO
CONDITION 11 (EMISSION LIMITS) OF
CONSTRUCTION PERMIT 19090021

January 27, 2020; Note from John Pinion of K&A:

The changes identified herein corresponded to the updated emission estimates submitted to IEPA dated January 22, 2020. The values below should be included in the draft final construction permit.

11a. Emissions from and operation of the Hammermill Shredder System shall not exceed the following limits:

i. VOM emissions:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	VOM Emission (Tons/Mo)	VOM Emission (Tons/Yr)
Hammermill Shredder RTO/Scrubber Stack	100,000	1,000,000	0.0119~~243~~	0.91~~24~~	5.12~~2.43~~

These limits are based upon maximum shredder material throughput, an uncontrolled emission factor derived from a stack test, and 98% removal efficiency by the RTO/Scrubber. All measured total hydrocarbon (THC) emissions are assumed to be VOM.

ii. HAP emissions:

Emission Unit	Single HAP (Tons/Mo)	Single HAP (Tons/Yr)	Combined HAPs (Tons/Mo)	Combined HAPs (Tons/Yr)
Metal Shredder RTO/Scrubber Stack	0.15~~0.03~~	1.54~~0.30~~	0.27~~0.06~~	2.6~~0.43~~

Commented [R11]: Hydrochloric acid (HCl) at scrubber outlet from November 2019 emission testing with safety factor of 4 included.

These limits are based upon measured emission rates from a stack test adjusted by safety factor of 4.0 at maximum shredder material throughput in Condition 11(a)(i) above. ~~Combined HAPs comprising 25% of the THC emissions and any single HAP comprising no more than 50% of the combined HAPs (12.5% of the THC emissions).~~

iii. Filterable PM, PM_{10}, and $PM_{2.5}$ emissions:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM, PM_{10}, and $PM_{2.5}$ Emissions (Tons/Mo)	PM, PM_{10}, and $PM_{2.5}$ Emissions (Tons/Yr)
Metal Shredder RTO/Scrubber Stack	100,000	1,000,000	0.0047	0.94~~04~~	9.40~~3.46~~

These limits are based upon maximum shredder material throughput, emission factors derived from stack test adjusted by a safety factor of 4.0 ~~applied and measured filterable PM emissions~~, and all measured filterable PM assumed to be PM_{10} and $PM_{2.5}$.

b. Emissions from fuel combustion in the Regenerative Thermal Oxidizer (RTO) associated with the Hammermill Shredding System shall not exceed the following limits:

i. Natural gas Usage: 6.57 mmscf/month, 52.5 mmscf/year

ii. Emissions from the combustion of natural gas:

Pollutant	Emission Factor (lbs/mmscf)	Emissions (Tons/Mo)	Emissions (Tons/Yr)
Carbon Monoxide (CO)	~~[illegible]~~583.55	1.50~~0.43~~	15.02~~3.45~~
Nitrogen Oxides (NO_x)	100.0	0.28	2.57~~20~~
Particulate Matter (PM)	7.6	0.02	0.20
Sulfur Dioxide (SO_2)	0.6	0.01	0.02
Volatile Organic Material (VOM)	5.5	0.02	0.14

These limits are based on the maximum firing rate of the RTO burner (15.0 mmBtu/hour), maximum natural gas usage, approximately 1% (12.8~~6.00~~ tons/year) of uncontrolled VOM emissions being emitted as CO emissions due to incomplete combustion, and standard emission factors (Tables 1.4-1 and 1.4-2, AP-42, Fifth Edition, Volume I, Supplement D, July 1998).

c. Emissions from and operation of the Ferrous Material Separation Process shall not exceed the following limits:

i. ~~A~~ Filterable Particulate Matter Emissions

a. PM~~, PM_{10}, and $PM_{2.5}$~~ emissions:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM~~, PM_{10}, and $PM_{2.5}$~~ Emissions (Tons/Mo)	PM~~, PM_{10}, and $PM_{2.5}$~~ Emissions (Tons/Yr)
59~~2~~ Conveyor Transfer Points	~~1,000,000~~	~~12,000,000~~	0.00014	~~0.09~~	~~0.80~~
	1,444,050	14,440,500		0.10	0.96
3 Truck~~, Railroad,~~ & Barge	~~174,000~~	~~1,740,000~~	0.000204	~~0.03~~	~~0.18~~
Loading Points	137,600	1,376,000		0.01	0.14
7 Stockpile Loading Points	300,000	3,000,000	~~0.00100~~	0.18	1.83
			varies		
				Total:	~~2.03~~
					2.93

b. PM_{10} emissions:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM_{10} Emissions (Tons/Mo)	PM_{10} Emissions (Tons/Yr)
59 Conveyor Transfer Points	1,444,050	14,440,500	0.000046	0.03	0.31
3 Truck & Barge Loading Points	137,600	1,376,000	0.0001	0.01	0.07
7 Stockpile Loading Points	300,000	3,000,000	Varies	0.09	0.87
				Total:	1.25

c. $PM_{2.5}$ emissions:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	$PM_{2.5}$ Emissions (Tons/Mo)	$PM_{2.5}$ Emissions (Tons/Yr)
59 Conveyor Transfer Points	1,444,050	14,440,500	0.000013	0.01	0.09
3 Truck & Barge Loading Points	137,600	1,376,000	0.000015	0.01	0.01
7 Stockpile Loading Points	300,000	3,000,000	Varies	0.01	0.13
				Total:	0.23

The above filterable $PM/PM_{10}/PM_{2.5}$ ~~es~~ limits are based upon maximum material throughput, Standard emission factors from AP-42 (Table 11.19.2-2, Fifth Edition, Volume I, Update 2004, August 2004) for conveyors transfer points and Truck/Barge Loading, stockpile loadings emission factor derived using AP-42, Section 13.2.4.3 (Table 13.2.4, AP-42, Fifth Edition, Volume I, November 2006) using coefficients of K=0.74 (PM), K=0.35 (PM_{10}), and K=0.053 ($PM_{2.5}$); U (mean windspeed) = 9.0 mph, and M (minimum moisture content) = 1.5% applied to light material stockpile, 5.4% applied to raw scrap metal handling, 10% applied to ASR stockpile loading.

ii. Combined HAP emissions from Ferrous Material Separation Process shall not exceed the following limits:

Emission Unit	Combined HAPs (Tons/Mo)	Combined HAPs (Tons/Yr)
Ferrous Material Separation Process	0.01	0.02~~6.04~~

These limits are based upon metal HAPs being 0.4~~9.99~~% of the total PM emissions~~ measured at the discharge of existing roll media filter during June 2010 metal emission test as Carbon Steel Lab.~~.

d. Emissions from and operation of the Non-Ferrous Material Separation Process and Fines Processing System shall not exceed the following limits:

i. Filterable PM, PM_{10}, and $PM_{2.5}$ emissions for sources inside building controlled by a baghouse shall be limited to 0.15 tons/month and 1.44 tons/year.~~.~~

Commented [R12]: The baghouse PM emission calculations, as described, are completely independent of the number of emission points or the total material throughput.

~~Emission Unit~~	~~Process Rate (Tons/Mo)~~	~~Process Rate (Tons/Yr)~~	~~Emission Factor (lb/Ton)~~	~~PM, PM_{10}, and $PM_{2.5}$ Emissions (Tons/Mo)~~	~~PM, PM_{10}, and $PM_{2.5}$ Emissions (Tons/Yr)~~
~~34 Conveyor Transfer Points (Uncontrolled)~~	~~130,624~~	~~1,306,236~~	~~0.00300~~	~~0.37~~	~~1.96~~
~~34 Conveyor Transfer Points (Controlled)~~	~~13,436~~	~~134,361~~	~~0.00014~~	~~0.01~~	~~0.01~~

~~5 Screening Points (Uncontrolled)~~	~~2,220~~	~~28,196~~	~~0.02500~~	~~0.04~~	~~0.36~~
~~6 Screening Points (Controlled)~~	~~1,541~~	~~15,406~~	~~0.00220~~	~~0.01~~	~~0.02~~
~~17 Stockpile Loading Points~~	~~636~~	~~8,381~~	~~0.00761~~	~~0.01~~	~~0.03~~
				~~Total:~~	~~2.07*~~

* These sources located inside building exhaust to the atmosphere through Dust Collector DC-01, ~~estimated~~ emissions may be calculation by using the stack flow rate (12,000 cfm) and grain loading of 0.005 gr/dscf and hours of operation ~~(1.36 tons/year)~~.

~~These limits are based upon maximum material throughput, standard emission factors from AP-42 (Table 11.19.2-2, Fifth Edition, Volume I, Update 2004, August 2004) for conveyors transfer points screening and Truck Loading, stockpile loading emission factors derived using AP-42, Section 13.2.4.3 (Table 13.2.4, AP-42, Fifth Edition, Volume I, November 2006) using coefficients of K=0.74 (PM), K=0.35 (PM_{10}), and K=0.053 ($PM_{2.5}$); U (mean windspeed) = 9.8 mph, and M (minimum moisture content) = 1.5% applied to light material stockpile loading.~~

ii. Filterable Particulate Matter Emissions~~PM, PM_{10}, and $PM_{2.5}$ emissions from outdoor emission units:~~

a. PM emissions from outdoor emission units:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM ~~& PM_{10}~~ (Tons/Mo)	Emission (Tons/Yr)
~~8~~ ~~9~~ Conveyor Transfer Points (Uncontrolled)	~~216,368~~ 338,876	~~2,153,675~~ 3,338,757	0.00300	~~0.32~~ 0.43	~~3.23~~ 4.34
11 Conveyor Transfer Points (Controlled)	57,210	572,103	0.00014	0.01	0.04
13 Screening Points (Uncontrolled)	13,670	136,702	0.02500	0.17	1.71
12 Screening Points (Controlled)	42,209	422,085	0.00220	0.04	0.41
2 Truck Loading Points	~~26,003~~ 45,847	~~260,027~~ 458,466	0.000204	0.01	~~0.03~~ 0.05
13~~0~~ Stockpile Loading Points	~~23,073~~ 23,338	~~230,725~~ 233,378	~~0.00761~~ Varies	0.0~~3~~8	0.86~~5~~
				Total:	~~6.27~~ 7.41

b. PM_{10} emissions from outdoor emission units:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM_{10} Emission (Tons/Mo)	PM_{10} Emission (Tons/Yr)

88 Conveyor Transfer Points (Uncontrolled)	338,876	3,338,757	0.0011	0.16	1.59
11 Conveyor Transfer Points (Controlled)	57,210	572,103	0.000046	0.01	0.01
13 Screening Points (Uncontrolled)	13,670	136,702	0.0087	0.06	0.60
12 Screening Points (Controlled)	42,209	422,085	0.00074	0.01	0.14
2 Truck Loading Points	45,847	458,466	0.0001	0.01	0.02
13 Stockpile Loading Points	23,338	233,378	Varies	0.04	0.41
				Total:	2.77

c. $PM_{2.5}$ emissions from outdoor emission units:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	$PM_{2.5}$ Emission (Tons/Mo)	$PM_{2.5}$ Emission (Tons/Yr)
88 Conveyor Transfer Points (Uncontrolled)	338,876	3,338,757	0.000167	0.02	0.24
11 Conveyor Transfer Points (Controlled)	57,210	572,103	0.000013	0.01	0.01
13 Screening Points (Uncontrolled)	13,670	136,702	0.001317	0.01	0.09
12 Screening Points (Controlled)	42,209	422,085	0.00005	0.01	0.01
2 Truck Loading Points	45,847	458,466	0.000015	0.01	0.01
13 Stockpile Loading Points	23,338	233,378	Varies	0.01	0.06
				Total:	0.42

The above PM/PM_{10}/$PM_{2.5}$ limits are based upon maximum material throughput, Standard emission factors from AP-42 (Table 11.19.2-2, Fifth Edition, Volume I, Update 2004, August 2004) for conveyors transfer points screening and Truck Loading, stockpile loading emission factor derived using AP-42, Section 13.2.4.3 (Table 13.2.4, AP-42, Fifth Edition, Volume I, November 2006) using coefficients of K=0.74 (PM), K=0.35 (PM_{10}), and $PM_{2.5}$ U (mean windspeed) = 9.0 mph, and M (minimum moisture content) = 1.5% applied to light material stockpile loading.

iii. Combined HAP emissions from Ferrous Material Separation Process shall not exceed the following limits:

Emission Unit	Combined HAPs (Tons/Mo)	Combined HAPs (Tons/Yr)

Non-Ferrous Material Separation Process	0.01	0.01

These limits are based upon metal HAPs being 0.83~~1.33%~~ of the total PM emissions. ~~Measured at the discharge of existing roll media filter during June 2014 metal emission test at General II, LLC.~~

~~c. This permit is issued based on negligible emissions of particulate matter (PM, PM_{10}, and $PM_{2.5}$) from the raw material receiving and handling, one Vibratory Feeder, and 4 Belt Conveyors (skirted or troughing). For this purpose, emissions from each emission unit shall not exceed nominal emission rate of 0.1 lb/hour and 0.44 ton/year for PM, PM_{10}, and $PM_{2.5}$.~~

~~e~~f. Compliance with the annual limits of this permit shall be determined on a monthly basis from the sum of the data for the current month plus the preceding 11 months (running 12 month total).

Commented [R13]: These emission points described in this condition consist of:
E01 (conv.)discharge to shredder feed chute;
Shredder discharge to E05 vibratory conv.;
E05 vibratory Conv. discharge to C001; C001 discharge to C002; and.
C002 discharge to Poker Picker stockpile(s).

Thesse emission points are included in the Ferrous Material Handling System PM emissions