ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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217/785-1705

CONSTRUCTION PERMIT

PERMITTEE

General III, LLC
Attn: Jim Kallas
11600 South Burley Avenue
Chicago, Illinois 60617

Application No.: 19090021 I.D. No.: 031600SFX
Applicant's Designation: Date Received: September 25, 2019
Subject: Scrap Metal Recycling Facility
Date Issued: June 25, 2020
Location: 11600 South Burley Avenue, Chicago, Cook County, 60617

This permit is hereby granted pursuant to the above-referenced application to the above-designated Permittee to CONSTRUCT a Scrap Metal Recycling Facility consisting of the following emission source(s) and/or air pollution control equipment:

Hammermill Shredder System:

One (1) Hammermill Shredder with Integral Water Injection System equipped with capture hood and Cyclone, and controlled by a Roll-Media Filter, 15.0 mmBtu/hour Natural Gas-Fired Regenerative Thermal Oxidizer (RTO), and Quench/Packed Tower Scrubber with feed and takeaway conveyors;
One (1) Vibratory Conveyor; and
One (1) Shredder Infeed Conveyor

Ferrous Material Separation System:
70 Material Transfer Points including:
- Seven (7) Magnetic Separators;
- Two (2) Z-Box Separators with Cyclones;
- Two (2) Ferrous Metal Stacking Conveyors;
- One (1) Auto Shredder Residue (ASR) Stacking Conveyor

2 Truck/Rail Loading Area
1 Barge Loading Point
7 material stockpiles including:
- 2 Poker Picker Stockpiles
- 2 Ferrous Metal Stockpiles
- 1 ASR Stockpile
- 1 Raw Material Stockpile
- 1 Fluff Stockpile (bin).

Non-Ferrous Material Separation System:
88 Uncontrolled Transfer Points including:
- Fifty-three (53) Conveyors;
- Twenty (20) Magnetic Separators;
- Fourteen (14) Eddy Current Separators (ECS) located in Enclosures;
- One (1) Low Speed Shredder for Size Reduction of Clean Non-Ferrous Material;

11 Controlled Transfer Points including:
- Nine (9) Conveyors;
- One (1) Air Vibe (Air Classifier) with Cyclone;
- One (1) Vibratory Batch Feeder;

13 Uncontrolled Screening Points including:
- Five (5) Polishers (Air Classifiers) with Cyclone;
- One (1) Vibratory Feeder;
- Three (3) Tec Screeners;

12 Controlled Screening Points including:
- Six (6) Wind Sifters (Air Classifiers) with Cyclones;
- Three (3) Tec Screeners;
- Six (6) AEI Ecostar Screeners;

2 Truck Loading Points including:
- One (1) ASR Feed Hopper with Vibratory Batch Feeder;

13 Stockpile Loading Points

Fines Processing Building - with All Equipment in Building Controlled by Dust Collector DC-01

Miscellaneous Fugitive Sources

Raw Material Unloading/Handling;
Intermediate Ferrous Material and Product Stockpiles;
Fluff Storage and Loadout;
Material Loadout;
Roadways-Paved and unpaved; and
Parking Areas

This Permit is subject to standard conditions attached hereto and the following special condition(s):

1a. This permit is issued based on the emissions of Hazardous Air Pollutants (HAP) as listed in Section 112(b) of the Clean Air Act from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System being less than 10 tons/year of any single HAP and 25 tons/year of any combination of such HAPs. As a result, this permit is issued based on the emissions of all HAPs from the above-listed equipment not triggering the requirements of Section 112(g) of the Clean Air Act.

b. This permit is issued based on the construction of the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System not constituting a new major source or major modification pursuant to Title I of the Clean Air Act, specifically 40 CFR 52.21 (Prevention of Significant Deterioration (PSD)). The source has requested that the Illinois EPA establish emission limitations and other appropriate terms and conditions in this permit that limit the emissions of Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Lead (Pb) from the above-listed equipment below the levels that would trigger the applicability of these rules.

c. This permit is issued based on the construction of the Hammermill Shredder System not constituting a new major source or major modification pursuant to Title I of the Clean Air Act, specifically 35 Ill. Adm. Code Part 203 (Major Stationary Sources Construction and Modification). The source has requested that the Illinois EPA establish emission limitations and other appropriate terms and conditions in this permit that limit the emissions of Volatile Organic Material (VOM) from the above-listed equipment below the levels that would trigger the applicability of these rules.

d. This permit is issued based on the analysis of the data from the dispersion modeling of the source's Lead (Pb) emissions, that relate to the expected emissions from the project to the maximum off-site ambient air impacts not to exceed the primary and secondary National Ambient Air Quality Standards (NAAQS) for Lead, specifically 40 CFR 50.16. Furthermore, this permit is also issued based on the analysis of the data from the dispersion modeling of emissions of Manganese (Mn) and other metal HAPs, that relate the expected emissions from the project to corresponding maximum off-site ambient air impacts not to exceed the Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels, hazardous air contaminant air quality standards in the Wisconsin Department of Natural Resources air toxics rule (Wisconsin Administrative Code, Chapter NR 445 - Control of Hazardous Pollutants), and an inhalation risk greater than 1 in 1,000,000 for carcinogenic metals with a unit risk factor established by the United States Environmental Protection Agency (USEPA) or the California Air Resources Board (CARB).

e. For purposes of this permit, General III, LLC is considered a single source with South Chicago Property Management, Ltd. (I.D. No. 031600GYI, located at 11600 South Burley Ave, Chicago).

f. Operation of the Scrap Metal Recycling Facility listed above is allowed under this construction permit for a period of twelve (12) months from the date that raw material is first processed through the Hammermill Shredder. This condition supercedes Standard Condition 1 of this construction permit

g. The operation of the emission units under this Construction Permit shall not begin until construction of the associated air pollution control equipment is complete and reasonable measures short of actual operation have been taken to verify proper operation of the air pollution control equipment.

2a. Pursuant to 40 CFR 50.16(a), the national primary and secondary ambient air quality standards for Lead (Pb) and its compounds are 0.15 micrograms per cubic meter, arithmetic mean concentration over a 3-month period, measured in the ambient air as Pb either by:

i. A reference method based on Appendix G of 40 CFR Part 50 and designated in accordance with 40 CFR Part 53;

ii. An equivalent method designated in accordance with 40 CFR Part 53.

b. Pursuant to 40 CFR 50.16(b), the national primary and secondary ambient air quality standards for Pb are met when the maximum arithmetic 3-month mean concentration for a 3-year period, as determined in accordance with Appendix R of 40 CFR Part 50, is less than or equal to 0.15 micrograms per cubic meter.

3a. The Hammermill Shredder System, Ferrous Material Separation System, Non-Ferrous Material Separation System, and Miscellaneous Fugitive Sources are subject to 35 Ill. Adm. Code Part 212 Subpart B (Visible Emissions). Pursuant to 35 Ill. Adm. Code 212.123(a), no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to 35 Ill. Adm. Code 212.122.

b. Pursuant to 35 Ill. Adm. Code 212.123(b), the emission of smoke or other particulate matter from any such emission unit may have an opacity greater than 30 percent but not greater than 60 percent for a period or periods aggregating 8 minutes in any 60 minute period provided that such opaque emissions permitted during any 60 minute period shall occur from only one such emission unit located within a 305 m (1000 ft) radius from the center point of any other such emission unit owned or operated by such person, and provided further that such opaque emissions permitted from each such emission unit shall be limited to 3 times in any 24 hour period.

c. This source is subject to 35 Ill. Adm. Code Part 212 Subpart K (Fugitive Particulate Matter). Pursuant to 35 Ill. Adm. Code 212.301, no person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith at a point beyond the property line of the source.

d. The Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System are subject to 35 Ill. Adm. Code Part 212 Subpart L (Particulate Matter Emissions from Process Emission Units). Pursuant to 35 Ill. Adm. Code 212.321(a), except as further provided in 35 Ill. Adm. Code Part 212, no person shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from any new process emission unit which, either alone or in combination with the emission of particulate matter from all other similar process emission units for which construction or modification commenced on or after April 14, 1972, at a source or premises, exceeds the allowable emission rates specified in 35 Ill. Adm. Code 212.321(c).

e. Pursuant to 35 Ill. Adm. Code 212.321(b), interpolated and extrapolated values of the data in 35 Ill. Adm. Code 212.321(c) shall be determined by using the equation:

$$E = A(P)^B$$

where:

P = Process weight rate; and
E = Allowable emission rate; and,

i. Up to process weight rates of 408 Mg/hr (450 T/hr):

	Metric	English
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	1.214	2.54
B	0.534	0.534

ii. For process weight rate greater than or equal to 408 Mg/hr (450 T/hr):

	Metric	English
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	11.42	24.8
B	0.16	0.16

f. Pursuant to 35 Ill. Adm. Code 212.321(c), Limits for Process Emission Units for Which Construction or Modification Commenced on or After April 14, 1972:

Metric		English	
P	E	P	E
Mg/hr	kg/hr	T/hr	lbs/hr
0.05	0.25	0.05	0.55
0.1	0.29	0.10	0.77
0.2	0.42	0.20	1.10
0.3	0.64	0.30	1.35
0.4	0.74	0.40	1.58
0.5	0.84	0.50	1.75
0.7	1.00	0.75	2.40
0.9	1.15	1.00	2.60
1.8	1.66	2.00	3.70
2.7	2.1	3.00	4.60
3.6	2.4	4.00	5.35
4.5	2.7	5.00	6.00
9.	3.9	10.00	8.70
13.	4.8	15.00	10.80
18.	5.7	20.00	12.50
23.	6.5	25.00	14.00
27.	7.1	30.00	15.60
32.	7.7	35.00	17.00
36.	8.2	40.00	18.20
41.	8.8	45.00	19.20
45.	9.3	50.00	20.50
90.	13.4	100.00	29.50
140.	17.0	150.00	37.00

Metric		English	
P	E	P	E
Mg/hr	kg/hr	T/hr	lbs/hr
180.	19.4	200.00	43.00
230.	22.	250.00	48.50
270.	24.	300.00	53.00
320.	26.	350.00	58.00
360.	28.	400.00	62.00
408.	30.1	450.00	66.00
454.	30.4	500.00	67.00

where:

P = Process weight rate in metric or T/hr, and
E = Allowable emission rate in kg/hr or lbs/hr.

g. The Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System are subject to 35 Ill. Adm. Code 212.324 (Process Emission Units in Certain Areas). Pursuant to 35 Ill. Adm. Code 212.324(b), except as otherwise provided in 35 Ill. Adm. Code 212.324, no person shall cause or allow the emission into the atmosphere, of PM_{10} from any process emission unit to exceed 68.7 mg/scm (0.03 gr/scf) during any one-hour period.

h. This source is subject to 35 Ill. Adm. Code Part 212 Subpart U (Additional Control Measures). Pursuant to 35 Ill. Adm. Code 212.700(a), 35 Ill. Adm. Code 212 Subpart U (Additional Control Measures) shall apply to those sources in the areas designated in and subject to 35 Ill. Adm. Code 212.324(a)(1) or 212.423(a) and that have actual annual source-wide emissions of PM_{10} of at least fifteen (15) tons per year.

4. The RTO associated with Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 214 Subpart K (Process Emission Sources). Pursuant to 35 Ill. Adm. Code 214.301, except as further provided by 35 Ill. Adm. Code Part 214, no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission source to exceed 2000 ppm.

5a. The Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 218 Subpart G (Use of Organic Material). Pursuant to 35 Ill. Adm. Code 218.301, no person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere from any emission unit, except as provided in 35 Ill. Adm. Code 218.302, 218.303, or 218.304 and the following exception: If no odor nuisance exists the limitation of 35 Ill. Adm. Code Part 218 Subpart G shall only apply to photochemically reactive material.

b. Pursuant to 35 Ill. Adm. Code 218.302(a), emissions of organic material in excess of those permitted by 35 Ill. Adm. Code 218.301 are allowable if such emissions are controlled by one of the following methods:

Flame, thermal or catalytic incineration so as either to reduce such emissions to 10 ppm equivalent methane (molecular weight 16) or less, or to convert 85 percent of the hydrocarbons to carbon dioxide and water.

c. The Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 218 Subpart TT (Other Emission Units). Pursuant to 35 Ill. Adm. Code 218.980(a):

i. A source is subject to 35 Ill. Adm. Code Part 218 Subpart TT if it contains process emission units not regulated by 35 Ill. Adm. Code Part 218 Subparts B, E, F (excluding 35 Ill. Adm. Code 218.204 (l)), H (excluding 35 Ill. Adm. Code 218.405), Q, R, S, T (excluding 35 Ill. Adm. Code 218.486), V, X, Y, Z or BB of this Part, which as a group both:

A. Have maximum theoretical emissions of 90.7 Mg (100 tons) or more per calendar year of VOM, and

B. Are not limited to less than 90.7 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment through production or capacity limitations contained in a federally enforceable permit or a SIP revision.

ii. If a source is subject to 35 Ill. Adm. Code Part 218 Subpart TT as provided in 35 Ill. Adm. Code Part 218 Subpart TT, the requirements of 35 Ill. Adm. Code Part 218 Subpart TT shall apply to a source's VOM emission units which are not included within any of the categories specified in 35 Ill. Adm. Code Part 218 Subparts B, E, F, H, Q, R, S, T, V, X, Y, Z, AA, BB, PP, QQ, or RR or which are not exempted from permitting requirements pursuant to 35 Ill. Adm. Code 201.146.

d. Pursuant to 35 Ill. Adm. Code 218.986(a), every owner or operator of an emission unit subject to 35 Ill. Adm. Code 218 Subpart TT shall comply with the requirements of 35 Ill. Adm. Code 218.986(a), (b), (c), (d), or (e) below.

Emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

6. This permit is issued based on the Scrap Metal Recycling Facility not being subject to the New Source Performance Standards (NSPS) for Metallic Mineral Processing Plants, 40 CFR 60 Subpart LL because the Raw Material Receiving and Handling System, Hammermill Shredder System, Ferrous Material Separation System, Non-Ferrous Material Separation System, and Fines Processing System at this source are not used to produce metallic mineral concentrates from ore.

7a. This permit is issued based on the Scrap Metal Recycling Facility not being subject to the National Emission Standards for Hazardous Air

Pollutants (NESHAP) from Off-Site Waste and Recovery Operations, 40 CFR 63 Subpart DD, because the plant site is not a major source of HAP emissions as defined in 40 CFR 63.2.

b. This permit is issued based on the Scrap Metal Recycling Facility not being subject to the NESHAP for Primary Nonferrous Metals Area Sources—Zinc, Cadmium, and Beryllium, 40 CFR 63 Subpart GGGGGG, because the source will not be engaged in primary zinc production or primary beryllium production.

c. This permit is issued based on the Scrap Metal Recycling Facility not being subject to the NESHAP for Secondary Nonferrous Metals Processing Area Sources, 40 CFR 63 Subpart TTTTTT, because the source will not be engaged in secondary nonferrous metals processing as defined in 40 CFR 63.11472.

d. This permit is issued based on the Scrap Metal Recycling Facility not being subject to the NESHAP for Nine Metal Fabrication and Finishing Source Categories, 40 CFR 63 Subpart XXXXXX, because the source will not be primarily engaged in the operations in one of the nine source categories listed in 40 CFR 63.11514(a)(1) through (9).

8a. Pursuant to 35 Ill. Adm. Code 212.314, 35 Ill. Adm. Code 212.301 shall not apply and spraying pursuant to 35 Ill. Adm. Code 212.304 through 212.310 and 35 Ill. Adm. Code 212.312 shall not be required when the wind speed is greater than 40.2 km/hr (25 mph). Determination of wind speed for the purposes of 35 Ill. Adm. Code 212.314 shall be by a one-hour average or hourly recorded value at the nearest official station of the U.S. Weather Bureau or by wind speed instruments operated on the site. In cases where the duration of operations subject to 35 Ill. Adm. Code 212.314 is less than one hour, wind speed may be averaged over the duration of the operations on the basis of on-site wind speed instrument measurements.

b. Pursuant to 35 Ill. Adm. Code 212.324(d), the mass emission limits contained in 35 Ill. Adm. Code 212.324(b) and (c) shall not apply to those emission units with no visible emissions other than fugitive particulate matter; however, if a stack test is performed, 35 Ill. Adm. Code 212.324(d) is not a defense finding of a violation of the mass emission limits contained in 35 Ill. Adm. Code 212.324(b) and (c).

9a. Pursuant to 35 Ill. Adm. Code 212.324(f), for any process emission unit subject to 35 Ill. Adm. Code 212.324(a), the owner or operator shall maintain and repair all air pollution control equipment in a manner that assures that the emission limits and standards in 35 Ill. Adm. Code 212.324 shall be met at all times. 35 Ill. Adm. Code 212.324(f) shall not affect the applicability of 35 Ill. Adm. Code 201.149. Proper maintenance shall include the following minimum requirements:

i. Visual inspections of air pollution control equipment;

ii. Maintenance of an adequate inventory of spare parts; and

iii. Expeditious repairs, unless the emission unit is shutdown.

b. Pursuant to 35 Ill. Adm. Code 212.701(a), those sources subject to 35 Ill. Adm. Code Part 212 Subpart U shall prepare contingency measure plans reflecting the PM_{10} emission reductions set forth in 35 Ill. Adm. Code 212.703. These plans shall become federally enforceable permit conditions. Such plans shall be submitted to the Illinois EPA by November 15, 1994. Notwithstanding the foregoing, sources that become subject to the provisions of 35 Ill. Adm. Code Part 212 Subpart U after July 1, 1994, shall submit a contingency measure plan to the Illinois EPA for review and approval within ninety (90) days after the date such source or sources became subject to the provisions of 35 Ill. Adm. Code Part 212 Subpart U or by November 15, 1994, whichever is later. The Illinois EPA shall notify those sources requiring contingency measure plans, based on the Illinois EPA's current information; however, the Illinois EPA's failure to notify any source of its requirement to submit contingency measure plans shall not be a defense to a violation of 35 Ill. Adm. Code Part 212 Subpart U and shall not relieve the source of its obligation to timely submit a contingency measure plan.

c. Pursuant to 35 Ill. Adm. Code 212.703(a), all sources subject to 35 Ill. Adm. Code Part 212 Subpart U shall submit a contingency measure plan. The contingency measure plan shall contain two levels of control measures:

i. Level I measures are measures that will reduce total actual annual source-wide fugitive emissions of PM_{10} subject to control under 35 Ill. Adm. Code 212.304, 212.305, 212.306, 212.308, 212.316(a) through (e), 212.424 or 212.464 by at least 15%.

ii. Level II measures are measures that will reduce total actual annual source-wide fugitive emissions of PM_{10} subject to control under 35 Ill. Adm. Code 212.304, 212.305, 212.306, 212.308, 212.316(a) through (e), 212.424 or 212.464 by at least 25%.

d. Pursuant to 35 Ill. Adm. Code 212.703(b), a source may comply with 35 Ill. Adm. Code Part 212 Subpart U through an alternative compliance plan that provides for reductions in emissions equal to the level of reduction of fugitive emissions as required at 35 Ill. Adm. Code 212.703(a) and which has been approved by the Illinois EPA and USEPA as federally enforceable permit conditions. If a source elects to include controls on process emission units, fuel combustion emission units, or other fugitive emissions of PM_{10} not subject to 35 Ill. Adm. Code 212.304, 212.305, 212.306, 212.308, 212.316(a) through (e), 212.424 or 212.464 at the source in its alternative control plan, the plan must include a reasonable schedule for implementation of such controls, not to exceed two (2) years. This implementation schedule is subject to Illinois EPA review and approval.

e. Pursuant to 35 Ill. Adm. Code 212.704(b), if there is a violation of the ambient air quality standard for PM_{10} as determined in accordance with 40 CFR Part 50, Appendix K, the Illinois EPA shall notify the source or sources the Illinois EPA has identified as likely to be causing or contributing to one or more of the exceedances leading to such violation, and such source or sources shall implement Level I or Level II measures, as determined pursuant to 35 Ill. Adm. Code 212.704(e). The source or sources so identified shall implement such measures corresponding to fugitive emissions within ninety (90) days after receipt of a notification and shall implement such measures corresponding to any nonfugitive emissions according to the approved schedule set forth in such source's alternative control plan. Any source identified as causing or contributing to a violation of the ambient air quality standard for PM_{10} may appeal any finding of culpability by the Illinois EPA to the Illinois Pollution Control Board pursuant to 35 Ill. Adm. Code 106 Subpart J.

f. Pursuant to 35 Ill. Adm. Code 212.704(e), the Illinois EPA shall require that sources comply with the Level I or Level II measures of their contingency measure plans, pursuant 35 Ill. Adm. Code 212.704(b), as follows:

   i. Level I measures shall be required when the design value of a violation of the 24-hour ambient air quality standard, as computed pursuant to 40 CFR 50, Appendix K, is less than or equal to 170 ug/m^3.

   ii. Level II measures shall be required when the design value of a violation of the 24-hour ambient air quality standard, as computed pursuant to 40 CFR 50, Appendix K, exceeds 170 ug/m^3.

10a. The Scrap Metal Recycling Facility shall be operated under the provisions of a Fugitive Emissions Operating Program. This operating program was submitted by the Permittee and designed to limit fugitive particulate matter emissions to ensure compliance with 35 Ill. Adm. Code 212.301.

b. The Fugitive Emissions Operating Program, as submitted by the Permittee pursuant to Condition 10(a) dated June 25, 2020, is incorporated herein by reference. The source shall comply with the provisions of this Program and any amendments to the Program submitted pursuant to Condition 10(c).

c. The Fugitive Emissions Operating Program shall be amended from time to time by the Permittee so that the operating Program is current. Such amendments shall be consistent with Condition 10(a) and shall be submitted to the Illinois EPA within thirty (30) days of amendment. Any future revision to the Program made by the Permittee during the permit term is automatically incorporated by reference unless expressly disapproved by the Illinois EPA within thirty (30) days of submission. In the event that the Illinois EPA notifies the Permittee that further information regarding the revision to the Program is needed, the Permittee shall respond to the notice within thirty (30) days of receipt of notification.

d. The Hammermill Shredder System shall be operated under the provisions of a Feedstock Management Plan. This plan shall be submitted to the

Illinois EPA for review and approval at least ninety (90) days prior to initially receiving recycling materials at the facility. At a minimum, this plan must contain the following:

i. Incoming material restrictions;

ii. Load inspection procedures;

iii. List of materials accepted requiring special handling;

iv. Procedures for each of the materials requiring special handling;

v. Personnel training procedures.

11a. The Roll-Media Filter, RTO, Quench/Packed Tower Scrubber, and Dust Collectors (DC-01 through DC-04) shall be in operation at all times when the associated emission units are in operation and emitting air contaminants.

b. The RTO combustion chambers shall be preheated to at least the manufacturer's recommended temperature, but no less than the temperature at which compliance was demonstrated in the most recent compliance test, or 1,400°F in the absence of a compliance test. This temperature shall be maintained during operation of the Metal Shredder System and calculated as a three-hour block average.

c. The RTO shall only be operated with natural gas as the fuel. The use of any other fuel in the RTO may require that the Permittee first obtain a construction permit from the Illinois EPA and then perform stack testing to verify compliance with all applicable requirements.

d. The RTO associated with the Hammermill Shredder System shall be equipped with a temperature monitoring device that is installed, calibrated, operated, and maintained, in accordance with vendor/manufacturer specifications and 35 Ill. Adm. Code 218.105(d)(2).

e. The Quench/Packed Tower Scrubber associated with the Hammermill Shredder System shall be equipped with a monitoring device for pressure differential, scrubbant liquid flow rate, and pH of the scrubbant liquid. These monitoring devices shall be installed, calibrated, operated, and maintained, in accordance with vendor/manufacturer specifications. The data measured by this device shall be automatically recorded on at least a 15 block minute averages basis and on an hourly average in an electronic database.

f. The Roll-Media Filter associated with the Hammermill Shredder System shall be equipped with a monitoring device for pressure differential. This monitoring device shall be installed, calibrated, operated and maintained, in accordance with vendor/manufacturer specifications. The data measured by this device shall be automatically recorded on at least a 15-block minute average basis and on an hourly average in an electronic database.

g. The Dust Collector (DC-01) associated with the Fines Processing Building shall be equipped with a monitoring device for pressure differential. This monitoring device shall be installed, calibrated, operated, and maintained, in accordance with vendor/manufacturer specifications. The data measured by this device shall be automatically recorded on at least an hourly basis in an electronic database.

h. The monitoring devices required in conditions 11(e)-(h) shall be installed and fully operational at prior to first processing material through the Hammermill Shredder System.

i. The Permittee shall operate the capture system, Roll-Media Filter, RTO and the Quench/Packed Tower Scrubber associated with the Hammermill Shredder System, Dust Collectors (DC-01 through DC-04) and equipment used for the control of fugitive dust identified in the Fugitive Emissions Operating Program under the provisions of an Operation and Maintenance Plan. At least thirty (30) days prior to first processing material through the Hammermill Shredder System, the Permittee shall submit to the Illinois EPA for review and approval an Operation and Maintenance Plan for the capture system, Roll-Media Filter, RTO and the Quench/Packed Tower Scrubber associated with the Hammermill Shredder System, Dust Collectors (DC-01 through DC-04) and equipment used for the control of fugitive dust identified in the Fugitive Emissions Operating Program. This plan shall provide specific operating parameters and inspection, and maintenance practices and procedures for the for each system or control device identified in this condition, including frequencies of such specific activities and actions and associated recordkeeping procedures.

j. The Permittee shall install, operate, and maintain a continuous gas flammability monitoring device for the shredder exhaust gas stream. This device shall measure the percent of the Lower Explosive Limit (% LEL) or percent of the Lower Flammability Limit (% LFL) of the shredder exhaust gas. This monitoring device shall have an accuracy of at least +/-3 percent of full scale. Values measured by this device shall be automatically recorded at least once per second and stored in an electronic data base.

k. The Permittee shall install, operate and maintain a continuous monitoring device for the control train for the Hammermill Shredder System for one of the following operational parameters. This monitoring device shall make measurements at least every minute and have an accuracy of at least ± 5 percent. The data measured by this device shall be automatically recorded on at least a minute by minute basis and on an hourly average in an electronic database. The Permittee shall determine the gas flow rate to be used to calculate VOM emissions from a Bypass Event using data collected by this monitoring system.

   i. The amperage or usage of electrical power by the motor for the Roll Media Filter fan;

ii. The shredder exhaust gas flow rate; or.

iii. Other operational parameter(s) approved by the Illinois EPA.

l. The Permittee shall install, operate, and maintain a continuous monitoring device for the status of the emergency bypass damper for the RTO in the control train for the Hammermill Shredder System, i.e., whether this damper is closed or open. The data collected by this device shall be automatically recorded in an electronic database.

m. The Permittee shall operate the continuous monitoring devices required by Condition 11(j), (k) and (l) at all times that the Hammermill Shredder System is in operation.

12a. Operation of the source's emission units and activities shall not exceed the following limits:

i. Hours of operation:

Site Operation	Monday to Friday		Saturday	
Ferrous System Operation (includes Hammermill Shredder RTO/Scrubber Stack and Rail and Truck Loading)	7:00 AM - 7:00 PM	12 hrs/day	7:00 AM - 5:00 PM	10 hrs/day
Barge, Loading	7:00 AM - 3:00 PM	8 hrs/day	7:00 AM - 3:00 PM	8 hrs/day
Non-Ferrous System Operation	5:00 AM - 11:00 PM	18 hrs/day	5:00 AM - 11:00 PM	18 hrs/day
Roadway Fugitive Emissions (Facility Vehicle Traffic)*	5:00 AM - 7:00 PM	14 hrs/day	5:00 AM - 5:00 PM	12 hrs/day

* The roadway fugitive emissions (Facility Vehicle Traffic) operation limitations in the table above is only intended to reflect haul truck traffic (semi-trailers) on specified road segments accompanying deliveries of metal scrap and removal of waste material.

ii. The limitations on hours of operation for the source are based upon the meteorological hours modeled for each operation as specified on Table 1 of the modeling analysis and page 1 of supplement No. 1 to the Air Dispersion Modeling Report, dated January 24, 2020, for assessment of metal emission impacts.

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

i. VOM emissions:

Emission Unit	Process Rate (Tons/Mo)	(Tons/Yr)	Uncontrolled Emission Factor (lb/Ton)	VOM Emission (Tons/Mo)	(Tons/Yr)
Hammermill Shredder RTO/Scrubber Stack	100,000	1,000,000	0.5119	0.51	5.12

These limits are based on maximum shredder material throughput, an uncontrolled emission factor derived from a stack test at the inlet of the RTO in November 2019 at GII, LLC (I.D. # 031600BTB), and 98% removal efficiency by the RTO/Scrubber. All measured total hydrocarbon (THC) emissions are assumed to be VOM.

ii. HAP emissions:

Emission Unit	Lead (Pb) (T/Mo)	(T/Yr)	Manganese (Mn) (T/Mo)	(T/Yr)	Hydrochloric Acid (HCl) (T/Mo)	(T/Yr)	Combined HAPs[1] (T/Mo)	(T/Yr)
Metal Shredder RTO/Scrubber Stack	0.000138	0.00138	0.000199	0.00199	0.08	0.77	0.13	1.33

[1] Combined HAPs means the total of all individual HAPs (as defined in Section 112(b) of the Clean Air Act) that are emitted from the Hammermill Shredder System.

These limits are based on the maximum shredder material throughput in Condition 12(b)(i) above and measured emission rates from the November 2019 stack test at GII, LLC (I.D. # 031600BTB) adjusted by safety factor of 2.0.

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

Emission Unit	Process Rate (Tons/Mo)	(Tons/Yr)	Emission Factor (lb/Ton)	PM, PM_{10}, and $PM_{2.5}$ Emissions (Tons/Mo)	(Tons/Yr)
Metal Shredder RTO/Scrubber Stack	100,000	1,000,000	0.0047	0.47	4.70

These limits are based on maximum shredder material throughput in Condition 12(b)(i) above, emission factors derived from the May/June 2018 stack test at GII, LLC (I.D. # 031600BTB) adjusted by a safety factor of 2.0, and all measured filterable PM assumed to be PM_{10} and $PM_{2.5}$.

c. Emissions from fuel combustion in the RTO associated with the Hammermill Shredding System shall not exceed the following limits:

i. Natural gas usage: 6.57 mmscf/month, 51.47 mmscf/year

ii. Emissions from the combustion of natural gas:

Pollutant	Emission Factor (lbs/mmscf)	Emissions (Tons/Mo)	Emissions (Tons/Yr)
Carbon Monoxide (CO)	583.55	1.50	15.02
Nitrogen Oxides (NO_x)	100.0	0.26	2.57
Particulate Matter (PM, PM_{10}, and $PM_{2.5}$)	7.6	0.02	0.20
Sulfur Dioxide (SO_2)	0.6	0.01	0.09

These limits are based on the maximum firing rate of the RTO burner (15.0 mmBtu/hour), maximum natural gas usage, 12.86 tons/year of CO emissions and 0.05 tons/year of SO_2 emissions based on data from the November 2019 stack test at GII, LLC (I.D. # 031600BTB), and standard emission factors (Tables 1.4-1 and 1.4-2, AP-42, Fifth Edition, Volume I, Supplement D, July 1998).

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

i. Material process rates and Particulate Matter (PM) Emissions:

Emission Unit	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM Emissions (Tons/Mo)	PM Emissions (Tons/Yr)
70 Conveyor Transfer Points	1,444,050	14,440,500	0.00014	0.10	0.96
2 Rail/Truck Loading areas and 1 Barge loading point	137,600	1,376,000	0.000204	0.01	0.14
7 Stockpile Loading Points	300,000	3,000,000	0.00122	0.18	1.83
				Total:	2.93

ii. PM_{10} and $PM_{2.5}$ Emissions:

Emission Units	PM_{10} Emission Factor (lb/Ton)	PM_{10} Emissions (Tons/Mo)	PM_{10} Emissions (Tons/Yr)	$PM_{2.5}$ Emission Factor (lb/Ton)	$PM_{2.5}$ Emissions (Tons/Mo)	$PM_{2.5}$ Emissions (Tons/Yr)
70 Conveyor Transfer Points	0.000046	0.03	0.31	0.000013	0.01	0.09
2 Rail/Truck Loading areas and 1 Barge loading point	0.00010	0.01	0.07	0.000015	0.01	0.01
7 Stockpile Loading Points	0.00058	0.09	0.87	0.000087	0.01	0.13
		Totals:	1.25			0.23

iii. HAP emissions:

Emission Unit	Lead (Pb) Emissions (Tons/Mo)	(Tons/Yr)	Manganese (Mn) Emissions (Tons/Mo)	(Tons/Yr)	Combined HAP Emissions[2] (Tons/Mo)	(Tons/Yr)
Ferrous Material Separation Process	0.0007	0.0069	0.0004	0.0042	0.0015	0.0143

[2] Combined HAPs means the total of all individual HAPs (as defined in Section 112(b) of the Clean Air Act) that are emitted from the Ferrous Material Separation Process.

iv. The above limits for PM, PM_{10}, and $PM_{2.5}$ are based on the 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. The above limits for HAP emissions limits are based upon total metal HAPs being 0.49% of the estimated total PM emissions based on metal HAP analyses performed on a site-specific sample of material at GII representing anticipated characteristics of Ferrous Material Processing.

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

i. PM, PM_{10}, and $PM_{2.5}$ emissions for Fines Separation System emission units and activities inside a building controlled by Dust Collector DC-01 shall not exceed 0.15 tons/month and 1.44 tons/year. This limit is based on PM, PM_{10}, and $PM_{2.5}$ emissions being calculated by using the stack flow rate (12,000 cfm) and grain loading of 0.005 gr/dscf and hours of operation.

ii. Emissions from and operation of other Non-Ferrous Separation System emission units shall not exceed the following limits:

A. Material process rates and Particulate Matter (PM) Emissions:

Emission Units	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM Emission (Tons/Mo)	PM Emission (Tons/Yr)
88 Conveyor Transfer Points (Uncontrolled)	333,876	3,338,757	0.00300	0.43	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	45,847	458,466	0.00020	0.01	0.05
13 Stockpile Loading Points	23,338	233,378	0.00737	0.09	0.86
				Total:	7.40

B. PM_{10} and $PM_{2.5}$ emissions from outdoor emission units:

Emission Units	PM_{10} Emission Factor (lb/Ton)	PM_{10} Emissions (Tons/Mo)	PM_{10} Emissions (Tons/Yr)	$PM_{2.5}$ Emission Factor (lb/Ton)	$PM_{2.5}$ Emission (Tons/Mo)	$PM_{2.5}$ Emission (Tons/Yr)
88 Conveyor Transfer Points (Uncontrolled)	0.0011	0.16	1.59	0.000167	0.02	0.24
11 Conveyor Transfer Points (Controlled)	0.000046	0.01	0.01	0.000013	0.01	0.01
13 Screening Points (Uncontrolled)	0.0087	0.06	0.59	0.001317	0.01	0.09
12 Screening Points (Controlled)	0.00074	0.01	0.14	0.00005	0.01	0.01
2 Truck Loading Points	0.0001	0.01	0.02	0.000015	0.01	0.01
13 Stockpile Loading Points	0.00351	0.04	0.41	0.00051	0.01	0.06
		Totals:	2.76			0.41

C. The above limits for PM, PM_{10}, and $PM_{2.5}$ are based on the 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. HAP emissions from Non-Ferrous Material Separation Process shall not exceed the following limits:

Emission Unit	Lead (Pb) Emissions (Tons/Mo)	(Tons/Yr)	Manganese (Mn) Emissions (Tons/Mo)	(Tons/Yr)	Combined HAP Emissions[3] (Tons/Mo)	(Tons/Yr)
Non-Ferrous Material Separation Process	0.0042	0.0417	0.0016	0.0156	0.01	0.07

[3] Combined HAPs means the total of all individual HAPs (as defined in Section 112(b) of the Clean Air Act) that are emitted from the Non-Ferrous Material Separation Process.

These limits are based on total metal HAPs being 0.83% of the estimated total PM emissions based on metal HAP analyses performed on a site-specific sample of material at GII representing anticipated characteristics of Non-Ferrous Material Processing.

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).

13a. Pursuant to 35 Ill. Adm. Code 201.282, every emission source or air pollution control equipment shall be subject to the following testing requirements for the purpose of determining the nature and quantities of specified air contaminant emissions and for the purpose of determining ground level and ambient air concentrations of such air contaminants:

i. Testing by Owner or Operator. The Illinois EPA may require the owner or operator of the emission source or air pollution control equipment to conduct such tests in accordance with procedures adopted by the Illinois EPA, at such reasonable times as may be specified by the Illinois EPA and at the expense of the owner or operator of the emission source or air pollution control equipment. The Illinois EPA may adopt procedures detailing methods of testing and formats for reporting results of testing. Such procedures and revisions thereto, shall not become effective until filed with the Secretary of State, as required by the APA Act. All such tests shall be made by or under the direction of a person qualified by training and/or experience in the field of air pollution testing. The Illinois EPA shall have the right to observe all aspects of such tests.

ii. Testing by the Illinois EPA. The Illinois EPA shall have the right to conduct such tests at any time at its own expense. Upon request of the Illinois EPA, the owner or operator of the emission source or air pollution control equipment shall provide, without charge to the Illinois EPA, necessary holes in stacks or ducts and other safe and proper testing facilities, including scaffolding, but excluding instruments and sensing devices, as may be necessary.

14a. Pursuant to 35 Ill. Adm. Code 212.107, for both fugitive and nonfugitive particulate matter emissions, a determination as to the presence or absence of visible emissions from emission units shall be conducted in accordance with Method 22, 40 CFR Part 60, Appendix A, except that the length of the observing period shall be at the discretion of the observer, but not less than one minute. 35 Ill. Adm. Code 212 Subpart A shall not apply to 35 Ill. Adm. Code 212.301.

b. Pursuant to 35 Ill. Adm. Code 212.109, except as otherwise provided in 35 Ill. Adm. Code Part 212, and except for the methods of data reduction when applied to 35 Ill. Adm. Code 212.122 and 212.123, measurements of opacity shall be conducted in accordance with Method 9, 40 CFR Part 60, Appendix A, and the procedures in 40 CFR 60.675(c) and (d), if applicable, except that for roadways and parking areas the number of readings required for each vehicle pass will be three taken at 5-second intervals. The first reading shall be at the point of maximum opacity and second and third readings shall be made at the same point, the observer standing at right angles to the plume at least 15 feet away from the plume and observing 4 feet above the surface of the roadway or parking area. After four vehicles have passed, the 12 readings will be averaged.

c. Pursuant to 35 Ill. Adm. Code 212.110(a), measurement of particulate matter emissions from stationary emission units subject to 35 Ill. Adm. Code Part 212 shall be conducted in accordance with 40 CFR Part 60, Appendix A, Methods 5, 5A, 5D, or 5E.

d. Pursuant to 35 Ill. Adm. Code 212.110(b), the volumetric flow rate and gas velocity shall be determined in accordance with 40 CFR Part 60, Appendix A, Methods 1, 1A, 2, 2A, 2C, 2D, 3, and 4.

e. Pursuant to 35 Ill. Adm. Code 212.110(c), upon a written notification by the Illinois EPA, the owner or operator of a particulate matter emission unit subject to 35 Ill. Adm. Code Part 212 shall conduct the applicable testing for opacity or visible emissions at such person's own expense, to demonstrate compliance. Such test results shall be submitted to the Illinois EPA within thirty (30) days after conducting the test unless an alternative time for submittal is agreed to by the Illinois EPA.

15. Pursuant to 35 Ill. Adm. Code 218.988(a), when in the opinion of the Illinois EPA it is necessary to conduct testing to demonstrate compliance with 35 Ill. Adm. Code 218.986, the owner or operator of a VOM emission unit subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart TT shall, at his own expense, conduct such tests in accordance with the applicable test methods and procedures specified in 35 Ill. Adm. Code 218.105.

16a. Within sixty (60) days after the date raw material is first processed through the Hammermill Shredder, the Permittee shall:

i. Conduct opacity observations from the Hammermill Shredder System stack, each emission unit in the Ferrous Material Separation

System, Fines Processing Building (DC-01), each emission unit in the Non-Ferrous Material Separation System, and Miscellaneous Fugitive Sources during conditions which are representative of maximum emissions in order to demonstrate compliance with 35 Ill. Adm. Code 212.123 and Condition 3(a) of this permit. Thereafter, this testing shall be conducted once every five (5) years from the preceding testing date.

ii. Measure and quantify (gr/dscf and lb/hr) the emissions of PM, PM_{10}, and $PM_{2.5}$ from the Fines Processing Building (DC-01) during conditions which are representative of maximum emissions in order to demonstrate compliance with 35 Ill. Adm. Code 212.321, 35 Ill. Adm. Code 212.324(b), and Conditions 3(d)-(g), and 12(e)(i) of this permit. Thereafter, this testing shall be conducted once every five (5) years from the preceding testing date.

iii. Measure and quantify the emissions of PM (gr/dscf and lb/hr), PM_{10} (gr/dscf and lb/hr), $PM_{2.5}$ (gr/dscf and lb/hr), SO_2 (ppmv and lb/hr), CO (ppmv and lb/hr), HCl (ppmv and lb/hr), and Metals (ppmv and lb/hr) emissions from the Hammermill Shredder System during conditions which are representative of maximum emissions in order to demonstrate compliance with 35 Ill. Adm. Code 212.321, and Conditions 3(d)-(g), 12(b)(ii), (b)(iii) and (c) of this permit.

iv. Measure (ppmv) and quantify (lb/hr) from the inlet and outlet emissions of VOM from the RTO, measure VOM capture efficiency of capture system, determine the destruction efficiency of the RTO, and calculate overall VOM control efficiency for the capture system and RTO, during conditions which are representative of maximum emissions in order to demonstrate compliance with 35 Ill. Adm. Code 218.986(a), and Condition 12(b)(i) of this permit. If VOM capture efficiency meets the criteria of a PTE as determined by USEPA Method 204 or an alternate method adopted by the USEPA to demonstrate capture efficiency, testing under this condition shall be conducted once every five (5) years from the preceding testing date. However, if the VOM capture efficiency does not meet the criteria of a PTE, subsequent testing shall be conducted within twelve (12) months from the preceding testing.

b. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA:(refer to 40 CFR 51, Appendix M and 40 CFR 60, Appendix A for USEPA test methods).

Sample and Velocity Traverses for Stationary Sources	USEPA Method 1
Sample and Velocity Traverses for Stationary Sources with Small Stacks or Ducts	USEPA Method 1A
Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)	USEPA Method 2
Direct Measurement of Gas Volume through Pipes and Small Ducts	USEPA Method 2A

Determination of Gas Velocity and Volumetric Flow Rate in Small Stacks or Ducts (Standard Pitot Tube)	USEPA Method 2C
Measurement of Gas Volume Flow Rates in Small Pipes and Ducts	USEPA Method 2D
Gas Analysis for the Determination of Dry Molecular Weight	USEPA Method 3
Gas Analysis for the Determination of Dry Molecular Weight-Instrumental Method	USEPA Method 3A
Determination of Moisture Content in Stack Gases	USEPA Method 4
Determination of Particulate Matter from Stationary Sources	USEPA Method 5
Determination of Sulfur Dioxide from Stationary Sources	USEPA Method 6
Determination of Sulfur Dioxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)	USEPA Method 6C
Visual Determination of the Opacity of Emissions from Stationary Sources	USEPA Method 9
Determination of Carbon Monoxide from Stationary Sources	USEPA Method 10
Determination of Inorganic Lead Emissions from Stationary Sources	USEPA Method 12
Visual Determination of Fugitive Emissions from Material Sources	USEPA Method 22
Determination of Total Gaseous Nonmethane Organic Emissions as Carbon	USEPA Method 25
Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer	USEPA Method 25A*
Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources—Isokinetic Method	USEPA Method 26A
Determination of Metals Emissions from Stationary Sources	USEPA Method 29**
Determination of PM_{10} and $PM_{2.5}$ Emissions from Stationary Sources (Constant Sampling Rate Procedure)	USEPA Method 201A
Dry Impinger Method for Determining Condensable Particulate Emissions from Stationary Sources	USEPA Method 202
Criteria for and Verification of a Permanent or Temporary Total Enclosure	USEPA Method 204, 204(A-F)

* USEPA Method 25A may only be used if outlet VOM concentration is less than 50 ppm as carbon (non-methane).

** USEPA Method 29 may be used as an alternate to USEPA Method 12 for lead emissions.

c. Within sixty (60) days prior to the actual date of testing, the Permittee shall submit a written test plan to the Illinois EPA, Bureau of Air, Compliance Section Manager. This plan shall include at a minimum:

i. The name (or other identification) of the emission unit(s) to be tested and the name and address of the facility at which they are located;

ii. The name and address of the independent testing service(s) performing the tests, with the names of the individuals who may be performing sampling and analysis and their experience with similar tests;

iii. The specific determinations of emissions and/or performance which are intended to be made, including the site(s) in the ductwork or stack at which sampling will occur;

iv. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of the maximum emissions, maximum operating rate, minimum control performance, the levels of operating parameters for the emission unit, including associated control equipment, at or within which compliance is intended to be shown, and the means by which the operating parameters will be determined;

v. The test method(s) which will be used, with the specific analysis method, if the method can be used with different analysis methods. The specific sampling, analytical and quality control procedures which will be used, with an identification of the standard methods upon which they are based;

vi. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification;

vii. Any proposed use of an alternative test method, with detailed justification; and

viii. The format and content of the Source Test Report.

d. The Permittee shall provide the Illinois EPA with written notification of testing at least thirty (30) days prior to testing and again five (5) days prior to the testing to enable the Illinois EPA to have an observer present. This notification shall include the name of emission unit(s) to be tested, scheduled date and time, and contact person with telephone number.

e. If testing is delayed, the Permittee shall promptly notify the Illinois EPA by e-mail or facsimile, at least five (5) days prior to the scheduled date of testing or immediately, if the delay occurs in the five (5) days prior to the scheduled date. This notification shall also include the new date and time for testing, if set, or a separate notification shall be sent with this information when it is set.

f. The Permittee shall submit the Final Source Test Report(s) for these tests accompanied by a cover letter stating whether or not compliance was shown, to the Illinois EPA, Bureau of Air, Compliance Section Manager within thirty (30) days after the test results are compiled, but no later than sixty (60) days after the date of testing or sampling. The Final Source Test Report shall include as a minimum:

i. General information describing the test, including the name and identification of the emission source, which was tested, date of testing, names of personnel performing the tests, and Illinois EPA observers, if any;

ii. A summary of results;

iii. Description of test procedures and method(s), including description and map of emission units and sampling points, sampling train, testing and analysis equipment, and test schedule;

iv. Detailed description of test conditions, including:

A. List and description of the equipment (including serial numbers or other equipment specific identifiers) tested and process information (i.e., mode(s) of operation, process rate or throughput, fuel or raw material consumption rate; and heat content of the fuels);

B. Control equipment information (i.e., equipment condition and operating parameters) during testing; and

C. A discussion of any preparatory actions taken (i.e., inspections, maintenance and repair).

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration. Identification of the applicable regulatory standards and permit conditions that the testing was performed to demonstrate compliance with, a comparison of the test results to the applicable regulatory standards and permit conditions, and a statement whether the test(s) demonstrated compliance with the applicable standards and permit conditions;

vi. An explanation of any discrepancies among individual tests, failed tests or anomalous data;

vii. The results and discussion of all quality control evaluation data, including a copy of all quality control data; and

viii. The applicable operating parameters of the pollution control device(s) during testing (temperature, pressure drop, scrubbant flow rate, etc.), if any.

17a. Pursuant to 35 Ill. Adm. Code 218.105(d)(2)(A)(i), an owner or operator: That uses an afterburner or carbon adsorber to comply with any Section of 35 Ill. Adm. Code Part 218 shall use Illinois EPA and USEPA approved continuous monitoring equipment which is installed, calibrated, maintained, and operated according to vendor specifications at all times the control device is in use except as provided in 35 Ill. Adm. Code 218.105(d)(3). The continuous monitoring equipment must monitor the following parameters:

For each afterburner which does not have a catalyst bed, the combustion chamber temperature of each afterburner.

b. Pursuant to 35 Ill. Adm. Code 218.105(d)(2)(B), an owner or operator: Must install, calibrate, operate and maintain, in accordance with manufacturer's specifications, a continuous recorder on the temperature monitoring device, such as a strip chart, recorder or computer, having an accuracy of ± 1 percent of the temperature measured in degrees Celsius or ± 0.5° C, whichever is greater.

18. Pursuant to 40 CFR 63.10(b)(3), if an owner or operator determines that his or her stationary source that emits (or has the potential to emit, without considering controls) one or more hazardous air pollutants regulated by any standard established pursuant to section 112(d) or (f) of the Clean Air Act, and that stationary source is in the source category regulated by the relevant standard, but that source is not subject to the relevant standard (or other requirement established under 40 CFR Part 63) because of limitations on the source's potential to emit or an exclusion, the owner or operator must keep a record of the applicability determination on site at the source for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The record of the applicability determination must be signed by the person making the determination and include an analysis (or other information) that demonstrates why the owner or operator believes the source is unaffected (e.g., because the source is an area source). The analysis (or other information) must be sufficiently detailed to allow the USEPA and/or Illinois EPA to make a finding about the source's applicability status regarding the relevant standard or other requirement. If relevant, the analysis must be performed in accordance with requirements established in relevant subparts of 40 CFR Part 63 for this purpose for categories of stationary sources. If relevant, the analysis should be performed in accordance with USEPA guidance materials published to assist sources in making applicability determinations under Section 112 of the Clean Air Act, if any. The requirements to determine applicability of a standard under 40 CFR 63.1(b)(3) and to record the results of that determination under 40 CFR 63.10(b)(3) shall not by themselves create an obligation for the owner or operator to obtain a Title V permit.

19a. Pursuant to 35 Ill. Adm. Code 212.110(e), the owner or operator of an emission unit subject to 35 Ill. Adm. Code Part 212 shall retain records of all tests which are performed.

b. i. Pursuant to 35 Ill. Adm. Code 212.324(g)(1), written records of inventory and documentation of inspections, maintenance, and repairs of all air pollution control equipment shall be kept in accordance with 35 Ill. Adm. Code 212.324(f).

ii. Pursuant to 35 Ill. Adm. Code 212.324(g)(2), the owner or operator shall document any period during which any process emission unit was in operation when the air pollution control equipment was not in operation or was malfunctioning so as to cause an emissions level in excess of the emissions limitation. These records shall include documentation of causes for pollution control equipment not operating or such malfunction and shall state what corrective actions were taken and what repairs were made.

iii. Pursuant to 35 Ill. Adm. Code 212.324(g)(3), a written record of the inventory of all spare parts not readily available from local suppliers shall be kept and updated.

iv. Pursuant to 35 Ill. Adm. Code 212.324(g)(5), the records required under 35 Ill. Adm. Code 212.324 shall be kept and maintained.

20a. Pursuant to 35 Ill. Adm. Code 218.991(a)(2), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart PP, QQ, RR or TT and complying using emission capture and control equipment shall comply with the following:

On and after a date consistent with 35 Ill. Adm. Code 218.106, or on and after the initial start-up date, the owner or operator of a subject VOM source shall collect and record all of the following information each day:

i. Control device monitoring data.

ii. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

iii. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

21a. The Permittee shall maintain records of the following items so as to demonstrate compliance with the conditions of this permit:

i. Records addressing use of good operating practices for the RTO and Quench/Packed Tower Scrubber associated with the Hammermill Shredder System and Dust Collectors (DC-01 through DC-04) associated with Non-Ferrous Material Separation System:

A. Records for periodic inspection of the Roll Media Filter, RTO, Quench/Packed Tower Scrubber, and Dust Collectors (DC-01 through DC-04) with date, individual performing the inspection, and nature of inspection; and

B. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

ii. A copy of the Fugitive Emissions Operating Program, any amendments or revisions to the Fugitive Emissions Operating

Program, and a record of activities completed according to the Fugitive Particulate Operating Program.

iii. A. Daily records demonstrating the temperature for the RTO;

B. Daily records demonstrating pressure differential across inlet and outlet of the Quench/Packed Tower Scrubber

C. Daily records demonstrating scrubbant liquid flow rate of the Quench/Packed Tower Scrubber;

D. Daily records demonstrating the pH of the scrubbant of the Quench/Packed Tower Scrubber;

E. Daily records demonstrating inlet gas stream to the control train for the Hammermill Shredder System for the flammability of this gas stream as a percentage of the lower explosive limit (LEL) of this stream

F. Daily records demonstrating amperage or usage of electrical power by the motor for the fan in the control train or inlet gas flow rate of the control train.

G. Daily records demonstrating status of the emergency bypass vent on the RTO in the control train for the Hammermill Shredder System, i.e., whether this vent is closed or open.

iv. Records of daily visual inspections of the Hammermill Shredder operations containing the date, time, individual performing the observation, observation details including operation of associated control systems, and any corrective actions taken.

v. Natural gas usage for RTO (mmscf/month and mmscf/year).

vi. Hours of operation for Non-Ferrous System, Barge loading, Hammermill Shredder System, RTO, and Quench/Packed Tower Scrubber (hours/day, hours/month and hours/year).

vii. Type and amount material received by the facility (tons/month and tons/year).

viii. Type and amount material processed by Hammermill Shredder System (tons/month and tons/year).

ix. Material throughput (tons/month and tons/year) for the Ferrous Material Separation Process, Non-Ferrous Material Process, and Fines Processing Building.

x. Amount of non-metallic materials (fluff) shipped offsite (tons/month and tons/year).

xi. Hours of operation for Dust Collector DC-01 (hours/month and hours/year).

xii. For each event when the emergency bypass vent on the RTO is open while feed material is being sent to or being processed in the Hammermill Shredder System, the Permittee shall maintain records that include: the date, starting time and duration of the event; a description of the event; the monitored flammability of the gas stream at the start of the event; an estimate of the additional VOM emissions attributable to the event, with supporting data; the likely explanation for the event.; and, if the stoppage of feed to the Hammermill Shredder System when this vent opens is not automated, the time that feed to this system ceased.; and

xiii. Monthly and annual emissions of PM, PM_{10}, CO, NOx, SO_2, VOM, and HAPs from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System with supporting calculations (tons/month and tons/year).

b. All records and logs required under this permit shall be retained at a readily accessible location at the source for at least five (5) years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer storage device) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.

22a. Pursuant to 35 Ill. Adm. Code 212.110(d), a person planning to conduct testing for particulate matter emissions to demonstrate compliance shall give written notice to the Illinois EPA of that intent. Such notification shall be given at least thirty (30) days prior to the initiation of the test unless a shorter period is agreed to by the Illinois EPA. Such notification shall state the specific test methods from 35 Ill. Adm. Code 212.110 that will be used.

b. Pursuant to 35 Ill. Adm. Code 212.324(g)(6), upon written request by the Illinois EPA, a report shall be submitted to the Illinois EPA for any period specified in the request stating the following: the dates during which any process emission unit was in operation when the air pollution control equipment was not in operation or was not operating properly, documentation of causes for pollution control equipment not operating or not operating properly, and a statement of what corrective actions were taken and what repairs were made.

23a. Pursuant to 35 Ill. Adm. Code 218.991(a), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart PP, QQ, RR or TT and complying by the use of emission capture and control equipment shall comply with the following:

i. By a date consistent with 35 Ill. Adm. Code 218.106, or upon initial start-up of a new emission unit, the owner or operator of the subject VOM emission unit shall demonstrate to the Illinois EPA that the subject emission unit will be in compliance on and after a date consistent with 35 Ill. Adm. Code 218.106, or on and after the initial start-up date by submitting to the Illinois EPA all calculations and other supporting data, including descriptions and results of any tests the owner or operator may have performed.

ii. On and after a date consistent with 35 Ill. Adm. Code 218.106, the owner or operator of a subject VOM emission source shall notify the Illinois EPA:

A. Of any violation of the requirements of 35 Ill. Adm. Code Part 218 Subpart PP, QQ, RR or TT by sending a copy of any record showing a violation to the Illinois EPA within 30 days following the occurrence of the violation;

B. At least 30 calendar days before changing the method of compliance with 35 Ill. Adm. Code Part 218 Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of 35 Ill. Adm. Code 218.991(a)(1). Upon changing the method of compliance with 35 Ill. Adm. Code Part 218 Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of 35 Ill. Adm. Code 218.991(a).

24a. The Permittee shall submit a written notification to the Illinois EPA, Bureau of Air, Compliance Section Manager of the initial receipt date of material to be processed in the Hammermill Shredder within seven (7) calendar days after the initial receipt date.

b. The Permittee shall submit a written notification to the Illinois EPA, Bureau of Air, Compliance Section Manager within seven (7) calendar days from the date that raw material is first processed through the hammermill shredder.

c. If, during a Bypass Event, the feed to the hammermill shredder continues for 30 seconds or more after the start of a Bypass Event, the Permittee shall notify the Illinois EPA within 3 hours of the start of the event, with this notification made by email to the Manager of the Compliance Section in the Illinois EPA, Bureau of Air. For all other Bypass Events, the Permittee shall submit to the Illinois EPA, Bureau of Air, Compliance Section Manager, within seven (7) calendar days of such event, a report for detailing the following information for each event when feed to the shredder was interlocked due to the LEL system: % of LEL detected, duration of the event, and VOM emissions with supporting documentation.

25a. The Permittee shall submit a quarterly report containing the following information for each month of the quarter:

i. Type and amount material received by the facility;

ii. Type and amount material processed by Hammermill Shredder System;

iii. Throughput for the Ferrous Material Separation Process, Non-Ferrous Material Process, and Fines Processing Building;

iv. PM, PM_{10}, and HAPs emissions from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System, with supporting calculations;

v. A summary of all bypass events that occur during the quarter and for each event, this summary shall include the date, time, duration, description, likely explanation and estimated additional VOM emissions due to the event.

vi. VOM emissions from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System, with supporting calculations; and

vii. Amounts of "fluff" and other non-metallic materials shipped offsite (truckloads/month).

b. The Permittee shall submit this quarterly report to the Illinois EPA, Bureau of Air, Compliance Section Manager within thirty (30) calendar days of the end of a calendar quarter.

26a. If there is an exceedance of or a deviation from the requirements of this permit as determined by the records required by this permit or otherwise, the Permittee shall submit a report to the Illinois EPA's Bureau of Air Compliance Section in Springfield, Illinois within thirty (30) days after the exceedance or deviation. The report shall identify the duration and the emissions impact of the exceedance or deviation, a copy of the relevant records and information to resolve the exceedance or deviation, and a description of the efforts to reduce emissions from, and the duration of exceedance or deviation, and to prevent future occurrences of any such exceedance or deviation.

b. One (1) copy of required reports and notifications shall be sent to:

Illinois Environmental Protection Agency
Bureau of Air
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

and an electronic copy of test protocols and test results to
epa.boa.smu@illinois.gov

If you have any questions on this permit, please call German Barria at 217/785-1705.

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:GB:tan

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emission of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the Permittee from compliance with the other applicable statues and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

   b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

   b. upon finding that any standard or special conditions have been violated, or

   c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

General III, LLC
Exhibit List

1. Hearing officer opening/closing statements (6 pages)
2. Permit section opening statement (1 page)
3. Connection instructions (2 pages)
4. Illinois EPA Project Summary (6 pages)
5. Draft Permit (29 pages)
6. Construction Permit Application [September 24, 2019] (436 pages)
7. Updated Emission Estimates [January 27, 2020] (65 pages)
8. Fugitive Particulate Operating Program [March 20, 2020] (34 pages)
9. Illinois EPA Inspection Report [March 20, 2020] (6 pages)
10. Air Dispersion Modeling Protocol to Assess Metal Emission Impacts [November 18, 2019] (54 pages)
11. Air Dispersion Modeling Report for Assessment of Metal Emission Impacts [January 24, 2020] (103 pages)
12. Supplement No. 1 to the January 24, 2020 Air Dispersion Modeling Report for Assessment of Metal Emission Impacts [February 12, 2020] (44 pages)
13. Illinois EPA Memorandum Regarding Permit Application [March 2, 2020] (6 pages)
14. Final Metal Emissions from South Chicago Property Management, Ltd. (44 pages)
15. Meleah Geertsma Email (5 pages)
16. Supplemental Information for Construction Permit Application [November 14, 2019] (22 pages)
17. GIII Public Notice (4 pages)
18. GIII Revised Public Notice (4 pages)
19. Hearing Order for Extended Comment Period/Meleah Geertsma Email (3 pages)
20. Amy Genender Email (1 page)
21. Mark Velez Email (2 pages)
22. Keith Harley Email (2 pages)
23. Thomas Ward Email (3 pages)
24. John Ashenden Email (1 page)
25. Haley McKeever Email (2 pages)
26. Emma Cullnan Email (2 pages)
27. Andrew Del Giudice Email (2 pages)
28. Terry Herlihy Email (2 pages)
29. Nicolette Cooke Email (2 pages)
30. Pastor Richard L. Martinez, Jr. Email and three attachments (30 pages)
31. Tom Meyer Email (2 pages)
32. Theodora Cunningham Email (1 page)
33. Matt Kraemer Email and attachment [article] (19 pages)
34. Danielle Austin-Cano Email (2 pages)
35. Rose E. Joshua Email (31 pages)
36. Pastor Matt Zemanick Email (2 pages)
37. Michael Caldie Email (2 pages)
38. Nancy Loeb Email with article (9 pages)
39. Article dated May 18, 2020 (17 pages)
40. Nancy Loeb Email (2 pages)

41. Group Exhibit (102 pages) - includes general correspondence of a logistical nature; not information constituting a main exhibit. Specific email (names) are provided below:
    - Amy Genender (aka Amy Genender Feltheimer) Email
    - Lara Compton Email
    - Eric Wallenius Email
    - Ann Zwick Email
    - Charles Stark Email
    - Cynthia Strickland Email
    - Maxwell Evans Email
    - Christopher O'Hara Email
    - Kiana Courtney Email
    - Pastor Richard Martinez Email
    - Meleah Geertsma Email
    - Jordan Diab Email
    - Juan Rojas Email
    - Alfredo Romo Email
    - Brian Cavanaugh Email
    - Mautice Elion Email
    - Gina Ramirez Email
    - Damon Watson Email
    - Peggy Salazar Email
    - Corina Pedraza Email
    - Jocelyn Rangel Email
    - Elihu K Blanks Email
    - Carolyn Marsh Email
    - Andy Daglas Email
    - Nick Radakovich Email
    - James Kinney Email
    - Mark Velez Email
    - Robert Adolfson Email
    - Miles Vance Email
    - Valerie Bollinger Email
    - Andres Villegas Email
    - Olga Bautista Email
    - Illinois EPA email

    41A: Nancy Loeb and Olga Bautista Emails (1 page)

    41B: Microsoft Teams Chat Hearing Record (4 pages)
42. Brian Gabriel Email (1 page)
43. Edwin Gonzalez Email (3 pages)
44. Gigi Buis Email (1 page)
45. Ms. Robateau Email (1 page)
46. Caroll Ordas Email (1 page)
47. cfa04@comcast.net Email (1 page)
48. Erik Ramirez Email (1 page)
49. Arlene Ramos Email (2 pages)
50. Maria Valerio Email (1 page)
51. Nelly Martinez Email (1 page)
52. arturo.b.anaya@gmail.com Email (1 page)
53. Mark Hagan Email (1 page)
54. Kimberly Boreczky Email (2 pages)
55. Carlos Cerda Email (1 page)
56. Pam Navarro Email (1 page)

57. Nancy Pacheco Email (1 page)
58. Mary Esquivel Email (1 page)
59. ibamfxd@gmail.com Email (1 page)
60. Gail Molinaro Email (1 page)
61. Diana Barthelemy Email (2 pages)
62. John Tabares Email (2 pages)
63. Tony Paz Email (2 pages)
64. Herminia Vanna Email (2 pages)
65. Jose Rodriguez Email (1 page)
66. Nicholas Valdez Email (1 page)
67. Joel Cortes Email (1 page)
68. Viviana Arellano Email (1 page)
69. Damien M. Spaulding Email (1 page)
70. Eddie Luna Email (1 page)
71. Rocio Ochoa Email (1 page)
72. Deeana Mendoza Email (1 page)
73. Julio Ponce Email (1 page)
74. Sandra Leon Email (1 page)
75. Aracely Galvan Email (1 page)
76. Maria Borja Email (1 page)
77. Margaret Cortes Email (2 pages)
78. Silvia Vaca Email (1 page)
79. Angelica Delacruz Email (1 page)
80. L. Rachel McKinzie Email (2 pages)
81. Rafael Razo Email (1 page)
82. Jessica Chavarria Email (1 page)
83. Elena Calvillo Email (1 page)
84. Ana Sanchez Email (1 page)
85. Mark Velez Email - includes 5 pictures (6 pages)
86. Enriqueta Pacheco Email (1 page)
87. Mark Velez Email - includes 4 pictures (5 pages)
88. Joseph and Bertha Aguilar Email (1 page)
89. Luis M. Alvarez Email (1 page)
90. Rachel Roti Email (1 page)
91. Annamarie Garza Email (1 page)
92. Joann Podkul-Murphy Email (1 page)
93. Yolie Rangel Email (1 page)
94. Angel Avalos Email (2 pages)
95. Merrick O'Connell Email (1 page)
96. lresteviz@gmail.com Email (1 page)
97. Ceasar Rodriguez Email (1 page)
98. Cristina Rodriguez Email (2 pages)
99. Hearing Session Detail Report (4 pages)
100. Ann Zwick FOIA Requests (3 pages)
101. Links to Hearing Recording Sessions (1 page)
102. Original Hearing Transcript (127 pages)
103. Keith Harley Email and Letter (7 pages)
104. Ricardo DeLeon Email (2 pages)
105. Betty Jo Joy Email (2 pages)
106. James and Angie Rodriguez Email (1 page)
107. Linda Young Email (1 page)
108. John Stajcic Email (1 page)

109. Carolina Diaz Martinez Email (1 page)
110. Adelina Avalos Email (1 page)
111. Nancy Loeb/Keith Harley Emails (9 pages)
112. Judith Andrade Email (2 pages)
113. Terry Evans Email (2 pages)
114. Wayne Garritano Email (1 page)
115. Jennifer Walling Email (2 pages)

NOTE: Exhibits 116 through 190 below include comments that appear to have been originated on a third party system or server intended for submittal of multiple emails of the same or nearly the same content. Each individual email was added to the hearing record *as a separate exhibit*. Subsequently, a single exhibit (Group Exhibit 191 - see below) was created based on the amount of emails that were received that had the same or nearly the same content.

116. Mark Mitrovich Email (3 pages)
117. Sarah Eddy Email (2 pages)
118. Esther Allman Email (2 pages)
119. Annie Morse Email (2 pages)
120. Gail Brandys Email (2 pages)
121. Janice Rodgers Email (2 pages)
122. Ryan Kannegiesser Email (2 pages)
123. Cathy Felix Email (2 pages)
124. Mark Lundholm Email (2 pages)
125. Matt Mitzen Email (2 pages)
126. Henrietta Saunders Email (2 pages)
127. Andrea Jakubas Email (2 pages)
128. Nicholas Noe Email (2 pages)
129. Kimberly Corn Email (2 pages)
130. Mary O'Connor Email (2 pages)
131. Elzbieta Pituch Email (2 pages)
132. Cristin Williams Email (2 pages)
133. n.s.231347839@p2a.co Email (2 pages)
134. Jessica Niekrasz Email (2 pages)
135. Eugene Wedoff Email (2 pages)
136. Lisa Albrecht Email (2 pages)
137. V Evan Email (2 pages)
138. Ruth Kurczewski Email (2 pages)
139. Carol Cooper Email (2 pages)
140. Bruce Davidson Email (2 pages)
141. Drucker Sally Email (2 pages)
142. Celeste Hammond Email (2 pages)
143. David O'Neill Email (2 pages)
144. John Massman Email (2 pages)
145. Glenn Reed Email (2 pages)
146. Janice Feinberg Email (2 pages)
147. Kim Buclet Email (2 pages)
148. Gloria Picchetti Email (2 pages)
149. Marcia Stoll Email (2 pages)
150. Lenore Reeves Email (2 pages)
151. Patrick Brown Email (2 pages)
152. Melinda Keith-Singleton Email (2 pages)
153. Kim Stone Email (2 pages)

154. Craig Schuttenberg Email (2 pages)
155. William Bromer Email (2 pages)
156. Carter O'Brien Email (2 pages)
157. Justin Hart Email (2 pages)
158. Edgar Lehr Email (2 pages)
159. Savannah Hawkins Email (2 pages)
160. Kevin Brubaker Email (2 pages)
161. Shirley Sutter Email (2 pages)
162. Barbara Evans Email (2 pages)
163. Nick Epstein Email (2 pages)
164. Judith Nemes Email (2 pages)
165. Mark Milby Email (2 pages)
166. Kevin Lindemann Email (2 pages)
167. Sara Kaplan Email (2 pages)
168. Grace Ramirez Email (2 pages)
169. Cheryl Henley Email (2 pages)
170. Carla Womack Email (2 pages)
171. Glen Moss Email (2 pages)
172. Dennis Kreiner Email (2 pages)
173. Ellen Craig Email (2 pages)
174. Kimberly Rigger Email (2 pages)
175. Lawrence Friedman Email (2 pages)
176. William Henggeler Email (2 pages)
177. Albert Legzdins Email (2 pages)
178. Eileen Culkin Email (2 pages)
179. Peter Sporn Email (2 pages)
180. Maya Crystal Email (2 pages)
181. Lewis Smith Email (2 pages)
182. Patricia Armstrong Email (2 pages)
183. Kathleen Hamill Email (2 pages)
184. Michaeline Hade Email (2 pages)
185. John Butler Email (2 pages)
186. Sue Crothers Email (2 pages)
187. Lee Canel Email (2 pages)
188. Thomas Schmidt Email (2 pages)
189. Maureen Kelleher Email (2 pages)
190. Rosemary Nash Email (2 pages)

191. Group Exhibit (120 pages): Includes email comments that appear to have been originated on a third party system or server intended for submittal of multiple emails of the same or nearly the same content. Specific email (names) are provided below:

Ellen.LaRue.110709516@p2a.co	Patricia.Pruitt.8501952@p2a.co	Ellyn.Jung.322065480@p2a.co
Brian.Holmes.321338046@p2a.co	Susan.Balaban.51569905@p2a.co	Valarie.Fairchild.322066461@p2a.co
Christina.tapia.321334329@p2a.co	Helen.Kessler.115329199@p2a.co	Ryan.Bailey.322070411@p2a.co
Ruby.ramirez.321333807@p2a.co	Renee.Patten.246464662@p2a.co	Mark.Kraemer.26231538@p2a.co
Robin.Wilson.29069022@p2a.co	Noah.Lande.320978326@p2a.co	Hillary.Colby.322090617@p2a.co
Maria.Avila.321310578@p2a.co	Nora.Zacharski.286546009@p2a.co	Meredith.West.322095829@p2a.co
Rev.Stolz.310425087@p2a.co>	Behn.Rudo.114746124@p2a.co	Jenny.Kendler.322100570@p2a.co
David.Wilcox.310377252@p2a.co	Kyla.Lamontagne.320963160@p2a.co	KAREN.NELSON.322107825@p2a.co
Victoria.Long.287043367@p2a.co	Robert.Handelsman.50095182@p2a.co	Timothea.Papas.322110740@p2a.co
Guillermo.RReyes.321166461@p2a.co	John.Stoner.320958869@p2a.co	Mickie.Weiss.322111172@p2a.co
Thomas.Gerez.321164607@p2a.co	Cynthia.Linton.39786061@p2a.co	Catharine.White.26329288@p2a.co

David.Boughner.321161817@p2a.co	Ralph.DeMott.320958256@p2a.co	Wynne.Coplea.322117833@p2a.co
Ricky.Lanham.18292783@p2a.co	Georgiann.Schulte.26360805@p2a.co	Georgia.Shankel.322128020@p2a.co
Marisol.Medina.321147840@p2a.co	Mollie.Bunis.158548937@p2a.co	Catherine.Palivos.322135077@p2a.co
Janet.Tapia.321144348@p2a.co	John.Gilroy.117356142@p2a.co	Mary.Shesgreen.8808114@p2a.co
Emily.Bohn.321090852@p2a.co	thomas.galka.320949940@p2a.co	Lynn.Schmitt.322141665@p2a.co
Matt.Geer.245619706@p2a.co	Marshall.Sorkin.17486266@p2a.co	Michael.barkowski.322142754@p2a.co
Cheryl.BrumbaughCayford.99110767@p2a.co	Bob.Schwartz.290008010@p2a.co	Leticia.Cortez.322150287@p2a.co
Monica.Brown.75182917@p2a.co	Barbara.Cornew.320943784@p2a.co	Carole.Arett.74917840@p2a.co
Tim.Fossa.93441577@p2a.co	Angela.Daidone.61050594@p2a.co	Sandra.Nickerson.320937754@p2a.co
Liam.Kenny.321530484@p2a.co	Corina.Lang.46753122@p2a.co	Rosemary.Maziarz.320936539@p2a.co
Ruth.Fast.321058759@p2a.co	Rachel.Havrelock.290634402@p2a.co	Dana.Renninger.320934405@p2a.co
Beth.Grunow.321053466@p2a.co	Veronica.Medina.321366540@p2a.co	Howard.Ehrman.320934234@p2a.co
Stacey.Doyle.321051909@p2a.co	Zhenya.Polozova.321430133@p2a.co	Rev.Roberts.321396547@p2a.co
Gwen.deVeer.321051783@p2a.co	Jessie.Gotsdiner.97289285@p2a.co	Jessica.Weninger.321049182@p2a.co
Richard.Stuckey.12564020@p2a.co	Ann.Chen.321444868@p2a.co	Norma.deYagcier.321058867@p2a.co
Jason.Woltman.321042909@p2a.co	Meryl.Domina.321456973@p2a.co	Rebecca.Brandtman.321543660@p2a.co
Eduardo.Diaz.321042512@p2a.co	Charlie.Ryan.321546216@p2a.co	Christine.DelPriore.321027735@p2a.co
Graciela.Diaz.321040857@p2a.co	William.Miller.107436234@p2a.co	Samantha.Abernethy.321896777@p2a.co
Amber.Sullivan.321039318@p2a.co	Nancy.Bennett.158591218@p2a.co	Brock.AuerbachLynn.68827397@p2a.co
Carolee.Kokola.321036636@p2a.co	Saj.Gumidyala.321737034@p2a.co	Diane.libman.248987949@p2a.co
Jaeda.Patton.321029625@p2a.co	Armand.Cann.321742209@p2a.co	Ira.GerardDiBenedetto.320999927@p2a.co
Angela.Baluk.132697192@p2a.co	Melissa.achettu.321765358@p2a.co	Randy.Juras.36042429@p2a.co
Shane.Nodurft.28769224@p2a.co	Stephanie.Bilotto.321913678@p2a.co	Jenna.Miller.321979900@p2a.co
Joseph.Zefran.33118905@p2a.co	Erika.Sullivan.321923172@p2a.co	Madison.Olivieri.322009941@p2a.co
Julie.Nold.217390639@p2a.co	Charles.Nadler.321933234@p2a.co	John.Ginger.103004543@p2a.co
M.up.230608858@p2a.co	Jennifer.Bissell.16960800@p2a.co	Rita.McCabe.145872427@p2a.co
Shannon.Behan.321886039@p2a.co	Jennifer.Smith.229886609@p2a.co	Kendall.Granberry.158662570@p2a.co
Cristina.Pepe.321012416@p2a.co	Gisela.Lopez.321014810@p2a.co	Dawn.Silver.158672957@p2a.co
Deloris.Lucas.321025719@p2a.co		

NOTE: emails ending with “@p2a.co” were undeliverable.

192. Rose.Panieri.272795468@p2a.co Email (1 page)
193. Margarita Mendoza Email (1 page)
194. Citlalli Garcia Email (1 page)
195. Cenia Mendoza Email (1 page)
196. Nicole Kemerer Email (2 pages)
197. Rita Malfeo-Klein Email (2 pages)
198. Emilia Garcia Email (1 page)
199. Mark A. Weintraub Emails and PDF file (1,679 pages)
200. USEPA Region 5 Comments (3 pages)
201. Charles Stark Email (4 pages)
202. Robin Lam Email (3 pages)
203. Renée L. Grigorian Email (3 pages)
204. Susan Sadlowski Garza Email (5 pages)
205. Zac Halden Email (3 pages)
206. Margaret Galka Email (3 pages)
207. Neighbors for Environmental Justice Email (8 pages)
208. Keith Harley Email (169 pages)
209. Samira Hanessian Email (3 pages)
210. Mark Velez Email (270 pages) – including 254 pages of signatures only - need to print
211. Daniel Villarreal Email (2 pages)
212. Hal Tolin Email (5 pages)
213. Josh Ellis Email (5 pages)
214. Nancy Loeb Email (5 pages)
215. John Pinion Email (22 pages)

216. Ted Stalnos Email (2 pages)
217. Meleah Geertsma Email/Dropbox link (4,333 pages total) – only printed email/main comments (first 83 pages). Please print pages 84 – 4,333
218. Fugitive Particulate Operating Program 6.25.20 (38 pages)
219. Responsiveness Summary (76 pages)
220. Final Permit (32 pages)
221. Pre-hearing notice comments (34 pages)
222. Signed hearing order

Exhibit 1

From: Guy, Jeff
To: EPA.PublicHearingCom
Bcc: Alfredo Romo; Amy Genender; Amy Genender Feltheimer; Andrew Del Giudice; Andy Daglas ; ANN M. ZWICK; Brian Cavanaugh; Carolyn A. Marsh; Chalres Stark; Christopher O"Hara; Cynthia Strickland; Elihu K Blanks; Emma Cullnan ; Erik Wallenius; Gina Ramirez; Haley McKeever; James Kinney; Jocelyn Rangel; John Ashenden ; Jordan Diab; Juan Rojas; Keith Harley; Kiana Courtney ; Lara Compton; Mark Velez; Maxwell Evans; Meleah Geertsma; Nick Radakovich ; Nicolette Cooke; Olga Bautista; Peggy Salazar; Richard L. Martinez, Jr.; Robert Adolfson ; Rose Joshua; Terry Herlihy ; Thomas Ward
Subject: General III, LLC Public Hearing
Date: Thursday, May 14, 2020 10:31:00 AM
Attachments: Connection Instructions.pdf
image001.png

Good morning,

Attached are more detailed connection instructions for today's public hearing. The connection instructions, in addition to the Agency's opening/closing statements, can be found at the following link: https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/default.aspx under General III LLC.

Thank you,

Jeffrey J. Guy

Hearing Officer, Illinois Environmental Protection Agency
Office of Community Relations
(217) 785-8724
Jeff.Guy@illinois.gov

EXHIBIT 1

Opening Statements
Illinois EPA Hearing Officer
General III, LLC Public Hearing
May 14, 2020
1:30 pm & 6:00 pm (CST)

Please press record. Good [afternoon/evening]. The current time is ______. On behalf of the Illinois EPA Director, John Kim, I'd like to welcome you to today's hearing. My name is Jeff Guy, and I am the Agency hearing officer. Before we get started, I would like to say that we appreciate your time today and we look forward to receiving your comments. Over the last several days, I have been in contact with many of you by phone or email and I know you are eager to be heard. After the Agency's opening statements, we will begin taking your comments. If you should run into connection or audio issues during this hearing, please attempt to reconnect.

Please note that the Agency has prepared opening and closing statements that will be included with the public record and posted on our web page in the same place where the hearing notice, draft permit, and other documents have been posted.

At this time, please mute your cell phones and other electronic devices. I am going to take a moment to identify certain speakers to make sure they are connected. If I call your name, please unmute yourself and state "I am on the line".

Identification of unidentified speakers

This is an informational hearing being held pursuant to Agency procedures for permit and closure plan hearings, which can be found at 35 Illinois Administrative Code Part 166, Subpart A. These regulations are available on the Illinois Pollution Control Board website at pcb.illinois.gov. My purpose as the hearing officer is to ensure that this hearing runs properly and according to these rules.

This is not a contested case hearing. Rather, this is an informational hearing in the matter of a construction permit for a scrap metal recycling plant. We are holding this hearing for the purpose of accepting comments from the public concerning this permit prior to making a final decision. The Agency has made available documents for public review that outline the major permit terms and conditions that are the subject of this hearing. Those documents are available on the Agency's public notices webpage.

On September 25, 2019, General III, LLC submitted a construction permit application to construct and operate a scrap metal recycling facility to be located at 11600 South Burley Avenue in Chicago, Illinois, which would relocate their existing operation of General II, LLC at 1909 North Clifton Avenue in Chicago, Illinois. This plant is required to obtain an air pollution control construction permit prior to beginning construction because it is a new emission source.

The Illinois EPA has reviewed the permit application and made a preliminary determination that the application meets the standards for issuance and has prepared a draft permit for public review and comment. However, before issuance of the permit, the Agency is holding a public comment period to provide an opportunity for the public to understand and comment on this proposed action. We will fully consider and respond to all significant public comments and may make changes to the permit based upon the comments.

The Agency is accepting written public comments on the draft permit during the comment period. As indicated in the public notice, written comments should be received no later than midnight June 13, 2020 and should be submitted to EPA.PublicHearingCom@Illinois.gov or to the Illinois EPA, attention Jeff Guy, Hearing Officer, P.O. Box 19276, 1021 North Grand Avenue, Springfield, Illinois 62974-9276. If a comment is e-mailed, please include “General III, LLC” in the subject line of the e-mail. We anticipate making a final decision in this matter by June 25, 2020.

Now I would like to explain how this hearing will proceed. First, we will have all Agency staff introduce themselves and identify their responsibilities within the Agency. Then a few of our staff will provide a brief overview of information we believe is relevant to today’s proceeding. This will be followed by additional instructions from me on how we will be taking public comments.

Today’s hearing will be recorded, and the recording will be included as part of the public record. We will post the recording on our web page in the same place where the hearing notice, draft permit, and other documents associated with the proceeding have been posted.

Written comments are given the same consideration as oral comments made during this hearing and may be submitted to us at any time during the comment period, which ends June 13, 2020. Although we will continue to accept comments through that date, today is the only time that we will accept oral comments.

Agency staff will be available to answer questions if those answers are readily available, but if the question calls for additional research or is too complicated for a quick answer, they may respond by deferring the response to the responsiveness summary, which will be available on the Agency’s public notice web page. The responsiveness summary will be prepared by the Agency as part of the hearing record and will include a summary of all the views, significant comments, criticisms, and suggestions, whether written or oral, submitted at the hearing or during the time the hearing record was open. The responsiveness summary will also provide a statement of the Agency's final action. All speakers and those that submit written comments during the comment period will be notified of the final decision in this matter and of the availability of the responsiveness summary.

As the hearing officer, I intend to treat everyone in a respectful manner, and I ask that Illinois EPA staff and the public please do the same. Please do not argue or engage in prolonged discussions with Agency staff, and please keep your comments related to issues involved with this permit. In addition, please avoid unnecessary repetition. Once a single point is made, it makes no difference if that same point is made once or a dozen times. It will be considered, and it will be responded to in the responsiveness summary. If you have lengthy comments, please consider giving only a summary of those comments and then submitting the entirety of your comments to the Agency before the end of the comment period and I will ensure that they are included in the hearing record. While the record is open, all comments, documents, and data will be placed into the hearing record as exhibits.

At this time, Agency staff will introduce themselves and then make brief statements. Afterwards, we will begin taking comments from the public.

Agency statements

As a reminder, all participants are muted automatically. We will unmute only the current speaker – one at a time. When it is your turn to speak, I will call your name. However, please wait for me to ask you to proceed before starting. When it is your turn to speak, please ensure that you are un-muted and then state your name and affiliation for the record. For example, you may indicate that you are a resident or a concerned citizen. For the benefit of creating an accurate record, please spell your last name. Please limit your comments to five minutes each.

Public comments

That concludes our public comment session. Thank you for your participation in today's public hearing. If you did not present oral comments today but still wish to comment, please submit your written comments to the Agency as directed in the public notice. The public notice can be accessed at the Illinois EPA web page. Written comments will be included in the record and reviewed by the Agency as the responsiveness summary is prepared.

The record in this matter closes on June 13, 2020. Please send your written comments to the attention of Jeff Guy, as indicated in the public notice. The repository of documents for the permitting action is available at Illinois EPA's office. You can obtain those through a FOIA request to the Agency. This can be done through our website. You can also contact the Agency if you need help with this request. Thank you for your participation today. The current time is __________ and this hearing is adjourned.

Permit Section Opening Statement **Exhibit 2**

From:	Guy, Jeff
To:	EPA.PublicHearingCom
Bcc:	Alfredo Romo; Amy Genender; Amy Genender Feltheimer; Andrew Del Giudice; Andy Daglas ; ANN M. ZWICK; Brian Cavanaugh; Carolyn A. Marsh; Chalres Stark; Christopher O"Hara; Cynthia Strickland; Elihu K Blanks; Emma Cullnan ; Erik Wallenius; Gina Ramirez; Haley McKeever; James Kinney; Jocelyn Rangel; John Ashenden ; Jordan Diab; Juan Rojas; Keith Harley; Kiana Courtney ; Lara Compton; Mark Velez; Maxwell Evans; Meleah Geertsma; Nick Radakovich ; Nicolette Cooke; Olga Bautista; Peggy Salazar; Richard L. Martinez, Jr.; Robert Adolfson ; Rose Joshua; Terry Herlihy ; Thomas Ward
Subject:	General III, LLC Public Hearing
Date:	Thursday, May 14, 2020 10:31:00 AM
Attachments:	Connection Instructions.pdf image001.png

Good morning,

Attached are more detailed connection instructions for today's public hearing. The connection instructions, in addition to the Agency's opening/closing statements, can be found at the following link: https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/default.aspx under General III LLC.

Thank you,

Jeffrey J. Guy

Hearing Officer, Illinois Environmental Protection Agency
Office of Community Relations
(217) 785-8724
Jeff.Guy@illinois.gov

Opening Statement

Good afternoon/evening. My name is Bob Bernoteit. I am the manager of the Federally Enforceable State Operating Permit unit, within the Illinois EPA Bureau of Air Permit Section. I will now provide a brief overview of permitting and of the permit that is the subject of this hearing.

Generally, permits are required in Illinois prior to construction and operation of emission units and air pollution control equipment. The permit program and permits issued thereunder provide a consistent and systematic way of ensuring that air emission sources are built and operated in compliance with applicable state and federal air pollution control laws and regulations.

In a permit application, the Illinois EPA requires: a description of the emission source and emission units proposed for construction, a list of types and amounts of the contaminants that will be emitted, and a description of the emission control equipment to be utilized. This information is used to determine whether the emission source can comply with standards adopted by the Illinois Pollution Control Board and the United States Environmental Protection Agency or USEPA.

In its review of an application, the Illinois EPA has no choice legally but to issue a construction permit to a source if the source will be in compliance with all state and federal air pollution control regulations.

To ensure compliance, the Illinois EPA establishes conditions in the permit or requirements that the source must follow. Conditions may restrict such things as the number of hours of operation, the amount and type of materials used, or the operating and control practices used by a source. Conditions within the permit may also include requirements for testing, parametric monitoring, record keeping, and reporting to demonstrate that restrictions are in fact being met. Failure to comply with conditions subjects a source to the risk of enforcement, that may include fines, and other penalties.

Additional tools for ensuring compliance include Agency review of reports that a source is obligated to submit and onsite inspections of sources. For example, a source must report its emissions to the Illinois EPA each year and must promptly report any deviation from permit requirements. These reports are reviewed by the Illinois EPA to assess compliance. The Illinois EPA also periodically visits a source to confirm compliance through observation of operations and review of source records. If problems are identified by either review of source reports or direct observation, corrective measures will be required and legal action may be pursued.

In this proposed permit, the new facility would be authorized to receive recyclable material such as end of life vehicles, used appliances, and metal scrap to be shredded and processed. The permit requires that the emissions from the shredder be controlled. That control train consists of an emission capture hood with rubber drapes that is inside a metal shed, a cyclone, roll media filter, a regenerative thermal oxidizer and a packed bed scrubber. The permit further requires inspection of the air pollution control equipment and a log of control equipment operation.

The permit places limits on emissions from the operations and requires testing of PM, PM10, PM2.5, metals, SO2, CO, lead, opacity, VOM, and halides/halogens to determine emissions from the source. Also, the permit calls for parametric monitoring. This monitoring addresses scrubber PH, temperature, differential pressure, and flow rate, and oxidizer combustion chamber temperature. And, the permit calls for record keeping and reporting.

In addition to the generally applicable statutory and regulatory requirements, the Illinois EPA required:

- Dispersion modeling
- Limitations on days and hours of operation based on the modeling
- Operation and emission limitations for all operations at the site
- A fugitive emissions control plan for piles, roadways, material processing and transfer
- A maintenance plan for the shredder

That concludes my opening remarks.

Exhibit 3

From:	Guy, Jeff
To:	EPA.PublicHearingCom
Bcc:	Alfredo Romo; Amy Genender; Amy Genender Feltheimer; Andrew Del Giudice; Andy Daglas ; ANN M. ZWICK; Brian Cavanaugh; Carolyn A. Marsh; Chalres Stark; Christopher O"Hara; Cynthia Strickland; Elihu K Blanks; Emma Cullnan ; Erik Wallenius; Gina Ramirez; Haley McKeever; James Kinney; Jocelyn Rangel; John Ashenden ; Jordan Diab; Juan Rojas; Keith Harley; Kiana Courtney ; Lara Compton; Mark Velez; Maxwell Evans; Meleah Geertsma; Nick Radakovich ; Nicolette Cooke; Olga Bautista; Peggy Salazar; Richard L. Martinez, Jr.; Robert Adolfson ; Rose Joshua; Terry Herlihy ; Thomas Ward
Subject:	General III, LLC Public Hearing
Date:	Thursday, May 14, 2020 10:31:00 AM
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Good morning,

Attached are more detailed connection instructions for today's public hearing. The connection instructions, in addition to the Agency's opening/closing statements, can be found at the following link: https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/default.aspx under General III LLC.

Thank you,

Jeffrey J. Guy

Hearing Officer, Illinois Environmental Protection Agency
Office of Community Relations
(217) 785-8724
Jeff.Guy@illinois.gov

<u>Webex Event Information</u>:
Date: Thursday, May 14, 2020
Times: 1:30 pm CST and 6:00 pm CST
Event Number: 804 080 241
Event Password: cWpHgfRA248

<u>Access to the hearing</u>:
You may connect to the hearing by computer or telephone. You may log in or call in beginning from 1:15 pm for the afternoon session or 5:45 pm for the evening session or anytime during the hearings. You will automatically be muted upon entry into the hearing.

<u>By computer</u>:

1. Click this link. This will take you to the Webex webpage for the hearing.

https://illinois.webex.com/illinois/onstage/g.php?MTID=ede15d1e3bc40793e54ad27332af9805d

2. Enter your information (name and email address) and click the "Join Now" button. You may be prompted for an Event Number or Event Password, shown above.

3. An audio connection is required. The best option for connecting is to use the "Call Me" option. From the "Select Audio Connection", drop down, select "Call Me". Input or select your telephone number.

<u>By smartphone browser or other electronic device</u>:

1. Click this link https://illinois.webex.com/illinois/onstage/g.php?MTID=ede15d1e3bc40793e54ad27332af9805d
2. Click "Join"
3. You will be prompted to download/install Cisco Webex mobile app
4. Once the app has installed click the above link again
5. Enter your name and email address and press "Join"

<u>By Dial-in phone</u>:

1. Call +1-312-535-8110
2. You will be prompted to enter the access code or meeting number. Enter the event number 804 080 241 and then press the pound sign.
3. You will be prompted to enter your attendee I.D. number. You do not need to enter a number just **press the pound sign.**

<u>Tips</u>:

- Find a quiet location with a power source for your device.
- Close all background applications or browser sessions even if you are not using them.
- Reduce distractions and practice good meeting etiquette.

<u>Device Options</u>:

- Non-smartphone cellular (mobile) phones or landlines provide an audio-only experience.
- Smartphone, iPad or Tablets use the Webex mobile application.
- Laptop or desktop computer user should download the desktop application.

EXHIBIT 4

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
1021 N. Grand Avenue East
P.O. Box 19506
Springfield, Illinois 62794-9506

Project Summary
Proposed Construction Permit
General III, LLC
Chicago, Cook County, Illinois

Site Identification No.: 031600SFX
Application No.: 19090021

Schedule
Public Comment Period Begins: March 30, 2020
Public Comment Period Closes: June 13, 2020

Illinois EPA Contacts
Permit Analyst: German Barria
Community Relations Coordinator: Brad Frost
217/782-7027
Brad.Frost@illinois.gov

I. INTRODUCTION

General III, LLC has applied for a Construction Permit for a scrap metal recycling plant to be located at 11600 South Burley Avenue in Chicago. This plant is required to obtain an air pollution control construction permit prior to beginning construction because it is a new source that contains emission units that are not exempt from the obligation to obtain a construction permit pursuant to 35 Ill. Adm. Code 201.146. The Illinois EPA has prepared a draft of the construction permit that it would propose to issue for the construction of the plant. However, before issuing the permit, the Illinois EPA is holding a public comment period to receive comments on this proposed action and the terms and conditions of the draft permit that it would propose to issue.

II. SOURCE DESCRIPTION

General III, LLC proposes to construct and operate a scrap metal recycling facility to move their existing operation of General II, LLC located 1909 North Clifton Avenue in Chicago, Illinois. The new facility will receive recyclable material such as End of Life Vehicles, used appliances, and metal scrap material to be shredded and processed in a variety of metal products, such as ferrous and non-ferrous materials. The emission units at this plant that require an construction permit are shown in Table 1, below.

Table 1. Listing of Non-Exempt Emission Units Located at the Source.

Emission Unit and Description	Construction Date (and Date Last Modified)
Hammermill Shredder System: One (1) Hammermill Shredder with Integral Water Injection System equipped with capture hood and Cyclone, and controlled by a Roll-Media Filter, 15.0 mmBtu/hour Natural Gas-Fired Regenerative Thermal Oxidizer (RTO), and Quench/Packed Tower Scrubber with feed and takeaway conveyors; One (1) Vibratory Conveyor; and One (1) Shredder Infeed Conveyor	TBD
Ferrous Material Separation System: One (1) Poker Picker with Gravity Chutes; Seven (7) Magnetic Separators; Two (2) Z-Box Separators with Cyclones; Seventy (70) conveyor transfer points; Two (2) Ferrous Metal Stacking Conveyors; One (1) Auto Shredder Residue (ASR) Stacking Conveyor Ferrous Material Barge Loading; Ferrous Material Rail Car Loading; and Ferrous Material Truck Loading	TBD

Emission Unit and Description	Construction Date (and Date Last Modified)
Non-Ferrous Material Separation System: One (1)ASR Feed Hopper with Vibratory Batch Feeder; Eight (8) Magnetic Separators; Three (3) Screens; Seven (7) Eddy Current Separators (ECS) located in Enclosures; Four (4) Wind Sifters (Air Classifiers) with Cyclones; Five (5) Polishers (Air Classifiers) with Cyclone; One (1) Air Vibe (Air Classifier) with Cyclone; One (1) Low Speed Shredder for Size Reduction of Clean Non-Ferrous Material;	TBD
Ninety nine (99) Material Transfer Points	TBD
Fines Processing Building – with All Equipment in Building Controlled by Dust Collector DC-01	TBD

The Source contains emission units which are sources of Particulate Matter (PM), Nitrogen Oxides (NOx), Carbon Monoxide (CO), Sulfur Dioxide (SO2), and Volatile Organic Material (VOM) generated from the shredding of recyclable materials and its associated control system, sorting, and handling of the shredded recyclable product. The recycled materials processed at the facility may contain components that are considered to be Hazardous Air Pollutants (HAPs), such as Hydrogen Chloride (HCl), Lead (Pb), and Manganese (Mn). PM and Metal HAPs are generated during the shredding and separation processes. VOM and Organic HAPs are generated during the shredding process and its associated control system.

The following table lists annual Potential to Emit (PTE) of pollutants to be emitted from this source, as limited by the proposed Construction permit:

Table 2. Potential Emissions of the Source (as limited by permit).

Pollutant	**PTE as limited by permit** (tons/year)
Carbon Monoxide (CO)	15.02
Nitrogen Oxides (NO_x)	2.57
Particulate Matter (PM)	41.72
Particulate Matter less than 10 microns (PM_{10}) in diameter	21.28
Particulate Matter less than 2.5 microns ($PM_{2.5}$) in diameter	15.06
Sulfur Dioxide (SO_2)	0.09
Volatile Organic Material (VOM)	5.26
Combined Hazardous Air Pollutants (HAPs)	1.4143
Hydrogen Chloride (HCl)	0.77
Lead (Pb)	0.0417
Manganese (Mn)	0.0218

Because this source has not yet been constructed, there have been no reported emissions.

This source also contains emission units and activities that are exempt from permitting under 35 Ill. Adm. Code 201.146 and the emissions from such units are not limited by the conditions of the draft permit. These emission units include:

No emission units were identified in the application as being exempt from the permitting requirements under 35 Ill. Adm. Code 201.146.

In cases where the potential emissions of exempt emission units may contribute to the source exceeding major source thresholds (for example, if the emission limits in the draft construction permit were 90% or more of the applicable major source thresholds and the exempt units' PTE were 5% or more of the threshold) the Illinois EPA would have established limits on such emission units in the draft construction permit that would normally be exempt from permitting. The permitting exemptions in 35 Ill. Adm. Code 201.146 do not relieve the owner or operator of any source from any obligation to comply with any other applicable requirements.

III. GENERAL DISCUSSION

Construction permits are federally enforceable, that is, the terms and conditions of the permits can be enforced by the United States Environmental Protection Agency (USEPA) and the public under federal law. The permit can also be enforced by Illinois government and the public under state law. These permits can establish federally enforceable limitations on the operation and emissions of a source that restrict the potential emissions of the source. However, in the absence of federally enforceable conditions and limitations, the plant's potential emissions would be such that the plant would be considered a major source.

The source would be allowed to construct this plant under this draft construction permit because the actual emissions of the plant will be below the levels at which the plant would be considered a major source under Titles I, III, and V of the federal Clean Air Act. The plant's potential emissions in the absence of limits established in the draft construction would be such that the plant would be considered a major source under Title V of the federal Clean Air Act and as a result the source may elect to apply for a Federally Enforceable State Operating Permit (FESOP) after construction and the performance testing required by the draft construction permit is complete. If the source elects to apply for a FESOP, it will not need to obtain a Clean Air Act Permit Program (CAAPP) permit for the plant, as would otherwise be required.

The draft construction permit proposes to allow operation of the equipment listed in Table 1 above for a period of twelve (12) months from the date of initial startup of any of the equipment listed in the construction permit in order to allow performance testing and the compilation of the results of such testing.

The draft construction permit proposes limits on the operation and annual emissions of the plant to below the major-source-thresholds of 250 tons for PM, PM_{10}, and $PM_{2.5}$, 50 tons for VOM, 10 tons for any individual HAP and 25 tons for combined HAPs. The potential emissions of other pollutants (e.g., CO, NO_x, and SO_2) from the plant are small enough that no restrictions are needed to avoid being a major source of these pollutants.)

IV. APPLICABLE EMISSION STANDARDS

All emission units in Illinois must comply with state emission standards adopted by the Illinois Pollution Control Board (Board). These emission standards represent the basic requirements for sources in Illinois. The Board has specific standards for units emitting PM and PM_{10} under 35 Ill. Adm. Code Part 212. The Hammermill Shredder System, Ferrous Material Separation System, Non-Ferrous Material Separation System, Outdoor Material Transfer Points, and Fines Processing System are subject to 35 Ill. Adm. Code Part 212 Subpart B (Visible Emissions), which limits the opacity of the PM emissions from each unit to no more than 30%, and Subpart L (Particulate Matter Emissions from Process Emission Units), which sets mass emission limits based on the process weight rate of each emission unit. The Hammermill Shredder System, Ferrous Material Separation System, Non-Ferrous Material Separation System, Outdoor Material Transfer Points, and Fines Processing System are subject to 35 Ill. Adm. Code 212.324 (Process Emission Units in Certain Areas), which limits the emission into the atmosphere of PM_{10} from any process emission unit to not exceed 68.7 mg/scm (0.03 gr/scf) during any one hour period. Furthermore, the source is subject to 35 Ill. Adm. Code Part 212 Subpart UU (Additional Control Measures), which requires a contingency measure plan to provide for additional reductions in fugitive PM_{10} emissions between 15% and 25%. This contingency measure plan will be subject to review and approval by the Illinois EPA and USEPA. In addition, the contingency measure plan will require an implementation schedule that is also subject to review and approval by the Illinois EPA.

The Board also has specific standards for units emitting VOM from stationary sources located in the Chicago area under 35 Ill. Adm. Code Part 218. The Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 218 Subpart G (Use of Organic Material),which limits the emissions of VOM from the use of liquid organic material to eight pouds per hour or requires an 85 percent reduction in uncontrolled VOM emissions, and 35 Ill. Adm. Code Part 218 Subpart TT (Other Emission Units), which requires that the Hammermill Shredder System be equipped with air pollution control equipment, such as the Rengerative Thermal Oxidier (RTO), that achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent.

During the analysis of the construction permit application, dispersion modeling of metal HAP emissions (including Lead and Manganese) was performed and reviewed. The analysis of the data from the dispersion modeling of the source’s emissions revealed that the emissions from the source to the maximum off-site ambient air impact are not expected to exceed the primary and secondary National Ambient Air Quality Standards (NAAQS), specifically 40 CFR 50.16 for Lead (Pb). Furthermore, the analysis of the data from the dispersion modeling of Manganese (Mn) emissions and emissions of all other HAPs that relate to the expected emissions from the source to the maximum off-site ambient air impact do not exceed the Agency for Toxic Substances and Disease Registry (ATSDSR), and Minimal Risk Levels, hazardous air contaminant air quality standard in the Wisconsin Department of Natural Resources air toxics rule (Wisconsin Administrative Code, Chapter NR 445 – Control of Hazardous Pollutants), and an inhalation risk greater than 1 in 1,000,000 for carcinogenic substances with a unit risk factor established by the USEPA or the California Air Resources Board (CARB).

The application proposes that the plant will comply with applicable state and federal emission standards.

V. CONTENTS OF THE PERMIT

The permit that the Illinois EPA is proposing to issue will identify the specific emission standards that apply to the emission units at the plant. As explained, the Hammermill Shredder System, Ferrous Material Separation System, Non-Ferrous Material Separation System, Outdoor Material Transfer Points, and Fines Processing System are subject to 35 Ill. Adm. Code Part 212 Subpart B, which limits the opacity of the PM emissions from each unit to no more than 30%, and 35 Ill. Adm. Code Part 212 Subpart L, which sets mass emission limits based on the process weight rate of each emission unit and limits the emission into the atmosphere of PM_{10} from any process emission unit to not exceed 68.7 mg/scm (0.03 gr/scf) during any one hour period. The source is subject to 35 Ill. Adm. Code Part 212 Subpart UU (Additional Control Measures) which requires the source to design a contingency measure plan to provide for additional reductions in fugitive PM_{10} emissions between 15% and 25%. The Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 218 Subpart G,which limits the emissions of VOM to no more than 8 pounds/hour or utilize air pollution control equipment to achieve an 85% reduction in VOM emssions, and 35 Ill. Adm. Code Part 218 Subpart TT, which requires that the Hammermill Shredder System be equipped with air pollution control equipment, such as the Rengerative Thermal Oxidier (RTO), that achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent. The conditions of this permit are intended to ensure that the source will comply with applicable emission standards.

The permit would also contain limitations and requirements to assure that this plant is constructed, tested, and operated as a non-major source. The permit would limit the operation and annual emissions of the plant to below the major-sourcethresholds of 250 tons for PM, PM_{10}, and $PM_{2.5}$, 50 tons for VOM, 10 tons for an individual HAP and 25 tons for combined HAPs. (Annual emissions of other pollutants from the plant are well below the major source thresholds for the applicability of Prevention of Significant Deterioration (PSD) and the Illinois' rules for Major Stationary Sources Construction and Modification).

The draft construction permit would also set limitations on the amount of scrap metal that may be received processed and shipped. The draft construction permit also sets limits on the times of operation and the number of hours that the plant may operate during the day and incorporates a voluntary plan for controlling the source's fugitive dust emissions. Furthermore, the draft construction permit will require that the air pollution control equipment, such as the RTO and the packed tower scrubber, be equipped with monitoring devices to insure that the air pollution control devices are operating and functioning properly. These limitations are consistent with the proposed actual operation of emission units for this plant.

The permit conditions would also require appropriate compliance procedures, including inspection practices as well as recordkeeping and reporting requirements. The source must carry out these procedures on an on-going basis to demonstrate that the plant is being operated within the limitations set by the permit and the plant's emissions are being properly controlled.

VI. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the source has met the requirements for issuance of this construction permit. The Illinois EPA is therefore proposing to issue this permit.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit. Because substantial public interest has already been shown in this matter, the Illinois EPA will be holding a public hearing in accordance with 35 Ill. Adm. Code Part 166.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/785-1705

CONSTRUCTION PERMIT

PERMITTEE

General III, LLC
Attn: Jim Kallas
11600 South Burley Avenue
Chicago, Illinois 60617

Application No.: 19090021
I.D. No.: 031600SFX
Applicant's Designation:
Date Received: September 25, 2019
Subject: Scrap Metal Recycling Facility
Date Issued:
Location: 11600 South Burley Avenue, Chicago, Cook County, 60617

This permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of:

Hammermill Shredder System:
One (1) Hammermill Shredder with Integral Water Injection System equipped with capture hood and Cyclone, and controlled by a Roll-Media Filter, 15.0 mmBtu/hour Natural Gas-Fired Regenerative Thermal Oxidizer (RTO), and Quench/Packed Tower Scrubber with feed and takeaway conveyors;
One (1) Vibratory Conveyor; and
One (1) Shredder Infeed Conveyor;

Ferrous Material Separation System:
One (1) Poker Picker with Gravity Chutes;
Seven (7) Magnetic Separators;
Two (2) Z-Box Separators with Cyclones;
Seventy (70) conveyor transfer points;
Two (2) Ferrous Metal Stacking Conveyors;
One (1) Auto Shredder Residue (ASR) Stacking Conveyor
Ferrous Material Barge Loading;
Ferrous Material Rail Car Loading; and
Ferrous Material Truck Loading

Non-Ferrous Material Separation System:
One (1) ASR Feed Hopper with Vibratory Batch Feeder;
Eight (8) Magnetic Separators;
Three (3) Screens;
Seven (7) Eddy Current Separators (ECS) located in Enclosures;
Four (4) Wind Sifters (Air Classifiers) with Cyclones;
Five (5) Polishers (Air Classifiers) with Cyclone;
One (1) Air Vibe (Air Classifier) with Cyclone;
One (1) Low Speed Shredder for Size Reduction of Clean Non-Ferrous Material;
Ninety nine (99) Material Transfer Points; and
Fines Processing Building – with All Equipment in Building Controlled by Dust Collector DC-01

pursuant to the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1a. This permit is issued based on the emissions of Hazardous Air Pollutants (HAP) as listed in Section 112(b) of the Clean Air Act from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System being less than 10 tons/year of any single HAP and 25 tons/year of any combination of such HAPs. As a result, this permit is issued based on the emissions of all HAPs from the above-listed equipment not triggering the requirements of Section 112(g) of the Clean Air Act.

b. This permit is issued based on the construction of the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System not constituting a new major source or major modification pursuant to Title I of the Clean Air Act, specifically 40 CFR 52.21 (Prevention of Significant Deterioration (PSD)). The source has requested that the Illinois EPA establish emission limitations and other appropriate terms and conditions in this permit that limit the emissions of Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Lead (Pb) from the above-listed equipment below the levels that would trigger the applicability of these rules.

c. This permit is issued based on the construction of the Hammermill Shredder System not constituting a new major source or major modification pursuant to Title I of the Clean Air Act, specifically 35 Ill. Adm. Code Part 203 (Major Stationary Sources Construction and Modification). The source has requested that the Illinois EPA establish emission limitations and other appropriate terms and conditions in this permit that limit the emissions of Volatile Organic Material (VOM) from the above-listed equipment below the levels that would trigger the applicability of these rules.

d. This permit is issued based on the analysis of the data from the dispersion modeling of the source’s Lead (Pb) emissions, that relate to the expected emissions from the project to the maximum off-site ambient air impacts not to exceed the primary and secondary National Ambient Air Quality Standards (NAAQS) for Lead, specifically 40 CFR 50.16. Furthermore, this permit is also issued based on the analysis of the data from the dispersion modeling of emissions of Manganese (Mn) and other metal HAPs, that relate the expected emissions from the project to corresponding maximum off-site ambient air impacts not to exceed the Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels, hazardous air contaminant air quality standards in the Wisconsin Department of Natural Resources air toxics rule (Wisconsin Administrative Code, Chapter NR 445 – Control of Hazardous Pollutants), and an inhalation risk greater than 1 in 1,000,000 for carcinogenic metals with a unit risk factor established by the United States Environmental Protection Agency (USEPA) or the California Air Resources Board (CARB).

e. For purposes of this permit, General III, LLC is considered a single source with South Chicago Property Management, Ltd. (I.D. No. 031600GYI, located at 11600 South Burley Ave).

f. Operation of the equipment listed above is allowed under this construction permit for a period of twelve (12) months from the date that raw material is first processed through the Hammermill Shredder.

g. The operation of the emission units under this Construction Permit shall not begin until construction of the associated air pollution control equipment is complete and reasonable measures short of actual operation have been taken to verify proper operation of the air pollution control equipment.

2a. Pursuant to 40 CFR 50.16(a), the national primary and secondary ambient air quality standards for Lead (Pb) and its compounds are 0.15 micrograms per cubic meter, arithmetic mean concentration over a 3-month period, measured in the ambient air as Pb either by:

i. A reference method based on Appendix G of 40 CFR Part 50 and designated in accordance with 40 CFR Part 53;

ii. An equivalent method designated in accordance with 40 CFR Part 53.

b. Pursuant to 40 CFR 50.16(b), the national primary and secondary ambient air quality standards for Pb are met when the maximum arithmetic 3-month mean concentration for a 3-year period, as determined in accordance with Appendix R of 40 CFR Part 50, is less than or equal to 0.15 micrograms per cubic meter.

3a. The Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System are subject to 35 Ill. Adm. Code Part 212 Subpart B (Visible Emissions). Pursuant to 35 Ill. Adm. Code 212.123(a), no person shall cause or allow the emission of smoke or other particulate matter, with an opacity greater than 30 percent, into the atmosphere from any emission unit other than those emission units subject to 35 Ill. Adm. Code 212.122.

b. Pursuant to 35 Ill. Adm. Code 212.123(b), the emission of smoke or other particulate matter from any such emission unit may have an opacity greater than 30 percent but not greater than 60 percent for a period or periods aggregating 8 minutes in any 60 minute period provided that such opaque emissions permitted during any 60 minute period shall occur from only one such emission unit located within a 305 m (1000 ft) radius from the center point of any other such emission unit owned or operated by such person, and provided further that such opaque emissions permitted from each such emission unit shall be limited to 3 times in any 24 hour period.

c. This source is subject to 35 Ill. Adm. Code Part 212 Subpart K (Fugitive Particulate Matter). Pursuant to 35 Ill. Adm. Code 212.301, no person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith at a point beyond the property line of the source.

d. The Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System are subject to 35 Ill. Adm. Code Part 212 Subpart L (Particulate Matter Emissions from Process Emission Units). Pursuant to 35 Ill. Adm. Code 212.321(a), except as further provided in 35 Ill. Adm. Code Part 212, no person shall cause or allow the emission of particulate matter into the atmosphere in any one hour period from any new process emission unit which, either alone or in combination with the emission of particulate matter from all other similar process emission units for which construction or modification commenced on or after April 14, 1972, at a source or premises, exceeds the allowable emission rates specified in 35 Ill. Adm. Code 212.321(c).

e. Pursuant to 35 Ill. Adm. Code 212.321(b), interpolated and extrapolated values of the data in 35 Ill. Adm. Code 212.321(c) shall be determined by using the equation:

$$E = A(P)^{B}$$

where:

P = Process weight rate; and
E = Allowable emission rate; and,

i. Up to process weight rates of 408 Mg/hr (450 T/hr):

	Metric	English
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	1.214	2.54
B	0.534	0.534

ii. For process weight rate greater than or equal to 408 Mg/hr (450 T/hr):

	Metric	English
P	Mg/hr	T/hr
E	kg/hr	lbs/hr
A	11.42	24.8
B	0.16	0.16

f. Pursuant to 35 Ill. Adm. Code 212.321(c), Limits for Process Emission Units for Which Construction or Modification Commenced on or After April 14, 1972:

Metric		English	
P	E	P	E
Mg/hr	kg/hr	T/hr	lbs/hr
0.05	0.25	0.05	0.55
0.1	0.29	0.10	0.77
0.2	0.42	0.20	1.10
0.3	0.64	0.30	1.35
0.4	0.74	0.40	1.58
0.5	0.84	0.50	1.75
0.7	1.00	0.75	2.40

Metric		English	
P	E	P	E
Mg/hr	kg/hr	T/hr	lbs/hr
0.9	1.15	1.00	2.60
1.8	1.66	2.00	3.70
2.7	2.1	3.00	4.60
3.6	2.4	4.00	5.35
4.5	2.7	5.00	6.00
9.	3.9	10.00	8.70
13.	4.8	15.00	10.80
18.	5.7	20.00	12.50
23.	6.5	25.00	14.00
27.	7.1	30.00	15.60
32.	7.7	35.00	17.00
36.	8.2	40.00	18.20
41.	8.8	45.00	19.20
45.	9.3	50.00	20.50
90.	13.4	100.00	29.50
140.	17.0	150.00	37.00
180.	19.4	200.00	43.00
230.	22.	250.00	48.50
270.	24.	300.00	53.00
320.	26.	350.00	58.00
360.	28.	400.00	62.00
408.	30.1	450.00	66.00
454.	30.4	500.00	67.00

where:

P = Process weight rate in metric or T/hr, and
E = Allowable emission rate in kg/hr or lbs/hr.

g. The Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System are subject to 35 Ill. Adm. Code 212.324 (Process Emission Units in Certain Areas). Pursuant to 35 Ill. Adm. Code 212.324(b), except as otherwise provided in 35 Ill. Adm. Code 212.324, no person shall cause or allow the emission into the atmosphere, of PM_{10} from any process emission unit to exceed 68.7 mg/scm (0.03 gr/scf) during any one hour period.

h. This source is subject to 35 Ill. Adm. Code Part 212 Subpart U (Additional Control Measures). Pursuant to 35 Ill. Adm. Code 212.700(a), 35 Ill. Adm. Code 212 Subpart U (Additional Control Measures) shall apply to those sources in the areas designated in and subject to 35 Ill. Adm. Code 212.324(a)(1) or 212.423(a) and that have actual annual source-wide emissions of PM_{10} of at least fifteen (15) tons per year.

4. The Regenerative Thermal Oxidizer (RTO) associated with Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 214 Subpart K (Process Emission Sources). Pursuant to 35 Ill. Adm. Code 214.301, except as further provided by 35 Ill. Adm. Code Part 214, no person shall cause or allow the emission of sulfur dioxide into the atmosphere from any process emission source to exceed 2000 ppm.

5a. The Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 218

Subpart G (Use of Organic Material). Pursuant to 35 Ill. Adm. Code 218.301, no person shall cause or allow the discharge of more than 3.6 kg/hr (8 lbs/hr) of organic material into the atmosphere from any emission unit, except as provided in 35 Ill. Adm. Code 218.302, 218.303, or 218.304 and the following exception: If no odor nuisance exists the limitation of 35 Ill. Adm. Code Part 218 Subpart G shall only apply to photochemically reactive material.

b. Pursuant to 35 Ill. Adm. Code 218.302(a), emissions of organic material in excess of those permitted by 35 Ill. Adm. Code 218.301 are allowable if such emissions are controlled by one of the following methods:

Flame, thermal or catalytic incineration so as either to reduce such emissions to 10 ppm equivalent methane (molecular weight 16) or less, or to convert 85 percent of the hydrocarbons to carbon dioxide and water.

c. The Hammermill Shredder System is subject to 35 Ill. Adm. Code Part 218 Subpart TT (Other Emission Units). Pursuant to 35 Ill. Adm. Code 218.980(a):

i. A source is subject to 35 Ill. Adm. Code Part 218 Subpart TT if it contains process emission units not regulated by 35 Ill. Adm. Code Part 218 Subparts B, E, F (excluding 35 Ill. Adm. Code 218.204 (l)), H (excluding 35 Ill. Adm. Code 218.405), Q, R, S, T (excluding 35 Ill. Adm. Code 218.486), V, X, Y, Z or BB of this Part, which as a group both:

A. Have maximum theoretical emissions of 90.7 Mg (100 tons) or more per calendar year of VOM, and

B. Are not limited to less than 90.7 Mg (100 tons) of VOM emissions per calendar year in the absence of air pollution control equipment through production or capacity limitations contained in a federally enforceable permit or a SIP revision.

ii. If a source is subject to 35 Ill. Adm. Code Part 218 Subpart TT as provided in 35 Ill. Adm. Code Part 218 Subpart TT, the requirements of 35 Ill. Adm. Code Part 218 Subpart TT shall apply to a source's VOM emission units which are not included within any of the categories specified in 35 Ill. Adm. Code Part 218 Subparts B, E, F, H, Q, R, S, T, V, X, Y, Z, AA, BB, PP, QQ, or RR or which are not exempted from permitting requirements pursuant to 35 Ill. Adm. Code 201.146.

d. Pursuant to 35 Ill. Adm. Code 218.986(a), every owner or operator of an emission unit subject to 35 Ill. Adm. Code 218 Subpart TT shall comply with the requirements of 35 Ill. Adm. Code 218.986(a), (b), (c), (d), or (e) below.

Emission capture and control equipment which achieves an overall reduction in uncontrolled VOM emissions of at least 81 percent from each emission unit.

6. This permit is issued based on the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System at this source not being subject to the New Source Performance Standards (NSPS) for Metallic Mineral Processing Plants, 40 CFR 60 Subpart LL because the Raw Material Receiving and Handling System, Hammermill Shredder System, Ferrous Material Separation System, Non-Ferrous Material Separation System, and Fines Processing System at this source are not used to produce metallic mineral concentrates from ore.

7a. This permit is issued based on the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System at this source not being subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) from Off-Site Waste and Recovery Operations, 40 CFR 63 Subpart DD, because the plant site is not a major source of HAP emissions as defined in 40 CFR 63.2.

b. This permit is issued based on the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System at this source not being subject to the NESHAP for Primary Nonferrous Metals Area Sources—Zinc, Cadmium, and Beryllium, 40 CFR 63 Subpart GGGGGG, because the source will not be engaged in primary zinc production or primary beryllium production.

c. This permit is issued based on the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System at this source not being subject to the NESHAP for Secondary Nonferrous Metals Processing Area Sources, 40 CFR 63 Subpart TTTTTT, because the source will not be engaged in secondary nonferrous metals processing as defined in 40 CFR 63.11472.

d. This permit is issued based on the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System at this source not being subject to the NESHAP for Nine Metal Fabrication and Finishing Source Categories, 40 CFR 63 Subpart XXXXXX, because the source will not be primarily engaged in the operations in one of the nine source categories listed in 40 CFR 63.11514(a)(1) through (9).

8a. Pursuant to 35 Ill. Adm. Code 212.314, 35 Ill. Adm. Code 212.301 shall not apply and spraying pursuant to 35 Ill. Adm. Code 212.304 through 212.310 and 35 Ill. Adm. Code 212.312 shall not be required when the wind speed is greater than 40.2 km/hr (25 mph). Determination of wind speed for the purposes of 35 Ill. Adm. Code 212.314 shall be by a one-hour average or hourly recorded value at the nearest official station of the U.S. Weather Bureau or by wind speed instruments operated on the site. In cases where the duration of operations subject to 35 Ill. Adm. Code 212.314 is less than one hour, wind speed may be averaged over the duration of the operations on the basis of on-site wind speed instrument measurements.

b. Pursuant to 35 Ill. Adm. Code 212.324(d), the mass emission limits contained in 35 Ill. Adm. Code 212.324(b) and (c) shall not apply to those emission units with no visible emissions other than fugitive particulate matter; however, if a stack test is performed, 35 Ill. Adm. Code 212.324(d) is not a defense finding of a violation of the mass emission limits contained in 35 Ill. Adm. Code 212.324(b) and (c).

9a. Pursuant to 35 Ill. Adm. Code 212.324(f), for any process emission unit subject to 35 Ill. Adm. Code 212.324(a), the owner or operator shall maintain and repair all air pollution control equipment in a manner that assures that the emission limits and standards in 35 Ill. Adm. Code 212.324 shall be met at all times. 35 Ill. Adm. Code 212.324(f) shall not affect the applicability of 35 Ill. Adm. Code 201.149. Proper maintenance shall include the following minimum requirements:

i. Visual inspections of air pollution control equipment;

ii. Maintenance of an adequate inventory of spare parts; and

iii. Expeditious repairs, unless the emission unit is shutdown.

b. Pursuant to 35 Ill. Adm. Code 212.701(a), those sources subject to 35 Ill. Adm. Code Part 212 Subpart U shall prepare contingency measure plans reflecting the PM_{10} emission reductions set forth in 35 Ill. Adm. Code 212.703. These plans shall become federally enforceable permit conditions. Such plans shall be submitted to the Illinois EPA by November 15, 1994. Notwithstanding the foregoing, sources that become subject to the provisions of 35 Ill. Adm. Code Part 212 Subpart U after July 1, 1994, shall submit a contingency measure plan to the Illinois EPA for review and approval within ninety (90) days after the date such source or sources became subject to the provisions of 35 Ill. Adm. Code Part 212 Subpart U or by November 15, 1994, whichever is later. The Illinois EPA shall notify those sources requiring contingency measure plans, based on the Illinois EPA’s current information; however, the Illinois EPA’s failure to notify any source of its requirement to submit contingency measure plans shall not be a defense to a violation of 35 Ill. Adm. Code Part 212 Subpart U and shall not relieve the source of its obligation to timely submit a contingency measure plan.

c. Pursuant to 35 Ill. Adm. Code 212.703(a), all sources subject to 35 Ill. Adm. Code Part 212 Subpart U shall submit a contingency measure plan. The contingency measure plan shall contain two levels of control measures:

i. Level I measures are measures that will reduce total actual annual source-wide fugitive emissions of PM_{10} subject to control under 35 Ill. Adm. Code 212.304, 212.305, 212.306, 212.308, 212.316(a) through (e), 212.424 or 212.464 by at least 15%.

ii. Level II measures are measures that will reduce total actual annual source-wide fugitive emissions of PM_{10} subject to control under 35 Ill. Adm. Code 212.304, 212.305, 212.306, 212.308, 212.316(a) through (e), 212.424 or 212.464 by at least 25%.

d. Pursuant to 35 Ill. Adm. Code 212.703(b), a source may comply with 35 Ill. Adm. Code Part 212 Subpart U through an alternative compliance plan that provides for reductions in emissions equal to the level of reduction of fugitive emissions as required at 35 Ill. Adm. Code 212.703(a) and which has been approved by the Illinois EPA and USEPA as federally enforceable permit conditions. If a source elects to include controls on process emission units, fuel combustion emission units, or other fugitive emissions of PM_{10} not subject to 35 Ill. Adm. Code 212.304, 212.305, 212.306, 212.308, 212.316(a) through (e), 212.424 or 212.464 at the source in its alternative control plan, the plan must include a reasonable schedule for implementation of such controls, not to exceed two (2) years. This implementation schedule is subject to Illinois EPA review and approval.

e. Pursuant to 35 Ill. Adm. Code 212.704(b), if there is a violation of the ambient air quality standard for PM_{10} as determined in accordance with 40 CFR Part 50, Appendix K, the Illinois EPA shall notify the source or sources the Illinois EPA has identified as likely to be causing or contributing to one or more of the exceedances leading to such violation, and such source or sources shall implement Level I or Level II measures, as determined pursuant to 35 Ill. Adm. Code 212.704(e). The source or sources so identified shall implement such measures corresponding to fugitive emissions within ninety (90) days after receipt of a notification and shall implement such measures corresponding to any nonfugitive emissions according to the approved schedule set forth in such source’s alternative control plan. Any source identified as causing or contributing to a violation of the ambient air quality standard for PM_{10} may appeal any finding of culpability by the Illinois EPA to the Illinois Pollution Control Board pursuant to 35 Ill. Adm. Code 106 Subpart J.

f. Pursuant to 35 Ill. Adm. Code 212.704(e), the Illinois EPA shall require that sources comply with the Level I or Level II measures of their contingency measure plans, pursuant 35 Ill. Adm. Code 212.704(b), as follows:

   i. Level I measures shall be required when the design value of a violation of the 24-hour ambient air quality standard, as computed pursuant to 40 CFR 50, Appendix K, is less than or equal to 170 ug/m^3.

   ii. Level II measures shall be required when the design value of a violation of the 24-hour ambient air quality standard, as computed pursuant to 40 CFR 50, Appendix K, exceeds 170 ug/m^3.

10a. All storage piles of materials which are located within the source’s property shall be sprayed with a surfactant solution or water, or treated by an equivalent method, in accordance with the operating program required by Condition 10(e).

b. All normal traffic pattern access areas surrounding storage piles and all normal traffic pattern roads and parking facilities which are located on the source’s property shall be paved or unpaved areas shall be treated with water, oils or chemical dust suppressants in accordance with the operating program required by Condition 10(e). All paved areas shall be cleaned as needed, in accordance with the operating program required by Condition 10(e). All areas treated with water, oils or chemical dust suppressants shall have the treatment applied, as needed, in accordance with the operating program required by Condition 10(e).

c. All unloading and transporting operations of materials collected by pollution control equipment shall be enclosed or shall utilize spraying, pelletizing, screw conveying or other equivalent methods in accordance with the operating program required by Condition 10(e).

d. The crushers, grinding mills, screening operations, bucket elevators, conveyor transfer points, conveyors, storage bins and product truck and railcar loading operations associated with the Raw Material Receiving and Handling System, Hammermill Shredder System, Ferrous Material Separation System, Non-Ferrous Material Separation System, and Fines Processing System shall be sprayed with water or a surfactant solution, utilize choke-feeding or be treated by an equivalent method in accordance with the operating program required by Condition 10(e).

e. The emission units described in Conditions 10(a) through (d) shall be operated under the provisions of an operating program, consistent with the requirements set forth in set forth in Condition 10(f) and prepared by the owner or operator and submitted to the Illinois EPA for its review. Such operating program shall be designed to limit fugitive particulate matter emissions to ensure compliance with applicable limits and standards.

f. As a minimum the operating program shall include the following:

   i. The name and address of the source;

   ii. The name and address of the owner or operator responsible for execution of the operating program;

   iii. A map or diagram of the source showing approximate locations of storage piles, conveyor loading operations, normal traffic pattern access areas surrounding storage piles and all normal traffic patterns within the source;

   iv. Location of unloading and transporting operations with pollution control equipment;

   v. A detailed description of the best management practices utilized to achieve compliance with 35 Ill. Adm. Code 212.301, including an engineering specification of particulate collection equipment, application systems for water, oil, chemicals and dust suppressants utilized and equivalent methods utilized;

vi. Estimated frequency of application of dust suppressants by location of materials; and

vii. Such other information as may be necessary to facilitate the Illinois EPA's review of the operating program.

g. The operating program shall include provisions for a visual inspection of the Hammermill Shredder enclosure. Inspection(s) shall be completed at a frequency pursuant to the operating program for this facility when the Hammermill Metal Shredder and associated RTO and Quench/Packed Tower Scrubber is in operation, and identify if any additional dust suppression measures are required. This inspection, and any corrective actions taken, will be recorded in accordance with the operating program required by Condition 10(e).

h. The Fugitive Particulate Operating Program, as submitted by the Permittee pursuant to Condition 10(e) dated December 11, 2019, is incorporated herein by reference. The source shall be operated under and shall comply with the provisions of this Fugitive Particulate Operating Program and any amendments to the Fugitive Particulate Operating Program submitted pursuant to Condition 10(e).

i. The Fugitive Particulate Operating Program shall be amended from time to time by the Permittee so that the operating program is current. Such amendments shall be consistent with Condition No. 10(e) and (f) and shall be submitted to the Illinois EPA within thirty (30) days of such amendment. Any future revision to the Fugitive Particulate Operating Program made by the Permittee during the permit term is automatically incorporated by reference. In the event that the Illinois EPA notifies the Permittee that further information regarding the revision to the Fugitive Particulate Operating Program is needed, the Permittee shall respond to the notice within thirty (30) days of receipt of notification.

11a. In the event that the operation of this source results in an odor nuisance, the Permittee shall take appropriate and necessary actions to minimize odors, including but not limited to, changes in material or installation of controls, in order to eliminate the odor nuisance.

b. The Roll-media Filter, Regenerative Thermal Oxidizer (RTO), Quench/Packed Tower Scrubber, and Dust Collectors (DC-01 through DC-04) shall be in operation at all times when the associated emission units are in operation and emitting air contaminants.

c. The Permittee shall, in accordance with the manufacturer(s) and/or vendor(s) recommendations, perform periodic maintenance on the Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber associated with the Hammermill Shredder System; and Dust Collectors (DC-01 through DC-04) associated with the Fines Processing System such that the Regenerative Thermal Oxidizer (RTO), Quench/Packed Tower Scrubber, and Dust Collectors (DC-01 through DC-04) are kept in proper working condition and not cause a violation of the Illinois Environmental Protection Act or regulations promulgated therein.

d. The Regenerative Thermal Oxidizer (RTO) combustion chambers shall be preheated to at least the manufacturer's recommended temperature but no less than the temperature at which compliance was demonstrated in the most recent compliance test or 1,400°F in the absence of a compliance test. This temperature shall be maintained during operation of the Metal Shredder System and calculated as a three hour block average.

e. The Regenerative Thermal Oxidizer (RTO) shall only be operated with natural gas as the fuel. The use of any other fuel in the RTO may require that the Permittee first obtain a construction permit from the Illinois EPA and then perform stack testing to verify compliance with all applicable requirements.

f. The Regenerative Thermal Oxidizer (RTO) associated with the Hammermill Shredder System shall be equipped with a temperature monitoring device that is installed, calibrated, operated and maintained, in accordance with vendor/manufacturer specifications and 35 Ill. Adm. Code 218.105(d)(2).

g. The Quench/Packed Tower Scrubber associated with the Hammermill Shredder System shall be equipped with a monitoring device for pressure differential, scrubbant liquid flow rate, and pH of the scrubbant liquid. These monitoring devices shall be installed, calibrated, operated and maintained, in accordance with vendor/manufacturer specifications.

h. Within 30 days of the startup of the Regenerative Thermal Oxidizer (RTO) and the Quench/Packed Tower Scrubber associated with the Hammermill Shredder System, the Permittee shall submit for Illinois EPA approval a Metal Shredder System operation and maintenance plan that details specific operation and maintenance practices for the equipment identified in this Permit, including frequencies of such specific activities and actions, individuals responsible for such activities and actions, and associated recordkeeping procedures.

12a. Operation of the source's emission units and activities shall not exceed the following limits:

i. Hours of operation:

Site Operation	Monday to Friday		Saturday	
Ferrous System Operation (includes Hammermill Shredder RTO/Scrubber Stack)	7:00 AM – 7:00 PM	12 hrs/day	7:00 AM - 5:00 PM	10 hrs/day
Barge Loading	7:00 AM – 3:00 PM	8 hrs/day	7:00 AM - 3:00 PM	8 hrs/day
Non-Ferrous System Operation	5:00 AM – 11:00 PM	18 hrs/day	5:00 AM - 11:00 PM	18 hrs/day
Roadway Fugitive Emissions (Facility Vehicle Traffic)*	5:00 AM – 7:00 PM	14 hrs/day	5:00 AM - 5:00 PM	12 hrs/day

* The roadway fugitive emissions (Facility Vehicle Traffic) operation limitations in the table above is only intended to reflect haul truck traffic (semi-trailers) on specified road segments accompanying deliveries of metal scrap and removal of waste material.

ii. The limitations on hours of operation for the source are based upon the meteorological hours modeled for each operation as specified on Table 1 of the modeling analysis and page 1 of supplement No. 1 to the Air Dispersion Modeling Report, dated January 24, 2020, for assessment of metal emission impacts.

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

i. VOM emissions:

Emission Unit	Process Rate (Tons/Mo)	(Tons/Yr)	Uncontrolled Emission Factor (lb/Ton)	VOM Emission (Tons/Mo)	(Tons/Yr)
Hammermill Shredder RTO/Scrubber Stack	100,000	1,000,000	0.5119	0.51	5.12

These limits are based on maximum shredder material throughput, an uncontrolled emission factor derived from a stack test at the inlet of the RTO in November 2019 at GII, LLC (I.D. # 031600BTB), and 98% removal efficiency by the RTO/Scrubber. All measured total hydrocarbon (THC) emissions are assumed to be VOM.

ii. HAP emissions:

Emission Unit	Lead (Pb) (T/Mo)	(T/Yr)	Manganese (Mn) (T/Mo)	(T/Yr)	Hydrochloric Acid (HCl) (T/Mo)	(T/Yr)	Combined HAPs[1] (T/Mo)	(T/Yr)
Metal Shredder RTO/Scrubber Stack	0.000138	0.00138	0.000199	0.00199	0.08	0.77	0.13	1.33

[1] Combined HAPs means the total of all individual HAPs (as defined in Section 112(b) of the Clean Air Act) that are emitted from the Hammermill Shredder System.

These limits are based on the maximum shredder material throughput in Condition 12(b)(i) above and measured emission rates from the November 2019 stack test at GII, LLC (I.D. # 031600BTB) adjusted by safety factor of 2.0.

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

Process Rate	Emission Factor	PM, PM_{10}, and $PM_{2.5}$ Emissions

Emission Unit	(Tons/Mo)	(Tons/Yr)	(lb/Ton)	(Tons/Mo)	(Tons/Yr)
Metal Shredder					
RTO/Scrubber Stack	100,000	1,000,000	0.0047	0.47	4.70

These limits are based on maximum shredder material throughput in Condition 12(b)(i) above, emission factors derived from the May/June 2018 stack test at GII, LLC (I.D. # 031600BTB) adjusted by a safety factor of 2.0, and all measured filterable PM assumed to be PM_{10} and $PM_{2.5}$.

c. 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, 51.47 mmscf/year

ii. Emissions from the combustion of natural gas:

Pollutant	Emission Factor (lbs/mmscf)	Emissions (Tons/Mo)	(Tons/Yr)
Carbon Monoxide (CO)	583.55	1.50	15.02
Nitrogen Oxides (NO_x)	100.0	0.26	2.57
Particulate Matter (PM, PM_{10}, and $PM_{2.5}$)	7.6	0.02	0.20
Sulfur Dioxide (SO_2)	0.6	0.01	0.09
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, 12.86 tons/year of CO emissions and 0.05 tons/year of SO_2 emissions based on data from the November 2019 stack test at GII, LLC (I.D. # 031600BTB), and standard emission factors (Tables 1.4-1 and 1.4-2, AP-42, Fifth Edition, Volume I, Supplement D, July 1998).

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

i. Material process rates and Particulate Matter (PM) Emissions:

Emission Unit	Process Rate (Tons/Mo)	(Tons/Yr)	Emission Factor (lb/Ton)	PM Emissions (Tons/Mo)	(Tons/Yr)
70 Conveyor Transfer Points	1,444,050	14,440,500	0.00014	0.10	0.96
3 Truck & Barge Loading Points	137,600	1,376,000	0.000204	0.01	0.14
7 Stockpile Loading Points	300,000	3,000,000	0.00122	0.18	1.83
				Total:	2.93

ii. PM_{10} and $PM_{2.5}$ Emissions:

Emission Units	PM_{10} Emission Factor (lb/Ton)	PM_{10} Emissions (Tons/Mo)	PM_{10} Emissions (Tons/Yr)	$PM_{2.5}$ Emission Factor (lb/Ton)	$PM_{2.5}$ Emissions (Tons/Mo)	$PM_{2.5}$ Emissions (Tons/Yr)
70 Conveyor Transfer Points	0.000046	0.03	0.31	0.000013	0.01	0.09
3 Truck & Barge Loading Points	0.00010	0.01	0.07	0.000015	0.01	0.01
7 Stockpile Loading Points	0.00058	0.09	0.87	0.000087	0.01	0.13
		Totals:	1.25			0.23

iii. HAP emissions:

Emission Unit	Lead (Pb) Emissions (Tons/Mo)	Lead (Pb) Emissions (Tons/Yr)	Manganese (Mn) Emissions (Tons/Mo)	Manganese (Mn) Emissions (Tons/Yr)	Combined HAP Emissions[2] (Tons/Mo)	Combined HAP Emissions[2] (Tons/Yr)
Ferrous Material Separation Process	0.0007	0.0069	0.0004	0.0042	0.0015	0.0143

[2] Combined HAPs means the total of all individual HAPs (as defined in Section 112(b) of the Clean Air Act) that are emitted from the Ferrous Material Separation Process.

iv. The above limits for PM, PM_{10}, and $PM_{2.5}$ are based on the 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. The above limits for HAP emissions limits are based upon total metal HAPs being 0.49% of the estimated total PM emissions based on metal HAP analyses performed on a site-specific sample of material at GII representing anticipated characteristics of Ferrous Material Processing.

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

i. PM, PM_{10}, and $PM_{2.5}$ emissions for Fines Separation System emission units and activities inside a building controlled by Dust Collector DC-01 shall not exceed 0.15 tons/month and 1.44 tons/year. This limit is based on PM, PM_{10}, and $PM_{2.5}$ emissions being calculated by using the stack flow rate (12,000 cfm) and grain loading of 0.005 gr/dscf and hours of operation.

ii. Emissions from and operation of other Non-Ferrous Separation System emission units shall not exceed the following limits:

A. Material process rates and Particulate Matter (PM) Emissions:

Emission Units	Process Rate (Tons/Mo)	Process Rate (Tons/Yr)	Emission Factor (lb/Ton)	PM Emission (Tons/Mo)	PM Emission (Tons/Yr)
88 Conveyor Transfer Points (Uncontrolled)	333,876	3,338,757	0.00300	0.43	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	45,847	458,466	0.00020	0.01	0.05
13 Stockpile Loading Points	23,338	233,378	0.00737	0.09	0.86
				Total:	7.40

B. PM_{10} and $PM_{2.5}$ emissions from outdoor emission units:

Emission Units	PM_{10} Emission Factor (lb/Ton)	PM_{10} Emissions (Tons/Mo)	PM_{10} Emissions (Tons/Yr)	$PM_{2.5}$ Emission Factor (lb/Ton)	$PM_{2.5}$ Emission (Tons/Mo)	$PM_{2.5}$ Emission (Tons/Yr)
88 Conveyor Transfer Points (Uncontrolled)	0.0011	0.16	1.59	0.000167	0.02	0.24
11 Conveyor Transfer Points (Controlled)	0.000046	0.01	0.01	0.000013	0.01	0.01
13 Screening Points (Uncontrolled)	0.0087	0.06	0.59	0.001317	0.01	0.09
12 Screening Points (Controlled)	0.00074	0.01	0.14	0.00005	0.01	0.01
2 Truck Loading Points	0.0001	0.01	0.02	0.000015	0.01	0.01
13 Stockpile Loading Points	0.00351	0.04	0.41	0.00051	0.01	0.06
		Totals:	2.76			0.41

C. The above limits for PM, PM_{10}, and $PM_{2.5}$ are based on the 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. HAP emissions from Non-Ferrous Material Separation Process shall not exceed the following limits:

Emission Unit	Lead (Pb) Emissions (Tons/Mo)	(Tons/Yr)	Manganese (Mn) Emissions (Tons/Mo)	(Tons/Yr)	Combined HAP Emissions[3] (Tons/Mo)	(Tons/Yr)
Non-Ferrous Material Separation Process	0.0042	0.0417	0.0016	0.0156	0.01	0.07

[3] Combined HAPs means the total of all individual HAPs (as defined in Section 112(b) of the Clean Air Act) that are emitted from the Non-Ferrous Material Separation Process.

These limits are based on total metal HAPs being 0.83% of the estimated total PM emissions based on metal HAP analyses performed on a site-specific sample of material at GII representing anticipated characteristics of Non-Ferrous Material Processing.

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).

13a. Pursuant to 35 Ill. Adm. Code 201.282, every emission source or air pollution control equipment shall be subject to the following testing requirements for the purpose of determining the nature and quantities of specified air contaminant emissions and for the purpose of determining ground level and ambient air concentrations of such air contaminants:

i. Testing by Owner or Operator. The Illinois EPA may require the owner or operator of the emission source or air pollution control equipment to conduct such tests in accordance with procedures adopted by the Illinois EPA, at such reasonable times as may be specified by the Illinois EPA and at the expense of the owner or operator of the emission source or air pollution control equipment. The Illinois EPA may adopt procedures detailing methods of testing and formats for reporting results of testing. Such procedures and revisions thereto, shall not become effective until filed with the Secretary of State, as required by the APA Act. All such tests shall be made by or under the direction of a person qualified by training and/or experience in the field of air pollution testing. The Illinois EPA shall have the right to observe all aspects of such tests.

ii. Testing by the Illinois EPA. The Illinois EPA shall have the right to conduct such tests at any time at its own expense. Upon request of the Illinois EPA, the owner or operator of the emission source or air pollution control equipment shall provide, without charge to the Illinois EPA, necessary holes in stacks or ducts and other safe and proper testing facilities, including scaffolding, but excluding instruments and sensing devices, as may be necessary.

b. Testing required by Conditions 14, 15, and 16 shall be performed upon a written request from the Illinois EPA by a qualified independent testing service.

14a. Pursuant to 35 Ill. Adm. Code 212.107, for both fugitive and nonfugitive particulate matter emissions, a determination as to the presence or absence of visible emissions from emission units shall be conducted in accordance with Method 22, 40 CFR Part 60, Appendix A, except that the length of the observing period shall be at the discretion of the observer, but not less than one minute. 35 Ill. Adm. Code 212 Subpart A shall not apply to 35 Ill. Adm. Code 212.301.

b. Pursuant to 35 Ill. Adm. Code 212.109, except as otherwise provided in 35 Ill. Adm. Code Part 212, and except for the methods of data reduction when applied to 35 Ill. Adm. Code 212.122 and 212.123, measurements of opacity shall be conducted in accordance with Method 9, 40 CFR Part 60, Appendix A, and the procedures in 40 CFR 60.675(c) and (d), if applicable, except that for roadways and parking areas the number of readings required for each vehicle pass will be three taken at 5-second intervals. The first reading shall be at the point of maximum opacity and second and third readings shall be made at the same point, the observer standing at right angles to the plume at least 15 feet away from the plume and observing 4 feet above the surface of the roadway or parking area. After four vehicles have passed, the 12 readings will be averaged.

c. Pursuant to 35 Ill. Adm. Code 212.110(a), measurement of particulate matter emissions from stationary emission units subject to 35 Ill. Adm. Code Part 212 shall be conducted in accordance with 40 CFR Part 60, Appendix A, Methods 5, 5A, 5D, or 5E.

d. Pursuant to 35 Ill. Adm. Code 212.110(b), the volumetric flow rate and gas velocity shall be determined in accordance with 40 CFR Part 60, Appendix A, Methods 1, 1A, 2, 2A, 2C, 2D, 3, and 4.

e. Pursuant to 35 Ill. Adm. Code 212.110(c), upon a written notification by the Illinois EPA, the owner or operator of a particulate matter emission unit subject to 35 Ill. Adm. Code Part 212 shall conduct the applicable testing for opacity or visible emissions at such person's own expense, to demonstrate compliance. Such test results shall be submitted to the Illinois EPA within thirty (30) days after conducting the test unless an alternative time for submittal is agreed to by the Illinois EPA.

15. Pursuant to 35 Ill. Adm. Code 218.988(a), when in the opinion of the Illinois EPA it is necessary to conduct testing to demonstrate compliance with 35 Ill. Adm. Code 218.986, the owner or operator of a VOM emission unit subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart TT shall, at his own expense, conduct such tests in accordance with the applicable test methods and procedures specified in 35 Ill. Adm. Code 218.105.

16a. Within sixty (60) days after the date raw material is first processed through the Hammermill Shredder, the PM, PM_{10}, $PM_{2.5}$, SO_2, CO, VOM, HCl, Pb and Mn emissions from the Hammermill Shredder System, and the PM, PM_{10}, $PM_{2.5}$, Pb and Mn emissions from the Non-Ferrous Material Separation System (DC-01) shall be measured and the VOM removal efficiency of the Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber shall be determined during conditions which are representative of maximum emissions in order to demonstrate compliance with 35 Ill. Adm. Code 212.321, 35 Ill. Adm. Code 218.986(a), and Condition 12 of this permit.

b. The following methods and procedures shall be used for testing of emissions, unless another method is approved by the Illinois EPA: Refer to 40 CFR 51, Appendix M and 40 CFR 60, Appendix A for USEPA test methods.

Sample and Velocity Traverses for Stationary Sources	USEPA Method 1
Sample and Velocity Traverses for Stationary Sources With Small Stacks or Ducts	USEPA Method 1A
Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)	USEPA Method 2
Direct Measurement of Gas Volume Through Pipes and Small Ducts	USEPA Method 2A
Determination of Gas Velocity and Volumetric Flow Rate in Small Stacks or Ducts (Standard Pitot Tube)	USEPA Method 2C
Measurement of Gas Volume Flow Rates in Small Pipes and Ducts	USEPA Method 2D
Gas Analysis for the Determination of Dry Molecular Weight	USEPA Method 3
Determination of Moisture Content in Stack Gases	USEPA Method 4
Determination of Particulate Matter from Stationary Sources	USEPA Method 5
Determination of Sulfur Dioxide from Stationary Sources	USEPA Method 6
Determination of Sulfur Dioxide Emissions From Stationary Sources (Instrumental Analyzer Procedure)	USEPA Method 6C
Visual Determination of the Opacity of Emissions from Stationary Sources	USEPA Method 9
Determination of Carbon Monoxide from Stationary Sources	USEPA Method 10
Determination of Inorganic Lead Emissions from Stationary Sources	USEPA Method 12
Visual Determination of Fugitive Emissions From Material Sources	USEPA Method 22
Determination of Total Gaseous Nonmethane Organic Emissions as Carbon	USEPA Method 25
Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer	USEPA Method 25A*
Determination of Hydrogen Chloride Emissions From Stationary Sources	USEPA Method 26
Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources—Isokinetic Method	USEPA Method 26A
Determination of Metals Emissions from Stationary Sources	USEPA Method 29**

Determination of PM_{10} and $PM_{2.5}$ Emissions from Stationary Sources (Constant Sampling Rate Procedure)	USEPA Method 201A
Dry Impinger Method for Determining Condensable Particulate Emissions from Stationary Sources	USEPA Method 202

* USEPA Method 25A may only be used if outlet VOM concentration is less than 50 ppm as carbon (non-methane).

** USEPA Method 29 may be used as an alternate to USEPA Method 12 for lead emissions.

c. At least thirty (30) days prior to the actual date of testing, the Permittee shall submit a written test plan to the Illinois EPA, Bureau of Air, Compliance Section Manager. This plan shall include at a minimum:

i. The name (or other identification) of the emission unit(s) to be tested and the name and address of the facility at which they are located;

ii. The name and address of the independent testing service(s) performing the tests, with the names of the individuals who may be performing sampling and analysis and their experience with similar tests;

iii. The specific determinations of emissions and/or performance which are intended to be made, including the site(s) in the ductwork or stack at which sampling will occur;

iv. The specific conditions under which testing will be performed, including a discussion of why these conditions will be representative of the maximum emissions, maximum operating rate, minimum control performance, the levels of operating parameters for the emission unit, including associated control equipment, at or within which compliance is intended to be shown, and the means by which the operating parameters will be determined;

v. The test method(s) which will be used, with the specific analysis method, if the method can be used with different analysis methods. The specific sampling, analytical and quality control procedures which will be used, with an identification of the standard methods upon which they are based;

vi. Any minor changes in standard methodology proposed to accommodate the specific circumstances of testing, with justification;

vii. Any proposed use of an alternative test method, with detailed justification; and

viii. The format and content of the Source Test Report.

d. The Permittee shall provide the Illinois EPA with written notification of testing at least thirty (30) days prior to testing and again five

(5) days prior to the testing to enable the Illinois EPA to have an observer present. This notification shall include the name of emission unit(s) to be tested, scheduled date and time, and contact person with telephone number.

e. If testing is delayed, the Permittee shall promptly notify the Illinois EPA by e-mail or facsimile, at least five (5) days prior to the scheduled date of testing or immediately, if the delay occurs in the five (5) days prior to the scheduled date. This notification shall also include the new date and time for testing, if set, or a separate notification shall be sent with this information when it is set.

f. The Permittee shall submit the Final Source Test Report(s) for these tests accompanied by a cover letter stating whether or not compliance was shown, to the Illinois EPA, Bureau of Air, Compliance Section Manager without delay, within thirty (30) days after the test results are compiled, but no later than sixty (60) days after the date of testing or sampling. The Final Source Test Report shall include as a minimum:

i. General information describing the test, including the name and identification of the emission source, which was tested, date of testing, names of personnel performing the tests, and Illinois EPA observers, if any;

ii. A summary of results;

iii. Description of test procedures and method(s), including description and map of emission units and sampling points, sampling train, testing and analysis equipment, and test schedule;

iv. Detailed description of test conditions, including:

A. List and description of the equipment (including serial numbers or other equipment specific identifiers) tested and process information (i.e., mode(s) of operation, process rate or throughput, fuel or raw material consumption rate, and heat content of the fuels);

B. Control equipment information (i.e., equipment condition and operating parameters) during testing; and

C. A discussion of any preparatory actions taken (i.e., inspections, maintenance and repair).

v. Data and calculations, including copies of all raw data sheets and records of laboratory analyses, sample calculations, and data on equipment calibration. Identification of the applicable regulatory standards and permit conditions that the testing was performed to demonstrate compliance with, a comparison of the test results to the applicable regulatory standards and permit conditions, and a statement whether the test(s) demonstrated compliance with the applicable standards and permit conditions;

vi. An explanation of any discrepancies among individual tests, failed tests or anomalous data;

vii. The results and discussion of all quality control evaluation data, including a copy of all quality control data; and

viii. The applicable operating parameters of the pollution control device(s) during testing (temperature, pressure drop, scrubbant flow rate, etc.), if any.

g. Satisfactory completion of this test so as to demonstrate compliance with applicable emission standards and permit conditions is a prerequisite to issuance of an operating permit, pursuant to 35 Ill. Adm. Code 201.160(b).

17a. Pursuant to 35 Ill. Adm. Code 218.105(d)(2)(A)(i), an owner or operator: That uses an afterburner or carbon adsorber to comply with any Section of 35 Ill. Adm. Code Part 218 shall use Illinois EPA and USEPA approved continuous monitoring equipment which is installed, calibrated, maintained, and operated according to vendor specifications at all times the control device is in use except as provided in 35 Ill. Adm. Code 218.105(d)(3). The continuous monitoring equipment must monitor the following parameters:

For each afterburner which does not have a catalyst bed, the combustion chamber temperature of each afterburner.

b. Pursuant to 35 Ill. Adm. Code 218.105(d)(2)(B), an owner or operator: Must install, calibrate, operate and maintain, in accordance with manufacturer’s specifications, a continuous recorder on the temperature monitoring device, such as a strip chart, recorder or computer, having an accuracy of ± 1 percent of the temperature measured in degrees Celsius or ± 0.5° C, whichever is greater.

18. Pursuant to 40 CFR 63.10(b)(3), if an owner or operator determines that his or her stationary source that emits (or has the potential to emit, without considering controls) one or more hazardous air pollutants regulated by any standard established pursuant to section 112(d) or (f) of the Clean Air Act, and that stationary source is in the source category regulated by the relevant standard, but that source is not subject to the relevant standard (or other requirement established under 40 CFR Part 63) because of limitations on the source's potential to emit or an exclusion, the owner or operator must keep a record of the applicability determination on site at the source for a period of 5 years after the determination, or until the source changes its operations to become an affected source, whichever comes first. The record of the applicability determination must be signed by the person making the determination and include an analysis (or other information) that demonstrates why the owner or operator believes the source is unaffected (e.g., because the source is an area source). The analysis (or other information) must be sufficiently detailed to allow the USEPA

and/or Illinois EPA to make a finding about the source's applicability status with regard to the relevant standard or other requirement. If relevant, the analysis must be performed in accordance with requirements established in relevant subparts of 40 CFR Part 63 for this purpose for particular categories of stationary sources. If relevant, the analysis should be performed in accordance with USEPA guidance materials published to assist sources in making applicability determinations under Section 112 of the Clean Air Act, if any. The requirements to determine applicability of a standard under 40 CFR 63.1(b)(3) and to record the results of that determination under 40 CFR 63.10(b)(3) shall not by themselves create an obligation for the owner or operator to obtain a Title V permit.

19a. Pursuant to 35 Ill. Adm. Code 212.110(e), the owner or operator of an emission unit subject to 35 Ill. Adm. Code Part 212 shall retain records of all tests which are performed. These records shall be retained for at least three (3) years after the date a test is performed.

b. i. Pursuant to 35 Ill. Adm. Code 212.324(g)(1), written records of inventory and documentation of inspections, maintenance, and repairs of all air pollution control equipment shall be kept in accordance with 35 Ill. Adm. Code 212.324(f).

ii. Pursuant to 35 Ill. Adm. Code 212.324(g)(2), the owner or operator shall document any period during which any process emission unit was in operation when the air pollution control equipment was not in operation or was malfunctioning so as to cause an emissions level in excess of the emissions limitation. These records shall include documentation of causes for pollution control equipment not operating or such malfunction and shall state what corrective actions were taken and what repairs were made.

iii. Pursuant to 35 Ill. Adm. Code 212.324(g)(3), a written record of the inventory of all spare parts not readily available from local suppliers shall be kept and updated.

iv. Pursuant to 35 Ill. Adm. Code 212.324(g)(5), the records required under 35 Ill. Adm. Code 212.324 shall be kept and maintained for at least three (3) years and shall be available for inspection and copying by Illinois EPA representatives during working hours.

20a. Pursuant to 35 Ill. Adm. Code 218.991(a)(2), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart PP, QQ, RR or TT and complying by the use of emission capture and control equipment shall comply with the following:

On and after a date consistent with 35 Ill. Adm. Code 218.106, or on and after the initial start-up date, the owner or operator of a subject VOM source shall collect and record all of the following information each day and maintain the information at the source for a period of three years:

i. Control device monitoring data.

ii. A log of operating time for the capture system, control device, monitoring equipment and the associated emission source.

iii. A maintenance log for the capture system, control device and monitoring equipment detailing all routine and non-routine maintenance performed including dates and duration of any outages.

21a. The Permittee shall maintain records of the following items so as to demonstrate compliance with the conditions of this permit:

i. Records addressing use of good operating practices for the Regenerative Thermal Oxidizer (RTO) and Quench/Packed Tower Scrubber associated with the Hammermill Shredder System and Dust Collectors (DC-01 through DC-04) associated with Non-Ferrous Material Separation System:

A. Records for periodic inspection of the Regenerative Thermal Oxidizer (RTO), Quench/Packed Tower Scrubber, and Dust Collectors (DC-01 through DC-04) with date, individual performing the inspection, and nature of inspection; and

B. Records for prompt repair of defects, with identification and description of defect, effect on emissions, date identified, date repaired, and nature of repair.

ii. The Permittee shall keep a copy of the Fugitive Particulate Operating Program, any amendments or revisions to the Fugitive Particulate Operating Program, and the Permittee shall also keep a record of activities completed according to the Fugitive Particulate Operating Program.

iii. Daily records demonstrating the temperature for the RTO and pressure differential across inlet and outlet of the Quench/Packed Tower Scrubber, liquid flow rate, and pH of the scrubbant liquid;

iv. Records of daily visual inspections of the Hammermill Shredder operations containing the date, time, individual performing the observation, observation details including operation of associated control systems, and any corrective actions taken;

v. Natural gas usage for RTO (mmscf/month and mmscf/year);

vi. Hours of operation for RTO and Quench/Packed Tower Scrubber (hours/month and hours/year);

vii. Material throughput (tons/month and tons/year) for the Raw Material Receiving and Handling System, Hammermill Shredder System, Ferrous Material Separation Process, Non-Ferrous Material

Process, and Fines Processing System;

viii. Hours of operation for Dust Collector DC-01 (hours/month and hours/year);

ix. Monthly and annual emissions of PM, PM_{10}, CO, NOx, SO_2, VOM, and HAPs from the Hammermill Shredder System, Ferrous Material Separation System, and Non-Ferrous Material Separation System with supporting calculations (tons/month and tons/year).

b. All records and logs required by Condition 21(a) of this permit shall be retained at a readily accessible location at the source for at least five (5) years from the date of entry and shall be made available for inspection and copying by the Illinois EPA or USEPA upon request. Any records retained in an electronic format (e.g., computer storage device) shall be capable of being retrieved and printed on paper during normal source office hours so as to be able to respond to an Illinois EPA or USEPA request for records during the course of a source inspection.

22a. Pursuant to 35 Ill. Adm. Code 212.110(d), a person planning to conduct testing for particulate matter emissions to demonstrate compliance shall give written notice to the Illinois EPA of that intent. Such notification shall be given at least thirty (30) days prior to the initiation of the test unless a shorter period is agreed to by the Illinois EPA. Such notification shall state the specific test methods from 35 Ill. Adm. Code 212.110 that will be used.

b. Pursuant to 35 Ill. Adm. Code 212.324(g)(6), upon written request by the Illinois EPA, a report shall be submitted to the Illinois EPA for any period specified in the request stating the following: the dates during which any process emission unit was in operation when the air pollution control equipment was not in operation or was not operating properly, documentation of causes for pollution control equipment not operating or not operating properly, and a statement of what corrective actions were taken and what repairs were made.

23a. Pursuant to 35 Ill. Adm. Code 218.991(a), any owner or operator of a VOM emission unit which is subject to the requirements of 35 Ill. Adm. Code Part 218 Subpart PP, QQ, RR or TT and complying by the use of emission capture and control equipment shall comply with the following:

i. By a date consistent with 35 Ill. Adm. Code 218.106, or upon initial start-up of a new emission unit, the owner or operator of the subject VOM emission unit shall demonstrate to the Illinois EPA that the subject emission unit will be in compliance on and after a date consistent with 35 Ill. Adm. Code 218.106, or on and after the initial start-up date by submitting to the Illinois EPA all calculations and other supporting data, including descriptions and results of any tests the owner or operator may have performed.

ii. On and after a date consistent with 35 Ill. Adm. Code 218.106, the owner or operator of a subject VOM emission source shall notify the Illinois EPA:

A. Of any violation of the requirements of 35 Ill. Adm. Code Part 218 Subpart PP, QQ, RR or TT by sending a copy of any record showing a violation to the Illinois EPA within 30 days following the occurrence of the violation;

B. At least 30 calendar days before changing the method of compliance with 35 Ill. Adm. Code Part 218 Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of 35 Ill. Adm. Code 218.991(a)(1). Upon changing the method of compliance with 35 Ill. Adm. Code Part 218 Subpart PP or TT from the use of capture systems and control devices to the use of complying coatings, the owner or operator shall comply with all requirements of 35 Ill. Adm. Code 218.991(a).

24. The Permittee shall notify the Illinois EPA, Bureau of Air, Compliance Section Manager of the initial receipt of material to be processed in the Hammermill Shredder and the date of the initial startup of the Hammermill Shredder within one week after each event has occurred.

25a. If there is an exceedance of or a deviation from the requirements of this permit as determined by the records required by this permit or otherwise, the Permittee shall submit a report to the Illinois EPA's Bureau of Air Compliance Section in Springfield, Illinois within thirty (30) days after the exceedance or deviation. The report shall identify the duration and the emissions impact of the exceedance or deviation, a copy of the relevant records and information to resolve the exceedance or deviation, and a description of the efforts to reduce emissions from, and the duration of exceedance or deviation, and to prevent future occurrences of any such exceedance or deviation.

b. One (1) copy of required reports and notifications shall be sent to:

Illinois Environmental Protection Agency
Bureau of Air
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

If you have any questions on this permit, please call German Barria at 217/785-1705.

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:GB:tan

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emission of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the Permittee from compliance with the other applicable statues and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. in no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

   b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

   a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

   b. upon finding that any standard or special conditions have been violated, or

   c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

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EXHIBIT 6

RK & Associates, Inc.

September 24, 2019

R17421-7

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

RECEIVED
STATE OF ILLINOIS
SEP 25 2019
Environmental Protection Agency
BUREAU OF AIR

Construction Permit Application for
Scrap Metal Recycling Facility
General III, LLC – 11600 South Burley - Chicago, Illinois

Dear Mr. Pilapil:

Please find attached three copies of a construction permit application for General III, LLC (GIII) for the construction of a Scrap Metal Recycling Facility (Facility) located in Cook County at 11600 South Burley in Chicago, Illinois.

A check for the applicable permitting fee, in the amount of $15,000, is attached to this application.

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

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

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

OCT 02 2019

REVIEWER: MED

Construction Permit Application for a Scrap Metal Recycling Facility General III, LLC - Chicago, Illinois

ORIGINAL

September 24, 2019

RECEIVED
STATE OF ILLINOIS
SEP 25 2019
Environmental Protection Agency
BUREAU OF AIR

R17421-7

Prepared for:

General III, LLC
1909 North Clifton Avenue
Chicago, Illinois 60614
Attn: Mr. Jim Kallas

Prepared by:

John G. Pinion
Principal Engineer
RK & Associates, Inc.

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE
OCT 02 2019
REVIEWER: MED

RK & Associates, Inc.
2 South 631 Route 59
Suite B
Warrenville, Illinois 60555
Phone: 630-393-9000
Fax: 630-393-9111

RK & Associates, Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Facility Location and Contact Information 3

2.0 SCRAP METAL RECYCLING PROCESS DESCRIPTIONS 7

2.1 Metal Shredder Controlled by Cyclone, Roll-Media Filter, RTO, and Scrubber 8

2.1.1 Cyclone / Roll-Media Filter 9

2.1.2 Regenerative Thermal Oxidizer (RTO) 9

2.1.3 Packed Tower Scrubber 12

2.1.4 Exhaust Stack 12

2.2 Ferrous Material Processing System 12

2.3 Non-Ferrous Material Processing System 15

2.4 Stockpile Operations 18

2.5 Vehicular Traffic 18

2.6 Natural Gas Combustion 19

2.7 Excluded Activities 19

3.0 FACILITY EMISSIONS ESTIMATES 21

3.1 Shredder Emissions Controlled by Cyclone, Roll-Media Filter, Regenerative Thermal Oxidizer, and Packed Tower Scrubber 22

3.1.1 Shredder VOM and CO Emissions 23

3.1.2 Shredder Particulate Emissions 24

3.1.3 Shredder Hazardous Air Pollutant Emissions 25

3.1.4 Shredder RTO Natural Gas Combustion Emissions 26

3.1.5 Shredder Emissions Summary 26

3.2 Ferrous Material Processing System Emissions 26

3.3 Non-Ferrous Material Processing System Emissions 29

3.4 Stockpile Fugitive Emissions 31

3.5 Fugitive Emissions from Paved and Unpaved Roads 32

3.6 Miscellaneous Natural Gas Combustion Emissions 34

3.7 Facility-Wide Criteria Pollutant Emissions 34

3.8 Facility-Wide HAP Emissions 34

4.0 REGULATORY APPLICABILITY 35

4.1 Single Source 35

4.2 Site Attainment Status 36

4.3 Fugitive Emissions 36

4.4 New Source Review for Ozone Nonattainment Area (NA-NSR) 37

4.5 Prevention of Significant Deterioration (PSD) 37

4.6 New Source Performance Standards (NSPS) 37

4.6.1 40 CFR 60 Subpart LL Metallic Mineral Processing 38

4.7 National Emission Standards for Hazardous Air Pollutants (NESHAPs) 38

4.7.1 40 CFR 63 Subpart 6J – Industrial, Commercial, and Institutional Boilers Area Sources 38

4.7.2 40 CFR Subpart 6G – Primary Non-Ferrous Metals Area Sources – Zinc, Cadmium and Beryllium 38

4.7.3 40 CFR 63 Subpart 6T – Secondary Non-Ferrous Metals Processing Area Sources 38

4.7.4 40 CFR 63 Subpart 6X – Nine Metal Fabrication and Finishing Source Categories 38

4.7.5 40 CFR 63 Subpart DD – Off-Site Waste Recovery Operations 39

4.8 State Rules 39

4.8.1 35 IAC 205 – Emission Reduction Market System 39

4.8.2 35 IAC 207 – Vehicle Scrappage Activities 39

4.8.3 35 IAC 212 – Visible and Particulate Matter Emissions 39

4.8.3.1 35 IAC 212.123 – Opacity Limits 39

4.8.3.2 35 IAC 212.301 – Process Fugitive Particulate Matter 39

4.8.3.3 35 IAC 212.309 – Fugitive Particulate Matter Operating Program 40

4.8.3.4 35 IAC 212.321 – Process Weight Rate 40

4.8.3.5 35 IAC 212.324 – Process Emission Units in Certain Areas 40

4.8.3.6 35 IAC 212 Subpart U – Additional Control Measures 40

4.8.4 35 IAC 241 – Sulfur Limitations 41

4.8.4.1 35 IAC 214.301 General Limitations for Process Emission Sources 41

4.8.5 35 IAC 216 - Carbon Monoxide Emissions 41

4.8.6 35 IAC 217 – Nitrogen Oxide Emissions 41

4.8.7 35 IAC 218 - Organic Material Emissions Standards and Limitations for the Chicago Area 42

4.8.7.1 Section 218.105 – Test Methods and Procedures 42

4.8.7.2 Section 218.301 – Use of Organic Material 42

4.8.7.3 Section 218 Subpart TT – Other Emission Units 43

4.8.8 35 IAC 244 – Episodes 43

4.8.9 35 IAC 254 - Annual Emissions Report 43

TABLES

Table 2-1 RTO Design Parameters 10

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

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

Table 3-1C Summary of Controlled Shredder HAP Emissions

Table 3-1D Shredder RTO Natural Gas Combustion Emissions

Table 3-1E Summary of Controlled Shredder Emissions

Table 3-2 Ferrous Material Processing – Particulate Emissions

Table 3-3 Non-Ferrous Material Processing – Particulate Emissions

Table 3-4 Summary of Estimated Fugitive Particulate Emission from Stockpile Operation

Table 3-5A Fugitive PM Emissions – Paved Roads

Table 3-5B Fugitive PM Emissions – Unpaved Roads

Table 3-6 Miscellaneous Natural Gas Fired Environmental Heaters

Table 3-7 Summary of Facility-Wide Criteria Pollutant Emissions

Table 3-8 Summary of Facility-Wide HAP Emissions

FIGURES

Figure 1-1 Site Location Map 4

Figure 1-2 Facility Map 5

Figure 2-1 Shredder Emission Control System Flow Diagram 11

Figure 2-2 General Facility Layout

APPENDICES

Appendix A IEPA Permitting Forms

APC-628 Construction Permit Application for a FESOP Source A-1

197-FEE Fee Form A-5

CAAPP-286 Single Source Determination A-7

CAAPP-220 Process Equipment Data and Information – Metal Shredder................................ A-11

CAAPP-260 Air Pollution Control Equipment Data and Information – Metal Shredder Roll-Media Filter, RTO, and Packed Tower Scrubber A-21

CAAPP-260C Supplement Form Air Pollution Control Equipment .... Roll-Media Filter A-31

CAAPP-260B Supplement Form Air Pollution Control Equipment .... Afterburner A-33

CAAPP-260G Supplement Form Air Pollution Control Equipment .... Packed Tower Scrubber A-35

CAAPP-220 Process Equipment Data and Information .... Ferrous Material Processing System A-37

CAAPP-220 Process Equipment Data and Information .... Ferrous Material Processing System A-37

CAAPP-220 Process Equipment Data and Information .... Non-Ferrous Material Processing System A-47

CAAPP-260 Air Pollution Control Equipment Data and Information .... Dust Collector DC-01 A-57

CAAPP-260C Supplement Form Air Pollution Control Equipment .... Dust Collector DC-01 A-67

Appendix B Shredder/RTO Stack Test Report (May/June 2018).. B-1

Appendix C Institute of Scrap Recycling Industries – Title V Workbook Select Emission Factor Tables C-1

RK
& ASSOCIATES, INC.

1.0 INTRODUCTION

General III, LLC (GIII), an affiliate of Reserve Management Group (RMG), is proposing to construct and operate a new scrap metal recycling facility (Facility) in Cook County at 11600 South Burley, Chicago, Illinois (see Figure 1-1). A Site Location Map and Facility Layout Map are presented in Figures 1-1 and 1-2.

The Facility described in this application will replace an existing facility currently owned and operated by General Iron Industries, Inc. (General Iron), located at 1909 North Clifton Avenue in Chicago, Illinois, which is scheduled to close by the end of 2020. This existing facility has been in operation at that location for over 60 years. Another RMG affiliate, GII, LLC (GII), is purchasing certain assets used in connection with the operation of General Iron's scrap metal business and intends to operate the business for a period of time at the existing facility and then transition the scrap metal operations from the Clifton Avenue location to its property at South Burley Avenue. Currently, the existing facility is processing approximately 750,000 ton per year of shreddable recyclables but is configured to process 1,000,000 tons per year. For purposes of this application, the existing facility is known as the "GII facility."

The proposed GIII facility on South Burley Avenue will also be configured to process 1,000,000 tons per year of shreddable recyclables and will effectively replace the existing GII facility. Currently, there is no other business in the Chicago area that has the capacity to handle this quantity of shreddable recyclables. If the GIII facility is not ready to accept and process material by the time the GII facility closes, there will be significant economic and environmental consequences to the City of Chicago and surrounding area.

Recycling offers the obvious benefit of keeping discarded metals out of landfills, but also provides other important and valuable benefits as well. There is a long nurtured a recyclable metal supply chain that includes thousands of individual peddlers at the GII facility. If these peddlers are unable to sell the discarded metal they collect for a fair price at an easily accessible location, there will be less incentive to search for and collect these materials. The burden for collection of discarded metals, such as used appliances and other bulk metal items, would then be shifted to local governments, which would significantly increase waste collection costs.

Peddlers often collect incidental items such as pressurized containers, used televisions, and batteries which are not safe or appropriate for city sanitation workers to manage. The GII facility provides a valuable community service by accepting these materials and properly disposing of them.

Disrupting the existing capacity for processing shreddable recyclables will also increase the cost of demolition required for redevelopment by increasing the transportation costs for shipment of shreddable material to other facilities located outside of the City of Chicago metropolitan area. The lack of adequate capacity to process this material would likely encourage illegal dumping or disposal of this material.

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. The proposed new shredder and processing operations will utilize the latest technology to create a clean, efficient, and environmentally sensitive plant that will preserve metal markets in Chicago, keep metal out of city alleys and landfills, maintain city garbage collection costs, support families that rely on the metal industry, and ensure that metals are reprocessed and reused instead of being abandoned or sent to landfills.

GIII will receive and shred mixed recyclable metal in various forms to produce uniform grades of ferrous and non-ferrous metals. Proposed scrap handling and processing activities include receiving, sorting, shredding, metal separation, and recovery of ferrous and non-ferrous metals.

GIII's proposed facility will be located in Cook County, which had been part a moderate ozone nonattainment area that was downgraded to a serious ozone nonattainment area effective September 23, 2019. GIII's proposed location is in an area that is 'in attainment' for all other National Ambient Air Quality Standards (NAAQS).

The proposed GIII facility will be a minor source with respect to federal and state nonattainment area new source review (NA NSR), prevention of significant deterioration (PSD) requirements and Title V permitting requirements. The proposed facility will also be an area source with respect to hazardous air pollutants (HAPs).

GIII will apply for and obtain a federally enforceable state operating permit (FESOP) for continued operation beyond the coverage of the construction permit requested by this application.

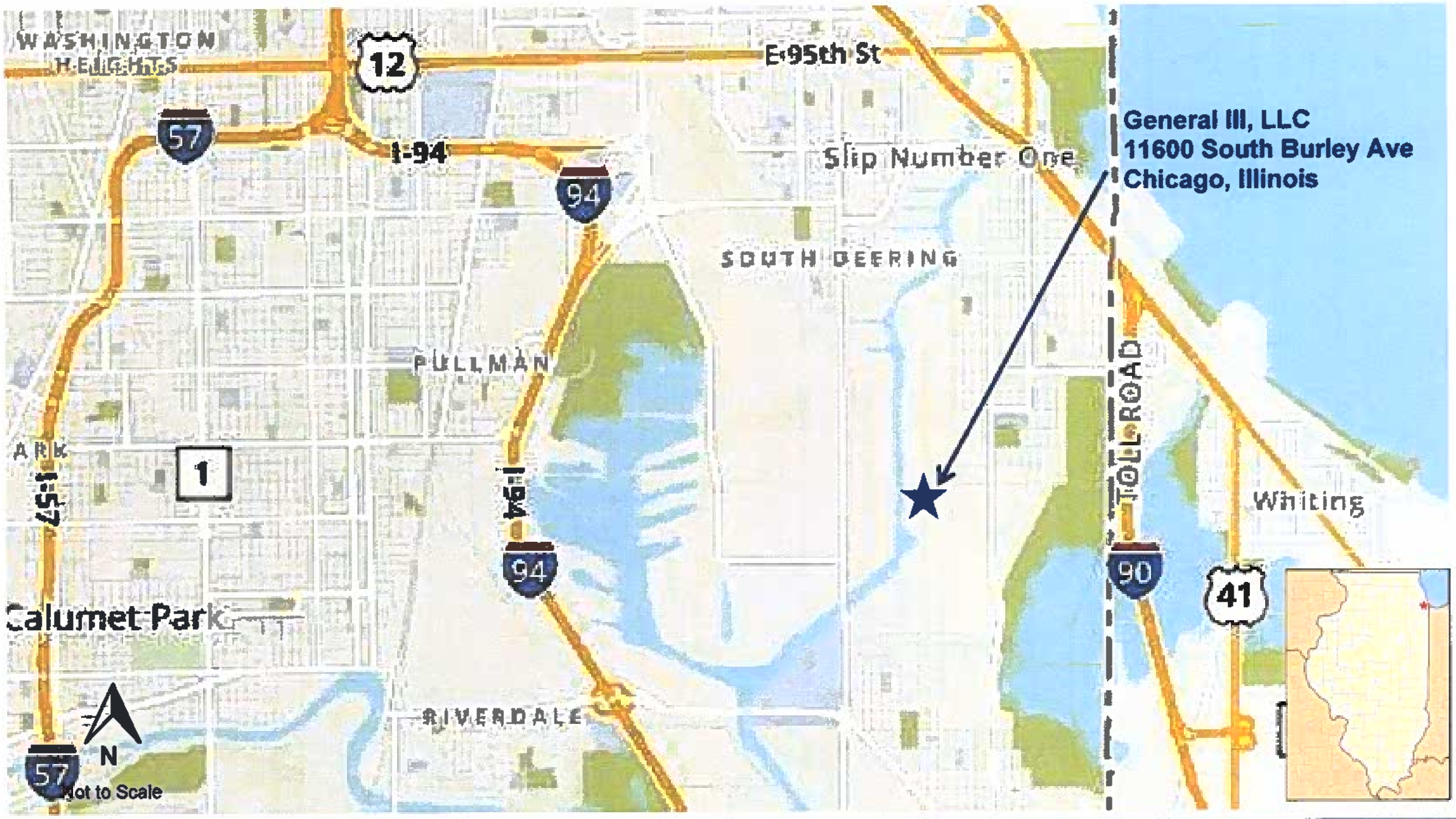
This permit application includes the following information:

- Scrap Metal Recycling Facility Process Descriptions (Section 2.0);
- Facility Emissions Estimates (Section 3.0);
- Regulatory Applicability (Section 4.0);
- Figures;
- Emission Tables;
- IEPA Construction Permit Application Forms (Appendix A);
- Shredder/Roll-Media Filter Stack Test Report (Appendix B); and
- ISRI Title V Workbook Emission Factor Tables (Appendix C)

Any questions regarding this application may be directed to Mr. Jim Kallas, Environmental Manager of GIII, at 847-508-9170 or to Mr. John Pinion, Principal Engineer at RKA at 630-393-9000 x 208.

1.1 Facility Location and Contact Information

Business Name:	General III, LLC.
Source Location:	11600 South Burley – Chicago, Illinois 60617 Hyde Park Township, Cook County Illinois
Latitude/Longitude	41.685201° N / -87.545847" W – Approximate Location of Front Gate
Office/Mailing Address:	1909 N. Clifton Avenue – Chicago, Illinois 60614
General III, LLC	Mr. Jim Kallas - Environmental Manager 847-508-9170 – jim@general-iron.com
IEPA Site ID No.:	Not yet assigned
SIC Code:	5093 – Scrap and Waste Materials
NAICS Code:	423930 – Recyclable Material Merchant Wholesalers
RKA Contact for Application Preparation	John Pinion - Principal Engineer 2S631 Route 59, Suite B - Warrenville, Illinois 60555 630-393-9000 - jpinion@rka-inc.com



RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: Construction Permit Application for a New Scrap Metal Recycling Facility		Site Location Map General III, LLC 11600 South Burley, Chicago, Illinois		FIGURE 1-1
	DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER R19439-2	DATE DRAWN: 09-04-2019	REVISED DATE

R 001179

RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: Construction Permit Application for New Scrap Metal Recycling Facility		Facility Map General III, LLC 11600 South Burley, Chicago, IL		FIGURE 1-2
	DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER: R19439-2	DATE DRAWN: 09-04-2019	REVISED DATE

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& Associates, Inc.

2.0 SCRAP METAL RECYCLING PROCESS DESCRIPTIONS

The Facility described in this application is a state-of-the-art scrap metal recycling facility designed to maximize recovery of reusable material from the raw feed stream received. The Facility will consist of the following operations:

- Raw material receiving and handling;
- Hammermill shredder;
- Ferrous separation and material processing; and,
- Non-ferrous separation and material processing.

A general facility layout diagram is presented in Figure 2-2. The Facility is designed and configured to process 1,000,000 tons per year of shreddable recyclables. GIII will be also one of the first scrap metal recycling facilities in the Midwest to install an emission capture and control system on the hammermill shredder to control particulate matter (PM), including metals and metal HAPs, and volatile organic material (VOM) and associated organic HAPs. This system will utilize a high capacity fan (approximately 60,000 cfm) and emission capture hood suspended over the top of the shredder to draw ambient air from around the outside of the shredder into the hood, capturing exhaust gases from the shredder and routing them to the control system.

The shredder emission control system will include:

- a cyclone for removal of large diameter material from the shredder exhaust before reaching the control system;
- a roll-media filter to remove PM (including associated metals and metal HAPs);
- a regenerative thermal oxidizer (RTO) for destruction VOM and organic HAPs; and,
- a packed tower scrubber to neutralize any acid gases formed in the RTO.

Additional features of this Facility that will minimize emissions include covers on selected conveyors and conveyor transfer points, processing of fines inside of a building equipped with four dust collectors to collect and capture fugitive particulate from inside the building before returning treated air back into the building, use of water atomizers to wet fugitive particulate matter in the outdoor ambient air and increase on site settling of suspended particulate, sweeping and watering of paved roadways, and watering or chemical treatment of unpaved roads.

The following sections describe the proposed operations and associated control equipment.

2.1 Metal Shredder Controlled by Cyclone, Roll-Media Filter, RTO, and Scrubber

GIII will install a new hammermill shredder capable of shredding up to 100,000 tons per month of mixed recyclable metal in various forms to produce uniform grades of ferrous and non-ferrous metal. 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.

The shredder will also be equipped with an emissions control system consisting of a capture hood, cyclone, roll-media filter, RTO and wet scrubber for control of PM, metals, metal HAPs, volatile organic material (VOM) and organic HAPs. The proposed control system has been installed and is currently being operated to control shredder emissions at the GII facility and will be relocated to the GIII facility in 2020.

The actual shredder feed rate will be dependent on the type and consistency of the feed material and the ability to consistently feed the mixed recyclable metal to the shredder. A belt scale, downstream of the shredder, measures the net mass of shredded ferrous metal produced in tons per hour. A site-specific ratio of total material received to the mass of ferrous metal produced is used to convert the measured rate of ferrous materials produced to the gross shredder feed rate. The existing facility's material ratio will be used until data from GIII's facility is available to update this ratio.

Shredded material, consisting primarily of ferrous material, non-ferrous metal, and non-metallic material is discharged at the bottom of the shredder by a vibratory conveyor and is routed by a series of belt conveyors to downstream processing equipment described in Section 2.3 below.

An emissions capture hood will be suspended above the top of the shredder by an overhead crane. The hood will be equipped with rubber curtains extending downward to the top of the shredder to enhance emissions capture efficiency. An induced draft fan draws shredder exhaust into the emission capture hood and through a cyclone and roll-media filter, for control of particulate matter, metals and metal HAPs before being routed to an RTO for control of volatile organic material (VOM) and organic HAPs and then through a packed tower scrubber for the control of acid gases and inorganic HAPs.

Treated exhaust gases will be discharged to the atmosphere through a stack mounted on the top of the packed tower scrubber.

Each component of the shredder control system is described in the following sections.

2.1.1 Cyclone / Roll-Media Filter

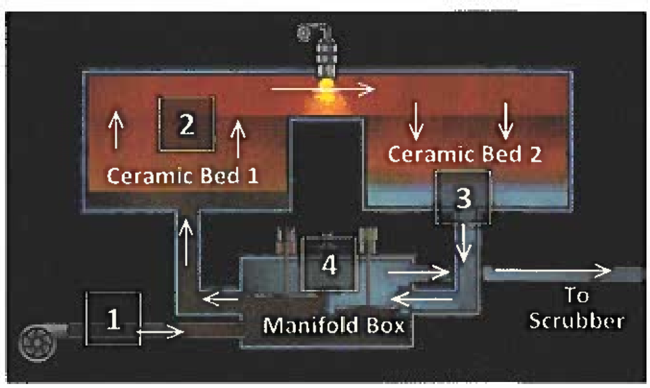
A standard cyclone is located between the shredder capture hood and the roll-media filter to remove any large material prior to entering the roll-media filter. Material collected in the cyclone is discharged through a rotary discharge valve and is added to the shredder residue (ASR) from the ferrous plant for further processing. This cyclone is integral to the process because it separates larger material from the conveying air stream to prevent it from plugging the downstream roll-media filter.

The roll-media filter includes a large rectangular section of duct measuring approximately 18 ft by 6 ft. A roll of unused filter material is placed on the supply side of the filter and fed through the rectangular section of duct to a take-up roll. The unit is designed so that the air flow passes downward through the filter to capture particulate matter. The filter material is automatically periodically advanced to remove spent filter material from the air stream and introduce clean filter material into the air stream. Spent filter material is collected on a take-up roll.

2.1.2 Regenerative Thermal Oxidizer (RTO)

RTOs achieve a very high thermal efficiency (95% or greater) and need only small amounts of supplemental fuel to maintain the desired operating temperature, even with low VOC concentrations in the process exhaust gas.

The RTO that will be installed at the Facility was designed and manufactured by Catalytic Products International of Lake Zurich, Illinois.



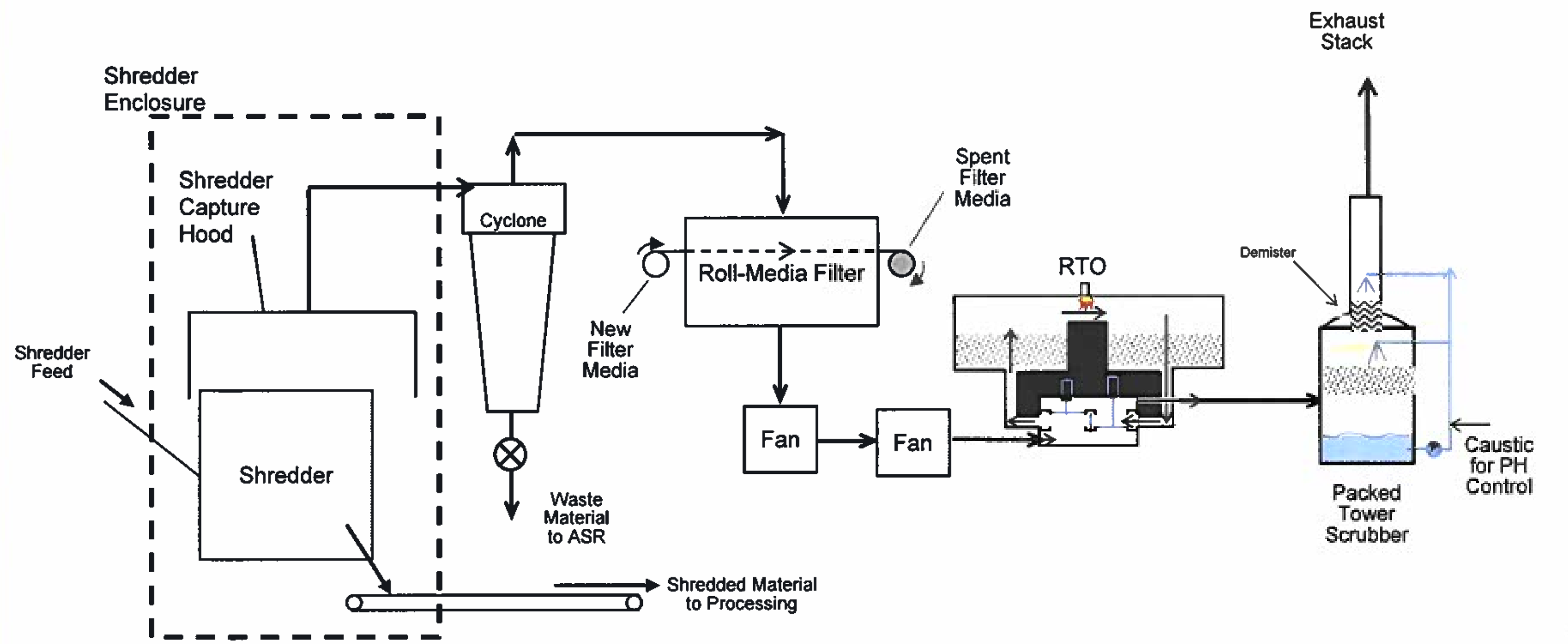
As illustrated on the right, the RTO is equipped with two beds of high-heat capacity ceramic media to store the heat released by the combustion of VOM and auxiliary fuel. At the beginning of an oxidization cycle, cool process exhaust gas [1] enter the RTO and are preheated as they pass through a hot ceramic bed [2] (heated by the combustion chamber exhaust gases from the previous cycle). The preheated inlet gas then enters the combustion chamber, between the two beds, where a natural gas fired burner adds additional heat required to maintain the desired temperature for destruction of the VOM. The hot gas exiting the combustion chamber is directed downward through the second bed of ceramic media [3], preheating the ceramic media for the next cycle. This heat is recovered when two valves in the manifold box [4] change position reversing the flow of gas through the RTO.

As shown in the shredder control system process flow diagram presented in Figure 2-1, an induced draft fan upstream of the RTO forces shredder exhaust gases through the RTO and packed bed scrubber and discharges the treated gases to the atmosphere.

A summary of the RTO design characteristics is presented in Table 2-1 below.

Table 2-1 – RTO Design Parameters

RTO Design Parameter	Value
Maximum Air Flow (scfm)	80,000
VOM Destruction Efficiency	98% or greater
Combustion Chamber Operating Temperature	Approx. 1,500 °F
Heat Exchange Media	Ceramic
Natural Gas Firing Rate	Approximately 10 to 18 MMBtu
Induced Draft Fan	Approximately 300 to 400 HP
Combustion Air Blower	Approximately 10 HP
Valve Type	Poppet



RK & Associates, Inc.

2S631 ROUTE 59, SUITE B
WARRENVILLE, IL 60555
630-393-9000/630-393-9111

COMMENTS: **Construction Permit Application for New Scrap Metal Recycling Facility**

Shredder Emission Control System Flow Diagram

General III, LLC - Chicago, Illinois

FIGURE: 2-1

DRAWN BY:	APPROVED BY:	PROJECT NUMBER	DATE DRAWN:	REVISED DATE
	JGP	R19439-2	09-09-2019	

R 001186

2.1.3 Packed Tower Scrubber

Combustion of potential chlorinated and fluorinated compounds in the shredder exhaust may generate hydrogen chloride (HCl) and hydrogen fluoride (HF). These acid gases will be neutralized in a quench/packed bed scrubber by contacting the acid gases with a solution of water and caustic.

The packed tower scrubber is a standard counter current design with gases entering the bottom of the scrubber and flowing upward through the packing. Water from the sump, located in the bottom portion of the scrubber vessel, is recirculated through one or more spray nozzles located at the top of the packing, to evenly distribute the scrubbing solution over the packing. Water will flow downward over the surfaces of the packing material. The packing material is designed to increase surface area to allow the reaction between the acid gases and scrubbing solution. In the packing, the acid gases react with the caustic in the scrubbing solution to convert the acids to salts that are disposed of with the spent scrubber water. As the treated gases exit the top of the packing, they will pass through a high efficiency mist eliminator to remove aerosols from the exhaust gases. The mist eliminator will be equipped with water sprays for periodic cleaning.

The scrubber will be equipped with a quench section located immediately upstream of the packed bed section. The quench will be equipped with water spray nozzles to ensure the process gas stream discharged from the RTO is controlled to the desired temperature, upon entering the packed tower section.

The scrubber will be equipped with a chemical metering pump suitable to handle the required caustic feed rate. The sump will be equipped with a level sensor to monitor the water level. The level transmitter will control the water makeup valve to ensure that the required volume of water is maintained. The pressure drop across the packing and demister pad will be monitored by a differential pressure gauge. In addition, a pH probe and analyzer, with control loop to the chemical metering pump, will maintain the target pH of the scrubbing solution.

The scrubber system will be designed to treat the maximum gas volume discharged by the RTO and to remove 99% of the acid gases.

2.1.4 Exhaust Stack

Treated gases are discharged to the atmosphere through a stack located on top of the packed tower scrubber.

2.2 Ferrous Material Processing System

The Ferrous Metal Processing System, including metal separation, cleaning system and equipment, that will be utilized by GIII will be designed by the Wendt Corporation of Buffalo, New York. Wendt is a leader in the metal recycling industry and has over 35 years of experience designing and implementing comprehensive metal recycling systems. Emissions from the Ferrous Material Processing System are discussed in Section 3.

Shredded material is discharged from the bottom of the shredder onto a vibratory feeder located within the shredder enclosure. The shredded material has been sprayed with water from the shredder water injection system, which minimizes emissions from conveyors and downstream processing equipment. The vibratory feeder discharges shredded material to a series of belt conveyor that transport the material to downstream processing equipment. The vast majority of conveyors are either skirted or troughing conveyors designed to minimize material spilling or leaking from the conveyor on to the ground.

The following describes the major features of the Ferrous Material Processing System.

Poker Picker

The shredded material is conveyed from the shredder to a Poker Picker that automatically removes longer pieces of metal that may disrupt or damage downstream conveyor belts and equipment. The material removed slides down a gravity chute to one of two poker collection piles located in three sided partial enclosures. The majority of the materials removed by the Poker Picker will be reprocessed.

Magnetic Separation

The shredded material then passes over magnetic separators that pick up some of the ferrous metal and discharge it to a gravity chute that splits the ferrous metal into two identical streams. Non-metallic material consists primarily of ASR and a limited amount of ferrous metal. This material drops onto a takeaway conveyor.

The takeaway conveyor transports the ASR to a secondary magnetic separation system to remove any residual ferrous metal. Magnetic metal removed is conveyed back to the ferrous metal stream.

ASR Stockpile

ASR that is not removed by magnetic separation (described above) drops to a conveyor that transports the material to the ASR stockpile. A stacking conveyor is used to distribute ASR within the stockpile area. ASR is the feed stream for the Non-Ferrous Material Processing System described in Section 2.4.

Secondary Magnetic Separation

Material that passes beyond the ASR removal section is conveyed to magnetic separation process that picks up ferrous metal and discharges it to downstream conveyors. ASR that is not removed by these magnets falls onto a conveyor that transports the material back to the ASR takeaway conveyor.

Z-Box Separators

Ferrous metal is then conveyed to one of two Z-Box Separators. Each separator is a lined abrasion-resistant box, or chute, configured similarly to the letter "Z", which causes the material entering the top of the separator to change directions several times at it falls via gravity through the separator. An air recirculation loop, equipped with a fan, forces a stream of air into the bottom of the separator. The air flows upward through the separator, counter current to the direction of the falling ferrous metal. Light material and fines are entrained in the upward flowing air and ducted out of the top of the separator and into a cyclone. The cyclone disengages the light material and fines from the air stream. The clean air stream exiting the cyclone is ducted back to the inlet of the fan, which recirculates the clean air by ducting it back to the bottom of the separator. The separator is equipped with integral conveyor seals and air knives at the material inlet and outlet. The high velocity air curtain created by the air knives prevents particulate escape from the system without relying on pressure differential at the inlet and outlet of the separator.

Clean metal discharged from the separators is conveyed to another magnetic separation system to separate ferrous from non-ferrous metals in the final recycled metal stream. Clean metals discharged from the drum magnets are conveyed to a Picking Platform where select materials are manually separated. Ferrous metal passing through the Picking Platform is conveyed to a ferrous metal stockpile or to barge loadout.

Light Material from Z-Box Separator Cyclones

Light material removed in the cyclones is discharged through a rotary air lock to a conveyor that transports the material to another magnetic separation to remove any small pieces of ferrous metal that may become mixed with the light material. Ferrous metal is conveyed to the ferrous stream.

Non-magnetic material is conveyed to a final separation process designed to separate higher density materials from the light material, or fluff. Higher density materials are separated and drop into a container for further processing. Light material is conveyed to the fluff stockpile, located in a three-sided partial enclosure. Fluff is a waste stream that is disposed of at a properly licensed waste disposal facility.

Ferrous Stockpiles and Barge Loading

Recovered ferrous metal is either conveyed to one of two stacking conveyors for controlled distribution of materials onto ferrous stockpiles or is conveyed to barge loadout where ferrous metal drops into a barge for off-site shipment to customers. Material from the ferrous stockpiles are loaded into barges, rail cars or trucks for off-site shipment to customers.

2.3 Non-Ferrous Material Processing System

The Non-Ferrous Material Processing System, including metal separation, cleaning system and equipment, that will be utilized by GIII will be designed by Wendt Corporation of Buffalo, New York. Wendt is a leader in the metal recycling industry and has over 35 years of experience designing and implementing comprehensive metal recycling systems.

The Non-Ferrous Material Processing System includes a Fines Processing System to recycle smaller pieces of recyclable metal. The majority of the non-ferrous processing equipment is located outdoors and the majority of outside conveyors are equipped with covers. A portion of the Non-Ferrous Material Processing System, consisting of the induction sorters and a polisher are located inside of the Fines Building and are controlled by Dust Collector DC-01, which exhausts to the outside atmosphere.

Emissions from the Non-Ferrous Material Processing System are discussed in Section 3.

The following describes the major features of the Non-Ferrous Material Processing System.

ASR Batch Feeder

A rubber-tired end loader will be used to move material from the ASR stockpile to a vibratory batch feeder that provides a uniform feed rate to the downstream processing equipment. The vibratory batch feeder discharges to a covered conveyor. The batch feeder is located outdoors.

Magnetic Separation

ASR will pass through a magnetic separator to remove residual ferrous metal. The magnetic separation process is located outdoors. Ferrous metal is discharged to a small storage pile equipped with a partial enclosure consisting of three side walls. Material from this stockpile is recycled back to the shredder infeed. Non-magnetic material passing the drum magnet is discharged to a covered conveyor that feeds into a two-step screening process.

Screening Process

A two-step screening process is used to separate the ASR into specific material sizes. Screening equipment and connecting conveyors are located outdoors. The first screen separates material into three sizes; material > 4.5 inches in diameter; material that is 2.5 to 4.5 inches in diameter; and, material that is 1.5 to 2.5 inches in diameter. Material less than 1.5 inches in diameter is conveyed to the second screening step.

In the second screening step, two vibratory screens separate material into three sizes: material 1.5 to 2.5 inches in diameter; material that is 5/8 to 1.5 inches in diameter; and, material that is less than 5/8" inches in diameter.

Material discharged from the screening process is conveyed to various downstream separation equipment, as described below.

Other Equipment

The following is a brief description of other types of processing equipment in the Non-Ferrous Material Processing System.

Eddy Current Separators (ECS)

Upon exiting the screeners, the material streams pass through one of seven Eddy Current Separators . Each ECS is enclosed in a building to protect equipment from the weather. No credit for emissions control is attributed to the ECS building. Each ECS processes material in a specific size range. Each ECS is preceded by a magnetic separator to separate magnetic and weakly magnetic materials that represent impurities that can negatively affect the value of recovered non-ferrous products.

An ECS has a conveyor belt system with a high-speed magnetic rotor at the drive end. The rotational speed of the magnet generates an induction field, creating a rapidly changing magnetic field that temporarily magnetizes non-ferrous metals.

Non-ferrous metal removed by each ECS is conveyed to a polisher for further separation by particle density before being conveyed to a product storage pile as a finished product.

Material that cannot be magnetized is conveyed for further processing in Wind Sifters and Induction Sorters as described below.

Wind Sifters

There are four Wind Sifters included in the Non-Ferrous Material Processing System. All Wind Sifters and connecting conveyors are located outdoors. A Wind Sifter is an air classifier, in which a conveyor belt discharges material into an upward flowing air stream that removes light material. The residue laden air stream is ducted to a cyclone to remove the light material. Clean air from the cyclone is then ducted to a fan and is recycled back to the Wind Sifter. The Wind Sifter is an air classifier that functions similarly to the Z-Box separators described above. The residue removed in the cyclone is discharged through a rotary valve to conveyors that transport the material to the waste storage pile for subsequent off-site disposal. This device is treated as a screen with for purposes of estimating emissions.

Heavier metallic material falls downward through the air stream to a takeaway conveyor that transports the material to an Induction Sorter.

Induction Sorters

There are eight Induction Sorters. An Induction Sorter consists of a conveyor belt that carries material over an inductive metal sensor that produces an electromagnetic field. Any conductive object passing through the sensor area is detected and classified. As the material falls off the end of the conveyor, a targeted blast of compressed air ejects the metal containing material onto separate takeaway conveyor. Nonmetallic material falls off the end of the conveyor onto another takeaway conveyor.

The eight induction sorters and connecting conveyors are located inside of the Fines Processing Building. A network of ductwork connect the induction sorter enclosures to Dust Collector DC-01, which exhausts to the outside atmosphere.

Polishers

There are five polishers. Polishers function as an air classifier. As material travels over a perforated conveyor, a gentle stream of air flows upward through the conveyor to lift light (low density) material, such as paper and plastic, directing it to a separate takeaway conveyor. This material is relatively clean by the time it enters the polishers and results in only minimal emissions; however, for the purposes of this application, emissions are calculated using screening emission factors.

Air Vibe

There is one Air Vibe. The Air Vibe and connecting conveyors are located outdoors. An Air Vibe is a vibratory air separator that uses a combination of vibratory screens and air to separate dry materials by different density, shape and surface characteristics. The air flow through the separator is a closed loop system with no discharge point. A fan forces air through the separator. Dirty air exiting the device is ducted to a cyclone to remove suspended particulate matter. Clean air is ducted back to the inlet of the fan.

Low-Speed Shredder

There is one small low-speed shredder located outdoors. The Low-Speed Shredder is a small, low speed, high torque, quad shaft shredder used for size reduction of clean metal on an as-needed basis.

Fines Processing System

The Fines Processing System is a separate system of conveyors and processing equipment located in the Fines Processing Building. A system of exhaust ducts connects the fines processing equipment to three identical dust collectors that exhaust treated air back into the building. A fourth identical dust collector controls non-ferrous equipment located in the Fines Processing Building and discharges to the outside atmosphere.

All four dust collectors are located outside of the east wall of the Fines Processing Building and are identical in design and function. Each dust collector has a design air flow rate of 12,000 cfm. Combined, the four dust collectors withdraw 48,000 cfm from the building, return 36,000 cfm to the building, and exhaust 12,000 cfm of treated air to the outside atmosphere. The difference between the building withdrawal and return rates must be satisfied with outside makeup air entering the building through conveyor wall penetrations and air makeup louvers. This configuration will minimize potential emission of fugitive particulate from the building by maintaining a low particulate concentration in the inside air and by maintaining an inward flow through building openings.

Based on the configuration described above, there three dust collectors that discharge to the interior of the Fines Processing Building are not control devices for purposes of permitting. Only the dust collector that exhausts to the outside atmosphere is a permitted control device.

There are no other control devices associated with the Non-Ferrous Material Processing System.

2.4 Stockpile Operations

Stockpile Operations includes three large stockpiles fed by stacking conveyors and multiple small stockpiles fed by a standard conveyor. Small stockpiles are located within partial enclosures consisting of three walls to minimize fugitive emissions and provide secure containment for the material. All stockpiled material is moved by rubber-tired end loaders or material handlers equipped with electromagnets or grapples. Individual stockpiles are identified on Table 3-4.

2.5 Vehicular Traffic

The vast majority of material received at the proposed facility will be delivered by dump and gondola trailers and the remaining portion will enter the facility in pickup truck sized vehicles driven by peddlers. Vehicles will enter the facility through a controlled gate and travel over a weigh scale before being routed to a designated unloading area.

Dump trailers will dump material near one of two raw material storage piles located adjacent to the shredder infeed conveyor. Cranes equipped with electromagnets and grapples will move material from the unloading areas to the storage piles and from the storage piles to the shredder infeed conveyor.

Pickup trucks will be directed to a dedicated peddler unloading area where scrap metal will be manually unloaded or by an electromagnet and sorted. Sorted material will be transported by rubber-tired loader, material handlers with grapples, or dump trailers to the raw material storage piles.

After unloading, all vehicles will travel over a scale before exiting the facility.

Emissions from unloading scrap from dump trailers are identified in Section 3.3 and emissions associated with vehicular traffic are identified in Section 3.5.

Approximately 95% of the interior plant roadways are paved roads consisting of concrete or asphalt. Only 5% of interior plant roadways are unpaved roads consisting of compacted slag or other similar materials.

2.6 Natural Gas Combustion

Natural gas will be combusted by the shredder RTO and by miscellaneous environmental heaters located throughout the proposed facility. The miscellaneous environmental heaters are exempt from the requirement to obtain a state construction or operating permit pursuant to 35 IAC 201.146(d).

2.7 Excluded Activities

The following activities, potentially associated with the operation of metal recycling facilities, are not included in this permit application:

- Torch Cutting;
- Fuel Storage Tanks; and
- Emergency Generators.

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3.0 FACILITY EMISSIONS ESTIMATES

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 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.

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

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. As of the date of this permit application, the existing GII shredder emissions, controlled by the RTO and packed tower scrubber, have not yet been measured. Emission testing of the RTO and packed tower scrubber are scheduled to be completed in early November 2019. This proposed testing will provide updated controlled shredder emission factors for PM/PM10, NOx, CO, SO2, VOM, metals, metal HAPs, hydrochloric acid, and hydrofluoric acid. Currently, the proposed testing of the existing shredder will not include organic HAPs. Once the emission data from the November 2019 testing have been finalized, the emission estimates in this application will be updated to incorporate the new November 2019 test results..

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 THC emissions testing performed on May 25, 2018, and PM and metals emissions testing performed on June 13 and 14, 2018. A copy of the test report from each of these testing events is presented in Appendix B of this application.

The emissions estimates presented in this section are calculated using demonstrated emission factors and proposed 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.

The new shredder for this facility will have a rated capacity of 100,000 tons/month. 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. These values are based on recent operating data and have also been used to estimate the proposed monthly and annual emissions limits requested in this construction permit application (see Table 3-1E).

Visual observations of the shredder capture hood by Agency observers during May 2018 emission testing showed that the capture hood is very effective and provides a high capture efficiency. 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. GIII anticipates that the new shredder emissions capture hood will perform similarly to the observed operation during the May/June 2018 testing of the existing shredder at the GII facility.

3.1.1 Shredder VOM and CO Emissions

For the purposes of these emission calculations, it is assumed that THC, as referenced in May 2018 GII shredder emission test report (presented in Appendix B) is equivalent to VOM.

The estimated controlled VOM and CO emissions from the proposed shredder, controlled by a cyclone, roll-media filter, RTO and packed tower scrubber, are presented in Table 3-1A. An uncontrolled VOM emission factor, adjusted to subtract methane, ethane, and other compounds exempt from the federal definition of volatile organic compound, was developed from THC emissions testing conducted on May 25, 2018, at the existing shredderat the GII facility. The THC test report is presented in Appendix B of this application.

The adjusted VOM emission factor is 0.2430 pounds of VOM (as propane) per ton of gross feed to the shredder. This VOM emission factor identifies captured/uncontrolled VOM, which is assumed to represent 95% or more of total VOM emissions.

The hourly shredder VOM emission rate is calculated using the following equation:

$$100{,}000\frac{ton}{month} \; x \; 0.2430\frac{lb\ VOM}{ton\ shredder\ feed} \; x \; (1-0.98) \; = \; 0.24\frac{tons}{month}$$

maximum monthly shredder throughput	adjusted VOM emission factor (captured emissions)	RTO VOM removal efficiency	monthly VOM emissions

The annual shredder RTO VOM emission rate is calculated using the following equation:

$$1{,}000{,}000\frac{ton}{year} \; x \; 0.2430\frac{lb\ VOM}{ton\ shredderfeed} \; x \; \frac{1\ ton}{2{,}000\ lbs} \; x \; (1-0.98) \; = 2.43\frac{tons}{year}$$

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

The monthly shredder RTO VOM emissions rate is based on 10% of the annual emission rate.

For the purposes of this application, shredder CO emissions are assumed to be 1% by weight of the uncontrolled VOM at the entrance of the RTO (See Table 3-1A).

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/Metals emission testing conducted on June 13 and 14, 2018, at a location downstream of the existing roll-media filter at the existing GIIfacility. The emissions test report for this testing event is presented in Appendix B of this application.

The measured controlled PM emission factor was 0.0047 lb-PM/ton of gross feed to the shredder. For the purposes of this permit application, the measured filterable PM is conservatively assumed to be PM_{10}. at the location where PM emission sampling was performed (downstream of the existing roll-media filter). For the purpose of this application, it has been assumed that the RTO and packed tower scrubber will not reduce the measured PM/PM_{10} emission rate at the outlet of the roll-media filter.

The PM/PM_{10} emissions factor identifies captured filterable PM/PM_{10}, which is assumed to be 95% of total shredder emissions.

The hourly shredder PM/PM_{10} emissions at the scrubber stack are calculated using the following equation:

$$100{,}000\,\frac{ton}{month}\ x\ 0.0047\,\frac{lb\ filterable\ PM/PM10}{ton\ shredder\ feed} = 0.24\,\frac{ton}{month}$$

maximum monthly shredder throughput	measured filterable PM/PM_{10} emission factor (captured emissions)	monthly filterable PM/PM_{10} emissions

The annual shredder PM/PM_{10} emissions at the scrubber stack are calculated using the following equation:

$$1{,}000{,}000\,\frac{ton}{year}\ x\ 0.0047\,\frac{lb\ filterable\ PM/PM10}{ton\ shredder\ feed}\ x\ \frac{1\ ton}{2000\ lbs} = 2.36\,\frac{tons}{year}$$

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

The monthly shredder PM/PM_{10} emission rate is based on 10% of the annual emission rate.

3.1.3 Shredder Hazardous Air Pollutant Emissions

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

The metal HAP emission factors identified in Table 3-1C are the measured controlled emission factors from the June 2018 metals emissions testing at the discharge of the roll-media filter at the existing GII facility.

Organic HAPs were not measured during the existing GIIshredder emissions compliance test. Therefore, in order to estimate organic HAP emissions from the GIII shredder, uncontrolled organic HAP emission factors were obtained from the *Institute of Scrap Recycling Industries (ISRI) Title V Applicability Workbook (1996), Table D-11F*. A copy of this table is presented in Appendix C.

For the purposes of this construction permit application, it has been conservatively assumed that the RTO and packed tower scrubber will not provide any additional metal HAP removal and that the RTO will control 98% of the organic HAPs.

Metal and organic HAP emissions from combustion of natural gas in the shredder RTO are identified on Table 3-1D.

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 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.

Emission estimates are presented for criteria pollutants, greenhouse gas (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 emission limits and shredder throughput limits requested in this permit application. Proposed emission units are in units of tons/month and tons/year and correspond to shredder gross feed rate of 100,000 tons/month and 1,000,000 tons/year.

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.

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.

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.

Identifier 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 with the exception of shredder emissions discussed in Section 3.1 above.

Metal HAP Emissions

There is no data available on HAP content of particulate emissions from the Ferrous Material Processing System.

For the purposes of this application, it has been assumed (as a worst case) that the particulate from the Ferrous Material Processing System will contain the same percentage of metal HAPs as the particulate emissions from the existing roll-media filter at the existing GII facility. Emission testing for metals using USEPA Method 29 was performed at the outlet of the existing roll-media filter (controlling shredder emissions) in June of 2018. The list of analytes specified in Method 29 includes 12 HAP metals.

Emissions of these metal HAPs are calculated by multiplying the estimated PM emissions from Ferrous Material Processing System by the weight % of each HAP (lb HAP/lb of PM) measured in the roll-media filter emissions. The following table identifies the metal HAP data from the roll-media filter used to estimate HAP emissions from Ferrous Material Processing.

Metal HAPs	% of Metal HAP in Roll-Media PM Emissions	Metal HAPs	% of Metal HAP in Roll-Media PM Emissions
Lead	0.0665%	Beryllium	0.0003%
Manganese	0.0535%	Cadmium	0.0147%
Mercury	1.2866%	Chromium	0.0163%
Nickel	0.0207%	Cobalt	0.0014%
Antimony	0.0040%	Phosphorus	0.2000%
Arsenic	0.0015%	Selenium	0.0074%

Metal HAP emissions in the Ferrous Material Processing System are summarized on Table 3-8 (Summary of Facility-Wide HAP Emissions).

3.3 Non-Ferrous Material Processing System Emissions

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.

Particulate Emissions

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

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

Metal HAP Emissions

There is no data available on metal HAP content of particulate emissions from the Non-Ferrous Material Processing System.

For the purposes of this application, it has been assumed (as a worst case) that the particulate emissions from the Non-Ferrous Material Processing System will contain the same percentage of metal HAPs as the particulate emissions from the existing roll-media filter at the existing GII facility. Emission testing for metals using USEPA Method 29 was performed at the outlet of the existing roll-media filter (controlling shredder emissions) in June of 2018. The list of analytes specified in Method 29 includes 12 HAP metals.

Emissions of these metal HAPs are calculated by multiplying the estimated PM emissions from the Non-Ferrous Material Processing System by the weight % of each HAP (lb HAP/lb of PM) measured in the roll-media filter emissions. The metal HAP data from the roll-media filter used to estimate HAP emissions from the Non-Ferrous Material Processing System are identified in Section 3.2 above.

Metal HAP emissions from the Non-Ferrous Material Processing System are summarized on Table 3-8 (Summary of Facility-Wide HAP Emissions).

3.4 Stockpile Fugitive Emissions

Fugitive emissions from stockpiles include particulate matter and assumed metal HAPs.

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:

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]

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

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

Metal HAP Emissions

There is no data available on the metal HAP content of particulate emissions from stockpiles.

For the purposes of this application, it has been assumed (as a worst case) that the fugitive particulate from stockpiles will contain the same percentage of metal HAPs as the particulate emissions from the existing roll-media filter at the existing GIIfacility. Emission testing for metals using USEPA Method 29 was performed at the outlet of the existing roll-media filter (controlling shredder emissions) in June of 2018. The list of analytes specified in Method 29 includes 12 HAP metals.

Emissions of these metal HAPs are calculated by multiplying the estimated PM emissions from the Non-Ferrous Material Processing System by the weight % of each HAP (lb HAP/lb of PM) measured in the roll-media filter emissions. The metal HAP data from the roll-media filter used to estimate HAP emissions from the Non-Ferrous Material Processing System are identified in Section 3.2 above.

Estimated metal HAP emissions from stockpiles are summarized on Table 3-8 (Summary of Facility Wide HAP Emissions).

3.5 Fugitive Emissions from Paved and Unpaved Roads

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

Particulate Emissions

Approximately 95% of interior plant roadways are paved with concrete or asphalt. The remaining approximately 5% of interior plant roadways will be lightly traveled and consist of crushed slag or similar materials. The facility will employ a program of sweeping and watering and posted speed limits of 10 mph to minimize generation of fugitive emissions.

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:

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

The estimated number and weight of vehicles required to operate the facility at its maximum throughput was calculated, and the mean vehicle weight (19.08 tons) 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.

Metal HAP Emissions

There is no data available on the metal HAP content of particulate emissions from paved or unpaved roads.

For the purposes of this application, it has been assumed (as a worst case) that the fugitive particulate from paved and unpaved roads will contain the same percentage of metal HAPs as the particulate emissions from the existing roll-media filter at the existing GIIfacility. Emission testing for metals using USEPA Method 29 was performed at the outlet of the existing roll-media filter (controlling shredder emissions) in June of 2018. The list of analytes specified in Method 29 includes 12 HAP metals.

Emissions of these metal HAPs are calculated by multiplying the estimated PM emissions from the Non-Ferrous Material Processing System by the weight % of each HAP (lb HAP/lb of PM) measured in the roll-media filter emissions. The metal HAP data from the roll-media filter used to estimate HAP emissions from the Non-Ferrous Material Processing System are identified in Section 3.2 above.

Estimated metal HAP emissions from pave and unpaved roads are summarized on Table 3-8 (Summary of Facility-Wide HAP Emissions).

3.6 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

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

3.8 Facility-Wide HAP Emissions

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

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4.0 REGULATORY APPLICABILITY

The proposed facility is a greenfield facility and has no existing state air permits at the South Burley Avenue location.

GIII is requesting limits on its potential to emit (PTE), so the Facility will be a minor source with respect to federal and state prevention of significant deterioration (PSD) and nonattainment area new source review (NA NSR) rules and an 'area source' (i.e., minor source) with respect to HAP emissions.

4.1 Single Source

The proposed facility will be located at the site of a former steel mill that has been converted into an industrial campus which currently houses the sources identified below, all of which share common ownership and control under Reserve Management Group, (RMG), which also has corporate offices at the South Burley Avenue industrial campus.

Source Name	Source Description
Reserve Marine Terminals (RMT)	RMT operates a foundry sand, slag and scrap recovery operation that includes conveyors, magnetic separation, screening, crushing, and conveying that processes approximately 60,000 tpy of material. Outdoor equipment is equipped with water misters as necessary to control particulate emissions. RMT generates fugitive particulate emissions from use of paved and unpaved roads, torch cutting, and operation of one 7 HP gasoline-fired generator and three diesel-fired electric generators (56 HP, 167 HP, and 241 HP) used to power process equipment. Generators operate only when processes are operating. RMT has no air permits and is not registered under the ROSS program.
Regency Technologies (RSR)	RSR is a small electronics recycling operation that operates indoors and has no process emissions. RSR also generates fugitive particulate emissions from use of paved roads. RSR has no process air emissions and therefore, is not required to obtain an air permit or register under the ROSS program.

Source Name	Source Description
Napuck Salvage of Waupaca (NSW)	NSW recycles approximately 262,800 tpy of aluminum (with some cast steel). Operations include crushing, screening and conveying with processing equipment located indoors. NSW also acquires, processes, and markets all grades of ferrous and non-ferrous scrap, specializing in engine blocks, foundry steel and aluminum. This includes processing of approximately 5,400 tpy of material by crushing, screening and other separation processes. All processing equipment is located indoors. NSW also generates fugitive particulate emissions from use of paved roads. NSW is registered under the Registration of Smaller Sources (ROSS) program (Application 12020006) – since February 6, 2012 continues to meet program eligibility requirements.
South Shore Recycling (SSR)	SSR purchases retail non-ferrous scrap metal and sells it to NSW or other offsite entities. SSR generates fugitive particulate emissions from use of unpaved roads and torch cutting (propane and plasma). SSR has no air emission permits and is not registered under the ROSS program.

The four entities identified above share their primary SIC code, 5093 – *Scrap and Waste Materials*, with the proposed GIII facility.

4.2 Site Attainment Status

The proposed facility is located in Cook County, Illinois, as illustrated in Figure 1-1. The following identifies the attainment status for this site.

Pollutant	**Designation**
Sulfur Dioxide (SO_2)	Attainment
Carbon Monoxide (CO)	Attainment
Ozone (O_3)	Cook County had been designated as a moderate non-attainment for the 8-hour ozone standard but was downgraded to serious on September 23, 2019.
Particulate Matter	

< 2.5 Microns in Diameter ($PM_{2.5}$)	Attainment
Particulate Matter < 10 Microns in Diameter (PM_{10})	Attainment
Oxides of Nitrogen (NO_2)	Attainment
Lead (Pb)	Attainment

4.3 Fugitive Emissions

Fugitive emission sources at the proposed facility include, but are not limited to, vehicular traffic emissions, conveyor transfer points, stockpile operations, and truck and barge loading.

Since metal recycling is not one of the twenty-eight listed industrial categories under 35 IAC 203.206(d) and there is no applicable New Source Performance Standard or National Emission Standard for Hazardous Air Pollutants that was in effect on August 7, 1980, fugitive emission of criteria pollutants are not counted toward the determination of potential to emit with respect to federal and state PSD, NA NSR, or Title V permitting rules. However, for purposes of NESHAP applicability, fugitive HAP emissions are included in the facility wide potential to emit for HAPs.

The fugitive emissions of hazardous air pollutants (HAPs) are counted toward the determination of Part 70 Permit (Title V Permitting) applicability and source status under Section 112 of the Clean Air Act (CAA).

4.4 New Source Review for Ozone Nonattainment Area (NA-NSR)

The proposed facility is located in an area that is designated as serious nonattainment for ozone (VOM and NOx). Proposed VOM and NOx emission limits are significantly less than 25 tpy, which is below the corresponding major source threshold of 50 tpy for both VOM and NOx.

4.5 Prevention of Significant Deterioration (PSD)

The proposed facility is located in an area that is designated in attainment or unclassifiable for criteria pollutants, other than ozone (VOM and NOx). The requested emission limits in this application limit potential to emit for each pollutant to below major source thresholds with respect to PSD.

4.6 New Source Performance Standards (NSPS)

The proposed facility will not be subject to any New Source Performance Standards (NSPS) codified in 40 CFR 60 as described in the following sections.

4.6.1 40 CFR 60 Subpart LL Metallic Mineral Processing

The requirements of the NSPS for Metallic Mineral Processing Plants, 40 CFR 60, Subpart LL, are not applicable because the proposed facility will not meet the definition of a metallic mineral processing plant, as defined in 40 CFR 60.381. The proposed facility is a scrap metal recycling facility and will not produce metallic mineral concentrates from ore.

4.7 National Emission Standards for Hazardous Air Pollutants (NESHAPs)

The proposed facility is not subject to any National Emission Standards for Hazardous Air Pollutants (NESHAP) codified in 40 CFR 60 as described in the following sections.

The proposed facility is also not subject to any NESHAP requirements in 40 CFR 61 or 63.

4.7.1 40 CFR 63 Subpart 6J – Industrial, Commercial, and Institutional Boilers Area Sources

The requirements of the NESHAP for Industrial, Commercial, and Institutional Boilers Area Sources, 40 CFR 63.11193, Subpart JJJJJJ (6J), are not applicable because the proposed facility will not include subject boilers or process heaters and because hot water heaters are exempt under 40 CFR 63.11195(f).

4.7.2 40 CFR 63 Subpart 6G – Primary Non-Ferrous Metals Area Sources – Zinc, Cadmium and Beryllium

The requirements of the NESHAP for Primary Non-Ferrous Metals Area Sources- Zinc, Cadmium and Beryllium, 40 CFR 63, Subpart GGGGGG (6G), are not applicable because the proposed facility will not be engaged in primary zinc production or primary beryllium production. The proposed facility is a scrap metal recycling facility.

4.7.3 40 CFR 63 Subpart 6T – Secondary Non-Ferrous Metals Processing Area Sources

The requirements of the NESHAP for Secondary Non-Ferrous Metals Processing Area Sources, 40 CFR 63, Subpart TTTTTT (6T), are not applicable because the proposed facility will not engage in secondary Non-Ferrous Metals Processing as defined in 40 CFR 63.11472.

4.7.4 40 CFR 63 Subpart 6X – Nine Metal Fabrication and Finishing Source Categories

The requirements of the NESHAP for Nine Metal Fabrication and Finishing Source Categories, 40 CFR 63, Subpart XXXXXX (6X), are not applicable because the proposed facility will not be primarily engaged in operations which are classified in one of the nine source categories listed in 40 CFR 63.11514(a)(1) through (9).

4.7.5 40 CFR 63 Subpart DD – Off-Site Waste and Recovery Operations

The requirements of the NESHAP for Off-Site Waste and Recovery Operations, 40 CFR 63, Subpart DD, are not applicable because the proposed facility is not located at, or part of, a major source of HAPs.

Emission limits requested in this permit limit HAP emission to below major source levels.

4.8 State Rules

4.8.1 35 IAC 205 – Emission Reduction Market System

The operating limits requested in this application limit the Facility's potential to emit VOM to less than 25 tpy, and is therefore, not subject to ERMS requirements.

4.8.2 35 IAC 207 – Vehicle Scrappage Activities

Part 207 identifies the procedures and performance requirements to be followed when conducting vehicle scrappage activities within the State of Illinois for the purpose of receiving Creditable Emission Reductions (CERs). Vehicle scrappage is defined in Section 207.102 as activities related to the retirement of eligible vehicles for the purpose of CERs.

Although the proposed facility will recycle End of Life Vehicles (ELVs), the proposed facility will not be performing these activities for the purposes of obtaining CERs and is, therefore, not subject to these requirements.

4.8.3 35 IAC 212 – Visible and Particulate Matter Emissions

4.8.3.1 35 IAC 212.123 – Opacity Limits

Section 212.123(a) prohibits the emission of smoke or other particulate matter from any process source to exceed 30% opacity.

4.8.3.2 35 IAC 212.301 – Process Fugitive Particulate Matter

Section 212.301 prohibits the emission of fugitive particulate matter from any process that is visible by an observer looking generally toward the zenith overhead, at a point beyond the property line of the source, unless wind speed is greater than 25 mph.

4.8.3.3 35 IAC 212.309 – Fugitive Particulate Matter Operating Program

Section 212.309 requires certain types of sources located in designated geographical areas defined in §212.302 to prepare, implement and maintain a fugitive particulate matter operating program meeting the minimum requirements identified in §212.310.

Although the proposed facility is located in Cook County, which is a geographical area defined in §212.302(a), the facility's SIC code (5093) is not included in the major SIC groups that are subject to this rule. Therefore, GIII is not subject to the requirements of §212.309.

Despite this exemption, GIII will voluntarily implement and maintain a fugitive particulate matter operating program that meets the requirements of §212.309.

4.8.3.4 35 IAC 212.321 – Process Weight Rate

Section 212.321(a) prohibits the emissions of particulate matter into the atmosphere in any one hour period from any new or modified emission unit to exceed the allowable emission rates specified in §212.321(c). The requested particulate emissions limit for emissions units identified in the application does not exceed the allowable particulate emission limit, as specified by the process weight rate equations in §212.321(c).

4.8.3.5 35 IAC 212.324 – Process Emission Units in Certain Areas

GIII's proposed facility is located in an area described by §212.324(a)(1)(B). Emissions units identified in this application will be subject to the following requirements:

§212.324(b) PM_{10} emissions from any process emissions unit shall not exceed 0.03 gr/scf during any one-hour period.

Pursuant to §212.324(d), this mass emissions limit shall not apply to emissions units with no visible emissions other than fugitive particulate matter.

§212.324(f) Requirements for maintenance and repair of air pollution control equipment.

§212.324(g) Recordkeeping of maintenance and repair of air pollution control equipment.

4.8.3.6 35 IAC 212 Subpart U – Additional Control Measures

The requirements of §212 Subpart U apply to facilities located within an area defined in §212.324(a)(1) and that have actual annual source-wide PM_{10} emissions of at least 15 tpy. Actual annual source-wide emissions is defined as the total of fugitive emissions and stack emissions from process emission units and fuel combustion units, as reported on a facility's annual emission report. For a newly constructed source, the estimated emissions included in this permit application are compared to the applicability threshold.

GIII's proposed facility is located in the area described by §212.324(a)(1)(B) and this permit application identifies estimated annual source wide PM_{10} emissions from fugitives and process emission units exceeding 15-tpy. Therefore, the requirements of §212 Subpart U are applicable to the proposed facility.

4.8.4 35 IAC 214 – Sulfur Limitations

4.8.4.1 35 IAC 214.301 General Limitations for Process Emission Sources

Section 214.301 prohibits the emission of sulfur dioxide from any process emissions source from exceeding 2,000 ppm.

Combustion emissions sources at the proposed facility are limited to small natural gas-fired environmental heaters with negligible emission of SO_2, due to negligible amounts of sulfur present in the fuel (pipeline quality natural gas). No solid or liquid fuel will be combusted in these units.

The materials that will be processed at this facility contain negligible amounts of sulfur and process operating conditions will not result in oxidization of sulfur to SO_2.

Based on the above, SO_2 emissions will be negligible.

4.8.5 35 IAC 216 - Carbon Monoxide Emissions

Part 216 regulates carbon dioxide (CO) emissions from various types of sources. Potentially regulated emission sources at the proposed facility are limited to natural gas-fired unit heaters under §216.121.

Section 216.121 prohibits emission of carbon monoxide into the atmosphere from any fuel combustion source with actual heat input greater than 10 MMBtu/hr to exceed 200 ppm, corrected to 50% excess air. None of the fuel combustion units at the proposed facility will have a design firing rate exceeding 10 MMBtu/hr and therefore, this facility is exempt from this limitation.

4.8.6 35 IAC 217 – Nitrogen Oxide Emissions

Part 217 regulates emission of oxides of nitrogen (NOx) from various types of sources. Pursuant to §217.150, the provisions of Subparts E, F, G H, I and M of this rule apply only to units that emit or have the potential to emit NOx in an amount equal to or greater than 100 tpy. As presented in Section 3 of this application, the proposed facility's potential to emit for NOx is less than 100 tpy, and the proposed facility does not include any other regulated NOx emission sources.

Based on the above, the proposed facility is not subject to any requirements in 35 IAC 217.

4.8.7 35 IAC 218 - Organic Material Emissions Standards and Limitations for the Chicago Area

4.8.7.1 Section 218.105 Test Methods and Procedures

Section 218.105 includes testing, monitoring, and recordkeeping requirements applicable to the proposed shredder emission control system (cyclone, roll-media filter, RTO and scrubber).

Section 218.105(c)(2) requires capture efficiency of an emission unit to be measured using one of the specified test protocols, unless the specified techniques are not suitable to a particular process, then an alternative capture efficiency protocol may be used pursuant to §218.108(b). Due to safety concerns, none of the specified methods for capture efficiency testing can be used at the shredder exhaust hood.

Section 218.105(d)(1) addresses demonstration of control device efficiency. Control device efficiency must be determined by simultaneously measuring the inlet and outlet gas phase VOM concentration and gas volumetric flow rates, in accordance with the gas phase test methods specified in §218.105(f).

Section 218.105(d)(2)(A) addresses control device monitoring requirements. When an afterburner (without a catalyst bed) is used, temperature of the combustion chamber must be continuously monitored with a monitoring device that is installed, calibrated, maintained, and operated according to vendor specifications at all times that the control device is in use.

Section 218.105(d)(2)(B) requires that a continuous temperature recorder must installed, calibrated, operated and maintained in accordance with the manufacturer's specifications.

4.8.7.2 Section 218.301 – Use of Organic Material

Section 218.301 limits the discharge of organic material from any emission source to less than 8 lb/hr, except as provided in Sections 218.302, 218.303, 218.304, and if no odor nuisance exists, the limitation of this Subpart shall apply only to photochemically reactive material.

Section 218.302(a) allows emissions of organic material in excess of that permitted by §218.301, if such emissions are controlled by a thermal incinerator so as either to reduce such emissions to 10 ppm equivalent methane or less, or to convert 85% of the hydrocarbons to carbon dioxide and water.

The only process unit with a potentially significant amount of organic material emissions is the hammermill shredder. The shredder will be equipped with a regenerative thermal oxidizer (RTO) that will have a destruction efficiency of at least 98%. The use of an RTO will ensure that the proposed shredder does not exceed the requirements of §218.301.

The ASR processed in the non-ferrous plant, contains negligible amounts of organic material, and operating conditions do not promote the generation of volatile organic material from the materials being processed. Based on the applicant's significant experience operating ferrous and non-ferrous separation processes, plant operations are not anticipated to result in an odor nuisance.

Based on the above, emissions of organic material will not exceed the allowable limit in this rule.

4.8.7.3 35 IAC 218 Subpart TT – Other Emission Units

35 IAC 218 Subpart TT identifies VOM control requirements for sources that have a potential to emit of 25 tpy or more of VOM. The application of an RTO to control VOM emissions from the hammermill shredder, limits the source-wide VOM potential to emit to less than 25 tpy, as evidenced by the VOM emission limits requested in this application.

Based on the above, the requirements of §218 Subpart TT are not applicable to the proposed facility.

4.8.8 35 IAC 244 – Episodes

Section 244.142 identifies the facilities for which Episode Action Plans are required. The proposed facility does not meet any of the applicability criteria identified in this section; therefore, 35 IAC 244 is not applicable to the proposed facility.

4.8.9 35 IAC 254 – Annual Emissions Report

Part 254 establishes uniform procedures for the reporting of air pollution emissions data from sources of regulated air pollutants. The proposed facility will be required to submit annual emissions reports to the IEPA and maintain associated facility records pursuant to this rule.

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RK & Associates, Inc.

Construction Permit Application for New Scrap Metal Recycling Facility

General III, LLC
11600 South Burley
Chicago, Illinois 60614

September 20, 2019

TABLES

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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	0.2430	Measured value from May 25, 2018 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.
VOM emission safety factor		1.00	Safety factor used to establish permitted shredder VOM emission limits.
Shredder VOM Emissions [a]	tons/month	0.24	Maximum VOM emission rates requested in construction permit application.
	tons/year	2.43	

Parameter	Units	Units	Comment
CO Emissions (from combustion of VOM)			
CO emissions as percent of VOM at RTO Inlet	%	1.0%	Assumed value identifed by IEPA
Total Shredder CO Emissions	tons/month	0.12	Maximum CO emission rates requested in construction permit application.
	tons/year	1.22	

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.
c. Minimum 81% VOM overall capture and control efficiency is required by 35 IAC 218 Subpart TT.

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 values from shredder filterable PM emission testing performed June 13 & 14, 2018, downstream from roll media filter (represents inlet to RTO).
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	
Assumed Shredder Emissions Capture Eff.	%	95.0%	Assumed value based on visible observations at shredder emissions capture hood.
Filterable PM Emissions Safety Factor		1.00	Safety factor used to establish permitted shredder PM emission rates.
Controlled Shredder Filterable PM Emission Rates	tons/month	0.24	Permitted filterable PM/PM_{10} emission rates requested in shredder RTO/Scrubber construction permit.
	tons/year	2.36	
Controlled Shredder Filterable PM_{10} Emission Rates	tons/month	0.24	Assumes that all PM is PM10. Estimates assume no PM/PM10 emission reductions in RTO/Scrubber.
	tons/year	2.36	

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.
c. Maximum allowable PM emission rate defined by the Process Weight Rate (35 IAC 212.321) is 67-lb/hr.

Table 3-1C Summary of Controlled Shredder HAP Emissions
General III, LLC - Chicago, Illinois

	Emission Factor From June 2018 Emission Testing lb/ton		Permitted Shredder Thruput Rates 100,000 ton/mo Maximum Hourly Emissions ton/month	Permitted Shredder Thruput Rates 1,000,000 tpy Maximum Annual Emissions tpy
Metal HAPs[1]				
Lead[(2)]	3.1377E-06	1	0.0002	0.0016
Manganese	2.5261E-06	1	0.0001	0.0013
Mercury	6.0694E-05	1	0.0030	0.0303
Nickel	9.7720E-07	1	0.0000	0.0005
Antimony	1.8777E-07	1	0.0000	0.0001
Arsenic	7.2614E-08	1	0.0000	0.0000
Beryllium	1.4583E-08	1	0.0000	7.29E-06
Cadmium	6.9228E-07	1	0.0000	0.0003
Chromium [(3)]	7.6720E-07	1	0.0000	0.0004
Cobalt	6.4876E-08	1	0.0000	0.0000
Phosphorus	9.4334E-06	1	0.0005	0.0047
Selenium	3.4861E-07	1	0.0000	0.0002
Volatile HAPs[2]				
Ethylbenzene	6.6700E-05	2	0.0001	0.0007
Styrene	1.3300E-05	2	0.0000	0.0001
Toluene	3.3300E-04	2	0.0003	0.0033
Tetrachloroethane (PCE)	2.6700E-06	2	0.0000	0.0000
m,p-Xylene	1.3300E-05	2	0.0000	0.0001
Benzene	4.0000E-04	2	0.0004	0.0040
1,1,1-Trichloroethane	2.0000E-04	2	0.0002	0.0020
Methylene Chloride	6.0000E-05	2	0.0001	0.0006
Trichloroethene (TCE)	6.6700E-05	2	0.0001	0.0007
o-Xylene	6.6700E-05	2	0.0001	0.0007

Total Metal HAPs	0.0039	0.0395
Total Organic HAPs	0.0012	0.0122
Total HAPs	**0.0052**	**0.0517**

Maximum Individual HAP	Mercury		0.0303

1. Measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.
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

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.

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

Emission Source	NOx		CO[e]		PM[a]		PM10[a]		SO2		VOM[a,b]		Total HAPs		Max Single HAP		GHG (CO_2e)	
	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr	ton/mo	ton/yr
Shredder RTO/Scrubber Stack Emissions[c]	-	-	0.12	1.22	0.24	2.36	0.24	2.36	-	-	0.24	2.43	0.0608	0.6076	0.0030	0.0303	309.59	3,096
Shredder RTO Natural Gas Combustion Emissions[c,d]	0.26	2.57	0.22	2.16	0.02	0.20	0.02	0.20	0.0015	0.02	0.01	0.14	0.0049	0.0486	0.0046	0.0463	309.59	3,096
Total Shredder RTO/Scrubber Stack Emissions	0.26	2.57	0.34	3.38	0.26	2.55	0.26	2.55	0.0015	0.02	0.26	2.57	0.0656	0.6562	0.0077	0.0767	619.18	6,192

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 reported as propane adjusted to remove compounds exempt from the federal definition of VOC.

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 from RTO are assumed to be 1% of total uncontrolled VOM at the inlet of the RTO (0.2430 lb/ton of shredder feed from May 2018 emission testing at the outlet of roll media filter at GII).

Requested Shredder Operating Limits:

Gross Shredder Feed Rate:	tons/month	100,000	based on a calendar month
	tons/year	1,000,000	based on a 12-month rolling average

Calculation of Actual Emissions:

Actual monthly and annual emissions will be calculated using pollutant emission factors and shredder material processing rates.

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

Equipment Generating Emissions	No of Points	Moisture > 1.5% Y / N	Transfer Point Location	Emission Factor Source[d]	Estimated Material Throughput		PM Emissions			PM_{10} Emissions			$PM_{2.5}$ Emissions		
					ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
Conveyor Transfer Points - Controlled Emission Factors[a]	52	Y [a]	Outside	A	1,245,450	12,454,500	0.00014 [a]	0.0874	0.8205	0.000046 [a]	0.0290	0.2692	0.000013 [a]	0.0085	0.0764
Truck Loading Crushed Stone - Uncontrolled Emission Factors[b]	3	NA [b]	Outside	D	174,000	1,740,000	0.00020 [b]	0.0177	0.1778	0.000100 [b]	0.0087	0.0870	0.000015 [b]	0.0014	0.0132
Stockpile Loading - material drop emissions[c]	7	NA [c]	Outside	Drop	300,000	3,000,000	[c]	0.1831	1.8294	[c]	0.0866	0.8653	[c]	0.0130	0.1309
Totals Ferrous Plant Material Handling PM Emissions								0.2882	2.8277		0.1243	1.2215		0.0229	0.2205
Totals Ferrous Plant Material Handling HAP Metal Emissions							1.33% [e]	0.0038	0.0375	Ratio of HAP metal to total PM from June 2018 emission test of existing roll media filter at General II, LLC.					

a. 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.

b. Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for truck loading of crushed stone - conservative. Use uncontrolled emission factor because controlled emissions factors are not identified.

c. **Material Drop PM Emission Equation from 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	Applied to light material stockpile loading. Moisture content for use of controlled emission factors for crushed stone processing - Conveyor Transfer Points - AP-42, Table 11.19.2-2. Considered to be conservative due to moisture added to material in shredder.
	5.4	Applied to raw scrap metal handling. Material moisture was assumed to be the mean of material moisture contents for Iron and Steel Production identified in AP42, Table 13.2.4-1.
	10.0	Applied to ASR stockpile loading. 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% moisture.

d. See emission factors identified in Section 3.2 of permit application.

e. Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter during June 2018 metal emissions testing at General II, LLC.

R 001227

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

Equipment Generating Emissions	No of Points	Moisture > 1.5% Y / N	Transfer Point Location	Transfer Point Controlled	Emission Factor Source[d]	Estimated Material Throughput		PM Emissions			PM_{10} Emissions			$PM_{2.5}$ Emissions		
						ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy	lb/ton	ton/mo	tpy
Conveyor Transfer Points - Uncontrolled Emission Factors	74	N [a1]	Inside Bldg	Y	A	110,624	1,106,236	0.00300	Note f	Note f	0.001100	Note f	Note f	0.000167	Note f	Note f
Conveyor Transfer Points - Controlled Emission Factors[e]	30	Y [a2]	Inside Bldg	Y	A	13,436	134,361	0.00014 [a]	Note f	Note f	0.000046 [a]	Note f	Note f	0.000013 [a]	Note f	Note f
Screening - Uncontrolled Emission Factors	8	N [a3]	Inside Bldg	Y	B	2,820	28,196	0.02500	Note f	Note f	0.008700	Note f	Note f	0.001317	Note f	Note f
Screening - Controlled Emission Factors	8	Y [a4]	Inside Bldg	Y	B	1,541	15,406	0.00220	Note f	Note f	0.000740	Note f	Note f	0.000050	Note f	Note f
Stockpile Loading - Material Drop Emissions[c]	17	NA [c]	Inside Bldg	Y	Drop	838	8,381	[c]	Note f	Note f	[c]	Note f	Note f	[c]	Note f	Note f
Total Emissions for Sources Inside Building									0.14	1.36		0.14	1.36		0.14	1.36
Conveyor Transfer Points - Uncontrolled Emission Factors	59	N [a1]	outside	N	A	215,368	2,153,675	0.00300 [a1]	0.3228	3.2259	0.00110 [a1]	0.1188	1.1824	0.000167 [a1]	0.0178	0.1791
Conveyor Transfer Points - Controlled Emission Factors[e]	11	Y [a2]	outside	Y	A	57,210	572,103	0.00014 [a2]	0.0040	0.0363	0.00005 [a2]	0.0014	0.0118	0.000013 [a2]	0.0004	0.0034
Screening - Uncontrolled Emission Factors	13	N [a3]	outside	N	B	13,670	136,702	0.02500 [a3]	0.1710	1.7088	0.00870 [a3]	0.0595	0.5944	0.001317 [a3]	0.0090	0.0900
Screening - Controlled Emission Factors	12	Y [a4]	outside	Y	B	42,209	422,085	0.00220 [a4]	0.0464	0.4140	0.00074 [a4]	0.0153	0.1394	0.000050 [a4]	0.0011	0.0093
Truck Loading Crushed Stone - Uncontrolled Emission Factors[b]	2	NA [b]	outside	NA	D	26,003	260,027	0.00020 [b]	0.0026	0.0266	0.00010 [b]	0.0013	0.0130	0.000015 [b]	0.0002	0.0020
Stockpile Loading - Material Drop Emissions[c]	10	NA [c]	outside	NA	Drop	23,073	230,725	[c]	0.0877	0.8480	[c]	0.0416	0.4010	[c]	0.0065	0.0609
Totals Ferrous Plant Material Handling PM Emissions									0.77	7.62		0.37	3.71		0.17	1.71
Totals Ferrous Plant Material Handling HAP Metal Emissions								1.33% [e]	0.0102	0.1012	Ratio of HAP metal to total PM from June 2018 emission test of existing roll media filter at General II, LLC.					

a1. Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for conveying.
a2. 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.
a3. Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for screening.
a4. Controlled particulate matter emission factors from AP-42, Table 11.19.2-2 for screening used based on conservative assumption that moisture content is greater than 1.5% due to water added in the shredder.
b. Uncontrolled particulate matter emission factors from AP-42, Table 11.19.2-2 for truck loading of crushed stone - conservative. Use uncontrolled emission factor because controlled emissions factors are not identified.
c. **Material Drop PM Emission Equation from 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	Applied to light material stockpile loading. Moisture content for use of controlled emission factors for crushed stone processing - Conveyor Transfer Points - AP-42, Table 11.19.2-2. Considered to be conservative due to moisture added to material in shredder.

d. See emission factors identified in Section 3.2 of permit application.
e. Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter during June 2018 metal emissions testing at General II, LLC.
f. Sources located inside the Fines Building emit to the atmosphere through Dust Collection DC-01. Emissions are estimated by multiplying the DC air flow rate rate of 12,000 cfm by a grain loading of 0.005 gr/dscf.
All PM emissions are assumed to be $PM_{2.5}$.

R 001228

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	0.1	312	0.0001	0.0001	0.0000	0.0024	0.0012	0.0002	0.0025	0.0013	0.0002
	Poker South	0.0115	0.1	312	0.0001	0.0001	0.0000	0.0024	0.0012	0.0002	0.0025	0.0013	0.0002
	ASR	0.2541	1	312	0.0236	0.0118	0.0018	0.5232	0.2616	0.0396	0.5468	0.2734	0.0414
	Ferrous North	0.3630	1	312	0.0337	0.0169	0.0026	0.7475	0.3738	0.0566	0.7812	0.3907	0.0592
	Ferrous South	0.3630	1	312	0.0337	0.0169	0.0026	0.7475	0.3738	0.0566	0.7812	0.3907	0.0592
	Fluff (Bin)	0.0161	0.1	312	0.0001	0.0001	0.0000	0.0033	0.0017	0.0003	0.0034	0.0018	0.0003
	Raw Material Truck Dumping (Drop 1)	0.3630	1	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	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	0.1	312	0.0000	0.0000	0.0000	0.0010	0.0005	0.0001	0.0010	0.0005	0.0001
	5" + Zorba	0.0189	0.1	312	0.0002	0.0001	0.0000	0.0039	0.0020	0.0003	0.0041	0.0021	0.0003
	2-1/2" - 5" Zorba	0.0189	0.1	312	0.0002	0.0001	0.0000	0.0039	0.0020	0.0003	0.0041	0.0021	0.0003
	5/8" - 2-1/2" Zorba	0.0189	0.1	312	0.0002	0.0001	0.0000	0.0039	0.0020	0.0003	0.0041	0.0021	0.0003
	Tailings	0.0195	0.1	312	0.0002	0.0001	0.0000	0.0040	0.0020	0.0003	0.0042	0.0021	0.0003
	Open	0.0195	0.1	312	0.0002	0.0001	0.0000	0.0040	0.0020	0.0003	0.0042	0.0021	0.0003
	Wire	0.0195	0.1	312	0.0002	0.0001	0.0000	0.0040	0.0020	0.0003	0.0042	0.0021	0.0003
	Wire Rich Solids	0.0195	0.1	312	0.0002	0.0001	0.0000	0.0040	0.0020	0.0003	0.0042	0.0021	0.0003
	Zurick	0.0195	0.1	312	0.0002	0.0001	0.0000	0.0040	0.0020	0.0003	0.0042	0.0021	0.0003
	Waste	0.0868	0.1	312	0.0008	0.0004	0.0001	0.0179	0.0090	0.0014	0.0187	0.0094	0.0015
				Totals							3.2893	1.6452	0.2493

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

b. Control Factor of 0.1 (90% control) for partial enclosure consisting of walls on three sides of bin. Control Factor of 1.0 for no control.

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.

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, 13.2.4S 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	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

Walls on three sides.
Use 0.10 as average control factor.

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 2, AP-42 13.2.1 Paved Roads (Jan 2011)

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 =	19.08	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	17	Hours per Year
Weekly Operating Days	6	Days /Week
Annual Operating Weeks =	52	Weeks/Yr
Annual Operating hours =	5,304	Hours per Year

Material Hauling

			PM	Particle size multiplier (k) =			0.011
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Annual Average Uncontrolled Emissions 1.6155-lb/VMT (lb/day)	(ton/month)	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM Emissions tpy
Semi (Shredded Steel)	26.75	27.17	43.893	0.685	10.973	0.171	1.71
Semi (scrap metal)	24.50	70.87	114.490	1.786	28.623	0.447	4.47
Semi (overseas container)	27.25	2.57	4.144	0.065	1.036	0.016	0.16
Semi (shredder residue (fluff))	27.75	9.69	15.654	0.244	3.914	0.061	0.61
Peddler Pickups	3.45	66.41	107.277	1.674	26.819	0.419	4.18
WA500 Loader (steel residue)	36.49	20.90	33.764	0.527	8.441	0.132	1.32
WA300 Loader (steel residue)	16.60	9.50	15.347	0.239	3.837	0.060	0.60
Weighted Average Weight:	19.08	Subtotals:	334.569	5.220	83.643	1.306	13.05

Material Hauling

			PM10	Particle size multiplier (k) =			0.0022
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Annual Average Uncontrolled Emissions 0.3231-lb/VMT (lb/day)	(ton/month)	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM10 Emissions tpy
Semi (Shredded Steel)	26.75	27.17	8.779	0.137	2.195	0.034	0.34
Semi (scrap metal)	24.50	70.87	22.898	0.357	5.725	0.089	0.89
Semi (overseas container)	27.25	2.57	0.829	0.013	0.207	0.003	0.03
Semi (shredder residue (fluff))	27.75	9.69	3.131	0.049	0.783	0.012	0.12
Peddler Pickups	3.45	66.41	21.455	0.335	5.364	0.084	0.84
WA500 Loader (steel residue)	36.49	20.90	6.753	0.105	1.688	0.026	0.26
WA300 Loader (steel residue)	16.60	9.50	3.069	0.048	0.767	0.012	0.12
Weighted Average Weight:	19.08	Subtotals:	66.914	1.044	16.729	0.260	2.61

Material Hauling

			PM2.5	Particle size multiplier (k) =			0.00054
Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Annual Average Uncontrolled Emissions 0.0793-lb/VMT (lb/day)	(ton/month)	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM2.5 Emissions tpy
Semi (Shredded Steel)	26.75	27.17	2.155	0.034	0.539	0.009	0.08
Semi (scrap metal)	24.50	70.87	5.620	0.088	1.405	0.022	0.22
Semi (overseas container)	27.25	2.57	0.203	0.003	0.051	0.001	0.01
Semi (shredder residue (fluff))	27.75	9.69	0.768	0.012	0.192	0.003	0.03
Peddler Pickups	3.45	66.41	5.266	0.082	1.317	0.021	0.21
WA500 Loader (steel residue)	36.49	20.90	1.657	0.026	0.414	0.007	0.07
WA300 Loader (steel residue)	16.60	9.50	0.753	0.012	0.188	0.003	0.03
Weighted Average Weight:	19.08	Subtotals:	16.422	0.257	4.106	0.066	0.64

Table 3.5B - Fugitive PM Emissions - Paved Roads
General III, LLC - Chicago, Illinois

Unpaved Industrial Road Fugitive Emission Calculation Procedure

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

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 =	19.08	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	17	Hours per Year
Weekly Operating Days	6	Days /Week
Annual Operating Weeks =	52	Weeks/Yr
Annual Operating hours =	5,304	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	Annual Average Uncontrolled Emissions 4.6548-lb/VMT (lb/day)	(ton/month)	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM Emissions tpy
Semi (Shredded Steel)	26.75	1.43	6.656	0.104	3.328	0.052	0.52
Semi (scrap metal)	24.50	3.73	17.362	0.271	8.681	0.136	1.35
Semi (overseas container)	27.25	0.14	0.628	0.010	0.314	0.005	0.05
Semi (shredder residue (fluff))	27.75	0.51	2.374	0.037	1.187	0.019	0.19
Peddler Pickups	3.45	3.50	16.269	0.254	8.135	0.127	1.27
WA500 Loader (steel residue)	36.49	1.10	5.120	0.080	2.560	0.040	0.40
WA300 Loader (steel residue)	16.60	0.50	2.327	0.036	1.164	0.018	0.18
Weighted Average Weight:	**19.08**	**Subtotals:**	50.736	0.792	25.369	0.397	**3.96**

Material Hauling

PM10 Particle size multiplier (k) = 1.5

Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Annual Average Uncontrolled Emissions 1.2405-lb/VMT (lb/day)	(ton/month)	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM10 Emissions tpy
Semi (Shredded Steel)	26.75	1.43	1.774	0.028	0.887	0.014	0.14
Semi (scrap metal)	24.50	3.73	4.627	0.072	2.314	0.036	0.36
Semi (overseas container)	27.25	0.14	0.167	0.003	0.084	0.001	0.01
Semi (shredder residue (fluff))	27.75	0.51	0.633	0.010	0.317	0.005	0.05
Peddler Pickups	3.45	3.50	4.336	0.068	2.168	0.034	0.34
WA500 Loader (steel residue)	36.49	1.10	1.365	0.021	0.683	0.011	0.11
WA300 Loader (steel residue)	16.60	0.50	0.620	0.010	0.310	0.005	0.05
Weighted Average Weight:	**19.08**	**Subtotals:**	13.522	0.211	6.763	0.106	**1.06**

Material Hauling

PM2.5 Particle size multiplier (k) = 0.15

Vehicle Type	Vehicle Weight (tons)	Miles Traveled per Day	Annual Average Uncontrolled Emissions 0.1240-lb/VMT (lb/day)	(ton/month)	Annual Average Controlled Emissions (lb/day)	(ton/month)	Annual PM2.5 Emissions tpy
Semi (Shredded Steel)	26.75	1.43	0.177	0.003	0.089	0.001	0.01
Semi (scrap metal)	24.50	3.73	0.463	0.007	0.232	0.004	0.04
Semi (overseas container)	27.25	0.14	0.017	0.000	0.009		0.00
Semi (shredder residue (fluff))	27.75	0.51	0.063	0.001	0.032		0.01
Peddler Pickups	3.45	3.50	0.433	0.007	0.217	0.003	0.03
WA500 Loader (steel residue)	36.49	1.10	0.136	0.002	0.068	0.001	0.01
WA300 Loader (steel residue)	16.60	0.50	0.062	0.001	0.031		0.00
Weighted Average Weight:	**19.08**	**Subtotals:**	1.351	0.021	0.678	0.009	**0.11**

Table 3-6 Miscellaneous Natural Gas Fired Environmental Heaters

General III, LLC - Chicago, Illinois

10

Pollutant	Pollutant Emission Factor [a] lb/MMscf	Total Max Firing Rate 10.0 MMBtu/hr NG HHV = 1,020-Btu/scf Annual Gas Consumption 65,700 MMBtu/yr ton/mo[e]	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[g]		Facility Wide Potential[h]	Fugitive Emissions From Stockpile Operations[e]		Fugitive Emissions from Paved 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				2.57						3.22	5.79					5.79
Carbon Monoxide - CO	0.12	1.22	0.22	2.16					2.71	2.71	6.08					6.08
Total Particulate Matter - PM	0.24	2.36		0.20		2.83		7.62		0.24	13.25	0.33	3.29	1.31	13.05	29.59
filterable PM less than 10 microns in diameter - PM_{10}	0.24	2.36		0.20		1.22		3.71		0.24	7.73	0.16	1.65	0.26	2.61	11.98
Filterable PM less than 2.5 microns in diameter - $PM_{2.5}$				0.20		0.22		1.71		0.24	2.37	0.02	0.25	0.06	0.64	3.26
Sulfur Dioxide - SO_2				0.02						0.02	0.03					0.03
Volatile Organic Material - VOM	0.24	2.43		0.14						0.18	2.75					2.75
Total - HAPs	0.0052	0.0517		0.0486		0.0473		0.1275		0.0608	0.3359	0.0055	0.0550	0.03	0.2845	0.6754
Max Individual HAP	Mercury	Mercury		Hexane		Mercury		Mercury		Hexane		Mercury	Mercury	Mercury	Mercury	
Mercury		0.0303				0.0364		0.0980			0.1648	0.0042	0.0423	0.02	0.2188	0.4259
Hexane				0.0463						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 1A (VOM and CO), Table 1B (PM), and Table 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 1D.
c. See Table 2.
d. See Table 3.
e. See Table 4.
f. See Table 5.
g. See Table 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.

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	6.67E-05	6.67E-04													6.67E-05	6.67E-04
Styrene	1.33E-05	1.33E-04													1.33E-05	1.33E-04
Toluene	3.33E-04	3.33E-03	8.75E-06	8.75E-05									1.10E-05	1.10E-04	3.53E-04	3.53E-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)	2.67E-06	2.67E-05													2.67E-06	2.67E-05
Pyrene			1.29E-08	1.29E-07									1.61E-08	1.61E-07	2.90E-08	2.90E-07
m,p-Xylene	1.33E-05	1.33E-04													1.33E-05	1.33E-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)anthracen			4.12E-08	4.12E-07									5.15E-08	5.15E-07	9.27E-08	9.27E-07
Benzene	4.00E-04	4.00E-03	5.40E-06	5.40E-05									6.76E-06	6.76E-05	4.12E-04	4.12E-03
1,1,1-Trichloroethane	2.00E-04	2.00E-03													2.00E-04	2.00E-03
Methylene Chloride	6.00E-05	6.00E-04													6.00E-05	6.00E-04
Trichloroethene (TCE)	6.67E-05	6.67E-04													6.67E-05	6.67E-04
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	6.67E-05	6.67E-04													6.67E-05	6.67E-04
Metal HAPs																
Lead	1.57E-04	1.57E-03	1.29E-06	1.29E-05	1.92E-04	1.88E-03	5.12E-04	5.07E-03	2.19E-04	2.19E-03	1.13E-03	1.13E-02	1.61E-06	1.61E-05	2.21E-03	2.20E-02
Manganese	1.26E-04	1.26E-03	9.78E-07	9.78E-06	1.54E-04	1.51E-03	4.12E-04	4.08E-03	1.76E-04	1.76E-03	9.11E-04	9.11E-03	1.22E-06	1.22E-05	1.78E-03	1.77E-02
Mercury	3.03E-03	3.03E-02	6.69E-07	6.69E-06	3.71E-03	3.64E-02	9.91E-03	9.80E-02	4.23E-03	4.23E-02	2.19E-02	2.19E-01	8.37E-07	8.37E-06	4.28E-02	4.26E-01
Nickel	4.89E-05	4.89E-04	5.40E-06	5.40E-05	5.97E-05	5.86E-04	1.60E-04	1.58E-03	6.81E-05	6.81E-04	3.52E-04	3.52E-03	6.76E-06	6.76E-05	7.01E-04	6.98E-03
Antimony	9.39E-06	9.39E-05			1.15E-05	1.13E-04	3.06E-05	3.03E-04	1.31E-05	1.31E-04	6.77E-05	6.77E-04			1.32E-04	1.32E-03
Arsenic	3.63E-06	3.63E-05	5.15E-07	5.15E-06	4.44E-06	4.35E-05	1.19E-05	1.17E-04	5.06E-06	5.06E-05	2.62E-05	2.62E-04	6.44E-07	6.44E-06	5.23E-05	5.21E-04
Beryllium	7.29E-07	7.29E-06	3.09E-08	3.09E-07	8.91E-07	8.74E-06	2.38E-06	2.36E-05	1.02E-06	1.02E-05	5.26E-06	5.26E-05	3.86E-08	3.86E-07	1.03E-05	1.03E-04
Cadmium	3.46E-05	3.46E-04	2.83E-06	2.83E-05	4.23E-05	4.15E-04	1.13E-04	1.12E-03	4.83E-05	4.83E-04	2.50E-04	2.50E-03	3.54E-06	3.54E-05	4.94E-04	4.92E-03
Chromium	3.84E-05	3.84E-04	3.60E-06	3.60E-05	4.69E-05	4.60E-04	1.25E-04	1.24E-03	5.35E-05	5.35E-04	2.77E-04	2.77E-03	4.51E-06	4.51E-05	5.49E-04	5.46E-03
Cobalt	3.24E-06	3.24E-05	2.16E-07	2.16E-06	3.96E-06	3.89E-05	1.06E-05	1.05E-04	4.52E-06	4.52E-05	2.34E-05	2.34E-04	2.71E-07	2.71E-06	4.62E-05	4.60E-04
Phosphorus	4.72E-04	4.72E-03			5.76E-04	5.65E-03	1.54E-03	1.52E-02	6.58E-04	6.58E-03	3.40E-03	3.40E-02			6.65E-03	6.62E-02
Selenium	1.74E-05	1.74E-04	6.18E-08	6.18E-07	2.13E-05	2.09E-04	5.69E-05	5.63E-04	2.43E-05	2.43E-04	1.26E-04	1.26E-03	7.73E-08	7.73E-07	2.46E-04	2.45E-03
Total HAPs	5.17E-03	5.17E-02	4.86E-03	4.86E-02	4.82E-03	4.73E-02	1.29E-02	1.27E-01	5.50E-03	5.50E-02	2.85E-02	2.85E-01	6.08E-03	6.08E-02	6.78E-02	6.75E-01
											Maximum Individual HAP			Mercury	4.28E-02	4.26E-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 June 2018 emission testing of the RTO at GII, LLC's existing Clifton Street facility in Chicago. No additonal control efficienency was applied to the metal HAP emission factors for the packed tower scrubber.

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 multiying 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).

R 001235

RK
& Associates, Inc.

Construction Permit Application for New Scrap Metal Recycling Facility

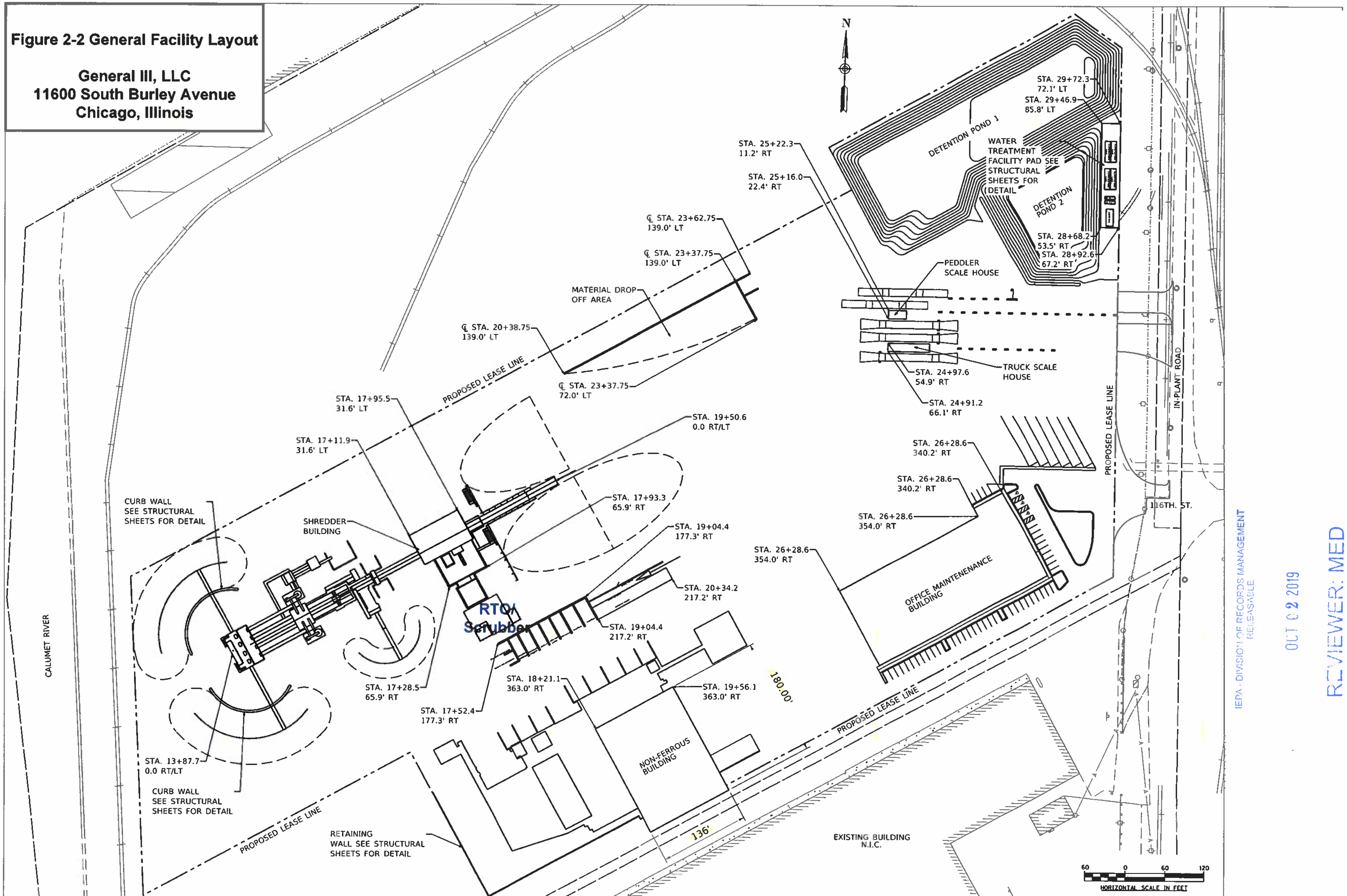
General III, LLC
11600 South Burley
Chicago, Illinois 60614

September 20, 2019

FIGURES

Figure 2-2 General Facility Layout

General III, LLC
11600 South Burley Avenue
Chicago, Illinois



RK
& Associates, Inc.

Construction Permit Application for New Scrap Metal Recycling Facility

General III, LLC
11600 South Burley
Chicago, Illinois 60614

September 24, 2019

APPENDIX A - IEPA PERMIT APPLICATION FORMS

APC-628	Construction Permit Application for a FESOP Source	A-1
197-FEE	Fee Form	A-5
CAAPP-286	Single Source Determination	A-7
CAAPP-220	Process Equipment Data and Information – Metal Shredder	A-11
CAAPP-260	Air Pollution Control Equipment Data and Information – Metal Shredder Roll-Media Filter, RTO, and Packed Tower Scrubber	A-21
CAAPP-260C	Supplement Form Air Pollution Control Equipment Roll-Media Filter	A-31
CAAPP-260B	Supplement Form Air Pollution Control Equipment Afterburner	A-33
CAAPP-260G	Supplement Form Air Pollution Control Equipment Packed Tower Scrubber	A-35
CAAPP-220	Process Equipment Data and Information Ferrous Material Processing System	A-37
CAAPP-220	Process Equipment Data and Information Non-Ferrous Material Processing System	A-47
CAAPP-260	Air Pollution Control Equipment Data and Information Dust Collector DC-01	A-57
CAAPP-260C	Supplement Form Air Pollution Control Equipment Dust Collector DC-01	A-67

R 001239

RECEIVED
STATE OF ILLINOIS
SEP 2 5 2019
Environmental Protection Agency
BUREAU OF AIR

Illinois Environmental Protection Agency
Division Of Air Pollution Control -- Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

# Construction Permit Application for a FESOP Source (FORM APC628)	For Illinois EPA use only
	BOA ID No.: 031 600 SFK
	Application No.: 19 09 0021
	Date Rec'd: 9-25-19

This form is to be used to supply information to obtain a construction permit for a proposed project involving a Federally Enforceable State Operating Permit (FESOP) or Synthetic Minor source, including construction of a new FESOP source. Other necessary information must accompany this form as discussed in the "General Instructions For Permit Applications," Form APC-201

Proposed Project

1. Working Name of Proposed Project:
   Scrap Metal Recycling Facility
2. Is the project occurring at a source that already has a permit from the Bureau of Air (BOA)?
   ☒ No ☐ Yes If Yes, provide BOA ID Number:
3. Does this application request a revision to an existing construction permit issued by the BOA?
   ☒ No ☐ Yes If Yes, provide Permit Number:
4. Does this application request that the new/modified emission units be incorporated into an existing FESOP issued by the BOA?
   (facility will apply for a FESOP)
   ☒ No ☐ Yes If Yes, provide Permit Number:

Source Information

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE
OCT 0 2 2019
REVIEWER: MED

5. Source name:* **General III, LLC**		
6. Source street address:* **11600 South Burley Avenue**		
7. City: **Chicago**	8. County: **Cook**	9. Zip code: **60617**

ONLY COMPLETE THE FOLLOWING FOR A SOURCE WITHOUT AN ID NUMBER.

10. Is the source located within city limits? ☒ Yes ☐ No
    If no, provide Township Name:

11. Description of source and product(s) produced: **Scrap metal recycling recovering ferrous and non-ferrous metals for reuse**	12. Primary Classification Code of source: SIC **5093** or NAICS **423930**
13. Latitude (DD:MM:SS.SSSS): **41° 41' 07.02" N**	14. Longitude (DD:MM:SS.SSSS): **87° 32' 45.09" W**

* If this information different than previous information, then complete a new Form 200-CAAPP to change the source name in initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Applicant Information

15. Who is the applicant? ☒ Owner ☒ Operator	16. All correspondence to: (check one) ☐ Source ☐ Owner ☒ Operator
17. Applicant's FEIN: **40-0011010**	18. Attention name and/or title for written correspondence: **Mr. Jim Kallas**

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Owner Information*		
19. Name: General III, LLC		
20. Address: 11600 South Burley Avenue		
21. City: Chicago	22. State: Illinois	23. Zip code: 60617

* If this information different than previous information, then complete Form 272-CAAPP for a Request for Ownership Change for CAAPP Permit for an initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Operator Information (if different from owner)*		
24. Name: Same as above		
25. Address:		
26. City:	27. State:	28. Zip code:

* If this information different than previous information, then complete a new Form 200-CAAPP to change the source name in initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously Issued

Technical Contacts for Application	
29. Preferred technical contact: (check one) ☒ Applicant's contact ☐ Consultant	
30. Applicant's technical contact person for application: Mr. Jim Kallas	
31. Contact person's telephone number(s) 847-508-9170	32. Contact person's e-mail address: jim@general-iron.com
33. Consultant for application: RK & Associates, Inc. – Mr. John G. Pinion	
34. Applicant's consultant's telephone number: 660-393-9000 x 208	35. Consultant's e-mail address: jpinion@rka-inc.com

Review Of Contents of the Application	
36. Is the emission unit covered by this application already constructed? If "Yes", provide the date construction was completed: Note: The Illinois EPA is unable to issue a construction permit for a emission unit that has already been constructed	☐ YES ☒ NO
37. Does the application include a narrative description of the proposed project?	☒ YES ☐ NO
38. Does the application contain a list or summary that clearly identifies the emission units and air pollution control equipment that are part of the project?	☒ YES ☐ NO
39. Does the application include process flow diagram(s) for the project showing new and modified emission units and control equipment, and related existing equipment and their relationships?	☒ YES ☐ NO
40. If the project is at a source that has not previously received a permit from the BOA, does the application include a source description, plot plan and site map?	☒ YES ☐ NO

Review Of Contents of the Application (continued)	
41. Does the application include relevant information for the proposed project as requested on Illinois, BOA application forms (or otherwise contain all relevant technical information)?	☒ YES ☐ NO
42. Does the application identify and address all applicable or potentially applicable emission standards, including: a. State emission standards (35 IAC Chapter I, Subtitle B); b. Federal New Source Performance Standards (40 CFR Part 60); c. Federal standards for HAPs (40 CFR Parts 61 & 63)?	☒ YES ☐ NO
43. Does the application address whether the proposed project or the source could be a major project for Prevention of Significant Deterioration, 40 CFR 52.21?	☒ YES ☐ NO ☐ N/A
44. Does the application address for which pollutant(s) the proposed project or source could be a major project for PSD, 40 CFR 52.21?	☐ YES ☐ NO ☒ N/A
45. Does the application address whether the proposed project or the source could be a major project for "Nonattainment New Source Review," (NA NSR), 35 IAC Part 203?	☒ YES ☐ NO ☐ N/A
46. Does the application address for which pollutant(s) the proposed project or the source could be a major project for NA NSR, 35 IAC Part 203?	☐ YES ☐ NO ☒ N/A*
47. Does the application address whether the proposed project or the source could potentially be subject to federal Maximum Achievable Control Technology (MACT) standard under 40 CFR Part 63 for Hazardous Air Pollutants (HAP) and identify the standard that could be applicable?	☒ YES ☐ NO ☐ N/A* * Source not major ☒ Project not major ☒
48. Does the application identify the HAP(s) from the proposed project or the source that would trigger the applicability of a MACT standard under 40 CFR Part 63?	☒ YES ☐ NO ☐ N/A
49. Does the application include a summary of the current and the future potential emissions of the source after the proposed project has been completed for each criteria air pollutant and/or HAP (tons/year)?	☒ YES ☐ NO ☐ N/A* * Applicability of PSD, NA NSR or 40 CFR 63 not applicable to the source's emissions.
50. Does the application include a summary of the requested permitted annual emissions of the proposed project for the new and modified emission units (tons/year)?	☒ YES ☐ NO ☐ N/A* * Project does not involve an increase in emission from new or modified emission units.
51. Does the application include a summary of the requested permitted production, throughput, fuel, or raw material usage limits that correspond to the annual emissions limits of the proposed project for the new and modified emission units?	☒ YES ☐ NO ☐ N/A* * Project does not involve an increase in emission from new or modified emission units.
52. Does the application include sample calculations or methodology for the emission estimations and the requested emission limits?	☒ YES ☐ NO
53. Does the application address the relationships with and implications of the proposed project for the source's FESOP?	☐ YES ☐ NO ☒ N/A* * FESOP not yet issued
54. If the application contains information that is considered a TRADE SECRET, has such information been properly marked and claimed and other requirements to perfect such a clam been satisfied in accordance with 35 IAC Part 130? Note: *Claimed information will not be legally protected from disclosure to the public if it is not properly claimed or does not qualify as trade secret information.	☐ YES ☐ NO ☒ N/A* * No information in the application is claimed to be a TRADE SECRET

Review Of Contents of the Application (continued)	
55. If the source is located in a county other than Cook County, are two separate copies of this application being submitted	☐ YES ☐ NO NA - Source located in Cook County
56. If the source is located in Cook County, are three separate copies of this application being submitted?	☒ YES ☐ NO
57. Does the application include a completed "FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION," Form 197-FEE, for the emission units and control equipment for which a permit for construction or modification is being sought?	☒ YES ☐ NO
58. Does the application include a check in the proper amount for payment of the Construction permit fee??	☒ YES ☐ NO

Note: Answering "No" to Items 36 through 58 may result in the application being deemed incomplete.

Signature Block

Pursuant to 35 IAC 201.159, all applications and supplements thereto shall be signed by the owner and operator of the source, or their authorized agent, and shall be accompanied by evidence of authority to sign the application. Applications without a signed certification will be deemed incomplete

59. Authorized Signature:

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete and that I am a responsible official for the source, as defined by Section 39.5(1) of the Environmental Protection Act. In addition, the technical contact person identified above is authorized to submit (by hard copy and/or by electronic copy) any supplemental information related to this application that may be requested by the Illinois EPA.

BY: ______________________ (SIGNATURE) COO (TITLE OF SIGNATORY)

Mr. Hal Tolin (TYPED OR PRINTED NAME OF SIGNATORY) 9 / 19 / 19 (DATE)

R 001243 SID: 70491

Illinois EPA FOIA Exemption Reference Sheet

Agency ID: 170002390446

Media File Type: AIR

Bureau ID: 031600SFX

Site Name: General III LLC

Site Address1: 11600 S Burley Ave

Site Address2:

Site City: Chicago State: IL Zip: 60617-

This record has been determined to be partially or wholly exempt from public disclosure

Exemption Type:

Redaction

Exempt Doc #: 1 **Document Date:** 9 /25/2019 **Staff:** MED

Document Description: CONSTRUCTION PERMIT CHECK

Category ID: 03M **Category Description:** AIR PERMIT - CONSTRUCTION/JOINT **Exempt Type:** Redaction

Permit ID: 19090021 **Date of Determination:** 10/2 /2019

FOR SECURITY PURPOSES, THE FACE OF THIS DOCUMENT CONTAINS A TWO-TONED COLORED BACKGROUND AND MICROPRINTING IN THE BORDER

Reserve FTL, LLC
11600 S. Burley Ave
Chicago, IL 60617

VOID AFTER 90 DAYS

No. 019714

11-25
1210

DATE	CHECK AMOUNT
08/20/19	$*****15,000.00

PAY EXACTLY *****15,000 DOLLARS AND 00 CENTS

Wells Fargo Bank, N.A.
420 Montgomery Street
San Francisco, CA 94104

AY TO THE
RDER OF

ILLINOIS EPA
1021 N GRAND AVENUE EAST
PO BOX 19506
SPRINGFIELD, IL 62794-9506

AUTHORIZED SIGNATURE

SECURITY FEATURES INCLUDED. DETAILS ON BACK

⑈019714⑈ ⑆121000248⑆ [redacted]

0316005FX/Cook
General III LLC
Air Permit – Construction/Joint

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

OCT 02 2019

REVIEWER: MED

Illinois Environmental Protection Agency

RECEIVED
STATE OF ILLINOIS
SEP 25 2019
Environmental Protection Agency
BUREAU OF AIR

Bureau of Air • 1021 North Grand Avenue East • P.O. Box 19506 • Springfield • Illinois • 62794-9506

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY

ID Number: 031600SFX
Permit #: 19090021
$15000
☑ Complete ☐ Incomplete
Date Complete: 8-20-19
Check Number: 019714
Account Name: ReSere FTL LLC

This form is to be used to supply fee information that must accompany all construction permit applications. This application must include payment in full to be deemed complete. Make check or money order payable to the Illinois Environmental Protection Agency, Division of Air Pollution Control - Permit Section at the above address. Do NOT send cash. Refer to instructions (197-INST) for assistance.

Source Information

1. Source Name: General III, LLC
2. Project Name: Metal Recycling Facility
3. Source ID #: (if applicable) ____
4. Contact Name: Jim Kallas
5. Contact Phone #: 847-508-9170

Fee Determination

6. The boxes below are automatically calculated.

Section 1 Subtotal $5,000.00 + Section 2, 3 or 4 Subtotal $10,000.00 = $15,000.00 Grand Total

Section 1: Status of Source/Purpose of Submittal

7. Your application will fall under only one of the following five categories described below. Check the box that applies. Proceed to applicable sections. For purposes of this form:
   - **Major Source** is a source that is required to obtain a CAAPP permit.
   - **Synthetic Minor Source** is a source that has taken limits on potential to emit in a permit to avoid CAAPP permit requirements (e.g.,FESOP).
   - **Non-Major Source** is a source that is not a major or synthetic minor source.

☐ Existing source without status change or with status change from synthetic minor to major source or vice versa. Proceed to Section 2.

☐ Existing non-major source that will become synthetic minor to major source. Proceed to Section 4.

☑ New major or synthetic minor source. Proceed to Section 4. $5,000.00

☐ New non-major source. Proceed to Section 3. Section 1 Subtotal

☐ AGENCY ERROR. If this is a timely request to correct an issued permit that involves only an agency error and if the request is received within the deadline for a permit appeal to the Pollution Control Board. Skip Sections 2, 3 and 4. Proceed directly to Section 5.

This agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 ET SEQ. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Section 2: Special Case Filing Fee

8. **Filing Fee.** If the application only addresses one or more of the following, check the appropriate boxes, skip Sections 3 and 4 and proceed directly to Section 5. Otherwise, proceed to Section 3 or 4 as appropriate.

Addition or replacement of control devices on permitted units.
Pilot projects/trial burns by a permitted unit
Land remediation projects $0.00
Revisions related to methodology or timing for emission testing
Minor administrative-type change to a permit

Section 3: Fees for Current or Projected Non-Major Sources

9.	This application consists of a single new emission unit or no more than two modified emission units. ($500 fee)	9. ________
10.	This application consists of more than one new emission unit or more than two modified units. ($1,000 fee)	10. ________
11.	This application consists of a new source or emission unit subject to Section 39.2 of the Act (i.e., Local Siting Review); a commercial incinerator or a municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or an emission unit designated as a complex source by agency rulemaking. ($15,000 fee)	11. ________
12.	A public hearing is held (see instructions). ($10,000 fee)	12. ________
13.	Section 3 subtotal. (lines 9 through 12 - entered on page 1)	13. $0.00

Section 4: Fees for Current or Projected Major or Synthetic Minor Sources

Application contains modified emission units only	14. For the first modified emission unit, enter $2,000.	
	15. Number of additional modified emission units = ________ x $1,000.	15. $0.00
	16. Line 14 plus line 15, or $5,000, whichever is less.	16. $0.00
Application contains new and/or modified emission units	17. For the first new emission unit, enter $4,000.	17. $4,000.00
	18. Number of additional new and/or modified emission units = > 10 x $1,000.	18. $10,000.00
	19. Line 17 plus line 18, or $10,000, whichever is less.	19. $10,000.00
Application contains netting exercise	20. Number of individual pollutants that rely on a netting exercise or contemporaneous emissions decrease to avoid application of PSD or nonattainment area NSR = ________ x $3,000.	20. $0.00
Additional Supplemental Fees	21. If the new source or emission unit is subject to Section 39.2 of the Act (i.e. siting); a commercial incinerator or other municipal waste, hazardous waste, or waste tire incinerator; a commercial power generator; or one or more other emission units designated as a complex source by Agency rulemaking, enter $25,000.	21. ________
	22. If the source is a new major source subject to PSD, enter $12,000.	22. ________
	23. If the project is a major modification subject to PSD, enter $6,000.	23. ________
	24. If this is a new major source subject to nonattainment area (NAA) NSR, enter $20,000.	24. ________
	25. If this is a major modification subject to NAA NSR, enter $12,000.	25. ________
	26. If the application involves a determination of MACT for a pollutant and the project is not subject to BACT or LAER for the related pollutant under PSD or NSR (e.g., VOM for organic HAP), enter $5,000 per unit for which a determination is requested or otherwise required. ________ x $5,000.	26. $0.00
	27. If a public hearing is held (see instructions), enter $10,000.	27. ________
28. Section 4 subtotal (line 16 and lines 19 through 28) to be entered on page1		28. $10,000.00

Section 5: Certification

NOTE: Applications without a signed certification will be deemed incomplete.

29. I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the information contained in this fee application form is true, accurate and complete.

by: ____________________   COO
Signature   Title of Signatory

Hal Tolin   9.19.19
Typed or Printed Name of Signatory   Date

ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE

Revision No.: ____________
Date: _____ / _____ / _____
Page: ________ of ______
Source Designation ____________

SINGLE SOURCE DETERMINATION

FOR AGENCY USE ONLY
ID NUMBER:
EMISSION POINT #:
DATE:

SECTION ONE	SOURCE INFORMATION
1) SOURCE NAME:: General III, LLC	
2) SOURCE ID NO.:	3) DATE FORM PREPARED: 09 / / 2019

SECTION TWO	INSTRUCTIONS IN BRIEF
1)	COMPLETE SECTION FOUR FOR EACH SOURCE THAT THE PERMITTEE DETERMINES IS OPERATING AS A SINGLE SOURCE WITH THE PERMITTEE. THIS SECTION MAY BE COPIED AS NEEDED FOR ADDITIONAL SOURCES OR IF ADDITIONAL SPACE IS NEEDED. IF COMPLETING THIS SECTION THERE IS NO NEED TO COMPLETE SECTION FIVE OF THIS FORM AS THE SOURCE CONFIRMS A SINGLE SOURCE RELATIONSHIP.
2)	COMPLETE SECTION FIVE FOR EACH SOURCE THAT THE PERMITTEE CONFIRMS IS NOT OPERATING AS A SINGLE SOURCE WITH THE PERMITTEE. CHECK ALL THAT APPLY AND PROVIDE AS AN ATTACHMENT TO THIS FORM A CONCISE BUT THOROUGH EXPLANATION OF EACH CHECKED SINGLE SOURCE FACTOR. REFERENCE THE ATTACHMENT(S) USING THE APPROPRIATE SINGLE SOURCE FACTOR CONDITION. THIS SECTION MAY BE COPIED AS NEEDED FOR ADDITIONAL SOURCES OR IF ADDITIONAL SPACE IS NEEDED.
3)	REFER TO 286-CAAPP INSTRUCTIONS FOR FURTHER GUIDANCE ON COMPLETING THIS FORM.

SECTION THREE	SINGLE SOURCE STATUS
1)	☐ THE ABOVE MENTIONED SOURCE IS A SINGLE SOURCE WITH ANOTHER SOURCE.
2)	☒ THE ABOVE MENTIONED SOURCE IS A SINGLE SOURCE WITH MULTIPLE SOURCES.
3)	☐ THE ABOVE MENTIONED SOURCE **IS NOT** A SINGLE SOURCE WITH ANOTHER SOURCE.

SIGNATURE BLOCK

NOTE: THIS CERTIFICATION MUST BE SIGNED BY A RESPONSIBLE OFFICIAL. APPLICATIONS WITHOUT A SIGNED CERTIFICATION WILL BE RETURNED AS INCOMPLETE.

I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION CONTAINED IN THIS APPLICATION ARE TRUE, ACCURATE AND COMPLETE.

AUTHORIZED SIGNATURE

BY: ____________________ COO
SIGNATURE TITLE OF SIGNATORY

Mr. Hal Tolin 9 / 19 / 19
TYPED OR PRINTED NAME OF SIGNATORY DATE

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER 39.5 OF THE ILLINOIS ENVIRONMENTAL PROTECTION ACT, 415 ILCS 5/39.5. FURTHER DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION, MOREOVER AS ALSO PROVIDED IN THAT SECTION FAILURE TO PROVIDE THIS INFORMATION MAY PREVENT THIS APPLICATION FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED.

SECTION FOUR	OPERATING AS A SINGLE SOURCE WITH THE FACILITY

COMPLETE THE FOLLOWING TABLE FOR ALL SOURCES WHICH ARE CONSIDERED SINGLE SOURCES WITH THIS SOURCE. FOR THE REQUESTED SINGLE SOURCE DESCRIPTION COLUMN, DESCRIBE THE FUNCTION AND PRODUCT/SERVICE PROVIDED BY THE SINGLE SOURCE. FOR THE REQUESTED SINGLE SOURCE RELATIONSHIP COLUMN, DESCRIBE THE INTERACTION(S) WITH THE SINGLE SOURCE BY CHOOSING FROM AMONG THE FOLLOWING REASONS LISTED BELOW, AND BRIEFLY EXPLAIN IF NECESSARY. USE ADDITIONAL PAGES OR ATTACHMENTS AS NECESSARY.

#	SOURCE NAME	SOURCE ID#	ADDRESS	SINGLE SOURCE DESCRIPTION	SINGLE SOURCE RELATIONSHIP
1	**Reserve Marine Terminals (RMT)**	**None**	**11600 South Burley Ave Chicago, IL 60617**	**See Section 4.1 of Application.**	• **Located on same site as other entities identified herein[(1)].** • **Primary SIC Code is 5093[(2)]** • **Common Ownership/ Control thru Reserve Management Group (RMG)**
2	**Regency Technologies (RSR)**	**None**	**11600 South Burley Ave Chicago, IL 60617**	**See Section 4.1 of Application.**	• **Located on same site as other entities identified herein[(1)].** • **Primary SIC Code is 5093[(2)]** • **Common Ownership/ Control thru Reserve Management Group (RMG)**
3	**Napuck Salvage of Waupaca (NSW)**	**031600GYI**	**11600 South Burley Ave Chicago, IL 60617**	**See Section 4.1 of Application.**	• **Located on same site as other entities identified herein[(1)].** • **Primary SIC Code is 5093[(2)]** • **Common Ownership/ Control thru Reserve Management Group (RMG)**
4	**South Shore Recycling (SSR)**	**None**	**11600 South Burley Ave Chicago, IL 60617**	**See Section 4.1 of Application.**	• **Located on same site as other entities identified herein[(1)].** • **Primary SIC Code is 5093[(2)]** • **Common Ownership/ Control thru Reserve Management Group (RMG)**
5					

(1) General III will be located at this site. (2) General III has a primary SIC code of 5093 – *Scrap and Waste Materials.*

A CHOOSE OF THE FOLLOWING REASONS AND BRIEFLY EXPLAIN IF NECESSARY: 1) SAME SIC CODE; 2) SHARED COMPANY STRUCTURE (E.G., SAME PARENT COMPANY, SISTER COMPANIES, ETC.); 3) CONTRACTUAL RELATIONSHIP(S); 4) PROCESS/PRODUCTION CO-DEPENDENCY; 5) CONTIGUOUS OR ADJACENT PROPERTIES; 6) INTEGRATED FACILITIES; 7) SUPPORT FACILITY RELATIONSHIP (E.G., CONVEYS, STORES, OR OTHERWISE ASSISTS IN THE PRODUCTION OF A PRINCIPAL PRODUCT AT ANOTHER SOURCE), OR 8) OTHER (EXPLAIN).

R 001248

SECTION FIVE NOT OPERATING AS A SINGLE SOURCE WITH THIS FACILITY	
1) SOURCE NAME	
2) SOURCE STREET ADDRESS:	
3) CITY	
4) ZIP:	5) PRIMARY SIC NO.:
6) PRIMARY STANDARD INDUSTRIAL CLASSIFICATION (SIC) CATEGORY:	
7) LONGITUDE (DD:MM:SS):	8) LONGITUDE (DD:MM:SS):

SINGLE SOURCE FACTORS: SINGLE MAJOR INDUSTRIAL GROUPING (SIC CODE)

9) THE ABOVE MENTIONED SOURCE IS A STATIONARY SOURCE BELONGING TO A **SINGLE MAJOR INDUSTRIAL GROUPING (SIC CODE)**:

☐ YES ☐ NO

PRIMARY SIC OF THE SINGLE SOURCE: ____________________

SINGLE SOURCE FACTORS: COMMON CONTROL

10) THE ABOVE MENTIONED SOURCE IS A STATIONARY SOURCE UNDER **COMMON CONTROL**:

☐ YES ☐ NO IF "YES" CONTINUE TO QUESTION 11 AS THE SOURCE CONFIRMS A COMMON CONTROL RELATIONSHIP

A	☐	SAME "PARENT" COMPANY BETWEEN THE TWO (OR MORE) FACILITIES?
B	☐	CONTRACTUAL RELATIONSHIPS BETWEEN THE TWO (OR MORE) FACILITIES?
C	☐	A FINANCIAL CO-DEPENDENCY BETWEEN THE TWO (OR MORE) FACILITIES?
D	☐	JOINT OWNERSHIP BETWEEN THE TWO (OR MORE) FACILITIES?
E	☐	VOTING INTEREST BETWEEN THE TWO (OR MORE) FACILITIES?
F	☐	SHARED LIABILITY BETWEEN THE TWO (OR MORE) FACILITIES?
G	☐	SHARED MANAGERIAL HIERARCHY BETWEEN THE TWO (OR MORE) FACILITIES?
H	☐	CONTRACT-FOR-SERVICE RELATIONSHIP BETWEEN THE TWO (OR MORE) FACILITIES?
I	☐	PROCESS/PRODUCTION CO-DEPENDENCY BETWEEN THE TWO (OR MORE) FACILITIES?
J	☐	ADJACENT LOCATION BETWEEN THE TWO (OR MORE) FACILITIES?
K	☐	FINANCIAL INTEREST BETWEEN THE TWO (OR MORE) FACILITIES?
L	☐	COMMON EMPLOYEES BETWEEN THE TWO (OR MORE) FACILITIES?
M	☐	SHARED EQUIPMENT BETWEEN THE TWO (OR MORE) FACILITIES?
N	☐	LANDLORD-TENANT RELATIONSHIP BETWEEN THE TWO (OR MORE) FACILITIES?
O	☐	FUNDING RELATIONSHIP BETWEEN THE TWO (OR MORE) FACILITIES?
P	☐	SHARED PRODUCTS OR BY-PRODUCTS BETWEEN THE TWO (OR MORE) FACILITIES?
Q	☐	SHARED TRANSPORTATION/PROCESS LINE BETWEEN THE TWO (OR MORE) FACILITIES?
R	☐	SHARED PAYROLL ACTIVITY, EMPLOYEE BENEFITS, HEALTH PLANS, RETIREMENT FUNDS, INSURANCE COVERAGE, OR OTHER ADMINISTRATIVE FUNCTIONS BETWEEN THE TWO (OR MORE) FACILITIES?
S	☐	SHARED RESPONSIBILITY FOR COMPLIANCE WITH AIR QUALITY CONTROL REQUIRMENTS BETWEEN THE TWO (OR MORE) FACILITIES?
T	☐	OTHER (EXPLAIN):

SINGLE SOURCE FACTORS: CONTIGUOUS OR ADJACENT PROPERTIES		
11) THE ABOVE MENTIONED SOURCE IS A STATIONARY SOURCE LOCATED ON ONE OR MORE **CONTIGUOUS OR ADJACENT PROPERTIES**: ☐ YES ☐ NO IF "YES" CONTINUE TO QUESTION 12 AS THE SOURCE CONFIRMS A CONTIGUOUS OR ADJACENT RELATIONSHIP. APPROXIMATE STRAIGHT LINE DISTANCE TO THE SOURCE (MILES): ________		
A	☐	WAS THE LOCATION CHOSEN DUE TO ITS PROXIMITY TO EXISTING FACILITY?
B	☐	ARE THE FACILITIES INTEGRATED SUCH THAT THEY SIGNIFICANTLY AFFECT THE DEGREE TO WHICH THEY MAY BE DEPENDENT ON EACH OTHER?
C	☐	ARE MATERIALS ROUTINELY TRANSFERRED BETWEEN FACILITIES? ☐ WATERWAY ☐ RAILWAY ☐ OVER THE ROAD – PUBLIC ROAD ☐ OVER THE ROAD – SPECIAL PURPOSE ROAD ☐ PIPELINE ☐ OTHER (EXPLAIN): ________
D	☐	ARE EMPLOYEES SHUTTLED BETWEEN FACILITIES? ☐ LINE WORKERS ☐ MAINTENANCE AND/OR REPAIR CREWS ☐ ADMINISTRATIVE PERSONNEL ☐ SECURITY ☐ ENVIRONMENTAL STAFF ☐ OTHER (EXPLAIN): ________
E	☐	ARE PRODUCTION PROCESSES SPLIT BETWEEN FACILITIES AND/OR IS THERE A FUNCTIONAL INTER-RELATIONSHIP? ☐ COMPONENTS PROCESSED IN FACILITY #1 AND FINISHED IN FACILITY #2. ☐ RAW MATERIAL PROCESSED IN FACILITY #1 AND FINISHED IN FACILITY #2. ☐ A BYPRODUCT PRODUCED IN FACILITY #1 AND PROCESSED IN FACILITY #2. ☐ OTHER (EXPLAIN): ________
F	☐	OTHER (EXPLAIN):

SINGLE SOURCE FACTORS: SUPPORT FACILITY RATIONALE		
12) THE ABOVE MENTIONED SOURCE IS A STATIONARY SOURCE OPERATING AS A **SUPPORT FACILITY**: ☐ YES ☐ NO IF "YES" STOP AS THE SOURCE CONFIRMS A SUPPORT FACILITY RELATIONSHIP.		
A	☐	THE SOURCE CONVEYS, STORES, OR OTHERWISE ASSISTS IN THE PRODUCTION OF A PRINCIPAL PRODUCT AT ANOTHER STATIONARY SOURCE (OR GROUP OF STATIONARY SOURCES).
B	☐	THE SOURCE PROVIDES MORE THAN 50 PERCENT OF ITS OUTPUT OR SERVICE TO ANOTHER STATIONARY SOURCE (OR GROUP OF STATIONARY SOURCES)?
C	☐	THE SOURCE'S PROCESSES ARE SOLELY DERIVED/SUPPLIED FROM/TO ANOTHER STATIONARY SOURCE (OR GROUP OF STATIONARY SOURCES).
D	☐	THE SOURCE HAS THE "TECHNICAL CAPABILITY" TO PROVIDE OUTPUT OR SERVICE TO OTHER CUSTOMERS.
E	☐	THE SOURCE WOULD NOT EXIST AT THAT SITE BUT FOR ANOTHER STATIONARY SOURCE (OR GROUP OF STATIONARY SOURCES).
F	☐	THE SOURCE HAS PRODUCTION PROCESS SPLIT BETWEEN ANOTHER STATIONARY SOURCE (OR GROUP OF STATIONARY SOURCES) AND/OR THERE IS A FUNCTIONAL INTER-RELATIONSHIP ☐ COMPONENTS PROCESSED IN FACILITY #1 AND FINISHED IN FACILITY #2. ☐ RAW MATERIAL PROCESSED IN FACILITY #1 AND FINISHED IN FACILITY #2. ☐ A BYPRODUCT PRODUCED IN FACILITY #1 AND PROCESSED IN FACILITY #2. ☒ OTHER (EXPLAIN): ________
G	☐	OTHER (EXPLAIN):

APPLICATION PAGE ________

FOR APPLICANT'S USE
Revision No.:
Date:
Page: of
Source Designation:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

PROCESS EMISSION UNIT DATA AND INFORMATION	*FOR AGENCY USE ONLY*
	ID NUMBER:
	EMISSION POINT #:
	DATE:

SOURCE INFORMATION

1) SOURCE NAME: **General III, LLC**	
2) DATE FORM PREPARED **September 2019**	3) SOURCE ID NO. (IF KNOWN):

GENERAL INFORMATION

4) NAME OF EMISSION UNIT: **Hammermill Shredder**	
5) NAME OF PROCESS: **Ferrous Material Processing System**	
6) DESCRIPTION OF PROCESS: **Scrap metal shredder**	
7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED: **Scrap metal is shredded to a size suitable for processing for recovery of ferrous metals**	
8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT: **Shredder**	
9) MANUFACTURER OF EMISSION UNIT (IF KNOWN): **To Be Determined (TBD)**	
10) MODEL NUMBER (IF KNOWN): **TBD**	11) SERIAL NUMBER (IF KNOWN): **TBD**
12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR): **June 2020**
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):
13) DESCRIPTION OF MODIFICATION (IF APPLICABLE):	

FOR APPLICANT'S USE

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 220-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

Emissions will be controlled by shredder emissions control system – See 260 CAAPP

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

Scheduled maintenance and malfunctions of any equipment in the ferrous material processing system (upstream or downstream of the shredder) potentially affects the ability to operate the shredder.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 220-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: **14**	DAYS/WEEK: **6**	WEEKS/YEAR: **52**	
b) TYPICAL OPERATING HOURS	HOURS/DAY: **10**	DAYS/WEEK: **6**	WEEKS/YEAR: **52**	
20) ANNUAL THROUGHPUT	DEC-FEB(%): **22**	MAR-MAY(%): **26**	JUN-AUG(%): **26**	SEP-NOV(%): **26**

MATERIAL USAGE INFORMATION

21a) RAW MATERIALS	APPROX MAXIMUM RATES LBS/HR	APPROX MAXIMUM RATES TONS/YEAR	APPROX TYPICAL RATES LBS/HR	APPROX TYPICAL RATES TONS/YEAR
Scrap Metal		**1,000,000**		**750,000**

21b) PRODUCTS	APPROX MAXIMUM RATES LBS/HR	APPROX MAXIMUM RATES TONS/YEAR	APPROX TYPICAL RATES LBS/HR	APPROX TYPICAL RATES TONS/YEAR
Shredded Scrap		1,000,000		750,000

21c) BY-PRODUCT MATERIALS	MAXIMUM RATES LBS/HR	MAXIMUM RATES TONS/YEAR	TYPICAL RATES LBS/HR	TYPICAL RATES TONS/YEAR
NA				

FUEL USAGE DATA

22a) MAXIMUM FIRING RATE (MILLION BTU/HR):	b) TYPICAL FIRING RATE (MILLION BTU/HR):	c) DESIGN CAPACITY FIRING RATE (MILLION BTU/HR):
None		

d) FUEL TYPE:

☐ NATURAL GAS ☐ FUEL OIL: GRADE NUMBER ______ ☐ COAL ☐ OTHER

IF MORE THAN ONE FUEL IS USED, ATTACH AN EXPLANATION AND LABEL AS EXHIBIT 220-2.

e) TYPICAL HEAT CONTENT OF FUEL (BTU/LB, BTU/GAL OR BTU/SCF):	f) TYPICAL SULFUR CONTENT (WT %., NA FOR NATURAL GAS):
g) TYPICAL ASH CONTENT (WT %., NA FOR NATURAL GAS):	h) ANNUAL FUEL USAGE (SPECIFY UNITS, E.G., SCF/YEAR, GAL/YEAR, TON/YEAR):

23) ARE COMBUSTION EMISSIONS DUCTED TO THE SAME STACK OR CONTROL AS PROCESS UNIT EMISSIONS? ☐ YES ☐ NO

IF NO, IDENTIFY THE EXHAUST POINT FOR COMBUSTION EMISSIONS:

APPLICABLE RULES

24) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.204(j)(4), 3.5 LBS/GAL):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

25) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)		REQUIREMENT(S)

See 260 CAAPP for Shredder Emissions Control System and Section 4 of the application.

26) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

27) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R 001254

29) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 220-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

30) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

31) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Operate shredder in accordance with manufacturer's recommendations

See CAAPP 260 for Shredder Emissions Control System

32) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Operating shredder emissions control system as described in 260 CAAPP

TESTING, MONITORING, RECORDKEEPING AND REPORTING

33a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
Scrap Throughput	**Tons/month**	**Belt scale and database of purchasing, shipping and inventory**	**monthly**

33b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
Scrap throughput	Electronic database	Environmental Manager	Environmental Manager

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

34a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

Recording scrap throughput

b) WHAT PARAMETER(S) IS (ARE) BEING MONITORED (E.G., VOM EMISSIONS TO ATMOSPHERE)?

Scrap throughput

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR 3 FEET FROM EXIT):

Belt scale data is adjusted based on monthly records reflecting purchases, shipments, and change in inventory.

34d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☒ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☒ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

35) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 220-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
NA				

36) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
Annual Emissions	Annual Emissions Report	Annually
Emission Deviations	Emission Deviation Report	Within 30 days of event

(37)EMISSION INFORMATION

☐ [1]ACTUAL EMISSION RATE
☐ [1]UNCONTROLLED EMISSION RATE

See 260 CAAPP for Shredder Emissions Control System

REGULATED AIR POLLUTANT		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE: [5]RATE (UNITS)	ALLOWABLE BY RULE EMISSION RATE: APPLICABLE RULES	ALLOWABLE BY RULE EMISSION RATE: TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE: RATE (UNITS)	[2]PERMITTED EMISSION RATE: TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G, PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001258

(38) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION			☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE				ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

See 260 CAAPP for Shredder Emissions Control System

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.

[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.

[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).

[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).

[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001259

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

39) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

Exhaust through Shredder Emissions Control System

40) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

41) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

42) DISCHARGE HEIGHT ABOVE GRADE (FT):

43) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

44) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

45) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
46) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

47) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

48) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

NAME	FLOW DIAGRAM DESIGNATION
a)	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

49a) LATITUDE:	c) LONGITUDE:	
50) UTM ZONE:	b) UTM VERTICAL (KM):	d) UTM HORIZONTAL (KM):

FOR APPLICANT'S USE	
Revision No.:	
Date:	
Page:	of
Source Designation:	

ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

AIR POLLUTION CONTROL EQUIPMENT DATA AND INFORMATION

FOR AGENCY USE ONLY
ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

THIS FORM MUST BE COMPLETED FOR EACH AIR POLLUTION CONTROL EQUIPMENT. COMPLETE AND PROVIDE THIS FORM IN ADDITION TO THE APPLICABLE ADDENDUM FORM 260-A THROUGH 260-K. A SEPARATE FORM MUST BE COMPLETED FOR EACH MODE OF OPERATION OF AIR POLLUTION CONTROL EQUIPMENT FOR WHICH A PERMIT IS BEING SOUGHT.

SOURCE INFORMATION

1) SOURCE NAME: **General III, LLC**	
2) DATE FORM PREPARED: **September 2019**	3) SOURCE ID NO. (IF KNOWN):

GENERAL INFORMATION

4) NAME OF AIR POLLUTION CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:

Metal Shredder Emissions Control System consisting of a Cyclone, Roll-Media Filter, Regenerative Thermal Oxidizer (RTO) and Packed Tower Scrubber

5) FLOW DIAGRAM DESIGNATION OF CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:

Metal Shredder Emissions Control System

6) MANUFACTURER OF CONTROL EQUIPMENT (IF KNOWN):

**Pedcon, Inc. (Cyclone and Roll-Media Filter) and
Catalytic Products International, Inc. (RTO/Scrubber)**

7) MODEL NUMBER (IF KNOWN):	8) SERIAL NUMBER (IF KNOWN):
9) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EQUIPMENT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR): **Jan 2021**
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):

10) BRIEFLY DESCRIBE MODIFICATION (IF APPLICABLE):

NA

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

11) LIST ALL EMISSION UNITS AND OTHER CONTROL EQUIPMENT DUCTING EMISSIONS TO THIS CONTROL EQUIPMENT:

NAME	DESIGNATION OR CODE NUMBER
Metal Shredder	Metal Shredder

12) DOES THE CONTROL EQUIPMENT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE AIR POLLUTION CONTROL EQUIPMENT FORM 260-CAAPP MUST BE COMPLETED FOR EACH MODE):

13) IDENTIFY ALL ATTACHMENTS TO THIS FORM RELATED TO THIS AIR POLLUTION CONTROL EQUIPMENT(E.G., TECHNICAL DRAWINGS):

Forms 260B, 260C, and 260G.

OPERATING SCHEDULE

14) IDENTIFY ANY PERIOD WHEN THE CONTROL EQUIPMENT WILL NOT BE OPERATING DUE TO SCHEDULED MAINTENANCE AND/OR REPAIRS WHEN THE FEEDING EMISSION UNIT(S) TO THIS CONTROL EQUIPMENT IS/ARE IN OPERATION:

None

15a) IDENTIFY ANY PERIODS DURING OPERATION OF THE FEEDING EMISSION UNIT(S) WHEN THE CONTROL EQUIPMENT IS/ARE NOT USED:

None

b) IS THIS CONTROL EQUIPMENT IN OPERATION AT ALL OTHER TIMES THAT THE FEEDING EMISSION UNIT(S) IS/ARE IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN AND PROVIDE THE DURATION OF THE CONTROL EQUIPMENT DOWNTIME:

APPLICABLE RULES

16) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.207(b)(1), 81% OVERALL & 90% CONTROL DEVICE EFF.):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

17) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

See Section 4.0 of Application

18) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH AR

REGULATED AIR POLLUTANT(S)	REPORTIN	REQUIREMENT(S)

19) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

20) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R 001263

COMPLIANCE INFORMATION

21) IS THE CONTROL SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

22) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Roll-Media Filter

- **Initial compliance will be demonstrated by operating the roll-media filter in accordance with manufacturer's instructions.**

RTO

- **Initial compliance will be demonstrated by operating the RTO in accordance with manufacturer's instructions and maintaining the oxidizer at the manufacturer's recommended operating temperature.**

Scrubber

- **Initial compliance will be demonstrated by operating the scrubber in accordance with manufacturer's recommendations.**

23) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Roll-Media Filter

- **Maintaining differential pressure across the filter at a value that is greater than the parameter values determined during a successful emission test.**

RTO

- **Maintaining operating temperature and by operating and maintaining the RTO in accordance with parameter values determined during a successful emission test.**

Scrubber

- **Ongoing compliance will be demonstrated by operating the scrubber in accordance with parameter values determined during a successful emission test.**

TESTING, MONITORING, RECORDKEEPING AND REPORTING

24a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
Roll-Media Filter	**Inches WC**	**Differential Pressure Sensor**	**Continuous**
Combustion Chamber Temp	**°F**	**Thermocouple**	**Continuous**
Scrubber Differential Press.	**Inches WC**	**Differential Pressure Sensor**	**Continuous**
Scrubber liquid flow rate	**gpm**	**Liquid Flow meter**	**Continuous**
Scrubbant pH	**Unitless**	**pH probe**	**Continuous**

24b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
Roll-Media Filter	**Data logger**	**Environmental Manager**	**Environmental Manager**
Combustion Chamber Temp	**Data logger**	**Environmental Manager**	**Environmental Manager**
Scrubber Differential Press.	**Data logger**	**Environmental Manager**	**Environmental Manager**
Scrubber liquid flow rate	**Data logger**	**Environmental Manager**	**Environmental Manager**
Scrubbant pH	**Data logger**	**Environmental Manager**	**Environmental Manager**

c) IS COMPLIANCE OF THE CONTROL EQUIPMENT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

25a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

See Item 24a above

b) WHAT OPERATING PARAMETER(S) IS(ARE) BEING MONITORED (E.G., COMBUSTION CHAMBER TEMPERATURE)?

See Item 24a above.

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., EXIT OF COMBUSTION CHAMBER):

Roll-media filter differential pressure sensors will be located on the upstream and downstream side of the filter material.

RTO combustion chamber temperature thermocouple will be centrally located in the combustion chamber.

Scrubber differential pressure sensors will be located above demister and below the packing.

Scrubber liquid flow meter will be located on the scrubber water recirculation system downstream of the recirculation pump.

Scrubber pH monitor will be located in the scrubber sump near the inlet to the recirculation pump.

25d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☒ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

25e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☒ NO

IF NO, EXPLAIN:

All monitoring devices will be reviewed for accuracy in accordance with manufacturers recommendations for operation, maintenance, and calibration.

25f) IS EACH MONITOR OPERATED AT ALL TIMES THE CONTROL EQUIPMENT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

26) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY, OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-1:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
NA				

27) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
Annual Emissions	**Annual Emissions Report**	**Annually**
Emission Deviations	**Emission Deviation Report**	**Within 30 days of event**

CAPTURE AND CONTROL

28) DESCRIBE THE CAPTURE SYSTEM USED TO CONTAIN, COLLECT, AND TRANSPORT EMISSIONS TO THE CONTROL EQUIPMENT. INCLUDE ALL HOODS, DUCTS, FANS, ETC. ALSO INCLUDE THE METHOD OF CAPTURE USED AT EACH EMISSION POINT. (IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-2):

An emissions capture hood will be located above the shredder. An induced draft fan will draw air through a closed duct to the emissions control system.

29) ARE FEATURES OF THE CAPTURE SYSTEM ACCURATELY DEPICTED IN THE FLOW DIAGRAM CONTAINED IN THIS APPLICATION? ☒ YES ☐ NO

IF NO, A SKETCH SHOWING THE FEATURES OF THE CAPTURE SYSTEM SHOULD BE ATTACHED AND LABELED AS EXHIBIT 260-3:

30) PROVIDE THE ACTUAL (MINIMUM AND TYPICAL) CAPTURE SYSTEM EFFICIENCY, CONTROL EQUIPMENT DESTRUCTION/REMOVAL EFFICIENCY, AND THE OVERALL REDUCTION EFFICIENCY PROVIDED BY THE COMBINATION OF THE CAPTURE SYSTEM AND CONTROL EQUIPMENT FOR EACH REGULATED AIR POLLUTANT TO BE CONTROLLED. ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH THESE EFFICIENCIES WERE BASED AND LABEL AS EXHIBIT 260-4:

a) CONTROL PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%) (MIN)	(TYP)	CONTROL EQUIPMENT EFFICIENCY (%) (MIN)	(TYP)	OVERALL REDUCTION EFFICIENCY (%) (MIN)	(TYP)
i.	VOM (controlled by RTO)	> 95	> 95	98	98	93	93
ii.	Acid Gases (controlled by scrubber)	100	100	>99	> 99	> 99	> 99
iii.							

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

None

b) METHOD USED TO DETERMINE EACH OF THE ABOVE EFFICIENCIES (E.G., STACK TEST, MATERIAL BALANCE, MANUFACTURER'S GUARANTEE, ETC.) AND THE DATE LAST TESTED, IF APPLICABLE:

	EFFICIENCY DETERMINATION METHOD	DATE LAST TESTED
CAPTURE:	VOM engineering estimates / observations Acid Gases – closed ducting from RTO to scrubber	NA
CONTROL:	VOM/HAP – RTO manufacturer's guarantee Acid Gases – Scrubber manufacturer's guarantee	NA
OVERALL:	capture % multiplied by control %	NA

c) REQUIRED PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)	CONTROL EQUIPMENT EFFICIENCY (%)	OVERALL REDUCTION EFFICIENCY (%)	APPLICABLE RULE
i.	VOM			85%	35 IAC 218.301
ii.	Acid Gases				None
iii.					

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

None

(31)EMISSION INFORMATION

See Tables 3-1A through 3-1E in Section 3 of this application.

REGULATED AIR POLLUTANT		[1] ACTUAL EMISSION RATE: LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3] OTHER TERMS	[3] OTHER TERMS	[4] DM	ALLOWABLE BY RULE EMISSION RATE: [5] RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	[2] PERMITTED EMISSION RATE: RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-5.

1 PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
2 PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
3 PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
4 DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
5 RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001268

(32) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		¹ACTUAL EMISSION RATE					ALLOWABLE BY RULE	
NAME OF HAP EMITTED	²CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	³OTHER TERMS	⁴DM	⁵RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

See Tables 3-1A through 3-1E in Section 3 of this application.

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-6.

1 PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
2 CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
3 PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
4 DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
5 RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001269

EXHAUST POINT INFORMATION

33) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

Shredder emissions control system will be vented to the atmosphere through an unobstructed circular vertical stack located on top of the scrubber vessel.

34) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

Approximately 690 ft

35) DISCHARGE HEIGHT ABOVE GRADE (FT):

Approximately 41 ft

36) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

37) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

Approximately 6 ft

38) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM): **80,000**	b) TYPICAL (ACFM): **70,000**
39) EXIT GAS TEMPERATURE	a) MAXIMUM (°F): **140**	b) TYPICAL (°F): **120**

40) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

Vertical

41) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)	**Metal shredder**	**Metal shredder**
b)	**Cyclone**	**Cyclone**
c)	**Roll-Media Filter**	**o**
d)	**Regenerative Thermal Oxidizer**	**RTO**
e)	**Scrubber**	**Scrubber**
f)		
g)		

42) WHAT PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS ARE BEING DUCTED TO THIS EXHAUST POINT (%)?

100%

43) IF THE PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS BEING DUCTED TO THE EXHAUST POINT IS NOT 100%, THEN EXPLAIN WHERE THE REMAINING EMISSIONS ARE BEING EXHAUSTED TO:

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

44a) LATITUDE: **Approx 41° 41’ 04” N**	b) LONGITUDE: **Approx 87° 32’ 58” W**

45) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

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AGENCY DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE	
Revision No.:	
Date:	
Page: of	
Source Designation:	

	FOR AGENCY USE ONLY
SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT AFTERBURNER (260B)	ID NUMBER:
	CONTROL EQUIPMENT#:
	DATE:

DATA AND INFORMATION

1) FLOW DIAGRAM DESIGNATION OF AFTERBURNER:
Metal Shredder RTO

2) FUEL USED IN BURNERS: ☒ NATURAL GAS ☐ FUEL OIL; NUMBER: ______
☐ OTHER, SPECIFY: ______

3) BURNERS PER AFTERBURNER **1** AT **15.0** (MILLION BTU/HR, EACH)

4) MINIMUM COMBUSTION CHAMBER TEMPERATURE (DEGREES FAHRENHEIT):
1,400° F

5) IS A CATALYST USED?: ☐ YES ☒ NO
IF YES, CATALYST MATERIAL:

6) EXPECTED FREQUENCY OF CATALYST REPLACEMENT:
NA

7) DATE CATALYST WAS LAST REPLACED (MONTH/YEAR):
NA

8) EXPLAIN DEGRADATION OR PERFORMANCE INDICATOR CRITERIA DETERMINING CATALYST REPLACEMENT:
NA

9a) IS A HEAT EXCHANGER USED?: IF YES, DESCRIBE: ☒ YES ☐ NO
RTO uses ceramic media to capture heat from afterburner exhaust to preheat the incoming gas stream.

b) HEAT EXCHANGER SURFACE AREA (FT^2):

c) AVERAGE THERMAL EFFICIENCY (%):
95%

10) DESCRIBE METHOD OF GAS MIXING USED:
Inherent to design of RTO (change of direction of gas flow, combustion air injection, and turbulence from natural gas burner in afterburner section).

11) RANGE OF RETENTION TIME: **1/2** TO **1** SEC

12) COMBUSTION CHAMBER LENGTH (FEET):

FOR APPLICANT'S USE ______

APPLICATION PAGE ______

13) COMBUSTION CHAMBER CROSS SECTIONAL AREA (SQUARE FEET):

14) INLET EMISSION STREAM PARAMETERS:

	MAX	TYPICAL
PRESSURE (mmHG):	Varies	Varies
HEAT CONTENT (BTU/SCF):	NA	NA
OXYGEN CONTENT (%):	Ambient	Ambient
MOISTURE CONTENT (%):	Approx 4%	Approx 5%

ARE HALOGENATED ORGANICS PRESENT? ☒ YES ☐ NO

ARE PARTICULATES PRESENT? ☒ YES ☐ NO

ARE METALS PRESENT? ☒ YES ☐ NO

15) AFTERBURNER OPERATING PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
COMBUSTION CHAMBER TEMPERATURE (DEGREES FAHRENHEIT):	1,500° F	> 1,400° F
INLET GAS TEMPERATURE (DEGREES FAHRENHEIT):	Ambient	Ambient
INLET FLOW RATE (SCFM):	Approx. 70,000	Approx. 60,000
EFFICIENCY (VOM REDUCTION):	98 %	98 %
EFFICIENCY (OTHER; SPECIFY CONTAMINANT: Organic HAPs CO):	98 % > 95 %	98 % > 95 %

16) FOR THERMAL AFTERBURNERS, IS THE COMBUSTION CHAMBER TEMPERATURE CONTINUOUSLY MONITORED AND RECORDED? ☒ YES ☐ NO

17) FOR CATALYTIC AFTERBURNERS, IS THE TEMPERATURE RISE ACROSS THE CATALYST BED CONTINUOUSLY MONITORED AND RECORDED? ☐ YES ☐ NO

NA

18) IS THE VOM CONCENTRATION OF EXHAUST MONITORED AND RECORDED? ☐ YES ☒ NO

19) IS THE OPERATION OF THE AFTERBURNER DISCONTINUED DURING THE NON-OZONE SEASON (SEPTEMBER 1 TO MAY 31)? ☐ YES ☒ NO

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FOR APPLICANT'S USE

Revision No.: ______
Date: ______
Page: ______ of ______
Source Designation: ______

SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT FILTER (260C)

FOR AGENCY USE ONLY

ID NUMBER:

CONTROL EQUIPMENT #:

DATE:

DATA AND INFORMATION

1) FLOW DIAGRAM DESIGNATION OF FILTER:

Roll-Media Filter

2) FILTER CONFIGURATION (CHECK ONE): ☐ OPEN PRESSURE ☒ CLOSED PRESSURE ☐ CLOSED SUCTION ☐ OTHER, SPECIFY: ______

3) DESCRIBE FILTER MATERIAL:

Polyester felt

4) FILTERING AREA (SQUARE FEET): 108 sq feet

5) AIR TO CLOTH RATIO (FEET/MIN):

6) CLEANING METHOD ☐ SHAKER ☐ REVERSE AIR ☐ PULSE AIR ☐ PULSE JET ☒ OTHER, SPECIFY: Roll-Media Filter – filter is continuously replaced

7) NORMAL RANGE OF PRESSURE DROP: 20 TO 35 (INCH H_2O)

8a) INLET EMISSION STREAM PARAMETERS:

	MAX	TYPICAL
MOISTURE CONTENT (% BY VOLUME):	saturated	saturated
PARTICULATE INLET LOADING (GRAINS/SCF):	varies	varies

b) MEAN PARTICLE DIAMETER (MICRONS): varies

FOR APPLICANT'S USE

APPLICATION PAGE ______

9) FILTER OPERATING PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
INLET FLOW RATE (SCFM):	**Approx. 70,000**	**Approx. 60,000**
INLET GAS TEMPERATURE (DEGREES FAHRENHEIT):	**Ambient**	**Ambient**
EFFICIENCY (PM REDUCTION):	**>99**	**>95**
EFFICIENCY (PM10 REDUCTION):	**>99**	**>95**

10) HOW IS FILTER MONITORED FOR INDICATIONS OF DETERIORATION (E.G., BROKEN BAGS)?

- ☐ CONTINUOUS OPACITY
- ☒ PRESSURE DROP
- ☐ ALARMS-AUDIBLE TO PROCESS OPERATOR
- ☐ VISUAL OPACITY READINGS, FREQUENCY: ______
- ☐ OTHER, SPECIFY: ______

11) DESCRIBE ANY RECORDING DEVICE AND FREQUENCY OF LOG ENTRIES:

Differential pressure across the filter is monitored continuously and recorded at least once every 15 minutes.

12) DESCRIBE ANY FILTER SEEDING BEING PERFORMED:

None

ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision No.:
Date:
Page: ______ of ______
Source Designation:

SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT PACKED TOWER SCRUBBER (260G)	FOR AGENCY USE ONLY
	ID NUMBER:
	CONTROL EQUIPMENT #:
	DATE:

NOTE: FOR PACKED COLUMN SCRUBBERS, FORM 260g SHOULD BE COMPLETED RATHER THAN FORM 260H.

DATA AND INFORMATION

2) FLOW DIAGRAM DESIGNATION OF FILTER:

Metal Shredder Quench/Scrubber

3) SCRUBBANT (LIQUID):

Water with NaOH addition controlled by pH analyzer

4) IS SCRUBBANT RECYCLED BACK INTO CONTROL SYSTEM? ☒ YES ☐ NO

IF YES, DESCRIBE METHOD BY WHICH SCRUBBANT SATURATION IS AVOIDED AND THE DESIRED CONTROL EFFICIENCY IS MAINTAINED?

Scrubber blow down controlled based on monitored parameters.

5) TYPE OF PACKING USED:

Polypropylene

APPLICATION PAGE ______

FOR APPLICANT'S USE

6) PACKING VOLUME (FT^3):	7) COLUMN DIAMETER (FEET): **Approximately 14 ft**
8) COLUMN HEIGHT – PACKED (FEET): **Approximately 6 to 8 ft**	9) COLUMN WEIGHT (LB):
10) PRESSURE DROP (INCHES H_2O): **Approximately 10 to 14**	11) SLOPE OF EQUILIBRIUM CURVE (LB PER MOLE LIQUID / LB PER MOLE GAS):

12) INLET EMISSIONS STREAM PARAMETERS:

	MAXIMUM	TYPICAL
PRESSURE (mmHg):	**varies**	**varies**
MOISTURE CONTENT (%):	**saturated**	**saturated**
RELATIVE HUMIDITY:	**100%**	**100%**

13) SCRUBBER OPERATING PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
INLET GAS TEMPERATURE (DEGREES °F): **(approx)**	**300**	**175**
INLET GAS FLOW RATE (SCFM): **(approx)**	**80,000**	**70,000**
SCRUBBANT RATE (GAL/MIN): **(approx)**	**1,000**	**800**
INLET LIQUID FLOW RATE (GAL/MIN): **(approx)**	**varies**	**varies**
OUTLET LIQUID FLOW RATE (GAL/MIN): **(approx)**	**varies**	**varies**
EFFICIENCY (PM REDUCTION) (%):	**NA**	**NA**
EFFICIENCY (OTHER; SPECIFY REGULATED AIR POLLUTANT): **HAPs (HCl – HF)**	**99%**	**99%**

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DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
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FOR APPLICANT'S USE	
Revision No.:	
Date:	
Page: of	
Source Designation:	

PROCESS EMISSION UNIT DATA AND INFORMATION	FOR AGENCY USE ONLY
	ID NUMBER:
	EMISSION POINT #:
	DATE:

SOURCE INFORMATION	
1) SOURCE NAME: **General III, LLC**	
2) DATE FORM PREPARED **September 2019**	3) SOURCE ID NO. (IF KNOWN):

GENERAL INFORMATION	
4) NAME OF EMISSION UNIT: **Ferrous Material Processing System**	
5) NAME OF PROCESS: **Ferrous Material Processing System**	
6) DESCRIPTION OF PROCESS: **Separation of ferrous scrap metal from shredded material includes conveyors, magnetic separators, Z-Box separators, and stockpiling.**	
7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED: **Scrap metal is shredded to a size suitable for processing for recovery of ferrous metals**	
8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT: **Ferrous Material Processing System**	
9) MANUFACTURER OF EMISSION UNIT (IF KNOWN): **To Be Determined (TBD)**	
10) MODEL NUMBER (IF KNOWN): **TBD**	11) SERIAL NUMBER (IF KNOWN): **TBD**
12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR): **June 2020**
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):
13) DESCRIPTION OF MODIFICATION (IF APPLICABLE):	

14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 220-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

None

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

Scheduled maintenance and malfunctions when equipment must be taken offline.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 220-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: **14**	DAYS/WEEK: **6**	WEEKS/YEAR: **52**
b) TYPICAL OPERATING HOURS	HOURS/DAY: **10**	DAYS/WEEK: **6**	WEEKS/YEAR: **52**

20) ANNUAL THROUGHPUT	DEC-FEB(%): **22**	MAR-MAY(%): **26**	JUN-AUG(%): **26**	SEP-NOV(%): **26**

MATERIAL USAGE INFORMATION

	APPROX MAXIMUM RATES		APPROX TYPICAL RATES	
21a) RAW MATERIALS	LBS/HR	TONS/YEAR	LBS/HR	TONS/YEAR
Shredded Scrap Metal		**1,000,000**		**750,000**

21b) PRODUCTS	APPROX MAXIMUM RATES LBS/HR	APPROX MAXIMUM RATES TONS/YEAR	APPROX TYPICAL RATES LBS/HR	APPROX TYPICAL RATES TONS/YEAR
Ferrous Metal		734,000		550,000
Auto Shredder Residue (ASR)		258,000		195,000

21c) BY-PRODUCT MATERIALS	APPROX MAXIMUM RATES LBS/HR	APPROX MAXIMUM RATES TONS/YEAR	APPROX TYPICAL RATES LBS/HR	APPROX TYPICAL RATES TONS/YEAR
Fluff		8,000		3,400

FUEL USAGE DATA

22a) MAXIMUM FIRING RATE (MILLION BTU/HR): None	b) TYPICAL FIRING RATE (MILLION BTU/HR):	c) DESIGN CAPACITY FIRING RATE (MILLION BTU/HR):

d) FUEL TYPE:

☐ NATURAL GAS ☐ FUEL OIL: GRADE NUMBER ______ ☐ COAL ☐ OTHER

IF MORE THAN ONE FUEL IS USED, ATTACH AN EXPLANATION AND LABEL AS EXHIBIT 220-2.

e) TYPICAL HEAT CONTENT OF FUEL (BTU/LB, BTU/GAL OR BTU/SCF):	f) TYPICAL SULFUR CONTENT (WT %., NA FOR NATURAL GAS):
g) TYPICAL ASH CONTENT (WT %., NA FOR NATURAL GAS):	h) ANNUAL FUEL USAGE (SPECIFY UNITS, E.G., SCF/YEAR, GAL/YEAR, TON/YEAR):

23) ARE COMBUSTION EMISSIONS DUCTED TO THE SAME STACK OR CONTROL AS PROCESS UNIT EMISSIONS? ☐ YES ☐ NO

IF NO, IDENTIFY THE EXHAUST POINT FOR COMBUSTION EMISSIONS:

APPLICABLE RULES

24) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.204(j)(4), 3.5 LBS/GAL):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

25) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

See Section 4 of Permit Application

26) PROVIDE ANY SPECIFIC REPORTING RULE(S) WH

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

27) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R 001280

29) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 220-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

30) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

31) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Visual observations and emission calculations

32) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Visual observations and emission calculations

TESTING, MONITORING, RECORDKEEPING AND REPORTING

33a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
Emissions	ton/mo & tons/yr	Calculations	Monthly
Shredder Throughput Rate	ton/mo & tons/yr	Calculations	Monthly

33b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
Emissions	Spreadsheet	Environmental Manager	Environmental Manager
Shredder Feed Rate	Production Logs	Environmental Manager	Environmental Manager

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

34a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

Visual observations and emission calculations

b) WHAT PARAMETER(S) IS (ARE) BEING MONITORED (E.G., VOM EMISSIONS TO ATMOSPHERE)?

Shredder throughput

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR 3 FEET FROM EXIT):

Belt scale data is adjusted based on monthly records reflecting purchases, shipments, and change in inventory.

34d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

NA

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

NA

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

NA

35) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 220-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
NA				

36) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
Annual Emissions	Annual Emissions Report	Annually
Emission Deviations	Emissions Deviation Report	Within 30 days of event

(37)EMISSION INFORMATION

☐ [1]ACTUAL EMISSION RATE
☐ [1]UNCONTROLLED EMISSION RATE

REGULATED AIR POLLUTANT		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE: [5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE: RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

See Permit Application – Table 3-2

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001284

(38) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE					ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

See Permit Application – Table 3-8

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.

[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.

[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).

[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).

[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001285

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

39) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

NA - equipment does not vent through a stack

40) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

41) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

42) DISCHARGE HEIGHT ABOVE GRADE (FT):

43) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

44) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

45) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
46) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

47) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

48) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

NAME	FLOW DIAGRAM DESIGNATION
a)	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

49a) LATITUDE:	c) LONGITUDE:	
50) UTM ZONE:	b) UTM VERTICAL (KM):	d) UTM HORIZONTAL (KM):

APPLICATION PAGE _______

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision No.:
Date:
Page: ____ of ____
Source Designation:

PROCESS EMISSION UNIT DATA AND INFORMATION	*FOR AGENCY USE ONLY*
	ID NUMBER:
	EMISSION POINT #:
	DATE:

SOURCE INFORMATION	
1) SOURCE NAME: **General III, LLC**	
2) DATE FORM PREPARED **September 2019**	3) SOURCE ID NO. (IF KNOWN):

GENERAL INFORMATION	
4) NAME OF EMISSION UNIT: **Non-Ferrous Material Processing System**	
5) NAME OF PROCESS: **Non-Ferrous Material Processing System**	
6) DESCRIPTION OF PROCESS: **Separation and recovery of non-ferrous metals from ASR including feed hoppers, conveyors, magnetic separators, screens, shakers, eddy current separators, wind sifters, induction separators, polishers, and stockpiles. Select equipment and conveyors are located inside of a building and are connected to dust collectors, 3 of which vent back into the building and one that vents to atmosphere.**	
7) DESCRIPTION OF ITEM OR MATERIAL PRODUCED OR ACTIVITY ACCOMPLISHED: **Ferrous and non-ferrous metals, including aluminum, stainless steel, zinc, copper, etc.**	
8) FLOW DIAGRAM DESIGNATION OF EMISSION UNIT: **Non-Ferrous Material Processing System**	
9) MANUFACTURER OF EMISSION UNIT (IF KNOWN): **Multiple equipment manufacturers**	
10) MODEL NUMBER (IF KNOWN):	11) SERIAL NUMBER (IF KNOWN):
12) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EMISSION UNIT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR): **June 2020**
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):
13) DESCRIPTION OF MODIFICATION (IF APPLICABLE):	

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14) DOES THE EMISSION UNIT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE PROCESS EMISSION UNIT FORM 220-CAAPP MUST BE COMPLETED FOR EACH MODE):

15) PROVIDE THE NAME AND DESIGNATION OF ALL AIR POLLUTION CONTROL EQUIPMENT CONTROLLING THIS EMISSION UNIT, IF APPLICABLE (FORM 260-CAAPP AND THE APPROPRIATE 260-CAAPP ADDENDUM FORM MUST BE COMPLETED FOR EACH ITEM OF AIR POLLUTION CONTROL EQUIPMENT):

There are four identical dust collectors that remove particulate matter from emission collection points connected to various equipment in the Fines Processing Building. Three dust collectors (DC-02 through DC-04) vent treated air back into the building and are therefore, not control devices. Only DC-01 vents to atmosphere (see 260 CAAPP – DC-01).

16) WILL EMISSIONS DURING STARTUP EXCEED EITHER THE ALLOWABLE EMISSION RATE PURSUANT TO A SPECIFIC RULE, OR THE ALLOWABLE EMISSION LIMIT AS ESTABLISHED BY AN EXISTING OR PROPOSED PERMIT CONDITION? ☐ YES ☒ NO

IF YES, COMPLETE AND ATTACH FORM 203-CAAPP, "REQUEST TO OPERATE WITH EXCESS EMISSIONS DURING STARTUP OF EQUIPMENT".

17) PROVIDE ANY LIMITATIONS ON SOURCE OPERATION AFFECTING EMISSIONS OR ANY WORK PRACTICE STANDARDS (E.G., ONLY ONE UNIT IS OPERATED AT A TIME):

Scheduled maintenance and malfunctions when equipment must be taken offline.

OPERATING INFORMATION

18) ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSION RELATED, FROM WHICH THE FOLLOWING OPERATING INFORMATION, MATERIAL USAGE INFORMATION AND FUEL USAGE DATA WERE BASED AND LABEL AS EXHIBIT 220-1. REFER TO SPECIAL NOTES OF FORM 202-CAAPP.

19a) MAXIMUM OPERATING HOURS	HOURS/DAY: 18	DAYS/WEEK: 6	WEEKS/YEAR: 52	
b) TYPICAL OPERATING HOURS	HOURS/DAY: 12	DAYS/WEEK: 6	WEEKS/YEAR: 52	
20) ANNUAL THROUGHPUT	DEC-FEB(%): 22	MAR-MAY(%): 26	JUN-AUG(%): 26	SEP-NOV(%): 26

MATERIAL USAGE INFORMATION

21a) RAW MATERIALS	APPROX MAXIMUM RATES LBS/HR	APPROX MAXIMUM RATES TONS/YEAR	APPROX TYPICAL RATES LBS/HR	APPROX TYPICAL RATES TONS/YEAR
ASR		258,000		193,500

APPLICATION PAGE _______

21b) PRODUCTS	APPROX MAXIMUM RATES LBS/HR	APPROX MAXIMUM RATES TONS/YEAR	APPROX TYPICAL RATES LBS/HR	APPROX TYPICAL RATES TONS/YEAR
Ferrous and Non-Ferrous metals		57,500		43,100

21c) BY-PRODUCT MATERIALS	APPROX MAXIMUM RATES LBS/HR	APPROX MAXIMUM RATES TONS/YEAR	APPROX TYPICAL RATES LBS/HR	APPROX TYPICAL RATES TONS/YEAR
Waste Residue		200,500		105,400

FUEL USAGE DATA

22a) MAXIMUM FIRING RATE (MILLION BTU/HR):
None

b) TYPICAL FIRING RATE (MILLION BTU/HR):

c) DESIGN CAPACITY FIRING RATE (MILLION BTU/HR):

d) FUEL TYPE:

☐ NATURAL GAS ☐ FUEL OIL: GRADE NUMBER ______ ☐ COAL ☐ OTHER

IF MORE THAN ONE FUEL IS USED, ATTACH AN EXPLANATION AND LABEL AS EXHIBIT 220-2.

e) TYPICAL HEAT CONTENT OF FUEL (BTU/LB, BTU/GAL OR BTU/SCF):

f) TYPICAL SULFUR CONTENT (WT %., NA FOR NATURAL GAS):

g) TYPICAL ASH CONTENT (WT %., NA FOR NATURAL GAS):

h) ANNUAL FUEL USAGE (SPECIFY UNITS, E.G., SCF/YEAR, GAL/YEAR, TON/YEAR):

23) ARE COMBUSTION EMISSIONS DUCTED TO THE SAME STACK OR CONTROL AS PROCESS UNIT EMISSIONS? ☐ YES ☐ NO

IF NO, IDENTIFY THE EXHAUST POINT FOR COMBUSTION EMISSIONS:

APPLICABLE RULES

24) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.204(j)(4), 3.5 LBS/GAL):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

25) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)		REQUIREMENT(S)

See Section 4 of Permit Application

26) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

27) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

28) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R 001290

29) DOES THE EMISSION UNIT QUALIFY FOR AN EXEMPTION FROM AN OTHERWISE APPLICABLE RULE? ☐ YES ☒ NO

IF YES, THEN LIST BOTH THE RULE FROM WHICH IT IS EXEMPT AND THE RULE WHICH ALLOWS THE EXEMPTION. PROVIDE A DETAILED EXPLANATION JUSTIFYING THE EXEMPTION. INCLUDE DETAILED SUPPORTING DATA AND CALCULATIONS. ATTACH AND LABEL AS EXHIBIT 220-3, OR REFER TO OTHER ATTACHMENT(S) WHICH ADDRESS AND JUSTIFY THIS EXEMPTION.

COMPLIANCE INFORMATION

30) IS THE EMISSION UNIT IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

31) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

ASR throughput rate

Uncontrolled Emission Points - visual observations

Dust Collector DC-01 – See 260 CAAPP for DC-01

32) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

ASR throughput rate

Uncontrolled Emission Points - visual observations and emission calculations

Dust Collector DC-01 – See 260 CAAPP for DC-01

TESTING, MONITORING, RECORDKEEPING AND REPORTING

33a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
Emissions	**ton/mo & tons/yr**	**Calculation**	**Monthly**
ASR Feed Rate	**ton/mo & tons/yr**	**Calculation**	**Monthly**

33b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
Emissions	**Spreadsheet**	**Environmental Manager**	**Environmental Manager**
ASR Feed Rate	**Production Logs**	**Environmental Manager**	**Environmental Manager**

c) IS COMPLIANCE OF THE EMISSION UNIT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

34a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

ASR Throughput

Uncontrolled Emission Points – periodic visual observations

Dust Collector DC-01 – See 260 CAAPP for DC-01

b) WHAT PARAMETER(S) IS (ARE) BEING MONITORED (E.G., VOM EMISSIONS TO ATMOSPHERE)?

ASR Throughput

Uncontrolled Emission Points – ASR Feed Rate used to calculate emissions

Dust Collector DC-01 – See 260 CAAPP for DC-01

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., IN STACK MONITOR 3 FEET FROM EXIT):

ASR Throughput

Uncontrolled Emission Points – NA

Dust Collector DC-01 – See 260 CAAPP for DC-01

34d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

Uncontrolled Emission Points – NA

Dust Collector DC-01 – See 260 CAAPP for DC-01

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

Uncontrolled Emission Points – NA

Dust Collector DC-01 – See 260 CAAPP for DC-01

f) IS EACH MONITOR OPERATED AT ALL TIMES THE ASSOCIATED EMISSION UNIT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

Uncontrolled Emission Points – NA

Dust Collector DC-01 – See 260 CAAPP for DC-01

35) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 220-4:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
NA				

36) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
Annual Emissions	**Annual Emissions Report**	**Annually**
Emission Deviations	**Emissions Deviation Report**	**Within 30 days of event**

(37)EMISSION INFORMATION

☐ [1]ACTUAL EMISSION RATE
☐ [1]UNCONTROLLED EMISSION RATE

REGULATED AIR POLLUTANT		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE: [5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE: RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

See Permit Application - Table 3-3

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-5.

[1]CHECK UNCONTROLLED EMISSION RATE BOX IF CONTROL EQUIPMENT IS USED, OTHERWISE CHECK AND PROVIDE THE ACTUAL EMISSION RATE TO ATMOSPHERE, INCLUDING INDOORS. SEE INSTRUCTIONS.
[2]PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5]RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001294

(38) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		☐ [1]ACTUAL EMISSION RATE ☐ [1]UNCONTROLLED EMISSION RATE					ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

See Permit Application - Table 3-8

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 220-6.

[1]PROVIDE UNCONTROLLED EMISSIONS IF CONTROL EQUIPMENT IS USED. OTHERWISE, PROVIDE ACTUAL EMISSIONS TO THE ATMOSPHERE, INCLUDING INDOORS. CHECK BOX TO SPECIFY.

[2]CAS - CHEMICAL ABSTRACT SERVICE NUMBER.

[3]PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).

[4]DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).

[5]RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001295

EXHAUST POINT INFORMATION

THIS SECTION SHOULD NOT BE COMPLETED IF EMISSIONS ARE EXHAUSTED THROUGH AIR POLLUTION CONTROL EQUIPMENT.

39) FLOW DIAGRAM DESIGNATION OF EXHAUST POINT:

Uncontrolled Equipment – NA

Dust Collector DC-01 – see 260 CAAPP for DC-01

40) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

41) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

42) DISCHARGE HEIGHT ABOVE GRADE (FT):

43) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

44) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

45) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
46) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

47) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

48) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

NAME	FLOW DIAGRAM DESIGNATION
a)	
b)	
c)	
d)	
e)	
f)	
g)	
h)	
i)	

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

49a) LATITUDE:	c) LONGITUDE:	
50) UTM ZONE:	b) UTM VERTICAL (KM):	d) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE
Revision No.:
Date:
Page: of
Source Designation:

AIR POLLUTION CONTROL EQUIPMENT DATA AND INFORMATION	FOR AGENCY USE ONLY
	ID NUMBER:
	CONTROL EQUIPMENT #:
	DATE:

THIS FORM MUST BE COMPLETED FOR EACH AIR POLLUTION CONTROL EQUIPMENT. COMPLETE AND PROVIDE THIS FORM IN ADDITION TO THE APPLICABLE ADDENDUM FORM 260-A THROUGH 260-K. A SEPARATE FORM MUST BE COMPLETED FOR EACH MODE OF OPERATION OF AIR POLLUTION CONTROL EQUIPMENT FOR WHICH A PERMIT IS BEING SOUGHT.

SOURCE INFORMATION

1) SOURCE NAME: General III, LLC	
2) DATE FORM PREPARED: September 2019	3) SOURCE ID NO. (IF KNOWN):

GENERAL INFORMATION

4) NAME OF AIR POLLUTION CONTROL EQUIPMENT AND/OR CONTROL SYSTEM: Dust Collector – DC-01	
5) FLOW DIAGRAM DESIGNATION OF CONTROL EQUIPMENT AND/OR CONTROL SYSTEM: DC-01	
6) MANUFACTURER OF CONTROL EQUIPMENT (IF KNOWN): Camfil	
7) MODEL NUMBER (IF KNOWN): GS16	8) SERIAL NUMBER (IF KNOWN):
9) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EQUIPMENT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR): June 2020
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):
10) BRIEFLY DESCRIBE MODIFICATION (IF APPLICABLE): NA	

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

11) LIST ALL EMISSION UNITS AND OTHER CONTROL EQUIPMENT DUCTING EMISSIONS TO THIS CONTROL EQUIPMENT:

NAME	DESIGNATION OR CODE NUMBER
Non-Ferrous Induction Sorters	E-19, E-20, E-25, E-26, E-30, E-31, E37 & E-38

12) DOES THE CONTROL EQUIPMENT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE AIR POLLUTION CONTROL EQUIPMENT FORM 260-CAAPP MUST BE COMPLETED FOR EACH MODE):

13) IDENTIFY ALL ATTACHMENTS TO THIS FORM RELATED TO THIS AIR POLLUTION CONTROL EQUIPMENT(E.G., TECHNICAL DRAWINGS):

OPERATING SCHEDULE

14) IDENTIFY ANY PERIOD WHEN THE CONTROL EQUIPMENT WILL NOT BE OPERATING DUE TO SCHEDULED MAINTENANCE AND/OR REPAIRS WHEN THE FEEDING EMISSION UNIT(S) TO THIS CONTROL EQUIPMENT IS/ARE IN OPERATION:

None

15a) IDENTIFY ANY PERIODS DURING OPERATION OF THE FEEDING EMISSION UNIT(S) WHEN THE CONTROL EQUIPMENT IS/ARE NOT USED:

None

b) IS THIS CONTROL EQUIPMENT IN OPERATION AT ALL OTHER TIMES THAT THE FEEDING EMISSION UNIT(S) IS/ARE IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN AND PROVIDE THE DURATION OF THE CONTROL EQUIPMENT DOWNTIME:

APPLICABLE RULES

16) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.207(b)(1), 81% OVERALL & 90% CONTROL DEVICE EFF.):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

17) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

18) PROVIDE ANY SPECIFIC REPORTING RULE(S) WH

See Section 4 of the application.

REGULATED AIR POLLUTANT(S)	R	REQUIREMENT(S)

19) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

20) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

R 001299

COMPLIANCE INFORMATION

21) IS THE CONTROL SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

22) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

Operating equipment in accordance with manufacturer's recommendations.

23) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

Operating equipment in accordance with manufacturer's recommendations.

TESTING, MONITORING, RECORDKEEPING AND REPORTING

24a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY
Operating Hours	**Hours**	**Production Logs**	**Daily**
Differential Pressure	**Inches of WC**	**Differential Pressure Gauge**	**Daily**

24b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON
Operating Hours	Production Logs	Environmental Manager	Environmental Manager
Differential Pressure Gauge	Logs	Environmental Manager	Environmental Manager

c) IS COMPLIANCE OF THE CONTROL EQUIPMENT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☒ YES ☐ NO

IF NO, EXPLAIN:

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☒ YES ☐ NO

IF NO, EXPLAIN:

25a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

Differential pressure gauge installed to measure the pressure drop across the filter media.

b) WHAT OPERATING PARAMETER(S) IS(ARE) BEING MONITORED (E.G., COMBUSTION CHAMBER TEMPERATURE)?

Differential Pressure

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., EXIT OF COMBUSTION CHAMBER):

Monitor located on filter housing or adjacent structural support.

25d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☒ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☒ YES ☐ NO

IF NO, EXPLAIN:

f) IS EACH MONITOR OPERATED AT ALL TIMES THE CONTROL EQUIPMENT IS IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN:

26) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY, OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-1:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS
NA				

27) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
Annual Emissions	Annual Emissions Report	Annually
Emission Deviations	Emission Deviation Report	Within 30 days of event

CAPTURE AND CONTROL

28) DESCRIBE THE CAPTURE SYSTEM USED TO CONTAIN, COLLECT, AND TRANSPORT EMISSIONS TO THE CONTROL EQUIPMENT. INCLUDE ALL HOODS, DUCTS, FANS, ETC. ALSO INCLUDE THE METHOD OF CAPTURE USED AT EACH EMISSION POINT. (IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-2):

Dust Collector fan pulls air from emission unit pickup points through a system of ductwork to the dust collector.

29) ARE FEATURES OF THE CAPTURE SYSTEM ACCURATELY DEPICTED IN THE FLOW DIAGRAM CONTAINED IN THIS APPLICATION ☒ YES ☐ NO

IF NO, A SKETCH SHOWING THE FEATURES OF THE CAPTURE SYSTEM SHOULD BE ATTACHED AND LABELED AS EXHIBIT 260-3:

30) PROVIDE THE ACTUAL (MINIMUM AND TYPICAL) CAPTURE SYSTEM EFFICIENCY, CONTROL EQUIPMENT DESTRUCTION/REMOVAL EFFICIENCY, AND THE OVERALL REDUCTION EFFICIENCY PROVIDED BY THE COMBINATION OF THE CAPTURE SYSTEM AND CONTROL EQUIPMENT FOR EACH REGULATED AIR POLLUTANT TO BE CONTROLLED. ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH THESE EFFICIENCIES WERE BASED AND LABEL AS EXHIBIT 260-4:

a) CONTROL PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)		CONTROL EQUIPMENT EFFICIENCY (%)		OVERALL REDUCTION EFFICIENCY (%)	
		(MIN)	(TYP)	(MIN)	(TYP)	(MIN)	(TYP)
i.	Particulate	100	100	99.9	99.9	99.9	99.9
ii.							
iii.							

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

0.03 gr/dscf pursuant to 35 IAC 212.315.

b) METHOD USED TO DETERMINE EACH OF THE ABOVE EFFICIENCIES (E.G., STACK TEST, MATERIAL BALANCE, MANUFACTURER'S GUARANTEE, ETC.) AND THE DATE LAST TESTED, IF APPLICABLE:

	EFFICIENCY DETERMINATION METHOD	DATE LAST TESTED
CAPTURE:	Engineering estimate	NA
CONTROL:	Vendor's filter performance data	NA
OVERALL:	Engineering estimate	NA

c) REQUIRED PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)	CONTROL EQUIPMENT EFFICIENCY (%)	OVERALL REDUCTION EFFICIENCY (%)	APPLICABLE RULE
i.					
ii.					
iii.					

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

(31) EMISSION INFORMATION

REGULATED AIR POLLUTANT		[1]ACTUAL EMISSION RATE: LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	ALLOWABLE BY RULE EMISSION RATE: [5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	[2]PERMITTED EMISSION RATE: RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY:	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

See Application Table 3-3 Row 138

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-5.

1 PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
2 PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
3 PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
4 DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
5 RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001304

(32) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

See Application Table 3-8

HAP INFORMATION		[1]ACTUAL EMISSION RATE					ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-6.

1 PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
2 CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
3 PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
4 DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
5 RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

R 001305

EXHAUST POINT INFORMATION

33) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

Circular discharge stack, unobstructed, venting vertically

34) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

Approximately 875 feet

35) DISCHARGE HEIGHT ABOVE GRADE (FT):

Approximately 47 feet

36) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

37) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

Approximately 2 feet

38) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM): **12,000**	b) TYPICAL (ACFM): **12,000**
39) EXIT GAS TEMPERATURE	a) MAXIMUM (°F): **ambient**	b) TYPICAL (°F): **ambient**

40) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):

Vertical

41) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

	NAME	FLOW DIAGRAM DESIGNATION
a)	**Dust Collector**	**DC-01**
b)		
c)		
d)		
e)		
f)		
g)		

42) WHAT PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS ARE BEING DUCTED TO THIS EXHAUST POINT (%)?

100

43) IF THE PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS BEING DUCTED TO THE EXHAUST POINT IS NOT 100%, THEN EXPLAIN WHERE THE REMAINING EMISSIONS ARE BEING EXHAUSTED TO:

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

44a) LATITUDE: **Approximately 41° 41’ 02’ N**	b) LONGITUDE: **Approximately 87° 32’ 54’ N**

45) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY DIVISION OF AIR POLLUTION CONTROL-PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE

Revision No.: ____________
Date: ____________
Page: ______ of ______
Source Designation: ____________

SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT FILTER (260C)

FOR AGENCY USE ONLY

ID NUMBER:
CONTROL EQUIPMENT #:
DATE:

DATA AND INFORMATION

1) FLOW DIAGRAM DESIGNATION OF FILTER:
Dust Collector DC-01

2) FILTER CONFIGURATION (CHECK ONE): ☐ OPEN PRESSURE ☒ CLOSED PRESSURE ☐ CLOSED SUCTION ☐ OTHER, SPECIFY: ____________

3) DESCRIBE FILTER MATERIAL:
Laminated polyester

4) FILTERING AREA (SQUARE FEET): **5,200**

5) AIR TO CLOTH RATIO (FEET/MIN): **2.31:1**

6) CLEANING METHOD ☐ SHAKER ☐ REVERSE AIR ☒ PULSE AIR ☐ PULSE JET ☐ OTHER, SPECIFY: ____________

7) NORMAL RANGE OF PRESSURE DROP: TO (INCH H_2O)

8a) INLET EMISSION STREAM PARAMETERS:

	MAX	TYPICAL
MOISTURE CONTENT (% BY VOLUME):	ambient	ambient
PARTICULATE INLET LOADING (GRAINS/SCF):	varies	varies

b) MEAN PARTICLE DIAMETER (MICRONS): **varies**

FOR APPLICANT'S USE

APPLICATION PAGE ______

9) FILTER OPERATING PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
INLET FLOW RATE (SCFM):	12,000	12,000
INLET GAS TEMPERATURE (DEGREES FAHRENHEIT):	ambient	ambient
EFFICIENCY (PM REDUCTION):	>99.90	>99.90
EFFICIENCY (PM10 REDUCTION):	>99	>99

10) HOW IS FILTER MONITORED FOR INDICATIONS OF DETERIORATION (E.G., BROKEN BAGS)?

☐ CONTINUOUS OPACITY

☒ PRESSURE DROP

☐ ALARMS-AUDIBLE TO PROCESS OPERATOR

☐ VISUAL OPACITY READINGS, FREQUENCY: ____________

☐ OTHER, SPECIFY: ____________

11) DESCRIBE ANY RECORDING DEVICE AND FREQUENCY OF LOG ENTRIES:

Operating logs

12) DESCRIBE ANY FILTER SEEDING BEING PERFORMED:

None

RK
& Associates, Inc.

Construction Permit Application for New Scrap Metal Recycling Facility

General III, LLC
11600 South Burley
Chicago, Illinois 60614

September 20, 2019

APPENDIX B

ROLL MEDIA FILTER STACK TEST REPORT
GENERAL II, LLC – CHICAGO, ILLINOIS
(FORMERLY GENERAL IRON INDUSTRIES, INC.)
PERFORMED MAY/JUNE 2018

R 001310

RK
& Associates, Inc.

June 25, 2018

R17421-3

Compliance Tracker, AE-18J
Air Enforcement and Compliance Assurance Branch
US Environmental Protection Agency - Region 5
77 W Jackson Boulevard
Chicago, IL 60604

Copy on Electronic Media
Delivered to USEPA Region V
Chicago, Illinois

Shredder Emissions Test Report - Total Hydrocarbons, Particulate, and Metals
General Iron Industries, Inc. – 1909 N. Clifton Avenue – Chicago, Illinois 60614

To Whom This May Concern:

On behalf of General Iron Industries, Inc. (General Iron), please find attached the report of total hydrocarbon (THC), filterable particulate matter (PM) and metals emissions testing from the existing hammermill shredder located at General Iron Industries in Chicago, Illinois.

These tests were performed in response to requirements specified in the United States Environmental Protection Agency's (USEPA's) *Request to Provide Information Pursuant to the Clean Air Act* (information request) dated November 16, 2017, and in accordance with the USEPA approved test protocol dated May 23, 2018.

The attached test report was prepared to provide the required information identified in Appendix B, Item 7 of the above-referenced USEPA information request.

In addition to the testing required by the information request, General Iron voluntarily decided to surpass the USEPA testing requirements and perform an impact assessment for the metals emissions on the surrounding community. The results of this analysis show that metals emissions from the shredder are far below the identified health-based standards, as described in Section 5 of the attached report.

Based on the results of the required emissions testing and the additional metals impact evaluation, we can reasonably conclude that:

1. Actual THC emissions from the shredder over the past 5 years were less than 89 tons per year, which demonstrates that emissions from this shredder do not exceed the current VOC major source threshold of 100 tpy.
2. PM/PM_{10} rate of 1.9 lb/hour is well below the limits in the current IEPA Lifetime Operation Permit.
3. Evaluation of the metals, as described above, demonstrates that related off-site impacts are far below the health-based standards identified in Section 5.

2 South 631 Route 59; Suite B
Warrenville, IL 60555
(630) 393-9000
Fax (630) 393-9111

If you have any questions, or require any additional information please do not hesitate to contact Mr. Jim Kallas, Environmental Manager for General Iron 847-508-9170 (jim@general-iron.com) or me at 630-393-9000 (jpinion@rka-inc.com).

Yours very truly,
RK & Associates, Inc.

John G. Pinion
Principal Engineer

Shredder Emissions Test Report for Total Hydrocarbons, Particulate, and Metals

General Iron Industries, Inc. – Chicago, Illinois

IEPA Bureau of Air Site ID No.: 031600BTB

June 25, 2018

R17421-3

Prepared for:
General Iron Industries, Inc.
1909 N. Clifton, Avenue
Chicago, Illinois 60614

Submitted to:
Compliance Tracker, AE-18J
Air Enforcement and Compliance Assurance Branch
US Environmental Protection Agency - Region 5
77 W Jackson Boulevard
Chicago, IL 60604

RK & Associates, Inc.
2 South 631 Route 59
Suite B
Warrenville, Illinois 60555
Phone: 630-393-9000
Fax: 630-393-9111

RK
& ASSOCIATES, INC.

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Facility Location 2
1.2 Project Contact Information 2
1.3 Report Certification 3

2.0 SUMMARY OF RESULTS 6
2.1 THC Emissions 6
2.1.1 THC Test Results 6
2.1.2 Process and Control Equipment Data – THC Testing 9
2.1.3 Errors During Testing 11
2.1.4 Deviation of Reference Test Methods 11
2.1.5 Production Rates During Testing 11
2.2 PM/Metals Emissions 11
2.2.1 PM/Metals Test Results 11
2.2.2 Process and Control Equipment Data – PM/Metals THC Testing 15
2.2.3 Errors During Testing 17
2.2.4 Deviation of Reference Test Methods 17
2.2.5 Production Rates During Testing 18
2.2.6 Metals Audit Samples 18

3.0 FACILITY OPERATIONS 19
3.1 Hammermill Shredder and Operating Parameters 19
3.2 Cyclone and Roll Filter PM Control System 20
3.3 Shredder Throughput 20

4.0 SAMPLING AND ANALYTICAL PROCEDURES 22
4.1 THC Emission Testing 22
4.2 PM and Metals Emissions Testing 22
4.3 Appendices (detailed testing information) 22

5.0 HEALTH EFFECTS SCREENING FOR METALS 23
5.1 Air Dispersion Modeling 23
5.2 Comparison with WDNR's NR 445 Standards for Metals 24
5.2.1 Non-Carcinogenic Metals 24
5.2.2 Carcinogens Metals 25
5.3 Comparison of Predicted Off-Site Metals Impacts with NR 445 25
5.4 Conclusions 25

FIGURES

Figure 1	Site Location Map	4
Figure 2	Site Layout Diagram	5
Figure 3	Shredder Flow Diagram	22

TABLES

Table 2-1	Summary of Shredder THC Emission Testing – May 25, 2018	6
Table 2-2	Measured Response Factors for VOC Exempt Compounds	8
Table 2-3	Summary of Shredder Feed Rates for THC Emission Testing	9
Table 2-4	Shredder Water Injection Rates for THC Emission Testing	10
Table 2-5	Shredder Motor Amperage for THC Emission Testing	10
Table 2-6	Summary of Shredder PM/Metals Emissions Testing – June 13 & 14	12
Table 2-7	Summary of Shredder Feed Rates for PM/Metals Emissions Testing	13
Table 2-8	Summary of PM/Metal Emission Factors	14
Table 2-9	Shredder Water Injection Rates for PM/Metals Emissions Testing	15
Table 2-10	Shredder Motor Amperage for PM/Metals Emissions Testing	15
Table 5-1	Comparison to NR 445 for Metals for Both Carcinogens and Non-Carcinogens	26

APPENDICES

Appendix A Report of VOC Emission Testing on the Shredder Exhaust at the General Iron Facility Located in Chicago, Illinois Prepared by Stack Test Group, Inc.

Appendix B Test Report Particulate Matter and Total Select Metals Hammermill Shredder General Iron Industries, Inc. – Chicago, Illinois, prepared by Montrose Air Quality Services and Dated June 21, 2018

1.0 INTRODUCTION

General Iron Industries, Inc. (General Iron) is an existing scrap metal recycling facility located at 1909 N. Clifton Avenue, Chicago, Illinois (see Figure 1). General Iron receives and shreds mixed recyclable metal in various forms to produce uniform grades of ferrous and non-ferrous metals. Existing scrap handling and processing activities include receiving, sorting, shredding, metal separation and recovery of ferrous and nonferrous metals.

General Iron currently operates under an Illinois Environmental Protection Agency (IEPA) Lifetime Operating Permit (Application No. 81050001; Site ID No. 031600BTB) most recently revised and reissued on September 1, 2004.

General Iron received a *Request to Provide Information Pursuant to the Clean Air Act* (Information Request) from the United States Environmental Protection Agency (USEPA) requiring that General Iron conduct emissions testing to quantify emissions for total hydrocarbons, methane, ethane, particulate matter (PM), and metals from its hammermill shredder.

Specifically, in Appendix B, Item 1 of the information request, USEPA is requiring General Iron to...

...perform emission testing at the facility to determine:

- *a. The total gaseous organic compound emission rate as volatile organic compounds (VOC) of the hammermill shredder using EPA Reference Methods 1 – 4 and Method 25A. Methane and ethane concentrations shall be determined using Method 18 and subtracted from the total hydrocarbon concentration measured following Method 25A to determine VOC concentrations;*
- *b. Particulate Matter emission rate using EPA Reference Methods 1 – 4 and Method 5; and,*
- *c. Metal emission rates of the hammermill shredder using EPA Methods 1 – 4 and Method 29.*

A revised protocol, dated May 23, 2018, was submitted to USEPA and approved. Testing for total hydrocarbon (THC) was performed by Stack Test Group on May 25, 2018, in accordance with the approved protocol. Testing for PM and Metals was performed by Montrose Environmental Services on June 13 and 14, 2018, in accordance with the approved protocol.

In addition to the testing required by the information request, General Iron voluntarily decided to surpass the USEPA testing requirements and perform an impact assessment for the metals emissions on the surrounding community. The results of this analysis show that metals emissions from the shredder are far below the identified health-based standards, as described in Section 5 of the attached report.

Based on the results of the required emissions testing and the additional metals impact evaluation, we can reasonably conclude that:

1. Actual THC emissions from the shredder over the past 5 years were less than 89 tons per year, which demonstrates that emissions from this shredder do not exceed the current VOC major source threshold of 100 tpy.
2. PM/PM_{10} rate of 1.9 lb/hour is well below the limits in the current IEPA Lifetime Operation Permit.
3. Evaluation of the metals, as described above, demonstrates that related off-site impacts are far below the health-based standards identified in Section 5.

The testing was witnessed by Mr. Scott Connolly, Environmental Engineer, from USEPA Region V and at USEPA's request, by Mr. Kevin Mattison, a stack testing specialist from Illinois Environmental Protection Agency (IEPA).

The Information Request requires that a complete report of emissions be submitted within 30 days of completion of the tests. This test report fulfills this requirement.

1.1 Facility Location

General Iron is located at 1909 N Clifton Avenue in Chicago (Cook County) Illinois as shown in Figure 1. A Facility Layout map is presented in Figure 2. Facility contact information is provided in Section 1.2.

1.2 Project Contact Information

Business Name:	General Iron Industries, Inc.
Source Location:	1909 N. Clifton Avenue – Chicago, Illinois 60614 Cook County Illinois
Latitude/Longitude	41.915823° N / -87.658231" W – Intersection of N Clifton Ave. and N Kingsbury Street - Front Gate
Office/Mailing Address:	1909 N. Clifton Avenue – Chicago, Illinois 60614
General Iron Contact:	Mr. Jim Kallas - Environmental Manager 847-508-9170 – jim@general-iron.com
IEPA Site ID No.:	031600BTB
SIC Code:	5093 – Scrap and Waste Materials
NAICS Code:	423930 – Recyclable Material Merchant Wholesalers
THC Emission Testing Contractor	Stack Test Group 1500 Boyce Memorial Drive - Ottawa, Illinois 61350 815-433-0545
PM/Metals Emissions Testing Contractor	Montrose Air Quality Services, LLC 1370 Brummel Avenue Elk Grove Village, Illinois 60007 630-860-4740
RKA Contact for Emission Testing	John Pinion - Principal Engineer 2S631 Route 59, Suite B - Warrenville, Illinois 60555 630-393-9000 jpinion@rka-inc.com

1.3 Report Certification

The Certification Statement required by the Information Request for all submittals is provided below.

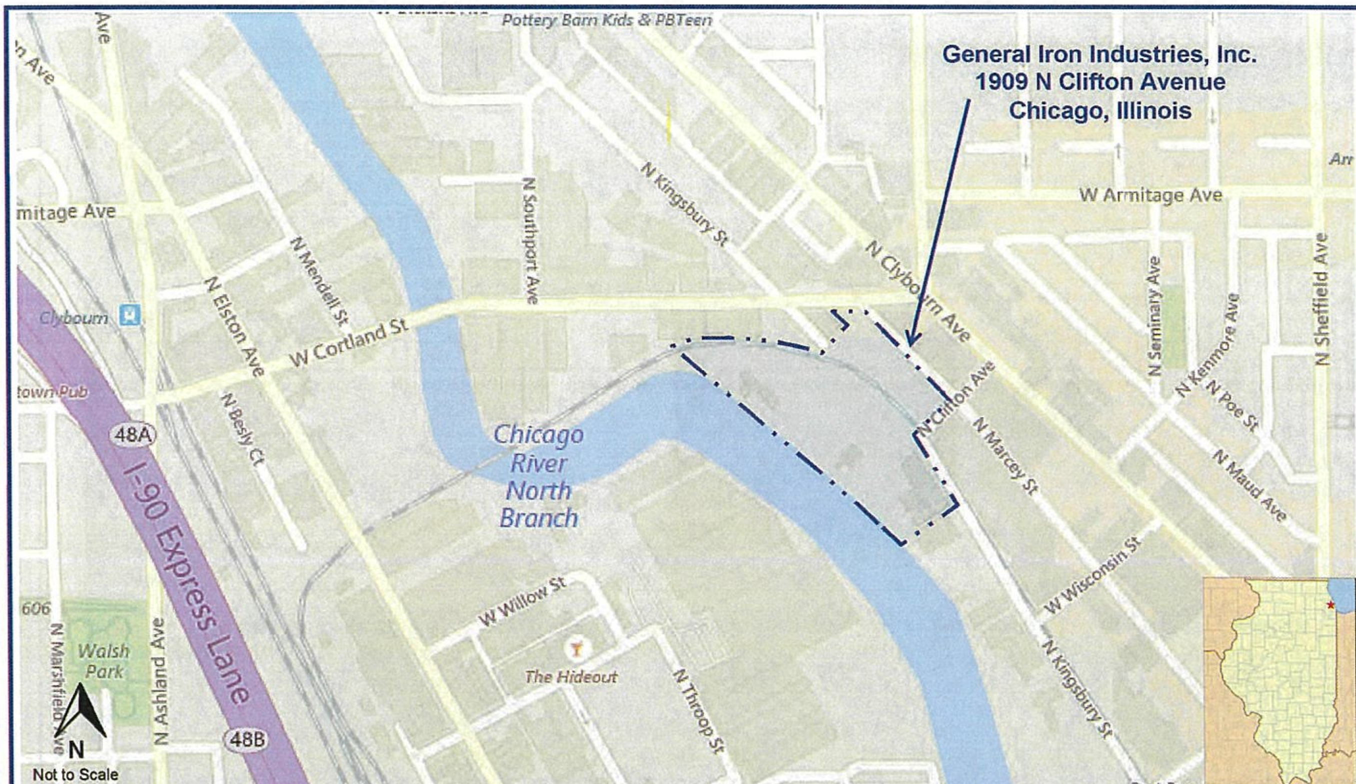
Certification Statement:

I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information including the possibility of fines or imprisonment pursuant to Section 113(c)(2) of the Clean Air Act and 18 U.S.C. §§ 1001 and 1341.

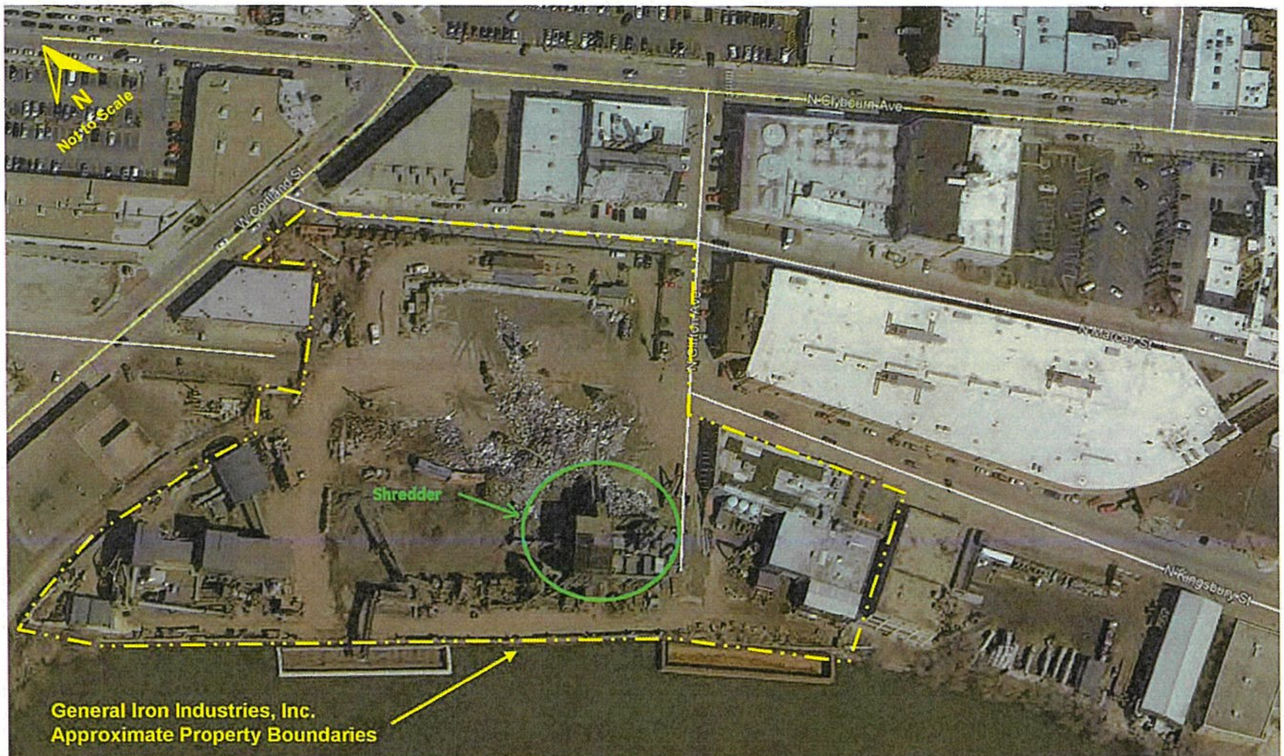
Signature: [signature] Date: 6/25/18

Name: JIM KALLAS

Attachment: Shredder Air Emission Test Report
General Iron Industries, Inc. – Chicago, Illinois



RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: **Shredder Emissions Test Report Total Hydrocarbons, Particulate, and Metals**	**Site Location Map** General Iron Industries, Inc. Chicago, Illinois	FIGURE **1**
DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER R17421-3	DATE DRAWN 06-2018 / REVISED DATE



RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: Shredder Emissions Test Report Total Hydrocarbons, Particulate, and Metals		Facility Map General Iron Industries, Inc. 1909 N Clifton Avenue - Chicago, Illinois	FIGURE: 2
	DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER: R17421-3	DATE: 06-2018	REVISED DATE:

RK
& Associates, Inc.

2.0 SUMMARY OF RESULTS

Detailed testing reports of THC and PM/Metals are presented in Appendices A and B respectively. THC emissions are discussed in Section 2.1 and PM/Metals emissions are discussed in Section 2.2.

2.1 THC Emissions

2.1.1 THC Test Results

THC testing was performed by Stack Test Group on May 25, 2018. Detailed information from sample collection and analyses is presented in Stack Test Group's report presented in Appendix A of this document.

Table 2-1 below presents a summary of THC emission testing including the shredder feed rate, Uncorrected and Corrected THC emissions, and the corrected THC emission factor.

Table 2-1
Summary of Shredder THC Emission Testing - May 25, 2018[a]
General Iron - Chicago, Illinois

Parameter	Run 1	Run 2	Run 3	Average
Date:	5/25/2018	5/25/2018	5/25/2018	
Start Time:	08:35AM	09:49AM	11:05AM	
Finish Time:	09:35AM	10:48 AM	12:26 PM	
Shredder Feed Rate (tph):	396.34	389.69	384.37	390.13
Stack Diameter, inches:	50	50	50	
Barometric Pressure, inches Hg:	29.33	29.33	29.33	
Static Pressure in Stack, Inches H2O:	-0.81	-0.81	-0.81	
Duration of Sample, minutes:	60	60	60	
Stack Gas Temperature, degrees F:	114.1	116.8	119.1	116.7
% Carbon Dioxide:	0.2	0.2	0.1	0.2
% Oxygen:	20.5	20.5	20.7	20.6
% Moisture:	4.1	3.77	3.86	3.91
Stack Gas Flow Rate, DSCFM:	60,258	60,953	61,197	60,803
VOC Calculations (Uncorrected)				
PPMvw as Propane:	281.0	169.9	270.3	240.4
LBS/DSCF	3.21E-05	1.94E-05	3.09E-05	2.75E-05
LBS/HR	121.0	73.7	117.9	104.2
THC from VOM-Exempt Compounds				
PPMvw as Propane (see Table 2-2):	10.7	28.0	27.6	20.1
VOC Calculations (Corrected)				
PPMvw as Propane:	268.8	146.6	241.4	218.9
LBS/DSCF	3.07E-05	1.67E-05	2.76E-05	2.50E-05
LBS/HR	115.72	63.61	105.27	94.87
LB-THC/TON SHREDDER FEED	0.2920	0.1632	0.2739	0.2430

a. See Appendix C of Stack Test Group THC Test Report attached in Appendix A of this document.

Uncorrected THC represents the 'raw' THC emissions measured during the test using Method 25A. No methane or ethane was detected in the samples collected.

Integrated exhaust gas samples were collected in Tedlar bags during each THC test run. Stack Test Group submitted the Tedlar Bag samples to DAT Laboratory in Plain City, Ohio. The gas samples were analyzed in accordance with USEPA Method TO-15 for the purposes of identifying compounds in the exhaust that are specifically exempt from the federal definition of Volatile Organic Compound (VOC) in 40 CFR 51.100(s).

The laboratory then prepared a 100 ppm sample of each VOC-exempt compound that had a three-sample average that exceeded the method detection limit. These samples were sent to Stack Test Group to measure an instrument response factor for each compound using the same Method 25A analyzer used during the testing. An instrument response factor is the ratio of the ppm of VOC-exempt compound to the corresponding ppm of THC. The average concentration of VOC-exempt compounds identified in the three TO-15 samples were then multiplied by the corresponding compound-specific instrument response factor to determine the concentration (ppm) of THC that could be subtracted from the raw data.

The total THC corresponding to the VOC-exempt compounds was then subtracted from the raw THC and is reported as the 'Corrected THC'. Table 2-2 identifies the VOC-Exempt compounds subtracted from the raw THC data.

The corrected THC, in Table 2-1 above, is the final result from these tests. Dividing the corrected THC (lb/hr) by the gross shredder feed rate (tph) yields a THC emission factor in units of lb-THC per ton of shredder feed. The shredder feed rate for the THC tests consisted of 21.3% end of life vehicles (ELVs) and 78.7% mixed recyclable metals. The average THC emission factor for this set of tests (as shown in Table 2-1 above) is 0.2430 lb/ton.

This emission factor may be applied to past actual shredder material feed rates to estimate past actual THC emissions. Information previously submitted in response to the EPA 114 Information Request included actual monthly shredder feed rates (tons per month) from July 2012 through December 2017. The maximum 12 consecutive month shredder feed rate was 729,790 tons from April 2016 through March 2017. Based on the above, application of the measured THC emission factor to the maximum annual shredder feed rate yields a maximum actual annual THC emission rate of 88.68 tons, which demonstrates that actual emissions from the shredder do not exceed the current VOC major source threshold of 100 tpy.

Table 2-2

Measured Response Factors for VOC Exempt Compounds[a]
General Iron - Chicago, Illinois

VOM Exempt Compound	Concentration in Sample PPM	FID Response (ppm) Trial 1	Trial 2	Trial 3	Average	Measured Response Factor
Chloromethane	100	67.1	67.0	67.0	67.0	0.67
Freon 22	100	47.50	47.70	47.80	47.70	0.48
Freon 12	100	117.60	117.40	117.80	117.60	1.18
Freon 152a	100	114.90	115.00	115.00	115.00	1.15
Freon 134a	100	114.80	115.10	115.20	115.00	1.15
Octamethycyclotetrasiloxane	100	114.80	114.90	114.90	114.90	1.15
Acetone	Response Factor obtained from Instrument Manufacturer					
Methylene Chloride	Response Factor obtained from Instrument Manufacturer					
Tetrachloroethylene	Response Factor obtained from Instrument Manufacturer					
Freon 11	Sample of Freon 11 was not available. The Freon 11 response factor is an estimated resonse factor based on the results of other Freon response factor testing					

a. See Appendix G of Stack Test Group THC Test Report attached in Appendix A of this document for details.

Corrected THC by Removal of VOC-Exempt Compounds[d]
General Iron - Chicago, Illinois

VOM Exempt Compound	Parameter	Run 1	Run 2	Run 3	Average	Response Factor
Chloromethane	TO-15 (PPM)	0.02	0.02	0.02	0.02	0.67 [a]
	Adjusted THC (PPM)	0.01	0.01	0.01	0.01	
Freon 22	TO-15 (PPM)	8.34	2.83	0.00	3.72	0.48 [a]
	Adjusted THC (PPM)	3.98	1.35	0.00	1.78	
Freon 12	TO-15 (PPM)	0.88	0.41	0.89	0.73	1.18 [a]
	Adjusted THC (PPM)	1.03	0.48	1.05	0.85	
Freon 152a	TO-15 (PPM)	0.00	3.84	1.56	1.80	1.15 [a]
	Adjusted THC (PPM)	0.00	4.42	1.79	2.07	
Freon 134a	TO-15 (PPM)	0.02	0.02	0.02	0.02	1.15 [a]
	Adjusted THC (PPM)	0.02	0.02	0.02	0.02	
Octamethycyclotetrasiloxane	TO-15 (PPM)	2.14	0.00	0.00	0.71	1.15 [b]
	Adjusted THC (PPM)	2.46	0.00	0.00	0.82	
Acetone	TO-15 (PPM)	2.71	14.73	29.91	15.80	0.72 [b]
	Adjusted THC (PPM)	1.95	10.61	21.54	11.40	
Methylene Chloride	TO-15 (PPM)	0.22	0.18	0.18	0.20	1.00 [b]
	Adjusted THC (PPM)	0.24	0.20	0.20	0.20	
Tetrachloroethylene	TO-15 (PPM)	0.03	0.03	0.04	0.03	1.30 [b]
	Adjusted THC (PPM)	0.04	0.04	0.05	0.04	
Freon 11	TO-15 (PPM)	2.00	10.21	5.98	6.10	0.48 [c]
	Adjusted THC (PPM)	0.95	4.87	2.85	2.90	
Methane	TO-15 (PPM)	3.29	3.10	3.40	3.26	0.33
	Adjusted THC (PPM)	1.10	1.03	1.13	1.09	
Ethane	TO-15 (PPM)	0.63	0.45	0.46	0.51	0.66
	Adjusted THC (PPM)	0.42	0.30	0.30	0.34	
Total THC from VOC Exempt Compounds		12.20	23.33	28.94	21.52	

a. Measured instrument response factor.
b. Instrument response factor from instrument manufacturer.
c. Instrument response factor for Freon 11 is conservatively assumed to be equal to the resonse factor for Freon 22.
d. See Appendix C of Stack Test Group THC Test Report attached in Appendix A of this document for details.

Uncorrected THC	PPM	281.0	169.9	270.3	240.4
Corrected THC	PPM	268.8	146.6	241.4	218.9

2.1.2 Process and Control Equipment Data – THC Testing

The following presents the process and control equipment data recorded during the test.

Shredder Feed Rate:

Table 2-3 presents a summary of shredder feed rate. A calibrated belt scale measures the total ferrous metal produced by the shredding operation. Based on recent facility operating data, the ferrous production rate is multiplied by a factor of 1.33 to estimate the gross shredder feed rate.

Table 2-3
Summary of Shredder Feed Rates for THC Emission Testing
General Iron Industries - Chicago, Illinois

Parameter	Units	Test Data from May 25, 2018			
		Run 1	Run 2	Run 3	Average
Pollutant		THC	THC	THC	THC
Test Method:		25A	25A	25A	25A
Start Time:		8:35 AM	9:49 AM	11:05 AM	
Stop Time:		9:35 AM	10:49 AM	12:26 PM	
Interruptions:		None	None	Note 1	
Duration:	minutes	60.0	60.0	60.0	60.0
Ferrous Metal Produced During Test Run	tons/hour	298	293	289	293
Factor to Convert Ferrous Produced to Gross Shredder Feed Rate	ton of gross feed / ton of ferrous produced	1.33	1.33	1.33	1.33
Hourly Gross Feed Rate to Shredder	tons/hour	396.3	389.7	384.4	390.1
Number of ELVs[2] Processed During Three Test Runs		189.00			
Average Weight of ELVs Processed[3]	ton/ELV	1.32			
Tons of ELVs Fed	tons	248.9			
Average Weight of ELVs Fed as % of Gross Shredder Feed	%	21.3%			

1. Run 3 testing was interrupted twice due to loss of feed to the shredder;
   - 11:19 to 11:30 AM (11-minutes) due to a feed roll jam
   - 11:33 to 11:43 AM (10-minutes) due to a feed discharge conveyor jam.
2. ELV = End of Life Vehicle.
3. A total of 201 ELVs (264.75-tons) were stockpiled for this test. These values were derived from summing the number of ELVs and corresponding weight of each load of ELVs. These data demonstrate that the average weight of ELVs stockpiled for this test was 1.32-tons.

End of life vehicles (ELVs) were fed to the shredder during this test. Based on recent operating data, the facility estimates that approximately 20% of total shredder feed is comprised of ELVs. The goal during this test was for ELVs to make up approximately 20% of the gross shredder feed rate.

ELVs were stockpiled for this test. The gross weight and number of ELVs in each incoming load of ELVs placed in the stockpile was recorded. A total of 201 ELVs weighing 264.75 tons were stockpiled for processing during the THC testing. The average weight of ELVs in this stockpile was 1.32 tons.

Ferrous production is electronically monitored in the control room from a totalizer on the calibrated belt scale. The value from the totalizer was manually recorded at the start and end of each test to identify the total mass of ferrous scrap produced. This value was multiplied by the conversion factor of 1.33 to estimate the gross shredder feed rate. During testing, the number of cars fed to the shredder was manually recorded. A total of 189 cars (248.9 tons) were fed to the shredder during the three THC test runs.

As shown in Table 2-3 above, the total tons of material processed during the three tests was 1,170.4 tons, which included 248.94 tons of ELVs. Based on the above, ELVs comprised 21.3% of the total mass of material process in the shredder. This is consistent with recent levels of ELV processing.

Shredder Water Injection:

Water is injected into the shredder as a safety measure. Heat from shredding converts the water to steam. The steam expands to displace ambient air from the interior of the shredder to reduce the volume of oxygen in the shredder to minimize the potential for deflagrations. The water feed rate is manually controlled such that the non-metal material discharged from the shredder contains some moisture. Water feed rate was manually recorded during the THC emissions tests. The average water injection rates from each THC test is shown in Table 2-4 below.

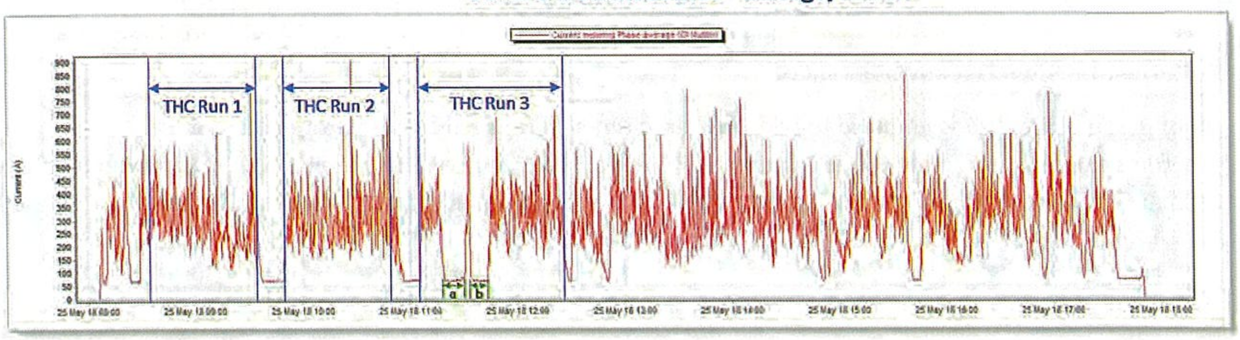
Table 2-4
Shredder Water Injection Rates
General Iron Industries - Chicago, Illinois

Test	Date	gpm
Run 1	5/25/18	42
Run 2	5/25/18	41
Run 3	5/25/18	41

Shredder Motor Amperage:

The amperage of the electric motor that powers the shredder is electronically recorded. Motor amperage is a function of the type and rate of material fed to the shredder. As shown in Table 2-5 below, the motor amperage indicates that the type and rate of material fed to the shredder was consistent during all three THC test runs.

Table 2-5 Shredder Motor Amperage
General Iron Industries - Chicago, Illinois



Shredder Emissions Capture:

An emissions capture hood is suspended over the top of the shredder. The hood is equipped with rubber curtains that extend downward to the top of the shredder to minimize the open area. The only opening to atmosphere is at the shredder feed chute, which is blocked by the feed rolls and incoming material. The placement of the hood and the air flow is maintained to minimize the amount of steam escaping the hood.

Although it is not possible to directly, or indirectly, measure the capture efficiency of the hood, it was the opinion of the USEPA and IEPA inspectors observing the test, that the hood appeared to provide > 95% capture of steam created in the shredder.

2.1.3 Errors During Testing – THC Testing

There were no errors during THC emission testing.

2.1.4 Deviation of Reference Test Methods – THC Testing

There were no deviations from the reference test methods as described in the approved test protocol.

2.1.5 Production Rates During Testing – THC Testing

The shredder production rate during THC testing is presented in Section 2.1.2 above.

2.2 PM/Metals Emissions

2.2.1 PM/Metals Test Results

PM/Metals emissions testing was performed using a single Method 29 sampling apparatus. Combining PM and Metals into a single test apparatus was approved by USEPA and IEPA observers on site at the initiation of testing on June 13, 2018. PM/Metals emissions testing was performed by Montrose Air Quality Services on June 13 and 14, 2018. Detailed information from sample collection and analyses is presented in the Montrose Air Quality Services test report presented in Appendix B of this document.

Table 2-6 below presents a summary of PM and Metals emissions testing including the shredder feed rate. PM emission rates averaged 1.9 lb/hr, which is significantly below the permitted PM emission limits from the current Lifetime Operation Permit of 67 lb/hr.

All of the filterable PM is assumed to be PM_{10} based on the performance of the roll media filter; therefore, measured filterable PM is assumed to be PM_{10}. The reported hourly PM/PM10 emission rate of 1.9 lb/hr is also significantly below the permitted PM_{10} emission limit from the current Lifetime Operation Permit of 34 lb/hr.

Table 2-6 Shredder PM/Metals Emissions Summary - June 13 & 14, 2018
General Iron Industries - Chicago, Illinois

Parameter	June 13, 2018 Run 1 lb/hr	June 13, 2018 Run 2 lb/hr	June 13, 2018 Run 3 lb/hr	June 14, 2018 Run 4 lb/hr	June 14, 2018 Run 5 lb/hr	Average Runs 1, 2, 4, 5 lb/hr
Start Time:	11:49	15:15	Run 3 failed the post test leak check due to a broken glass probe liner. With the concurrence of the IEPA observer on site to witness the leak check, Run 3 was deemed to be invalid and samples were not submitted for analysis.	10:56	13:45	
End Time:	13:40	17:09		12:45	15:33	
Particulate	1.55	2.09		2.21	1.75	1.90
Antimony	0.0000667	0.0000874		0.0000778	0.0000504	0.0000706
Arsenic	0.0000300	0.0000351		<0.0000238	<0.0000237	0.0000282
Barium	0.000551	0.00109		0.000469	0.000411	0.000630
Beryllium	<0.00000583	<0.00000583		<0.00000595	<0.00000592	<0.0000059
Cadmium	0.000398	0.000231		0.000226	0.000188	0.0002608
Chromium	0.000288	0.000365		0.000289	0.000235	0.0002943
Cobalt	<0.0000233	0.0000318		<0.0000238	<0.0000237	0.0000257
Copper	0.000315	0.000714		0.000369	0.00109	0.0006220
Lead	0.00105	0.00171		0.00114	0.000727	0.0011568
Manganese	0.000857	0.00111		0.00114	0.000738	0.0009613
Nickel	0.000349	0.000588		0.000284	0.000198	0.000355
Phosphorus	0.00388	0.00451		0.00319	0.00292	0.00363
Selenium	0.000149	0.000269		<0.0000238	0.0000434	0.0001213
Thallium	<0.0000233	<0.0000233		<0.0000238	<0.0000237	<0.0000235
Silver	0.0000233	0.0000233		0.000337	<0.0000237	0.0001018
Zinc	0.0705	0.0795		0.0654	0.0563	0.0679
Mercury	0.0291	0.0117		0.0368	0.00243	0.0200

Table 2-7 identifies the average shredder feed rate from Runs 1, 2, 4, and 5.

**Table 2-7 Summary of Shredder Feed Rates for PM and Metals Emission Testing
General Iron Industries - Chicago, Illinois**

Parameter	Units	Test Data from June 13 & 14, 2018				
		Run 1	Run 2	Run 4	Run 5	Average
Pollutant		PM/Metals	PM/Metals	PM/Metals	PM/Metals	PM/Metals
Test Method:		M29	M29	M29	M29	M29
Start Time:		11:49 AM	3:15 PM	10:56 AM	1:45 PM	
Stop Time:		1:40 PM	5:09 PM	12:45 PM	3:33 PM	
Test Run Duration (includes traverse change)		111.0	114.0	109.0	108.0	
Sample Collection Time	minutes	96.0	96.0	96.0	96.0	
Shredder Feed Interruptions		None	None	None	None	
Hourly Rate of Ferrous Metal Production	tons/hour	303.38	303.89	300.00	304.04	302.83
Factor to Convert Ferrous Produced to Gross Shredder Feed	ton of gross feed / ton of ferrous produced	1.33	1.33	1.33	1.33	1.33
Gross Feed to Shredder During Testing Period	tons/hour	403.50	404.18	399.00	404.37	402.76
Hourly Rate of ELVs[1] Fed to Shredder	tons/hour	70.33	74.08	91.10	85.05	80.14
ELVs Fed as % of Gross Shredder Feed	%	17.4%	18.3%	22.8%	21.0%	19.9%
Average Weight of ELVs Processed[3]	ton/ELV	1.46	1.45	1.44	1.55	1.48
No. of ELVs Fed	# of ELVs	89	97	118	95	100

1. ELV = End of Life Vehicle.

As shown in Table 2-7 above, the demonstrated gross shredder feed rates were consistent with the targeted gross feed rate of 400 tph. ELVs ranged from 17.4% of gross shredder feed in Run 1 to 22.8% of gross shredder feed in Run 4. The average ELV feed rate was 19.9% of the gross shredder feed rate, which was consistent with the targeted ELV feed rate of 20%.

PM and Metals emission factors were calculated by dividing the average hourly emission rate by the average hourly shredder gross feed rate. Table 2-9 presents a summary of PM and Metal emission factors.

The PM and Metal emission factors in Table 2-8 can be combined with the past maximum actual annual shredder feed rate identified in Section 2.1.1 above to estimate maximum annual emissions from the shredder.

Table 2-8 Shredder PM/Metals Emission Factors
General Iron Industries - Chicago, Illinois

Parameter	June 13, 2018 Run 1 lb/ton of Feed	June 13, 2018 Run 2 lb/ton of Feed	June 13, 2018 Run 3 lb/ton of Feed	June 14, 2018 Run 4 lb/ton of Feed	June 14, 2018 Run 5 lb/ton of Feed	Average Runs 1, 2, 4, 5 lb/ton of Feed
Shredder Feed Rate (tph)	403.50	404.18		399.00	404.37	402.76
Particulate	3.84E-03	5.17E-03		5.54E-03	4.33E-03	4.72E-03
Antimony	1.65E-07	2.16E-07		1.95E-07	1.25E-07	1.75E-07
Arsenic	7.43E-08	8.68E-08		5.96E-08	5.86E-08	6.99E-08
Barium	1.37E-06	2.70E-06		1.18E-06	1.02E-06	1.56E-06
Beryllium	1.44E-08	1.44E-08		1.49E-08	1.46E-08	1.46E-08
Cadmium	9.86E-07	5.72E-07		5.66E-07	4.65E-07	6.47E-07
Chromium	7.14E-07	9.03E-07		7.24E-07	5.81E-07	7.31E-07
Cobalt	5.77E-08	7.87E-08		5.96E-08	5.86E-08	6.37E-08
Copper	7.81E-07	1.77E-06		9.25E-07	2.70E-06	1.54E-06
Lead	2.60E-06	4.23E-06		2.86E-06	1.80E-06	2.87E-06
Manganese	2.12E-06	2.75E-06		2.86E-06	1.83E-06	2.39E-06
Nickel	8.65E-07	1.45E-06		7.12E-07	4.90E-07	8.80E-07
Phosphorus	9.62E-06	1.12E-05		7.99E-06	7.22E-06	9.00E-06
Selenium	3.69E-07	6.66E-07		5.96E-08	1.07E-07	3.00E-07
Thallium	5.77E-08	5.76E-08		5.96E-08	5.86E-08	5.84E-08
Silver	5.77E-08	5.76E-08		8.45E-07	5.86E-08	2.55E-07
Zinc	1.75E-04	1.97E-04		1.64E-04	1.39E-04	1.69E-04
Mercury	7.21E-05	2.89E-05		9.22E-05	6.01E-06	4.98E-05

2.2.2 Process and Control Equipment Data – PM/Metals Emissions Testing

The following presents the process and control equipment data recorded during the PM/Metals emissions testing.

Shredder Feed Rate:

Table 2-7 above, presents a summary of shredder feed rate. A calibrated belt scale measures the total ferrous metal produced by the shredding operation. Based on recent facility operating data, the ferrous production rate is multiplied by a factor of 1.33 to estimate the gross shredder feed rate.

End of life vehicles (ELVs) were fed to the shredder during this test. Based on recent operating data, the facility estimates that approximately 20% of total shredder feed is comprised of ELVs. The goal during this test was for ELVs to make up approximately 20% of the gross shredder feed rate.

ELVs were stockpiled for these tests. The gross weight and number of ELVs in each incoming load of ELVs placed in the stockpile was recorded.

Ferrous production is electronically monitored in the control room from a totalizer on the calibrated belt scale. The value from the totalizer was manually recorded at the start and end of each test to identify the total mass of ferrous scrap produced. This value was multiplied by the conversion factor of 1.33 to estimate the gross shredder feed rate. During testing, the number of cars fed to the shredder was manually recorded. A total of 320.42 tons of ELVs were fed to the shredder during the four PM/Metals test runs.

The total tons of material shredded during the four PM/Metals tests was 1,611.05 tons, which included 320.42 tons of ELVs. Based on the above, ELVs comprised 19.9% of the total mass of material processed in the shredder. This is consistent with recent ELV processing rates.

Shredder Water Injection:

Water is injected into the shredder as a safety measure. Heat from shredding converts the water to steam. The steam expands to displace ambient air from the interior of the shredder to reduce the volume of oxygen in the shredder to minimize the potential for deflagrations. The water feed rate is manually controlled such that the non-metal material discharged from the shredder contains some moisture. Water feed rate was manually recorded during the PM/Metals emissions tests. The average water injection rates from each PM/metals emission test is shown in Table 2-9 below.

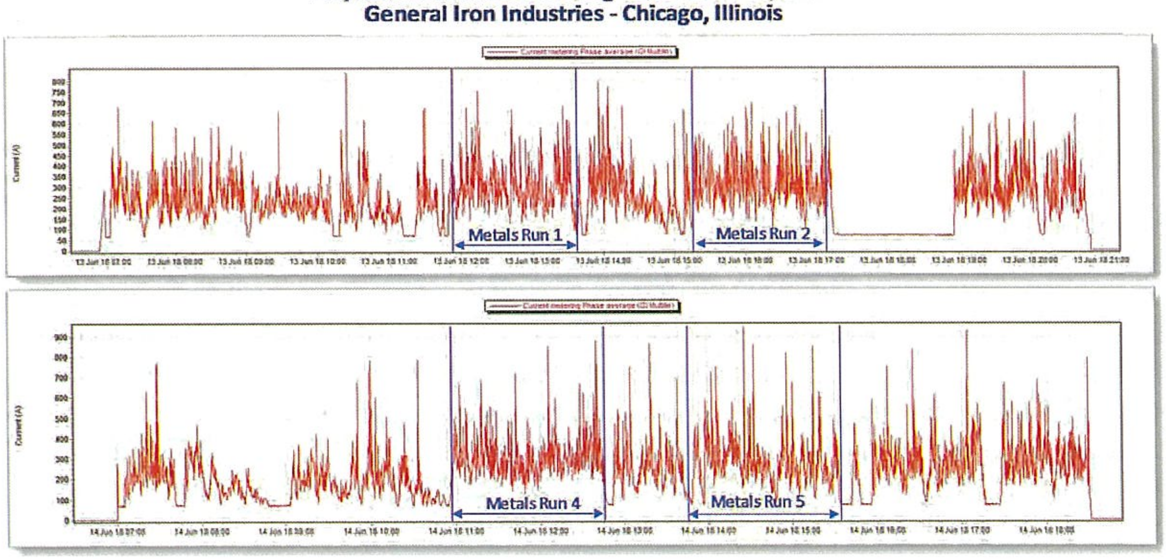
Table 2-9
Shredder Water Injection Rates
PM/Metals Emission Testing
General Iron Industries - Chicago, Illinois

Test	Date	gpm
Run 1	6/13/18	45
Run 2	6/13/18	47
Run 4	6/14/18	45
Run 5	6/14/18	46

Shredder Motor Amperage:

The amperage of the electric motor that powers the shredder is electronically recorded. Motor amperage is a function of the type and rate of material fed to the shredder. As shown in Table 2-10 below, the motor amperage indicates that the type and rate of material fed to the shredder was consistent during all four PM/Metals test runs.

Table 2-10 Shredder Motor Amperage
PM/Metals Emissions Testing - June 13 & 14, 2018
General Iron Industries - Chicago, Illinois



Shredder Emissions Capture:

An emissions capture hood is suspended over the top of the shredder. The hood is equipped with rubber curtains that extend downward to the top of the shredder to minimize the open area. The only opening to atmosphere is at the shredder feed chute, which is blocked by the feed rolls and incoming material. The placement of the hood and the air flow is maintained to minimize the amount of steam escaping the hood.

Although it is not possible to directly, or indirectly, measure the capture efficiency of the hood, it was the opinion of the USEPA and IEPA inspectors observing the test, that the hood appeared to provide > 95% capture of steam created in the shredder.

2.2.3 Errors During Testing – PM/Metals

There were no process errors or upsets during PM/Metals emissions testing.

During Test Run 2, an operator mistakenly advanced the roll filter material approximately three times further than when the filter material is advanced automatically. Because there were no obvious visual indications that the samples were affected by this error, a decision was made to send the Run 2 samples for analysis and conduct a fourth test run in the event that analytical results confirmed that this error negatively impacted the samples. In the event that analysis confirmed no impacts to Run 2, the test would include the results of all four test runs in the reported average results. The USEPA and IEPA observers present during Run 2 concurred with this decision.

Test Run No. 3 was performed on June 13, 2018, however, the post-test leak check failed due to a broken glass liner in the sampling probe. A failed leak check indicates that ambient air may have been leaking into the sampling apparatus diluting or replacing process exhaust gas. Due to the failed leak check, this run was considered invalid and the samples were not sent for analysis. The IEPA observer, present at the time of the leak check concurred with this conclusion and agreed that the samples should not be sent for analysis.

There were no other errors identified during the PM /Metals emissions testing.

2.2.4 Deviation of Reference Test Methods – PM/Metals

Prior to the initiation of PM/Metals emissions testing, the USEPA and IEPA observers were consulted to request approval to measure PM emissions as part of the Method 29 Metals test to eliminate the need to perform a separate Method 5 test for PM. Combining PM and Metals in a single Method 29 test is done routinely, has no impact on the validity of either test, and is not prohibited by Method 29. When PM and Metals are combined in a Method 29 test, the filter and front half probe are first dried and weighed to obtain the PM emissions data and are then digested and analyzed for metals in accordance with Method 29. Upon receipt of verbal approval from both the USEPA and IEPA observers, a single Method 29 test was performed to measure both PM and Metals. Based on the above, this change was not a deviation from the reference method but was a deviation from the protocol.

There were no other deviations from the reference test methods as described in the approved test protocol.

2.2.5 Production Rates During Testing – PM/Metals

The shredder production rate during PM and Metals emissions testing is presented in Section 2.2.2 above.

2.2.6 Metals Audit Samples

A total selected metals (TSM) audit sample, prepared by ERA, was sent to the laboratory selected for analysis with the metals test samples. The purpose of the audit sample is to evaluate the accuracy of the analytical results. Detailed results from analysis of the audit sample are presented in Montrose Air Quality Services' report in Appendix B of this document.

The results of the audit sample were 'Acceptable' for all metals with the exception of Cadmium. The term 'Acceptable' as used above refers only to the accuracy and reliability of the analytical results and do not infer noncompliance with any applicable limit. The audit sample was prepared with 20.6 ug/filter of cadmium and required an analytical response of 16.5 to 24.7 ug/filter. The reported value from the lab was 16 ug/filter, which is just below the minimum required response. ERA verbally reported the result to Kevin Mattison of IEPA.

It is our understanding that the metals laboratory will conduct additional analyses to determine the potential source of the error. It is possible that the cadmium results reported in this document may be adjusted slightly based on any correction factor that may be identified. In the event that the reported cadmium results require adjustment, a supplemental report will be prepared and submitted to USEPA and IEPA. Because the error was so small, Kevin Mattison of IEPA indicated that any change to the reported cadmium emission rates would be minimal.

All other metals in the audit sample had an "Acceptable Result."

3.0 FACILITY OPERATIONS

The following information presents a process description of the hammermill shredder and roll filter particulate control device operated during THC and Metals emissions testing.

3.1 Hammermill Shredder and Operating Parameters

The actual shredder feed rate is dependent on the type and consistency of the feed material and the ability to consistently feed the mixed recyclable metal to the shredder. Based on monthly shredder operating data (monthly tons of material processed and daily operating hours) previously submitted to USEPA in response to the 114 Information Request, during the period of July 2012 through December 2017, the average gross shredder feed rate was approximately 313.9 tph. This value more accurately represents long term operation of the shredder.

During the limited testing period, General Iron selected a target gross shredder feed rate of 400 tph (with 20% comprised of ELVs). Data presented in Sections 2.1.2 and 2.2.2 of this test report demonstrate that the facility met its targeted feed rate. It should be noted however, that it is not possible to sustain a feed rate of 400 tph over a long period of time because the amount of material entering the facility on a day-to-day basis is not sufficient to sustain this rate.

Based on recent operating data, the facility estimates that shredder feed is comprised of approximately 20% end of life vehicles (ELVs) and 80% mixed recyclable metal. Shredded metal is discharged by conveyor and travels over two drum magnets, to separate ferrous and non-ferrous metal. Ferrous metal is then routed through a Z-Box separator to remove any remaining light materials. Metal discharged from the Z-Box separator is then conveyed to stockpiles. In the Z-Box separator, shredded metal passes through a rising column of air. A fan and ducting system maintains an upward flow of air through the Z-Box (counter current to the direction of the shredded metal). Shredded metal falls downward through the rising column of air and is discharged at the bottom of the Z-Box over a conveyorized belt scale. The belt scale measures the net mass of shredded metal produced (tph). The amount of ferrous metal produced is multiplied by a factor of 1.33, based on recent operating data, to estimate the gross shredder feed rate.

The upward flow of air through the Z-Box removes light material. The air stream carries this light material to an integral cyclone that disengages the material from the air stream. Light material is discharged from the bottom of the cyclone where it is collected for further processing. The majority of the air exiting from the top of the cyclone is recycled through the fan, back to the bottom of the Z-Box.

The shredder is equipped with an integral water injection system to minimize the potential for fires and deflagrations within the shredder. The shredder is located within an enclosure consisting of curtain walls on four sides, and solid plate and metal grating on the roof. The water injection rate is monitored by a flow meter and the flow rate is electronically recorded.

A flow diagram of the shredder is presented in Figure 3.

3.2 Cyclone and Roll Filter PM Control System

An exhaust hood, located above the shredder, is equipped with rubber curtains extending downward to the top of the shredder to enhance emissions capture efficiency. An induced draft fan draws exhaust from the shredder through the exhaust hood, a cyclone and roll media filter for control of particulate matter before being discharged to the atmosphere.

The roll filter is essentially a rectangular section of duct measuring approximately 18 ft by 6 ft. A roll of unused filter material is placed on the supply side of the filter media system and fed through the rectangular section of duct to a take-up roll. The unit is designed so that the air flow passes downward through the filter. The filter periodically advances automatically.

3.3 Shredder Throughput

The feed rate of the shredder is monitored by measuring the production of ferrous metal. A material conversion factor is used to convert ferrous metal produced to gross shredder feed rate. A discussion of the demonstrated shredder feed rate with respect to shredder throughput is presented in Section 3.1 above.

Hammermill Shredder Flow Diagram

A. Shredder Feed Conveyor

B. Shredder Enclosure

C. Z-Box

D. Z-Box Cyclone

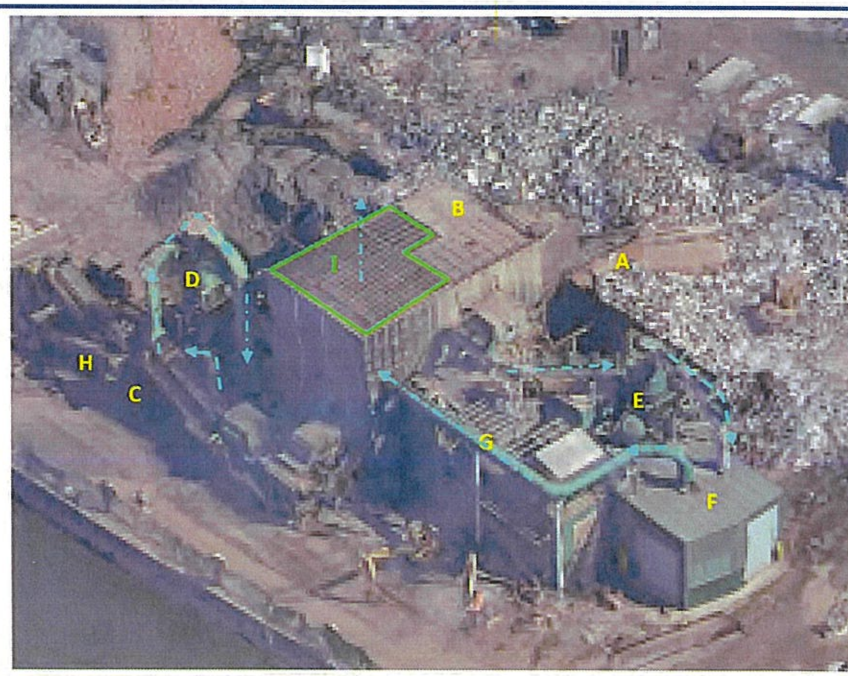
E. Shredder Exhaust Cyclone

F. Shredder Exhaust Roll media filter and Induced Draft Fan

G. Test Ports on Horizontal Duct

H. Ferrous Material Belt Scale

I. Shredder Exhaust
(exhaust gases discharge to the interior of the shredder enclosure and are released to the atmosphere through an area of expanded metal grating on the roof of the shredder enclosure)



RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000	COMMENTS: Shredder Emissions Test Report Total Hydrocarbons, Particulate, and Metals	Shredder Flow Diagram General Iron Industries, Inc. – Chicago, Illinois	FIGURE: 3
	DRAWN BY: / APPROVED BY: JGP	PROJECT NUMBER: R17421-3 / DATE DRAWN: 06-2018	REVISED DATE:

RK
& Associates, Inc.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

Sampling and analytical procedures are presented in the THC and PM/Metals test reports presented in Appendix A and B of this document.

4.1 THC Emission Testing

The required detailed sampling and analytical data for THC emission testing is presented in Stack Test Group's detailed test reports presented in Appendix A of this document.

4.2 PM/Metals Emissions Testing

The required detailed sampling and analytical data for PM/Metals emissions testing is presented in Montrose Environmental Service' detailed test reports presented in Appendix B of this document.

4.3 Appendices (detailed testing information)

The required detailed sampling and analytical data for the THC and PM/Metals tests are presented in the detailed test reports presented in Appendix A and B of this document respectively.

5.0 HEALTH EFFECTS SCREENING FOR METALS

The test results required by the USEPA information request are presented in Section 2.2 of this report. General Iron has voluntarily decided to surpass the USEPA testing requirements and provide the following impact assessment for the metals emissions on the surrounding community.

There are no IEPA or USEPA regulations limiting emissions of specific metals or requiring an ambient impact analysis. In an effort to identify a standard for metals emissions, regulations from other states in Region V were reviewed. The State of Wisconsin has a rule regulating the emissions of air toxic pollutants (including metals) that is applicable to facilities that are not subject to other state or federal rules for metals emissions. Wisconsin's air toxics rule (NR 445) sets health-based emission standards for about 550 air toxics, also known as hazardous air pollutants (HAPs), to protect people from air emissions that are known or suspected to cause cancer or other serious health problems. These problems include asthma, respiratory damage, kidney failure, heart failure, infertility, and birth defects. Facilities seeking an air emissions permit in Wisconsin must demonstrate compliance with applicable requirements of this rule in a construction permit application.

NR 445 can be used as a screening tool to assess the potential impacts from metals emissions from the shredder. The standards in NR 445 are based on threshold limit values established by American Conference of Governmental Industrial Hygienists (ACGIH) and USEPA or California Air Resources Board risk factors.

The results of this analysis show that metals emissions from the shredder are far below the health-based standards identified in NR 445.

In order to use NR 445 as a screening tool for metals emissions from the shredder, the estimated off-site impacts must be identified. For this purpose, and in accordance with NR 445, an air dispersion modeling analysis was performed as described in Section 5.1 below.

5.1 Air Dispersion Modeling

EPA refined dispersion model, AERMOD (version 16216r), was used to predict maximum off-site concentrations of the metals identified by the recent air emission testing program described herein.

Commercially available hourly meteorological data for the years 2012 through 2016, measured at Midway Airport, was used for modeling to predict the maximum 1-Hr, 24-Hr, and annual average concentrations ($\mu g/m^3$) of each identified organic compound and metals.

Each of General Iron's buildings on the site was set up in the model to take into account building wake effects. Based on the orientation of the shredder exhaust stack, and on advice of IEPA air dispersion modeling experts, the shredder emissions were modeled as a volume source with a unitized pollutant emission rate of 1 lb/hr. Particulate deposition was not included in this modeling analysis. Modeling of shredder emissions was performed using the average shredder feed rate demonstrated during the period of July 2012 through December 2017.

A total 5,568 receptors were identified in the model by establishing a rectangular receptor, centered on the shredder emission point, with grid with spacing of 25-m from the property line out to 500-m and a spacing of 100-m from a distance of 500-m to 2,500-m from the property line. Receptors were also placed on the property line. Based on our experience, this receptor grid was extended to a distance that would ensure that the maximum off-site impacts would be identified (i.e. a maximum ground level impact would not occur further than 2,500-meters from the property line.)

In all cases, the modeling results identified the point of maximum impact at or near the property line. Based on principles of air dispersion modeling, the mathematical relationship between the mass emission rate (lb/hr) from the stack and the maximum off site impact concentration ($\mu g/m^3$) is identical for all pollutants. Therefore, the off-site impacts for any pollutant can determined simply by multiplying the predicted off-site impact concentration ($\mu g/m^3$) by the measured mass emission rate in lbs/hr. If the measured mass pollution emission rate is 2 lb/hr, the predicted impact would be twice as much as the modeled impact at an emission rate of 1 lb/hr. The predicted pollutant-specific impacts can then be compared to concentration-based standards, such as those in NR 445.

5.2 WDNR's NR 445 Standards for Metals

According to NR 445.08(2)(b)(c), for each hazardous air contaminant, a permittee shall either limit the ambient air concentration off the source property to less than the ambient air standard concentration allowed under column (g) of the Tables A or B of s. NR 445.07; or not cause an ambient air concentration off the source property that results in an inhalation impact greater than 1×10^{-6}. Specific compounds may have more than one standard based on a non-carcinogenic and carcinogenic health effects.

5.2.1 Non-Carcinogenic Metals

According to NR 445.08(2)(b), for acute and chronic non-carcinogens, any air toxic pollutant that has a standard expressed as an ambient air concentration in Table A or B of s. NR 445.07, the off-property ambient air concentration must be less than the maximum allowable concentration identified in column (g) of the tables.

The modeled maximum off-site concentrations were compared with the allowable concentration ($\mu g/m^3$) in column (g) of NR 445 for the corresponding averaging time period listed in column (h). The results of this analysis show that metals emissions from the shredder are far below the health-based standards identified in NR 445.

5.2.2 Carcinogenic Metals

According to NR 445.08(2)(c), emissions of carcinogenic air contaminants having a unit risk factor established by either the EPA or the California Air Resources Board shall not result in an ambient air concentration off the source property corresponding to an inhalation impact (or risk) greater than 1 in 1,000,000 (1×10^{-6}).

The inhalation impact is determined by the following equation:

Inhalation impact = (Inhalation impact concentration annual average) x (Unit risk factor)

where:

inhalation impact concentration annual average is the annual average concentration of a contaminant in ($\mu g/m^3$)

unit risk factor for the contaminant is the unit risk factor value established by either EPA or the California Air Resources Board and is expressed in $(\mu g/m^3)^{-1}$

The predicted (modeled) maximum annual concentrations were multiplied by the compounds corresponding unit risk factor, and then compared to a value of 1 in 1,000,000. The results of this analysis show that metals emissions from the shredder are far below the health-based standards identified in NR 445.

5.3 Comparison of Predicted Off-Site Metals Impacts with NR 445

Table 5-1 identifies the predicted maximum off-site metals impacts (ug/m^3) to the applicable NR 445 standards for non-carcinogenic and carcinogenic metals identified from the recent metals emissions testing. The measured metal emission rates were calculated using the actual average shredder feed rate demonstrated from July 2012 through December of 2017.

NR 445 identifies standards for all of the identified metals except lead, silver and zinc. The predicted maximum off-site concentrations of all other identified metals were far below the applicable NR 445 standards.

5.4 Conclusions

The results of this analysis show that metals emissions from the shredder are far below the health-based standards identified in NR 445.

Table 5-1 Comparison to NR 445 for Metals for Both Carcinogens and Non-Carcinogens
Shredder Metals Emissions from Testing Conducted June 13 & 14, 2018 - General Iron Industries - Chicago, Illinois
Using Average Metal Emission Rates from Runs 1, 2, 4, and 5 (all test runs)

	Shredder Metal Emission Test Results Mass Emission Rates Reflect Actual Average Shredder Feed Rate					Modeled Maximum Results[3]		NR 445 Ambient Air Standard for Non-Carcinogens		NR 445 for Carcinogens			
	Run 1 6/13/2018 lb/hr	Run 2 6/13/2018 lb/hr	Run 4 6/14/2018 lb/hr	Run 5 6/14/2018 lb/hr	Average Runs 1,2,4,5 lb/hr	24 Hour (ug/m³)	Annual (ug/m³)			Unit Risk Factor		Inhalation Impact[4]	Complies with
Metals	Modeled Maximum Impact for Unit Emission (1 lb/hr)					6.45135	0.64704	24 Hour (ug/m³)	Annual (ug/m³)	$(ug/m^3)^{-1}$	Source	< 1.0E-06	NR 445
Antimony	0.0000519	0.0000679	0.0000612	0.0000391	0.0000550	0.0004	0.00004	12.00	NA				Yes
Arsenic	0.0000233	0.0000273	0.0000187	0.0000184	0.0000219	0.0001	0.00001	NA	Carcinogen	0.00430	IRIS	6.10E-08	Yes
Barium	0.0004286	0.0008465	0.0003690	0.0003190	0.000491	0.0032	0.0003	12.00	NA				Yes
Beryllium	0.00000454	0.00000453	0.00000468	0.00000460	0.00000458	0.000030	0.000003	NA	Carcinogen 0.02	0.00240	IRIS	7.12E-09	Yes Yes
Cadmium	0.0003096	0.0001794	0.0001778	0.0001459	0.000203	0.0013	0.0001	NA	Carcinogen	0.00180	IRIS	2.37E-07	Yes
Chromium [1]	0.000224	0.000283	0.000227	0.000182	0.000229	0.0015	0.0001	12.00	NA				Yes
Cobalt	0.0000181	0.0000247	0.0000187	0.0000184	0.0000200	0.0001	0.0000	0.48	NA				Yes
Copper	0.000245	0.000555	0.000290	0.000846	0.000484	0.0031	0.0003	24.00	NA				Yes
Lead[2]	0.00082	0.00133	0.00090	0.00056	0.00090	0.0058	0.0006	NA	NA				NA
Manganese	0.000667	0.000862	0.000897	0.000573	0.000750	0.0048	0.0005	4.80	NA				Yes
Nickel	0.000272	0.000457	0.000223	0.000154	0.000276	0.0018	0.0002	NA	Carcinogen	0.00026	CAL	4.65E-08	Yes
Phosphorus	0.00302	0.00350	0.00251	0.00227	0.00282	0.0182	0.0018	2.43	NA				Yes
Selenium	0.000116	0.000209	0.000019	0.000034	0.000094	0.0006	0.0001	4.80	NA				Yes
Thallium	0.0000181	0.0000181	0.0000187	0.0000184	0.0000183	0.0001	0.00001	2.40	NA				Yes
Silver[2]	0.0000181	0.0000181	0.0002651	0.0000184	0.0000799	0.0005	0.0001	NA	NA				NA
Zinc[2]	0.0548	0.0617	0.0515	0.0437	0.0529	0.3415	0.0343	NA	NA				NA
Mercury	0.0226	0.0091	0.0290	0.0019	0.0156	0.1009	0.0101	0.60	0.30				Yes

RK
& Associates, Inc.

Shredder Emissions Test Report for Total Hydrocarbons, Particulate, and Metals General Iron Industries, Inc. – Chicago, Illinois IEPA Bureau of Air Site ID No.: 031600BTB

JUNE 25, 2018

APPENDIX A –

Report of VOC Emission Testing on the Shredder Exhaust at the General Iron Facility Located in Chicago, Illinois

Prepared by Stack Test Group, Inc.

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Air Compliance & Emissions Solutions

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REPORT OF VOC EMISSION TESTING ON THE SHREDDER EXHAUST AT THE GENERAL IRON FACILITY LOCATED IN CHICAGO, ILLINOIS

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MAY 25, 2018
STACK TEST GROUP, INC. PROJECT NO. 18-3042

Report Prepared By:

Bill J. Byczynski
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TABLE OF CONTENTS

		Page #
1.0	Executive Summary	1
2.0	Introduction	1
3.0	Summary of Sampling Procedures	2
3.1	Exhaust Gas Parameters	2
	3.1.1 Traverse and Sampling Points	2
	3.1.2 Gas Composition	2
	3.1.2 Moisture Content	2
3.2	VOC Emission Testing	2
	3.2.1 Sampling Method	2
	3.2.2 Sample Duration and Frequency	3
	3.2.3 Calibrations	3
4.0	Discussion of Results	3
	Table 4.1 – Shredder Exhaust Test Results	4

APPENDIX A	EXAMPLE CALCULATIONS
APPENDIX B	FIELD DATA SHEETS
APPENDIX C	FIELD PARAMETER SHEET
APPENDIX D	CALIBRATION DATA
APPENDIX E	DATA LOGGER RECORDINGS
APPENDIX F	CALIBRATION GAS CERTIFICATION SHEETS
APPENDIX G	RESPONSE FACTOR DETERMINATION FOR VOC EXEMPT COMPOUNDS
APPENDIX H	LABORATORY REPORT FOR EXEMPT COMPOUNDS
APPENDIX I	LOCATION OF SAMPLE PORTS & POINTS

1.0 EXECUTIVE SUMMARY

On May 25, 2018, The Stack Test Group, Inc. performed volatile organic compound (VOC) emission testing on the shredder exhaust at the General Iron facility located in Chicago, IL. Three one-hour tests were conducted on this source for the VOC emission testing. Presented below are the average results of these tests.

Shredder Exhaust Stack:

VOC Concentration:	240.4 PPM as Propane Uncorrected
VOC Concentration:	104.20 Pounds per Hour Uncorrected
VOC Concentration:	218.9 PPM as Propane Corrected*
VOC Concentration:	94.87 Pounds per Hour Corrected*

*VOC corrected refers to correcting for exempt compounds

2.0 INTRODUCTION

On May 25, 2018, The Stack Test Group, Inc. performed volatile organic compound (VOC) emission testing on the shredder exhaust at the General Iron facility located in Chicago, IL.

Testing was conducted while General Iron personnel operated the shredder and corresponding control equipment under normal conditions. A copy of the operating data is included.

Testing was conducted by Mr. Bill J. Byczynski, Mr. Nicholas Sergenti, Mr. Lee Kennedy and Mr. Benjamin Byczynski of the Stack Test Group, Inc. Testing was under the direction of Ms. Ann M. Zwick of Freeborn & Peters, LLC. Testing was witnessed by Mr. Kevin Mattison of the Illinois Environmental Protection Agency (IEPA) and Mr. Scott Connolly of the U.S. EPA.

A TO-15 sample was integrated simultaneously with the Method 25A testing. The samples were sent to the laboratory and analyzed for exempt VOC compounds per Method TO-15. A response factor was then developed on the FID used in this test series. The response factor for each compound was used in subtracting the exempt VOC compounds from the total VOC readings.

All testing followed the guidelines of U.S. EPA Reference Methods 1 through 4, 25A and TO-15. This report contains a summary of results for the above-mentioned tests and all the supporting field, process, and computer generated data.

At the beginning of the test series, the analyzer was calibrated and then checked for calibration error by introducing zero, low-range, mid-range and high-range calibration gases to the back of the analyzers. Before and after each individual test run, a system bias was performed by introducing a zero and mid-range propane calibration gas to the outlet of the probe. Calibration gases used were U.S. EPA Protocol 1 certified.

3.3.2 Sample Duration and Frequency

The Method 25A train samples were collected in triplicate with each test lasting sixty minutes in duration.

3.3.3 Calibrations

All sampling equipment was calibrated according to the procedures outlined in EPA Reference Method 25A. Copies of the FID calibrations are included in Appendix D.

4.0 TEST RESULTS

Presented in this section are the results of this test series. Test results are reported in Table 4.1. Table 4.1 reports the results for the shredder exhaust including stack gas temperature, percent carbon dioxide and oxygen, percent moisture, molecular weight of the stack gas dry and wet, velocity in feet per second (fps), and flow rate in actual cubic feet per minute (acfm), standard cubic feet per minute (scfm), and dry standard cubic feet per minute (dscfm).

Tables 4.1 also presents the VOC results for the shredder exhaust. The VOC results are presented in terms of parts per million as propane uncorrected, ppm as propane corrected, pounds per standard cubic feet (lb/scf), and pounds per hour (lb/hr). · The exempt VOC compounds are also listed in Table 4.1 in terms of ppm. The exempt VOC compounds are subtracted from the total VOC uncorrected ppm to obtain the corrected ppm.

Copies of the calculations used to determine these emission rates may be found in Appendix A. Copies of the field data sheets are presented in Appendix B. Copies of equipment calibrations are presented in Appendix D.

Table 4.1

VOC Results
General Iron
Chicago, IL
05/25/18
Shredder Exhaust

Test No:	T1	T2	T3	Avg.
Start Time:	08:35 AM	09:49 AM	11:05 AM	
Finish Time:	09:35 AM	10:48 AM	12:26 PM	
Stack Gas Temperature, °F:	114.1	116.8	119.1	116.7
% Carbon Dioxide:	0.2	0.2	0.1	0.2
% Oxygen:	20.5	20.5	20.7	20.6
% Moisture:	4.10	3.77	3.86	3.91
Molecular Weight dry, lb/lb-Mole:	28.85	28.85	28.84	28.85
Molecular Weight wet, lb/lb-Mole:	28.41	28.44	28.42	28.42
Velocity and Flow Results:				
Average Stack Gas Velocity FPS:	85.33	86.43	87.20	86.32
Stack Gas Flow Rate, ACFM:	69,834	70,734	71,364	70,644
Stack Gas Flow Rate, SCFM:	62,834	63,341	63,654	63,276
Stack Gas Flow Rate, DSCF/HR:	3,615,492	3,657,182	3,671,800	3,648,158
Stack Gas Flow Rate, DSCFM:	60,258	60,953	61,197	60,803
VOC Results (Uncorrected):				
PPM as Propane:	281.0	169.9	270.3	240.4
LBS/DSCF:	3.21E-05	1.94E-05	3.09E-05	2.75E-05
LBS/HR (as Propane):	120.98	73.74	117.89	104.20
VOC Results (Corrected):				
PPM as Propane:	268.8	146.6	241.4	218.9
LBS/DSCF:	3.07E-05	1.67E-05	2.76E-05	2.50E-05
LBS/HR (as Propane):	115.72	63.61	105.27	94.87

APPENDIX A

SAMPLE CALCULATIONS

GENERAL IRON
CHICAGO, IL

STG PROJECT No: 18-3042

SAMPLE CALCULATIONS

The tables presenting the results are generated electronically from raw data. It may not be possible to exactly duplicate these results using a calculator. The reference method data, results and all calculations are carried to sixteen decimal places throughout. The final table is formatted to an appropriate number of significant figures.

1. Volume of water collected (wscf)

$$V_{wstd} = (0.04707)(V_{lc})$$

Where:

V_{lc}	total volume of liquid collected in impingers and silica gel (ml)
V_{wstd}	volume of water collected at standard conditions (ft^3)
0.04707	conversion factor (ft^3/ml)

2. Volume of gas metered, standard conditions (dscf)

$$V_{mstd} = \frac{(17.64)(V_m)\left(P_{bar} + \frac{\Delta H}{13.6}\right)(Y_d)}{(460 + T_m)}$$

Where:

P_{bar}	barometric pressure (in. Hg)
T_m	average dry gas meter temperature (°F)
V_m	volume of gas sample through the dry gas meter at meter conditions (ft^3)
V_{mstd}	volume of gas sample through the dry gas meter at standard conditions (ft^3)
Y_d	gas meter correction factor (dimensionless)
ΔH	average pressure drop across meter box orifice (in. H_2O)
17.64	conversion factor (°R/in. Hg)
13.6	conversion factor (in. H_2O/in. Hg)
460	°F to °R conversion constant

SAMPLE CALCULATIONS (CONTINUED)

3. Volume of gas metered, standard conditions (dscm)

$$V_{mstd(m)} = \frac{\left(V_{mstd(ft)}\right)}{35.35}$$

Where:

$V_{mstd(ft)}$	volume of gas sample through the dry gas meter at standard conditions (ft^3)
$V_{mstd(m)}$	volume of gas sample through the dry gas meter at standard conditions (m^3)
35.35	conversion factor (ft^3 to m^3)
13.6	conversion factor (in. H_2O/in. Hg)

4. Sample gas pressure (in. Hg)

$$P_s = P_{bar} + \left(\frac{P_g}{13.6}\right)$$

Where:

P_{bar}	barometric pressure (in. Hg)
P_g	sample gas static pressure (in. H_2O)
P_s	absolute sample gas pressure (in. Hg)
13.6	conversion factor (in. H_2O/in. Hg)

5. Actual vapor pressure (in. Hg)[1]

$$P_v = P_s$$

Where:

P_v	vapor pressure, actual (in. Hg)
P_s	absolute sample gas pressure (in. Hg)

6. Moisture content (%)

$$B_{wo} = \frac{V_{wstd}}{V_{mstd} + V_{wstd}}$$

Where:

B_{wo}	proportion of water vapor in the gas stream by volume (%)
V_{mstd}	volume of gas sample through the dry gas meter at standard conditions (ft^3)
V_{wstd}	volume of water collected at standard conditions (ft^3)

[1] For effluent gas temperatures over 212°F, P_v is assumed to be equal to P_s.

GENERAL IRON
CHICAGO, IL

STG PROJECT No: 18-3042

SAMPLE CALCULATIONS (CONTINUED)

7. Saturated moisture content (%)

$$B_{ws} = \frac{(P_v)}{(P_s)}$$

Where:

B_{ws}	proportion of water vapor in the gas stream by volume at saturated conditions (%)
P_s	absolute sample gas pressure (in. Hg)
P_v	vapor pressure, actual (in. Hg)

Whichever moisture value is smaller is used for B_{wo} in the following calculations.

8. Molecular weight of dry gas stream (lb/lb·mole)

$$M_d = M_{CO_2}\frac{(CO_2)}{(100)} + M_{O_2}\frac{(O_2)}{(100)} + M_{CO+N_2}\frac{(CO+N_2)}{(100)}$$

Where:

Md	dry molecular weight of sample gas (lb/lb·mole)
M_{CO_2}	molecular weight of carbon dioxide (lb/lb·mole)
M_{O_2}	molecular weight of oxygen (lb/lb·mole)
$M_{CO}+N_2$	molecular weight of carbon monoxide and nitrogen (lb/lb·mole)
CO_2	proportion of carbon dioxide in the gas stream by volume (%)
O_2	proportion of oxygen in the gas stream by volume (%)
$CO+N_2$	proportion of carbon monoxide and nitrogen in the gas stream by volume (%)
100	conversion factor (%)

9. Molecular weight of sample gas (lb/lb·mole)

$$M_s = (M_d)(1 - B_{wo}) + (M_{H_2O})(B_{wo})$$

Where:

B_{wo}	proportion of water vapor in the gas stream by volume
M_d	dry molecular weight of sample gas (lb/lb·mole)
M_{H_2O}	molecular weight of water (lb/lb·mole)
M_s	molecular weight of sample gas, wet basis (lb/lb·mole)

GENERAL IRON
CHICAGO, IL

STG PROJECT No: 18-3042

SAMPLE CALCULATIONS (CONTINUED)

10. Velocity of sample gas (ft/sec)

$$V_s = (K_p)(C_p)\left(\overline{\sqrt{\Delta P}}\right)\left(\sqrt{\frac{(\overline{T_s}+460)}{(M_s)(P_s)}}\right)$$

Where:

K_p	velocity pressure coefficient (dimensionless)
C_p	pitot tube constant
M_s	molecular weight of sample gas, wet basis (lb/lb·mole)
P_s	absolute sample gas pressure (in. Hg)
T_s	average sample gas temperature (°F)
V_s	sample gas velocity (ft/sec)
$\overline{\sqrt{\Delta P}}$	average square roots of velocity heads of sample gas (in. H_2O)
460	°F to °R conversion constant

11. Total flow of sample gas (acfm)

$$Q_a = (60)(A_s)(V_s)$$

Where:

A_s	cross sectional area of sampling location (ft^2)
Q_a	volumetric flow rate at actual conditions (acfm)
V_s	sample gas velocity (ft/sec)
60	conversion factor (sec/min)

12. Total flow of sample gas (dscfm)

$$Q_{std} = \frac{(Q_a)(P_s)(17.64)(1-B_{wo})}{(\overline{T_s}+460)}$$

Where:

B_{wo}	proportion of water vapor in the gas stream by volume
P_s	absolute sample gas pressure (in. Hg)
Q_a	volumetric flow rate at actual conditions (acfm)
Q_{std}	volumetric flow rate at standard conditions, dry basis (dscfm)
T_s	average sample gas temperature (°F)
17.64	conversion factor (°R/in. Hg)
460	°F to °R conversion constant

SAMPLE CALCULATIONS (CONTINUED)

13. VOC concentration (lb/scf)

$$E_{lb/scf} = \frac{(ppm)(MW)}{(385.3 \times 10^6)}$$

Where:

$E_{lb/scf}$	emission rate
C_{ppm}	measured concentration in the gas stream (ppm_v)
MW	molecular weight of NMP (99.13)
385.3	conversion factor

14. VOC emission (lb/hr)

$$E_{lb/hr} = (lb/scf)(60)(scfm)$$

Where:

$E_{lb/hr}$	emission rate
$E_{lb/scf}$	concentration
SCFM	flow rate
$60_{min/hr}$	conversion factor

APPENDIX B

FIELD DATA SHEETS

FLOW / MOISTURE DATA SHEET

Location: General Iron
Unit: Shredder
Inlet **Outlet**

Run: 1

Vam **Testing**

Method 1- 4, 25A

Client: General Iron	Meter Lk Ck Pre: .004 @ 23 "			Bar. Press. (in. Hg): 29.33	
Plant: Chicago, IL	Meter Lk Ck Post: .001 @ 6 "			Pitot ID No.: STG-7	
Meter Operator: BR/NS	Pitot Lk Ck: +0.0@ 7.1 -0.0@ " 6.6			O_2 (dry, vol. %): SEE DATA LOGGER	
Probe Operator: LH	Start Time (approx.): 0810 / 0835			CO_2 (dry, vol. %):	
Date: 5/25/18	Stop Time (approx.): 9:35			H_2O (condensate, ml): 34	
Meter Box No.: 70	Static Press. (in. H2O): -.81			H_2O (silica gel, g): 6	
Y_d: 0.978	Port Length (in.): 8.0			Total H_2O: 40	
ΔH: 1.463	First Point (all the way): (in) (out)	Duct Dimensions (in.): 50			

Pre Velocity Traverse			Moisture Train							Post Velocity Traverse		
Traverse Point Number	Pitot ΔP (in. H2O)	Stack Temp, Ts (°F)	Min./Pt. 5 / Elapsed Time	Metered Vol. (ft³)	Sample ΔH (in.H2O)	Dry Gas Meter Tmi (°F)	Dry Gas Meter Tmo (°F)	Exit Temp. (°F)	Pump Vac (in.H2O)	Pitot ΔP (in. H2O)	Stack Temp, Ts (°F)	Notes
				387.65								
1	2.1	112	5	375.81	1.5	71	70	55	3.0	1.9	116	
2	2.2	112	10	397.64		77	70	56	3.0	1.7	117	
3	2.2	112	15	399.46		74	72	55	3.0	1.7	117	
4	2.2	113	20	403.48		89	75	52	3.0	1.8	116	
5	2.2	113	25	407.29		96	77	54	3.0	1.7	116	
6	2.4	114	30	411.19		98	77	61	3.0	1.7	116	
7	2.5	114	35	415.13		98	80	62	3.0	1.9	117	
8	2.4	116	40	419.08		98	81	62	3.0	2.0	116	
1	2.2	104	45	423.04		98	82	63	3.0	1.5	118	
2	2.3	101	50	426.94		98	83	63	3.0	1.7	118	
3	2.4	108	55	431.01		98	84	64	3.0	1.6	118	
4	2.5	108	60	434.92		99	84	60		1.7	118	
5	2.5	109								1.8	118	
6	2.4	110								1.9	118	
7	2.4	108								2.0	118	
8	2.2	102								2.1	118	
Avg.	1.5222	110.94		Ending FV: 434.92	1.50		84.50			1.3380	117.19	

Stack Test Group, Inc.

1.4301 114.07

B-45

R 001355

GI0000222

FLOW / MOISTURE DATA SHEET

Location: General Iron
Unit: Shredder
Inlet **Outlet**
Run: 2
Vom **Testing**
Method 1- 4, 25A

Client:	General Iron
Plant:	Chicago, IL
Meter Operator:	LW/BB
Probe Operator:	LW
Date:	5/23/14
Meter Box No.:	70
Y_d:	0.978
ΔH:	1.463

Meter Lk Ck Pre:	.001 @ 18 "
Meter Lk Ck Post:	.001 @ 6 "
Pitot Lk Ck:	+.00 @ 7.1 -.00@6.6"
Start Time (approx.):	9:44
Stop Time (approx.):	10:49
Static Press. (in. H2O):	-0.41
Port Length (in.):	8 in
First Point (all the way): (in) (out)	

Duct Dimensions (in.): 50

Bar. Press. (in. Hg):	29.33
Pitot ID No.:	STG-7
O_2 (dry, vol. %):	SEE
CO_2 (dry, vol. %):	DATALOGGER
H_2O (condensate, ml):	32
H_2O (silica gel, g):	~~8~~
Total H_2O:	40

Pre Velocity Traverse | Moisture Train | Post Velocity Traverse

Traverse Point Number	Pitot ΔP (in. H2O)	Stack Temp. Ts (°F)	Min/Pt. 5 Elapsed Time	Metered Vol. (ft³) 435.08	Sample ΔH (in.H2O)	Dry Gas Meter Tmi (°F)	Dry Gas Meter Tmo (°F)	Exit Temp. (°F)	Pump Vac. (in.H20)	Pitot ΔP (in. H2O)	Stack Temp. Ts (°F)	Notes
1	1.9	116	5	439.23	1.5	85	85	50	2.0	1.6	113	
2	1.7	117	10	442.90		103	86	51	2.0	1.7	117	
3	1.7	117	15	446.57		103	86	51	2.0	1.9	119	
4	1.8	116	20	451.79		104	87	52	2.0	1.8	120	
5	1.7	116	25	455.86		103	88	53	2.0	2.0	120	
6	1.7	116	30	460.01		104	89	54	2.0	2.2	120	
7	1.9	117	35	464.17		103	89	56	2.0	2.2	120	
8	2.0	116	40	468.33		103	90	57	2.0	2.1	120	
1	1.5	118	45	472.56		103	90	58	2.0	2.0	111	
2	1.7	118	50	476.66		104	91	58	2.0	2.0	112	
3	1.6	118	55	480.89		104	92	60	2.0	1.5	118	
4	1.7	118	60	484.99		100	91	60	2.0	1.7	119	
5	1.4	118								1.6	119	
6	1.9	118								1.5	118	
7	2.0	118								1.9	109	
8	2.1	118								1.9	108	
Avg.	1.3380	117.19					95.04			1.5535	116.44	

Stack Test Group, Inc.

1.4458 116.82

B-46

R 001356

GI000223

FLOW / MOISTURE DATA SHEET

Location: General Iron
Unit: Shredder — **Run:** 3 — VOM **Testing** — **Method 1-4,** 25A
Inlet **Outlet**

Client: General Iron	Meter Lk Ck Pre: .002 @ 20 "		Bar. Press. (In. Hg): 29.33
Plant: Chicago, IL	Meter Lk Ck Post: .002 @ 10 "		Pitot ID No.: STG-7
Meter Operator: LW/BB	Pitot Lk Ck: +.00 @ 7.1 -.00 @ 6.6"		O_2 (dry, vol. %): SEE
Probe Operator: LW	Start Time (approx.): 11:05		CO_2 (dry, vol. %): DATALOGGER
Date: 5-25-18	Stop Time (approx.): 12:26		H_2O (condensate, ml): 30
Meter Box No.: 70	Static Press. (In. H2O): -0.81		H_2O (silica gel, g): 9
Y_d: 0.978	Port Length (in.): 9 in		Total H_2O: 39
ΔH: 1.463	First Point (all the way): (in) (out)	Duct Dimensions (in.): 60	

Pre Velocity Traverse — **Moisture Train** — **Post Velocity Traverse**

Traverse Point Number	Pitot ΔP (In. H2O)	Stack Temp Ts (°F)	Min/Pt: 5 Elapsed Time	Metered Vol. (ft³)	Sample ΔH (In. H2O)	Dry Gas Meter Tmi (°F)	Dry Gas Meter Tmo (°F)	Exit Temp. (°F)	Pump Vac (In. H20)	Pitot ΔP (In. H2O)	Stack Temp Ts (°F)	Notes
				485.89								
1	1.6	113	5	489.92	1.5	101	91	53	3.0	1.9	120	
2	1.7	117	10	494.08		107	91	56	3.0	1.9	124	
3	1.9	114	15	498.25		108	92	57	3.0	1.7	124	
4	1.9	120	20	502.45		108	93	59	3.0	1.8	125	
5	2.0	120	25	506.67		104	93	61	3.0	1.7	125	
6	2.2	120	30	511.08		99	92	59	3.0	1.8	125	
7	2.2	120	35	515.24		107	93	64	3.0	1.7	125	
8	2.1	120	40	519.36		108	93	60	3.0	1.7	126	
1	2.0	111	45	523.50		108	94	63	3.0	2.0	125	
2	2.0	112	50	527.65		108	94	64	3.0	1.8	118	
3	1.8	118	55	531.82		108	95	64	3.0	1.6	120	
4	1.7	119	60	536.22		108	95	64	3.0	1.7	118	
5	1.6	114								2.0	119	
6	1.5	118								2.0	118	
7	1.9	109								2.0	118	
8	1.9	108								2.0	114	
Avg.	1.5535	116.44					99.58			1.3510	121.75	

Stack Test Group, Inc.

1.4553

119.10

B-47

R 001357

GI0000224

APPENDIX C

FIELD PARAMETER SHEET

STACK TEST GROUP, INC.
Air Quality Services

Exhaust VOC Sampling Train Calculations

Client:	General Iron
Project No:	18-3042
Date:	05/25/18
Source:	Shredder Exhaust

Test No:	T1	T2	T3	Avg.
Start Time:	08:35 AM	09:49 AM	11:05 AM	
Finish Time:	09:35 AM	10:48 AM	12:26 PM	
Pitot Cal. Factor:	0.84	0.84	0.84	
Meter Calibration Factor:	0.978	0.978	0.978	
Stack Length, inches:	0	0	0	
Stack Width, inches:	0	0	0	
Stack Diameter, inches:	50	50	50	
Barometric Pressure, inches Hg:	29.33	29.33	29.33	
Static Pressure in Stack, Inches H2O:	-0.81	-0.81	-0.81	
Duration of Sample, minutes:	60	60	60	
Meter Start Volume:	387.65	435.08	485.89	
Meter Final Volume:	434.92	484.98	536.22	
Average Meter Pressure, Inches H2O:	1.50	1.50	1.50	1.5000
Average Meter Temperature, degrees F:	84.5	95.04	99.58	93.0
Average Sqrt. Velocity Pressure:	1.4301	1.4458	1.4553	1.4437
Stack Gas Temperature, degrees F:	114.1	116.8	119.1	116.7
% Carbon Dioxide:	0.2	0.2	0.1	0.2
% Oxygen:	20.5	20.5	20.7	20.6
% Carbon Monoxide:	0.0	0.0	0.0	0.0
Liquid Volume Collected, milliliters:	40	38	39	39.0

Sample Train Calculations

Meter Volume, Actual:	47.270	49.900	50.330	49.167
Meter Volume, STP:	44.093	45.665	45.680	45.146
Volume of Water Vapor Condensed:	1.883	1.789	1.836	1.836
Total Gas Sampled:	45.976	47.454	47.516	46.982
% Moisture:	4.10	3.77	3.86	3.91
Area of Stack, Square Feet:	13.64	13.64	13.64	13.64
% Excess Air at Test Location:	4710.5	4710.5	9913.8	6444.9
Molecular Weight dry, lb/lb-Mole:	28.85	28.85	28.84	28.85
Molecular Weight wet, lb/lb-Mole:	28.41	28.44	28.42	28.42
Absolute Stack Gas Pressure, in Hg:	29.27	29.27	29.27	29.27

Velocity and Flow Calculations

Average Stack Gas Velocity FPS:	85.33	86.43	87.20	86.32
Stack Gas Flow Rate, ACFM:	69,834	70,734	71,364	70,644
Stack Gas Flow Rate, SCFM:	62,834	63,341	63,654	63,276
Stack Gas Flow Rate, DSCF/HR:	3,615,492	3,657,182	3,671,800	3,648,158
Stack Gas Flow Rate, DSCFM:	60,258	60,953	61,197	60,803

VOC Calculations (Uncorrected):

PPMvw as Propane:	281.0	169.9	270.3	240.4
LBS/DSCF:	3.21E-05	1.94E-05	3.09E-05	2.75E-05
LBS/HR:	120.98	73.74	117.89	104.20

VOC Calculations (Corrected):

PPM Chloromethane:	0.02	0.02	0.02	0.02
PPM Chloromethane RF Adjusted:	0.01	0.01	0.01	0.01
PPM Freon 22:	8.34	2.83	0.00	3.72
PPM Freon 22 RF Adjusted:	3.98	1.35	0.00	1.78
PPM Freon 12:	0.88	0.41	0.89	0.73
PPM Freon 12 RF Adjusted:	1.03	0.48	1.05	0.85
PPM Freon 152A:	0.00	3.84	1.56	1.80
PPM Freon 152A RF Adjusted:	0.00	4.42	1.79	2.07
PPM Freon 134A:	0.02	0.02	0.02	0.02
PPM Freon 134A RF Adjusted:	0.02	0.02	0.02	0.02
PPM Octamethycyclotetrasiloxane:	2.14	0.00	0.00	0.71
PPM Octamethycyclotetrasiloxane RF Adjusted:	2.46	0.00	0.00	0.82
PPM Acetone:	2.71	14.73	29.91	15.8
PPM Acetone RF Adjusted:	1.95	10.61	21.54	11.4
PPM Methylene Chloride:	0.22	0.18	0.18	0.2
PPM Methylene Chloride RF Adjusted:	0.24	0.20	0.20	0.2
PPM Tetrachloroethylene:	0.03	0.03	0.04	0.0
PPM Tetrachloroethylene RF Adjusted:	0.04	0.04	0.05	0.0
PPM Freon 11**:	2.000	10.21	5.98	6.1
PPM Tetrachloroethylene RF Adjusted**:	0.95	4.87	2.85	2.9
PPM Methane (as Propane):	1.10	1.03	1.13	1.09
PPM Ethane (as Propane):	0.42	0.30	0.30	0.34
PPMv as Propane (Corrected):	268.8	146.6	241.4	218.9
LBS/DSCF (Corrected):	3.07E-05	1.67E-05	2.76E-05	2.50E-05
LBS/HR (Corrected):	115.72	63.61	105.27	94.87

* See Appendix G for response factor determinations for each compound.
** Freon 11 is an ESTIMATED response factor. The laboratory was not able to obtain a Freon 11 sample in order to develop a response factor by the issuance deadline of this report.

APPENDIX D

CALIBRATIONS

General Iron
18-3042
Chicago, Illinois
EPA Method 25A
Shredder Exhaust
Exhaust Stack (1,000 Range)

Analyte	VOC		Wet
Initial Calibration	Value	Response	Calibration Error
***Span	1145.0		
High	916.0	927.0	1.20%
Mid	506.3	527.0	4.09%
Low	305.0	316.0	3.61%
Zero	0.0	1.0	0.09%

*Pre Upscale and Corrected Run Average cells must be adjusted if a high or low calibration gas is used for post calibration upscale checks.

***All Drift and Bias calculations for VOC are based off of the most lenient Span value possible (High Cal gas is 80% of Span). May not agree with report values if a more restrictive span is identified.

Type	Run Average	Pre Zero	Post Zero	*Pre Upscale	Post Upscale	Zero System Bias	Upscale System Bias	Zero Drift	Upscale Drift
Initial System Bias Check									
Run 1	281.0	1.0	10.0	527.0	522.0			0.79%	0.44%
Run 2	169.9	10.0	10.0	522.0	534.0			0.00%	1.05%
Run 3	270.3	10.0	11.0	534.0	529.0			0.09%	0.44%

General Iron
18-3042
Chicago, Illinois
EPA Method 25A
Shredder Exhaust
Exhaust Stack (10,000 range)

Analyte	VOC		Wet
Initial Calibration	Value	Response	Calibration Error
***Span	10621.3		
High	8497.0	8421.0	0.89%
Mid	4988.0	4861.0	2.55%
Low	2976.0	2955.0	0.71%
Zero	0.0	1.0	0.01%

*Pre Upscale and Corrected Run Average cells must be adjusted if a high or low calibration gas is used for post calibration upscale checks.

***All Drift and Bias calculations for VOC are based off of the most lenient Span value possible (High Cal gas is 80% of Span). May not agree with report values if a more restrictive span is identified.

Type	Run Average	Pre Zero	Post Zero	*Pre Upscale	Post Upscale	Zero System Bias	Upscale System Bias	Zero Drift	Upscale Drift
Initial System Bias Check									
Run 1	281.0	1.0	10.0	4861.0	4900.0			0.08%	0.37%
Run 2	169.9	10.0	10.0	4861.0	4900.0			0.00%	0.37%
Run 3	270.3	10.0	11.0	4861.0	4900.0			0.01%	0.37%

General Iron 18-3042
Chicago, Illinois
5/25/2018
Shredder Exhaust

Analyte	Oxygen		Dry
Initial Calibration	Value	Response	Calibration Error
High	23.20	23.20	0.00%
Mid	11.91	12.00	0.39%
Low (Zero)	0.00	0.00	0.00%

*Corrected Run Average and Upscale System Bias cell formulas must be adjusted if the high calibration gas is used for post calibration upscale checks.

Type	Run Average	Pre Zero	Post Zero	Pre Upscale	Post Upscale	*Corrected Run Average	Zero System Bias	*Upscale System Bias	Zero Drift	Upscale Drift
Initial System Bias Check			0.0		12.0		0.00%	0.00%		
Run 1	20.7	0.0	0.0	12.0	12.0	20.5	0.00%	0.00%	0.00%	0.00%
Run 2	20.7	0.0	0.0	12.0	12.0	20.5	0.00%	0.00%	0.00%	0.00%
Run 3	20.7	0.0	0.1	12.0	11.9	20.7	0.43%	0.43%	0.43%	0.43%

Analyte	Carbon Dioxide		Dry
Initial Calibration	Value	Response	Calibration Error
High	24.01	24.00	0.04%
Mid	12.15	12.00	0.62%
Low (Zero)	0.00	0.10	0.42%

*Corrected Run Average and Upscale System Bias cell formulas must be adjusted if the high calibration gas is used for post calibration upscale checks.

Type	Run Average	Pre Zero	Post Zero	Pre Upscale	Post Upscale	*Corrected Run Average	Zero System Bias	*Upscale System Bias	Zero Drift	Upscale Drift
Initial System Bias Check			0.0		12.0		0.42%	0.00%		
Run 1	0.2	0.0	0.0	12.0	12.0	0.2	0.42%	0.00%	0.00%	0.00%
Run 2	0.2	0.0	0.1	12.0	12.0	0.2	0.00%	0.00%	0.42%	0.00%
Run 3	0.2	0.1	0.1	12.0	11.8	0.1	0.00%	0.83%	0.00%	0.83%

APEX INSTRUMENTS
EPA Method 5
522 Series Meter Box Calibration
Pre-Test Orifice Method
English Meter Box Units, English K' Factor

Filename: S:\Calibrations\MeterCals\[Meter Cal Spread Sheet.xls]27100203
Revised: 7/21/95 Version: 2.2

Model #: Apex Method 5
Serial #: 70

Date: ------------------------> 11/9/17
Barometric Pressure: ---------> 29.65 (in. Hg)
Theoretical Critical Vacuum:---> 13.99 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

B-55

----- DRY GAS METER READINGS -----										-CRITICAL ORIFICE READINGS-					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	-- Ambient Temperature --		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
0.51	13.00	837.620	843.720	6.100	65.0	65.0	67.0	64.0	CJ48	0.350	23.0	68.0	68.0	68.0
0.93	10.00	843.940	850.140	6.200	68.0	64.0	71.0	66.0	CJ55	0.461	22.0	68.0	68.0	68.0
1.60	11.00	850.300	859.060	8.760	71.0	65.0	77.0	68.0	CJ63	0.598	20.0	68.0	68.0	68.0
3.00	19.00	859.250	880.000	20.750	76.0	67.0	91.0	73.0	CJ73	0.821	17.5	68.0	68.0	68.0
4.50	6.00	880.200	888.310	8.110	86.0	73.0	97.0	75.0	CJ81	1.012	15.0	68.0	68.0	68.0

** RESULTS **

-- DRY GAS METER --		-------- ORIFICE --------			-- DRY GAS METER --		-------- ORIFICE --------		
VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL	CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@		
Vm(std) (cu ft)	Vm(std) (liters)	Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)	Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)
6.082	172.2	5.878	166.5	5.934	0.968	-0.011	1.400	35.56	-0.063
6.165	174.6	5.942	168.3	5.999	0.964	-0.014	1.477	37.51	0.013
8.675	245.7	8.494	240.5	8.574	0.979	0.001	1.500	38.10	0.037
20.370	576.9	20.118	569.8	20.310	0.988	0.010	1.486	37.74	0.023
7.902	223.8	7.837	221.9	7.911	0.992	0.014	1.454	36.93	-0.009
		Average Y ------>			0.978		1.463	37.17	<------ Average dH@

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED: [signature] Date: 11-9-17

R 001365

GI0000232

StackTestGroup

Pitot Tube
Calibration Sheet

Client General Iron

Plant Chicago, IL

Pitot ID P-7A-S-Type

External Tubing Diameter	0.375	inches
Base To Opening Plane Distance(P_a)	0.521	inches
Base To Opening Plane Distance(P_b)	0.523	inches
Pitot Cofficient	0.84	

B-56

	Measured	Allowable
P_a/D_t	1.389	1.05-1.50
P_b/D_t	1.395	1.05-1.50
Angle $\alpha 1°$	0.0	10.0
Angle $\alpha 1°$	0.0	10.0
Angle $\beta 1°$	0.0	5.0
Angle $\beta 1°$	0.0	5.0
z (inches)	0	0.125 in.
w(inches)	0.000	0.031 in.

Signiture R. Schueller

Date 1/5/2018

R 001366

GI0000233

Pyrometer Calibration Sheet

STG Project No. 18-3042
Client: General Iron
Chicago, IL

Date: 5/25/2018
Date Calibrated: 1/5/2018
Temperature Scale Used: °F

Probe No. STG-7A
Reference Used: Mercury Thermometer

Calibration Reference Settings °F	Pyrometer Reading °F
29	30
76	76
212	213

Calibrated by: R. Schueller

APPENDIX E

VOC DATALOGGER RECORDINGS

General Iron 18-3042
Chicago, Illinois
Shredder Exhaust
Method 25A
Run 1

Date	Time	O_2 %	CO_2 %	VOC PPMvw
2018/05/25	8:35:00 AM	20.7	0.2	322
2018/05/25	8:36:00 AM	20.7	0.2	309
2018/05/25	8:37:00 AM	20.7	0.2	295
2018/05/25	8:38:00 AM	20.8	0.2	234
2018/05/25	8:39:00 AM	20.7	0.2	202
2018/05/25	8:40:00 AM	20.7	0.2	204
2018/05/25	8:41:00 AM	20.7	0.2	441
2018/05/25	8:42:00 AM	20.7	0.2	157
2018/05/25	8:43:00 AM	20.7	0.2	95
2018/05/25	8:44:00 AM	20.7	0.2	297
2018/05/25	8:45:00 AM	20.7	0.2	387
2018/05/25	8:46:00 AM	20.7	0.2	414
2018/05/25	8:47:00 AM	20.8	0.2	264
2018/05/25	8:48:00 AM	20.7	0.2	564
2018/05/25	8:49:00 AM	20.7	0.2	177
2018/05/25	8:50:00 AM	20.7	0.2	788
2018/05/25	8:51:00 AM	20.7	0.2	252
2018/05/25	8:52:00 AM	20.7	0.2	577
2018/05/25	8:53:00 AM	20.7	0.2	225
2018/05/25	8:54:00 AM	20.7	0.2	427
2018/05/25	8:55:00 AM	20.7	0.2	430
2018/05/25	8:56:00 AM	20.8	0.2	176
2018/05/25	8:57:00 AM	20.7	0.2	124
2018/05/25	8:58:00 AM	20.7	0.2	408
2018/05/25	8:59:00 AM	20.8	0.2	197
2018/05/25	9:00:00 AM	20.8	0.2	172
2018/05/25	9:01:00 AM	20.7	0.2	193
2018/05/25	9:02:00 AM	20.7	0.2	218
2018/05/25	9:03:00 AM	20.7	0.2	160
2018/05/25	9:04:00 AM	20.7	0.2	459
2018/05/25	9:05:00 AM	20.7	0.2	1062
2018/05/25	9:06:00 AM	20.7	0.2	355
2018/05/25	9:07:00 AM	20.7	0.2	211
2018/05/25	9:08:00 AM	20.7	0.2	772
2018/05/25	9:09:00 AM	20.7	0.2	181
2018/05/25	9:10:00 AM	20.8	0.2	42
2018/05/25	9:11:00 AM	20.7	0.2	449
2018/05/25	9:12:00 AM	20.7	0.2	296
2018/05/25	9:13:00 AM	20.7	0.2	213
2018/05/25	9:14:00 AM	20.7	0.2	174
2018/05/25	9:15:00 AM	20.7	0.2	104
2018/05/25	9:16:00 AM	20.7	0.2	321
2018/05/25	9:17:00 AM	20.7	0.2	163
2018/05/25	9:18:00 AM	20.7	0.2	242
2018/05/25	9:19:00 AM	20.7	0.2	357
2018/05/25	9:20:00 AM	20.7	0.2	52
2018/05/25	9:21:00 AM	20.7	0.2	100
2018/05/25	9:22:00 AM	20.7	0.2	214
2018/05/25	9:23:00 AM	20.8	0.2	183
2018/05/25	9:24:00 AM	20.7	0.2	288
2018/05/25	9:25:00 AM	20.7	0.2	212
2018/05/25	9:26:00 AM	20.7	0.2	111
2018/05/25	9:27:00 AM	20.7	0.2	194
2018/05/25	9:28:00 AM	20.7	0.2	292
2018/05/25	9:29:00 AM	20.7	0.2	184
2018/05/25	9:30:00 AM	20.7	0.2	190
2018/05/25	9:31:00 AM	20.7	0.2	177
2018/05/25	9:32:00 AM	20.7	0.2	255
2018/05/25	9:33:00 AM	20.7	0.2	209
2018/05/25	9:34:00 AM	20.7	0.2	87
	Avg.	20.7	0.2	281.0

General Iron 18-3042
Chicago, Illinois
Shredder Exhaust
Method 25A
Run 2

Date	Time	O_2 %	CO_2 %	VOC PPMvw
2018/05/25	9:49:00 AM	20.7	0.2	11
2018/05/25	9:50:00 AM	20.7	0.2	29
2018/05/25	9:51:00 AM	20.7	0.2	59
2018/05/25	9:52:00 AM	20.7	0.2	104
2018/05/25	9:53:00 AM	20.7	0.2	43
2018/05/25	9:54:00 AM	20.7	0.2	204
2018/05/25	9:55:00 AM	20.7	0.2	92
2018/05/25	9:56:00 AM	20.7	0.2	113
2018/05/25	9:57:00 AM	20.7	0.2	103
2018/05/25	9:58:00 AM	20.7	0.2	43
2018/05/25	9:59:00 AM	20.8	0.2	55
2018/05/25	10:00:00 AM	20.7	0.2	441
2018/05/25	10:01:00 AM	20.8	0.2	183
2018/05/25	10:02:00 AM	20.7	0.2	214
2018/05/25	10:03:00 AM	20.7	0.2	244
2018/05/25	10:04:00 AM	20.7	0.2	150
2018/05/25	10:05:00 AM	20.7	0.2	37
2018/05/25	10:06:00 AM	20.7	0.2	110
2018/05/25	10:07:00 AM	20.7	0.2	152
2018/05/25	10:08:00 AM	20.7	0.2	455
2018/05/25	10:09:00 AM	20.7	0.2	150
2018/05/25	10:10:00 AM	20.7	0.2	97
2018/05/25	10:11:00 AM	20.8	0.2	106
2018/05/25	10:12:00 AM	20.7	0.2	133
2018/05/25	10:13:00 AM	20.7	0.2	291
2018/05/25	10:14:00 AM	20.7	0.2	171
2018/05/25	10:15:00 AM	20.7	0.2	145
2018/05/25	10:16:00 AM	20.7	0.2	199
2018/05/25	10:17:00 AM	20.7	0.2	100
2018/05/25	10:18:00 AM	20.7	0.2	283
2018/05/25	10:19:00 AM	20.7	0.2	162
2018/05/25	10:20:00 AM	20.7	0.2	175
2018/05/25	10:21:00 AM	20.7	0.2	236
2018/05/25	10:22:00 AM	20.7	0.2	174
2018/05/25	10:23:00 AM	20.7	0.2	192
2018/05/25	10:24:00 AM	20.7	0.2	139
2018/05/25	10:25:00 AM	20.7	0.2	414
2018/05/25	10:26:00 AM	20.7	0.2	96
2018/05/25	10:27:00 AM	20.7	0.2	201
2018/05/25	10:28:00 AM	20.7	0.2	164
2018/05/25	10:29:00 AM	20.7	0.2	107
2018/05/25	10:30:00 AM	20.7	0.2	225
2018/05/25	10:31:00 AM	20.7	0.2	171
2018/05/25	10:32:00 AM	20.7	0.2	264
2018/05/25	10:33:00 AM	20.7	0.2	401
2018/05/25	10:34:00 AM	20.7	0.2	181
2018/05/25	10:35:00 AM	20.7	0.2	203
2018/05/25	10:36:00 AM	20.7	0.2	127
2018/05/25	10:37:00 AM	20.7	0.2	106
2018/05/25	10:38:00 AM	20.7	0.2	293
2018/05/25	10:39:00 AM	20.7	0.2	166
2018/05/25	10:40:00 AM	20.7	0.2	489
2018/05/25	10:41:00 AM	20.7	0.2	317
2018/05/25	10:42:00 AM	20.7	0.2	61
2018/05/25	10:43:00 AM	20.7	0.2	98
2018/05/25	10:44:00 AM	20.7	0.2	109
2018/05/25	10:45:00 AM	20.7	0.2	92
2018/05/25	10:46:00 AM	20.7	0.2	66
2018/05/25	10:47:00 AM	20.7	0.2	145
2018/05/25	10:48:00 AM	20.7	0.2	102
	Avg.	20.7	0.2	169.9

General Iron 18-3042
Chicago, Illinois
Shredder Exhaust
Method 25A
Run 3

Date	Time	O_2 %	CO_2 %	VOC PPMvw
2018/05/25	11:05:00 AM	20.7	0.2	11
2018/05/25	11:06:00 AM	20.7	0.2	20
2018/05/25	11:07:00 AM	20.7	0.2	76
2018/05/25	11:08:00 AM	20.7	0.2	1934
2018/05/25	11:09:00 AM	20.7	0.2	404
2018/05/25	11:10:00 AM	20.7	0.2	92
2018/05/25	11:11:00 AM	20.7	0.2	80
2018/05/25	11:12:00 AM	20.7	0.2	96
2018/05/25	11:13:00 AM	20.7	0.2	117
2018/05/25	11:14:00 AM	20.7	0.2	101
2018/05/25	11:15:00 AM	20.7	0.2	156
2018/05/25	11:16:00 AM	20.7	0.2	102
2018/05/25	11:17:00 AM	20.7	0.2	125
2018/05/25	11:18:00 AM	20.7	0.2	62
2018/05/25	11:19:00 AM	20.7	0.2	41
2018/05/25	11:20:00 AM	20.7	0.2	29
2018/05/25	11:21:00 AM	20.7	0.2	23
2018/05/25	11:22:00 AM	20.7	0.2	20
2018/05/25	11:23:00 AM	20.8	0.2	18
2018/05/25	11:24:00 AM	20.7	0.2	17
2018/05/25	11:25:00 AM	20.7	0.2	15
2018/05/25	11:26:00 AM	20.7	0.2	15
2018/05/25	11:27:00 AM	20.7	0.2	17
2018/05/25	11:28:00 AM	20.7	0.2	13
2018/05/25	11:29:00 AM	20.7	0.2	13
2018/05/25	11:30:00 AM	20.7	0.2	21
2018/05/25	11:31:00 AM	20.7	0.2	26
2018/05/25	11:32:00 AM	20.7	0.2	210
2018/05/25	11:33:00 AM	20.7	0.2	112
2018/05/25	11:34:00 AM	20.7	0.2	103
2018/05/25	11:35:00 AM	20.7	0.2	33
2018/05/25	11:36:00 AM	20.7	0.2	20
2018/05/25	11:37:00 AM	20.7	0.2	17
2018/05/25	11:38:00 AM	20.7	0.2	14
2018/05/25	11:39:00 AM	20.7	0.2	12
2018/05/25	11:40:00 AM	20.7	0.2	11
2018/05/25	11:41:00 AM	20.7	0.2	11
2018/05/25	11:42:00 AM	20.7	0.2	11
2018/05/25	11:43:00 AM	20.7	0.2	10
2018/05/25	11:44:00 AM	20.7	0.2	12
2018/05/25	11:45:00 AM	20.7	0.2	39
2018/05/25	11:46:00 AM	20.7	0.2	136
2018/05/25	11:47:00 AM	20.7	0.2	2752
2018/05/25	11:48:00 AM	20.7	0.2	525
2018/05/25	11:49:00 AM	20.7	0.2	234
2018/05/25	11:50:00 AM	20.7	0.2	233
2018/05/25	11:51:00 AM	20.7	0.2	181
2018/05/25	11:52:00 AM	20.7	0.2	224
2018/05/25	11:53:00 AM	20.7	0.2	108
2018/05/25	11:54:00 AM	20.7	0.2	118
2018/05/25	11:55:00 AM	20.7	0.2	400
2018/05/25	11:56:00 AM	20.7	0.2	343
2018/05/25	11:57:00 AM	20.7	0.2	90
2018/05/25	11:58:00 AM	20.7	0.2	216
2018/05/25	11:59:00 AM	20.7	0.2	158
2018/05/25	12:00:00 PM	20.7	0.2	143
2018/05/25	12:01:00 PM	20.7	0.2	171
2018/05/25	12:02:00 PM	20.7	0.2	254
2018/05/25	12:03:00 PM	20.7	0.2	277
2018/05/25	12:04:00 PM	20.7	0.2	698
2018/05/25	12:05:00 PM	20.7	0.2	375
2018/05/25	12:06:00 PM	20.7	0.2	224
2018/05/25	12:07:00 PM	20.7	0.2	142
2018/05/25	12:08:00 PM	20.7	0.2	281
2018/05/25	12:09:00 PM	20.7	0.2	241
2018/05/25	12:10:00 PM	20.7	0.2	149
2018/05/25	12:11:00 PM	20.7	0.2	228
2018/05/25	12:12:00 PM	20.7	0.2	323
2018/05/25	12:13:00 PM	20.7	0.2	647
2018/05/25	12:14:00 PM	20.7	0.2	223
2018/05/25	12:15:00 PM	20.7	0.2	86
2018/05/25	12:16:00 PM	20.7	0.2	199
2018/05/25	12:17:00 PM	20.7	0.2	156
2018/05/25	12:18:00 PM	20.7	0.2	206
2018/05/25	12:19:00 PM	20.7	0.2	157
2018/05/25	12:20:00 PM	20.7	0.2	274
2018/05/25	12:21:00 PM	20.7	0.2	300
2018/05/25	12:22:00 PM	20.7	0.2	514
2018/05/25	12:23:00 PM	20.7	0.2	338
2018/05/25	12:24:00 PM	20.7	0.2	121
2018/05/25	12:25:00 PM	20.7	0.2	77
	Avg.	20.7	0.2	270.3

*Shredder was down during this period. These numbers are not included in the average.

APPENDIX F

CALIBRATION GAS CERTIFICATION SHEETS

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
12722 South Wentworth Ave.
Chicago, IL 60628
773-785-3000 Fax: 773-785-1928
Airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI76E15A0295	Reference Number:	54-124572685-1
Cylinder Number:	SG9133821BAL	Cylinder Volume:	152.5 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12016	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Aug 22, 2016

Expiration Date: Aug 22, 2024

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	12.00 %	12.15 %	G1	+/- 1.0% NIST Traceable	08/22/2016
OXYGEN	12.00 %	11.91 %	G1	+/- 1.0% NIST Traceable	08/22/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060817	CC416652	24.04 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 16, 2019
NTRM	12062016	CC367570	22.88 % OXYGEN/NITROGEN	+/- 0.2%	Apr 24, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Aug 13, 2016
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Aug 22, 2016

Triad Data Available Upon Request

Approved for Release

Airgas
an Air Liquide company

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Airgas Specialty Gases
Airgas USA, LLC
12722 South Wentworth Ave.
Chicago, IL 60628
773-785-3000 Fax: 773-785-1928
Airgas.com

Part Number:	E03NI52E15A38Q7	Reference Number:	54-124572686-1
Cylinder Number:	CC183526	Cylinder Volume:	163.9 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12016	Valve Outlet:	296
Gas Code:	CO2,O2,BALN	Certification Date:	Aug 26, 2016

Expiration Date: Aug 26, 2024

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	24.00 %	24.01 %	G1	+/- 1.0% NIST Traceable	08/26/2016
OXYGEN	24.00 %	23.18 %	G2	+/- 1.1% NIST Traceable	08/26/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	13060817	CC416652	24.04 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	May 16, 2019
NTRM	06120112	CC195607	9.898 % OXYGEN/NITROGEN	+/- 0.7%	Jun 26, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Aug 13, 2016
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Aug 22, 2016

Triad Data Available Upon Request

Approved for Release

LIQUID TECHNOLOGY CORPORATION

"INDUSTRY LEADER IN SPECIALTY GASES"

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Stack Test Group (Ottawa, IL)
Date	April 30, 2014
Delivery Receipt	DR-51311
Gas Standard	900 ppm Propane/Nitrogen - EPA PROTOCOL
Final Analysis Date	April 28, 2014
Expiration Date	April 28, 2022

Component	Propane
Balance Gas	Air

DO NOT USE BELOW 100 psig

Analytical Data:
EPA Protocol, Section No. 2.2, Procedure G-1

Reported Concentrations

Propane: 916 ppm +/- 3.0 ppm

Nitrogen: Balance

Reference Standards:

SRM/GMIS:	GMIS	GMIS
Cylinder Number:	CC-125618	CC-165614
Concentration:	497.23 ppm Propane/Nitrogen	1011.92 ppm Propane/Nitrogen
Expiration Date:	04/09/20	04/09/20

Certification Instrumentation

Component:	Propane
Make/Model:	Agilent 7890A
Serial Number:	CN10736166
Principal of Measurement:	GC-FID
Last Calibration:	April 09, 2014

Cylinder Data

Cylinder Serial Number:	CC-185323	Cylinder Outlet:	CGA 350
Cylinder Volume:	140 Cubic Feet	Cylinder Pressure:	2000 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-12/531.

Certified by: Cole Dylewski

Cole Dylewski

PGVP Vendor ID: E12014

"UNMATCHED EXCELLENCE"
2048 APEX COURT APOPKA, FLORIDA 32703 ~ PHONE (407)-292-2990 FAX (407)-292-3313
WWW.LIQUIDTECHCORP.COM
APOPKA, FL • HOUSTON, TX

Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0932	Reference Number:	54-124545729-1
Cylinder Number:	CC349203	Cylinder Volume:	144.4 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12016	Valve Outlet:	350
Gas Code:	PPN,BALN	Certification Date:	Mar 21, 2016

Expiration Date: Mar 21, 2024

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	500.0 PPM	506.3 PPM	G1	+/- 1.1% NIST Traceable	03/21/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	10060532	CC281503	495.3 PPM PROPANE/AIR	+/- 0.5%	Jan 06, 2022

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Feb 28, 2016

Triad Data Available Upon Request

Approved for Release

LIQUID TECHNOLOGY CORPORATION

"INDUSTRY LEADER IN SPECIALTY GASES"

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	Stack Test Group (Ottawa, IL)
Date	April 30, 2014
Delivery Receipt	DR-51311
Gas Standard	300 ppm Propane/Nitrogen - EPA PROTOCOL
Final Analysis Date	April 28, 2014
Expiration Date	April 28, 2022

Component	Propane
Balance Gas	Air

Analytical Data:
EPA Protocol, Section No. 2.2, Procedure G-1

DO NOT USE BELOW 100 psig

Reported Concentrations

Propane: 305 ppm +/- 1.0 ppm

Nitrogen: Balance

Reference Standards:

SRM/GMIS:	GMIS	GMIS
Cylinder Number:	CC-231424	CC-125618
Concentration:	106.42 ppm Propane/Nitrogen	497.23 ppm Propane/Nitrogen
Expiration Date:	04/09/20	04/09/20

Certification Instrumentation

Component:	Propane
Make/Model:	Agilent 7890A
Serial Number:	CN10736166
Principal of Measurement:	GC-FID
Last Calibration:	April 09, 2014

Cylinder Data

Cylinder Serial Number:	EB-0050476	Cylinder Outlet:	CGA 350
Cylinder Volume:	140 Cubic Feet	Cylinder Pressure:	2000 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-12/531.

Certified by: Cole Dylewski

Cole Dylewski

PGVP Vendor ID: E12014

"UNMATCHED EXCELLENCE"
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WWW.LIQUIDTECHCORP.COM
APOPKA, FL • HOUSTON, TX

WELDSTAR
OLD VALUES...NEW IDEAS

PurityPlus® Specialty Gases

Certificate of Analysis

Certificate Number: 3034A-07T5-C01
Certification Date: 4 November 2014
Mixture Grade: EPA Protocol Standard Gas Mixture

Cylinder Number: CC454471

Mixture Components	Requested Composition	Certified Composition	U (Expanded Uncertainty, k=2)
Propane	8500 PPM	8497 PPM	+/- 55 PPM (absolute)
Nitrogen	Balance	Balance	

Cylinder Pressure:	1900 psi – Do not use below 100 psi (0.7 megapascals)
Lot Number:	3034A-07T5
CGA Outlet Conn.:	350
UN Number:	UN 1956
Classification:	Compressed Gas, n. o. s.
Certification Expiration Date:	4 November 2022
Procedure Used:	EPA Traceability Protocol for Gaseous Calibration Standards Procedure G1, EPA/600/R-12/531 May 2012
Analytical Method:	FTIR
Multipoint Calibration Date:	17 October 2014
Production Lab:	Tier 5 Labs, LLC, Naperville, IL, PGVP Vendor ID R12014

Reference Standards:

NIST SRM Number	2647a
NIST Sample Number	104-C-44
Cylinder Identification Number	XF002995B
Certified Concentration	2467 μmol/mol
Expanded Uncertainty	+/- 13 μmol/mol
Certification Expiration	6-May-17

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025-2005.

Steve Tarrant

Weldstar Aurora
1750 Mitchell Road, PO Box 1150
Aurora, IL 60505
Phone 630.859.3100
Fax 630.859.3199

Weldstar Logansport
1000 E. Main Street
Logansport, IN 46947
Phone 574.722.1177
Fax 574.753.3113

Weldstar University Park
1100 Hamilton Avenue
University Park, IL 60484
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Fax 708.534.7819

Airgas.
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E02NI99E15A0561	Reference Number:	54-401002568-1
Cylinder Number:	CC175226	Cylinder Volume:	144.7 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12017	Valve Outlet:	350
Gas Code:	PPN,BALN	Certification Date:	Sep 20, 2017

Expiration Date: Sep 20, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
PROPANE	5000 PPM	4988 PPM	G1	+/- 0.6% NIST Traceable	09/20/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061208	CC357634	5026 PPM PROPANE/NITROGEN	+/- 0.6%	Jan 20, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Aug 21, 2017

Triad Data Available Upon Request

Approved for Release

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OLD VALUES...NEW IDEAS

PurityPlus®
Specialty Gases

Certificate of Analysis

Certificate Number: 3034A-06T5-C01
Certification Date: 4 November 2014
Mixture Grade: EPA Protocol Standard Gas Mixture

Cylinder Number: CC451707

Mixture Components	Requested Composition	Certified Composition	U (Expanded Uncertainty, k=2)
Propane	3000 PPM	2976 PPM	+/- 35 PPM (absolute)
Nitrogen	Balance	Balance	

Cylinder Pressure:	1900 psi – Do not use below 100 psi (0.7 megapascals)
Lot Number:	3034A-06T5
CGA Outlet Conn.:	350
UN Number:	UN 1956
Classification:	Compressed Gas, n. o. s.
Certification Expiration Date:	4 November 2022
Procedure Used:	EPA Traceability Protocol for Gaseous Calibration Standards Procedure G1, EPA/600/R-12/531 May 2012
Analytical Method:	FTIR
Multipoint Calibration Date:	17 October 2014
Production Lab:	Tier 5 Labs, LLC, Naperville, IL, PGVP Vendor ID R12014

Reference Standards:

NIST SRM Number	2647a
NIST Sample Number	104-C-44
Cylinder Identification Number	XF002895B
Certified Concentration	2467 µmol/mol
Expanded Uncertainty	+/- 13 µmol/mol
Certification Expiration	6-May-17

The calibration results published in this certificate were obtained using equipment and standards capable of producing results that are traceable to National Institute of Standards and Technology (NIST) and through NIST to the International System of Units (SI). The expanded uncertainties, if included on this certificate, use a coverage factor of k=2 to approximate the 95% confidence level of the measurement, unless otherwise noted. If uncertainties are not included on this certificate, they are available upon request. This calibration certificate applies only to the item described and shall not be reproduced other than in full, without written approval from the calibration facility. Calibration certificates without signatures are not valid. This calibration meets the requirements of ISO/IEC 17025-2005.

Steve Tarrant

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Fax 708.534.7819

APPENDIX G

RESPONSE FACTOR DETERMINATION FOR VOC EXEMPT COMPOUNDS

General Iron
Chicago, IL
VOM Testing
Response Factor Testing
6/13/2018

Compound		Bag Concentration	FID Response
Chloromethane			
	Trial #1	100 PPM	67.1
	Trial #2	100 PPM	67.0
	Trial #3	100 PPM	67.0
	Avg.		**67.0**
Freon 22			
	Trial #1	100 PPM	47.5
	Trial #2	100 PPM	47.7
	Trial #3	100 PPM	47.8
	Avg.		**47.7**
Freon 12			
	Trial #1	100 PPM	117.6
	Trial #2	100 PPM	117.4
	Trial #3	100 PPM	117.8
	Avg.		**117.6**
Freon 152A			
	Trial #1	100 PPM	114.9
	Trial #2	100 PPM	115.0
	Trial #3	100 PPM	115.0
	Avg.		**115.0**
Carbon Disulfide			
	Trial #1	120 PPM	0.2
	Trial #2	120 PPM	0.1
	Trial #3	120 PPM	0.3
	Avg.		**0.2**
Freon 134A			
	Trial #1	100 PPM	114.8
	Trial #2	100 PPM	115.1
	Trial #3	100 PPM	115.2
	Avg.		**115.0**
Octamethycyclotetrasiloxane			
	Trial #1	100 PPM	114.8

Trial #2	100 PPM	114.9
Trial #3	100 PPM	114.9
Avg.		**114.9**

APPENDIX H

LABORATORY REPORT FOR VOC EXEMPT COMPOUNDS

DAT Reports®

Data Summary
GPA 2286

Client:	Stack Test Group
Client Project:	
DAT Project:	0518042
Date Sampled:	5/25/2018
Date Analyzed:	6/25/2018
Analyst:	SM

Client Sample ID	DAT Sample ID	Analyte	Detector	ppm (vol)	ppm as Propane	Q
Run 1	0518042- 1	Methanc	FID	3.29	1.10	
		Ethane	FID	0.63	0.42	

ND = Not detected in the sample.
D = Value measured from a dilution.
J=Below the lowest calibration point

DAT Reports®

Data Summary
GPA 2286

Client:	Stack Test Group
Client Project:	
DAT Project:	0518042
Date Sampled:	5/26/2018
Date Analyzed:	6/25/2018
Analyst:	SM

Client Sample ID	DAT Sample ID	Analyte	Detector	ppm (vol)	ppm as Propane	Q
Run 2	0518042- 2	Methane	FID	3.10	1.03	
		Ethane	FID	0.45	0.30	

ND = Not detected in the sample.
D = Value measured from a dilution.
J=Below the lowest calibration point

DAT Reports®

Data Summary
GPA 2286

Client:	Stack Test Group
Client Project:	
DAT Project:	0518042
Date Sampled:	5/27/2018
Date Analyzed:	6/25/2018
Analyst:	SM

Client Sample ID	DAT Sample ID	Analyte	Detector	ppm (vol)	ppm as Propane	Q
Run 3	0518042- 3	Methane	FID	3.40	1.13	
		Ethane	FID	0.46	0.30	

ND = Not detected in the sample.
D = Value measured from a dilution.
J=Below the lowest calibration point

DAT Reports®

TO-15 Data Summary

Client ID	Test 1
Sample Name :	0518042-1 1.0mL
Date Acquired :	05/31/18 16:40
Method File :	TO151805
Data File Path :	C:\HPCHEM\1\DATA\0518042\
Data File Name :	05318R01.D
Sample Multiplier :	200
Dilution factor :	1

Name	Amount (ppb)	PQL (ppb)	MDL (ppb)	Q
Dichlorodifluoromethane	882.72	250.00	22.80	
Chloromethane	ND	250.00	19.80	
1,2-dichlorotetrafluoroethane	ND	250.00	19.20	
Acetone	2714.54	250.00	22.00	
Trichlorofluoromethane	2003.48	250.00	23.40	
Methylene Chloride	221.01	250.00	177.40	
1,1,2-Trichlorotrifluoroethane	ND	250.00	20.80	
1,1,1-Trichloroethane	ND	250.00	21.60	
Tetrachloroethylene	ND	250.00	25.40	

Surrogate %R	%R
4-bromofluorobenzene	83.26

ND= Not Detected at the Method Detection Limit.
PQL=Practical Quantitation Limit
MDL= Method Detection Limit

DAT Reports®

Tentatively Identified Compound (LSC) summary

Operator ID: CSM Date Acquired: 31 May 18 4:40 pm
Data File: C:\HPCHEM\1\DATA\0518042\05318R01.D
Name: 0518042-1 1.0mL
Misc: Test 1
Method: C:\HPCHEM\1\METHODS\TO151812.M (Chemstation Integrator)
Title: TO-15
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units
Methane, chlorodifluoro-	4.53	8336.8	ppb
Cyclotetrasiloxane, octamethyl-	20.34	2142.2	ppb

RT=Retention time (minutes)

DAT Reports

TO-15 Data Summary

Client ID	Test #2
Sample Name :	0518042-2 1.0 mL
Date Acquired :	06/ 8/18 15:57
Method File :	TO151805
Data File Path :	C:\HPCHEM\1\DATA\0518042F\
Data File Name :	06088R03.D
Sample Multiplier :	200
Dilution factor :	1

Name	Amount (ppb)	PQL (ppb)	MDL (ppb)	Q
Dichlorodifluoromethane	406.2	250	22.8	
Chloromethane	ND	250	19.8	
1,2-dichlorotetrafluoroethane	ND	250.00	19.20	
Acetone	14729.93	250.00	22.00	
Trichlorofluoromethane	10211.55	250.00	23.40	
Methylene Chloride	ND	250.00	177.40	
1,1,2-Trichlorotrifluoroethane	ND	250.00	20.80	
1,1,1-Trichloroethane	ND	250.00	21.60	
Tetrachloroethylene	ND	250.00	25.40	
Surrogate %R	%R			
4-bromofluorobenzene	100.9			

ND= Not Detected at the Method Detection Limit.
PQL=Practical Quantitation Limit

MDL= Method Detection Limit

reports@datlab.com

DAT Laboratory, Inc.
7715 Corporate Blvd.
Plain City, OH 43064

800-733-8644

DAT Reports®

Tentatively Identified Compound (LSC) summary

Operator ID: Date Acquired: 8 Jun 18 3:57 pm
Data File: C:\HPCHEM\1\DATA\0518042F\06088R03.D
Name: 0518042-2 1.0 mL
Misc: Test #2
Method: C:\HPCHEM\1\METHODS\TO151812.M (Chemstation Integrator)
Title: TO-15
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units
Methane, chlorodifluoro-	4.47	2831.2	ppb
Ethane, 1,1-difluoro-	4.89	3844.5	ppb

DAT Reports®

TO-15 Data Summary

Client ID	Test #3
Sample Name :	0518042-3 1.0 mL
Date Acquired :	06/ 8/18 15:14
Method File :	TO151805
Data File Path :	C:\HPCHEM\1\DATA\0518042F\
Data File Name :	06088R02.D
Sample Multiplier :	200
Dilution factor :	1

Name	Amount (ppb)	PQL (ppb)	MDL (ppb)	Q
Dichlorodifluoromethane	890.44	250.00	22.80	
Chloromethane	ND	250.00	19.80	
1,2-dichlorotetrafluoroethane	ND	250.00	19.20	
Acetone	29905.85	250.00	22.00	
Trichlorofluoromethane	5978.77	250.00	23.40	
Methylene Chloride	ND	250.00	177.40	
1,1,2-Trichlorotrifluoroethane	ND	250.00	20.80	
1,1,1-Trichloroethane	ND	250.00	21.60	
Tetrachloroethylene	42.35	250.00	25.40	

Surrogate %R	%R
4-bromofluorobenzene	106.4

ND= Not Detected at the Method Detection Limit.
PQL=Practical Quantitation Limit
MDL= Method Detection Limit

reports@datlab.com

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7715 Corporate Blvd.
Plain City, OH 43064

800-733-8644

DAT Reports®

Tentatively Identified Compound (LSC) summary

Operator ID: Date Acquired: 8 Jun 18 3:14 pm
Data File: C:\HPCHEM\1\DATA\0518042F\06088R02.D
Name: 0518042-3 1.0 mL
Misc: Test #3
Method: C:\HPCHEM\1\METHODS\TO151812.M (Chemstation Integrator)
Title: TO-15
Library Searched: C:\DATABASE\NBS75K.L

TIC Top Hit name	RT	EstConc	Units
Ethane, 1,1-difluoro-	4.89	1560.6	ppb

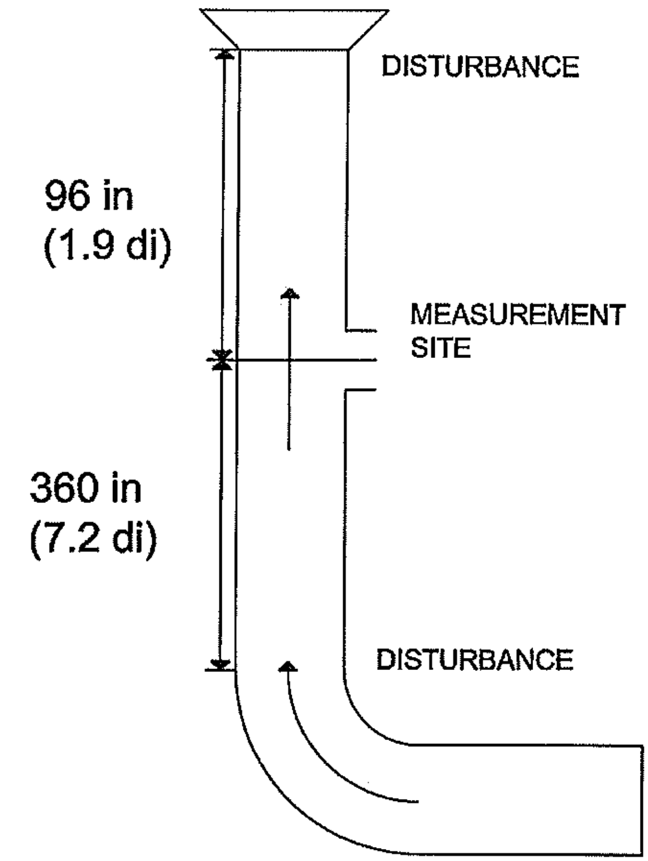
APPENDIX I

LOCATION OF SAMPLING PORTS & POINTS

Stack Test Group, Inc.
Air Compliance & Emissions Solutions

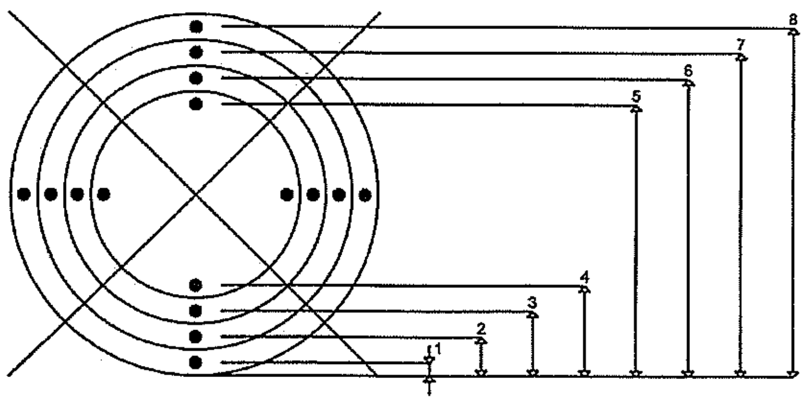
General Iron
Shredder Exhaust

Diameter of Stack = 50 in



Location of Sample Ports

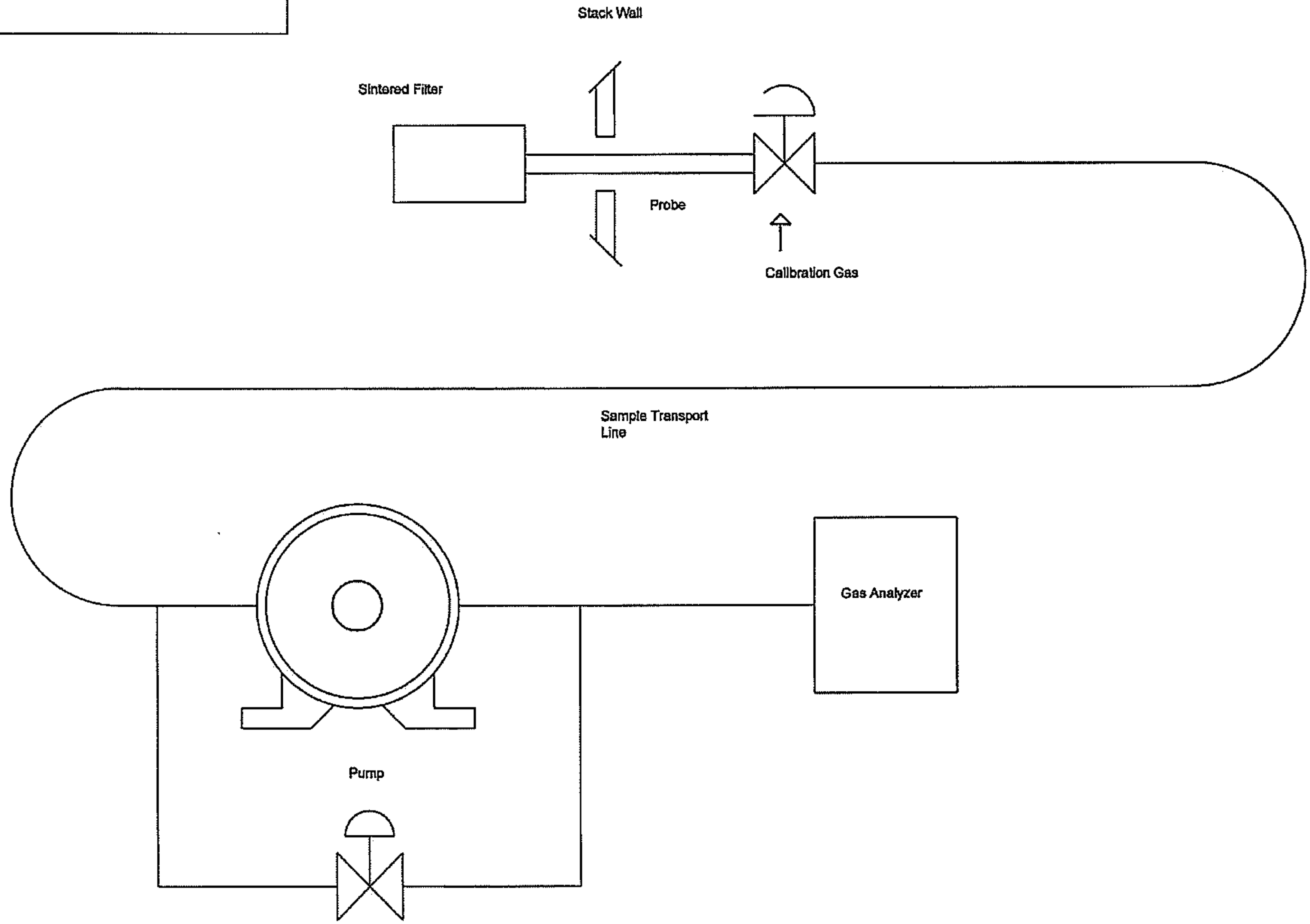
Traverse Point	% of diameter Distance	Distance form Stack Wall (in)
1	.032	1.6
2	.105	5.25
3	.194	9.7
4	.323	16.15
5	.677	33.85
6	.806	40.3
7	.895	44.75
8	.968	48.4



Location of Sample Points

Stack Test Group, Inc.
Air Compliance & Emissions Solutions

Method 25A



RK
& Associates, Inc.

Shredder Emissions Test Report for Total Hydrocarbons, Particulate, and Metals General Iron Industries, Inc. – Chicago, Illinois IEPA Bureau of Air Site ID No.: 031600BTB

JUNE 25, 2018

APPENDIX B –

Test Report Particulate Matter and Total Select Metals Hammermill Shredder General Iron Industries, Inc. – Chicago, Illinois

Prepared by Montrose Air Quality Services and Dated June 21, 2018

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TEST REPORT
PARTICULATE MATTER AND TOTAL SELECT METALS
HAMMERMILL SHREDDER
GENERAL IRON INDUSTRIES, INC.
IEPA BUREAU OF AIR SITE ID NO.: 031600BTB
CHICAGO, ILLINOIS

Prepared For:

Freeborn & Peters, LLP
311 South Wacker Drive
Chicago, Illinois 60606

Prepared By:

Montrose Air Quality Services, LLC
1371 Brummel Avenue
Elk Grove Village, Illinois

Document Number:	023AS-451738-RT-144
Test Dates:	June 13 and 14, 2018
Document Date	June 25, 2018

STAC
ACCREDITED TO ASTM D7036 ONLY CERT #3925.01

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TABLE OF CONTENTS

SECTIONS **PAGE**

1.0 PROJECT OVERVIEW 4

1.1 General 4
1.2 Methodology....................4
1.3 Parameters....................5
1.4 Results 5

2.0 SUMMARY OF RESULTS 6

3.0 TEST PROCEDURES 11

3.1 Method Listing....................11
3.2 Method Descriptions 11
3.2.1 Method 1 11
3.2.2 Method 2 11
3.2.3 Method 3A....................12
3.2.4 Method 4 12
3.2.5 Method 5/29....................13

4.0 DESCRIPTION OF INSTALLATION....................15

LIST OF TABLES

TABLE 1-1 EXECUTIVE SUMMARY....................5

TABLE 2 – 1 SUMMARY OF PM RESULTS....................6

TABLE 2 – 2 SUMMARY OF TSM RESULTS....................7

APPENDICES

APPENDIX A FIGURES
APPENDIX B SAMPLE CALCULATIONS
APPENDIX C PARAMETERS
APPENDIX D FIELD DATA PRINTOUTS
APPENDIX E FIELD DATA
APPENDIX F LABORATORY DATA
APPENDIX G CALIBRATION DATA

REPORT CERTIFICATION

STATEMENT OF CONFORMANCE AND TEST REPORT CERTIFICATION

I certify, to the best of my knowledge, that this test program was conducted in a manner conforming to the criteria set forth in ASTM D7036-04: Standard Practice for Competence of Air Emission Testing Bodies, and that project management and supervision of all project related activities were performed by qualified individuals as defined by this practice.

I further certify that this test report and all attachments were prepared under my direction or supervision in accordance with the Montrose Air Quality Services, LLC quality management system designed to ensure that qualified personnel gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed the sampling and analysis relating to this performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate and complete.

Performance data is available upon request.

Cathy Busse

Cathy Busse
Technical Writer
Montrose Air Quality Services, LLC

Roy Slick

Roy Slick, Technical Writer
Quality Assurance Manager
Montrose Air Quality Services, LLC

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AIR QUALITY SERVICES

1.0 PROJECT OVERVIEW

1.1 GENERAL

Montrose Air Quality Services, LLC (Montrose) located at 1371 Brummel Avenue, Elk Grove Village, Illinois was contracted by Freeborn & Peters, LLP to conduct an air emissions test program at the General Iron Industries, Inc. (General Iron) facility located at 1909 N Clifton Ave, Chicago, Illinois. This test program was conducted in accordance with the United States Environmental Protection Agency (USEPA) Request to Provide Information Pursuant to the Clean Air Act (information request) dated November 16, 2017. The specific objectives of this test program were to determine the concentration of particulate matter (PM), and total selected metals (TSM[1]) from the exhaust duct of the Hammermill Shredder.

Testing was performed at the direction of Freeborn & Peters, LLP.

Testing was performed on June 13 and June 14, 2018. Coordinating the field portion of the test program were:

John Pinion – RK & Associates, Inc. (630) 393-9000
Jim Kallas – General Iron Industries, Inc. (847) 508-9710
Michael Hess – Montrose Air Quality Services, LLC (630) 670-4740

Testing was witnessed on site by the following regulatory officials:
Kevin Mattison – Illinois Environmental Protection Agency (IEPA)
Scott Connolly – United States Environmental Protection Agency (USEPA)

1.2 METHODOLOGY

EPA Methods 5 and Method 29 were used in a combined sample train to determine the PM and TSM at the test location. In Method 5/29, a sample of the gas stream was withdrawn isokinetically from the exhaust duct and the PM collected in a glass lined sample probe and on a quartz fiber filter. TSM were collected in the glass lined probe, on the quartz fiber filter and in a series of chilled impingers charged with metals absorbing solutions. The mass of filterable and gaseous TSM, collected within the sample train, combined with the volume of dry gas withdrawn from the test location was used to calculate the TSM concentration. Analysis of samples for PM and TSM was conducted by ElementOne, Inc. at their laboratory located in Wilmington, North Carolina. PM results are expressed in units of grains per dry standard cubic foot (gr/dscf) and pounds per hour (lb/hr). Results for TSM are reported in units of microgram per dry standard cubic meter (ug/dscm) and lb/hr.

In order to convert the concentration of each constituent to a mass emissions rate, the volumetric flow rate through the test location was determined concurrently with each test run using EPA Methods 1, 2, 3A and 4.

[1] For this test program, TSM will include the following constituents: antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, mercury, nickel, phosphorus, selenium, silver, thallium and zinc.

1.3 PARAMETERS

The following parameters were determined at the test location during each test run:

- gas temperature
- gas velocity
- carbon dioxide concentration
- oxygen concentration
- moisture concentration
- particulate matter concentration
- TSM concentrations

1.4 RESULTS

TABLE 1-1 EXECUTIVE SUMMARY

Pollutant	Method	Results (lb/hr)
PM	EPA Method 5	**1.90**
TSM	EPA Method 29	**0.0973**

A complete summary of test results is presented in Tables 2 - 1 and 2 - 2[2].

A TSM audit sample was submitted to ERA and analysis was conducted. The results of all audits may be found in the Laboratory section of the Appendix.

Due to the location of the test ports, a heated flexible ambilocal was used to connect the sampling probe to the impinger box. This is a modification from the Methods 5/29 procedures.

Run 3 did not meet the post leak check requirements. The results obtained with this sampling train were not analyzed and an additional run was performed to replace Run 3.

The blank correction used for the PM results was adjusted to 0.001% of the weight of the acetone. 222 ml of acetone was used for the field blank. The blank correction was calculated as follows: Blank sample volume X specific gravity X 0.001/100. The specific calculation was: (222 X 0.791 X .001)/100 = 0.0018

[2] MEASUREMENT UNCERTAINTY STATEMENT
Both qualitative and quantitative factors contribute to field measurement uncertainty and should be taken into consideration when interpreting the results contained within this report. Whenever possible, Montrose personnel reduce the impact of these uncertainty factors through the use of approved and validated test methods. In addition, Montrose personnel perform routine instrument and equipment calibrations and ensure that the calibration standards, instruments, and equipment used during test events meet, at a minimum, test method specifications as well as the specifications of the Montrose Quality Manual and ASTM D7036-04. The limitations of the various methods, instruments, equipment, and materials utilized during this test have been reasonably considered, but the ultimate impact of the cumulative uncertainty of this project is not fully identified within the results of this report.

2.0 SUMMARY OF RESULTS

TABLE 2 – 1
SUMMARY OF PM RESULTS

Test Parameters	Run 1	Run 2	Run 4	Run 5	Average
Date	6/13/18	6/13/18	6/14/18	6/14/18	
Start Time	11:49	15:15	10:56	13:45	
Stop Time	13:40	17:09	12:45	15:33	
Gas Conditions					
Temperature (°F)	120	117	120	117	**119**
Volume Metered Standard, $V_{m(std)}$ (ft^3)	64.68	69.74	62.11	63.41	**64.99**
Volumetric Flow Rate (acfm)	66,300	71,200	65,500	66,100	**67,300**
Volumetric Flow Rate (scfm)	60,400	64,900	59,600	60,300	**61,300**
Volumetric Flow Rate (dscfm)	57,000	61,500	55,900	56,700	**57,800**
Carbon Dioxide (% dry)	0.40	0.30	0.39	0.40	**0.37**
Oxygen (% dry)	20.80	20.90	20.79	20.80	**20.82**
Moisture (%)	5.59	5.36	6.24	6.04	**5.81**
Particulate Results					
Concentration (grains/dscf)	0.00318	0.00398	0.00460	0.00361	**0.00384**
Emission Rate (lb/hr)	1.55	2.10	2.21	1.75	**1.90**

TABLE 2 – 2
SUMMARY OF TSM RESULTS

Test Parameters	Run 1	Run 2	Run 4	Run 5	Average
Date	6/13/18	6/13/18	6/14/18	6/14/18	
Start Time	11:49	15:15	10:56	13:45	
Stop Time	13:40	17:09	12:45	15:33	
Gas Conditions					
Temperature (°F)	120	117	120	117	**119**
Volumetric Flow Rate (acfm)	66,300	71,200	65,500	66,100	**67,300**
Volumetric Flow Rate (scfm)	60,400	64,900	59,600	60,300	**61,300**
Volumetric Flow Rate (dscfm)	57,000	61,500	55,900	56,700	**57,800**
Carbon Dioxide (% dry)	0.40	0.30	0.39	0.40	**0.37**
Oxygen (% dry)	20.80	20.90	20.79	20.80	**20.82**
Moisture (%)	5.59	5.36	6.24	6.04	**5.81**
Antimony - Sb					
Concentration (µg/dscm)	0.312*	0.379	0.371	0.237*	**0.325**
Concentration (gr/dscf)	1.36E-07*	1.66E-07	1.62E-07	1.04E-07*	**1.42E-07**
Emission Rate (lb/hr)	0.0000667*	0.0000874	0.0000778	0.0000504*	**0.0000706**
Arsenic - As					
Concentration (µg/dscm)	0.140*	0.152*	<0.114	<0.111	**0.129**
Concentration (gr/dscf)	6.13E-08*	6.66E-08*	<4.97E-08	<4.87E-08	**5.66E-08**
Emission Rate (lb/hr)	0.0000300*	0.0000351*	<0.0000238	<0.0000237	**0.0000281**
Barium - Ba					
Concentration (µg/dscm)	2.58	4.73	2.24	1.93	**2.87**
Concentration (gr/dscf)	1.13E-06	2.07E-06	9.79E-07	8.45E-07	**1.25E-06**
Emission Rate (lb/hr)	0.000551	0.00109	0.000469	0.000411	**0.000630**
Beryllium - Be					
Concentration (µg/dscm)	<0.0273	<0.0253	<0.0284	<0.0278	**<0.0272**
Concentration (gr/dscf)	<1.19E-08	<1.11E-08	<1.24E-08	<1.22E-08	**<1.19E-08**
Emission Rate (lb/hr)	<0.00000583	<0.00000583	<0.00000595	<0.00000592	**<0.00000588**

< indicates the results of both fractions were below the detection limit of the Method
* indicates one fraction was below the detection limit of the Method

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TABLE 2 – 2
SUMMARY OF TSM RESULTS (CONTINUED)

Test Parameters	Run 1	Run 2	Run 4	Run 5	Average
Date	6/13/18	6/13/18	6/14/18	6/14/18	
Start Time	11:49	15:15	10:56	13:45	
Stop Time	13:40	17:09	12:45	15:33	
Cadmium - Cd					
Concentration (µg/dscm)	1.86*	1.00*	1.08	0.886*	**1.21**
Concentration (gr/dscf)	8.13E-07*	4.38E-07*	4.72E-07	3.87E-07*	**5.28E-07**
Emission Rate (lb/hr)	0.000398*	0.000231*	0.000226	0.000188*	**0.000261**
Chromium - Cr					
Concentration (µg/dscm)	1.35	1.59	1.38	1.10	**1.35**
Concentration (gr/dscf)	5.89E-07	6.93E-07	6.02E-07	4.83E-07	**5.92E-07**
Emission Rate (lb/hr)	0.000288	0.000365	0.000289	0.000235	**0.000294**
Cobalt - Co					
Concentration (µg/dscm)	<0.109	0.138*	<0.114	<0.111	**<0.118**
Concentration (gr/dscf)	<4.77E-08	6.04E-08*	<4.97E-08	<4.87E-08	**<5.16E-08**
Emission Rate (lb/hr)	<0.0000233	0.0000318*	<0.0000238	<0.0000237	**<0.0000257**
Copper - Cu					
Concentration (µg/dscm)	1.47	3.10	1.76	5.14	**2.87**
Concentration (gr/dscf)	6.44E-07	1.36E-06	7.70E-07	2.24E-06	**1.25E-06**
Emission Rate (lb/hr)	0.000315	0.000714	0.000369	0.00109	**0.000622**
Lead - Pb					
Concentration (µg/dscm)	4.93	7.43	5.44	3.42	**5.30**
Concentration (gr/dscf)	2.15E-06	3.25E-06	2.38E-06	1.49E-06	**2.32E-06**
Emission Rate (lb/hr)	0.00105	0.00171	0.00114	0.000727	**0.001158**
Manganese - Mn					
Concentration (µg/dscm)	4.01	4.82	5.42	3.48	**4.43**
Concentration (gr/dscf)	1.75E-06	2.11E-06	2.37E-06	1.52E-06	**1.94E-06**
Emission Rate (lb/hr)	0.000857	0.00111	0.00114	0.000738	**0.000960**

< indicates the results of both fractions were below the detection limit of the Method
* indicates one fraction was below the detection limit of the Method

MONTROSE AIR QUALITY SERVICES

General Iron Industries: Chicago, Illinois
Hammermill Shredder PM and TSM

TABLE 2 – 2
SUMMARY OF TSM RESULTS (CONTINUED)

Test Parameters	Run 1	Run 2	Run 4	Run 5	Average
Date	6/13/18	6/13/18	6/14/18	6/14/18	
Start Time	11:49	15:15	10:56	13:45	
Stop Time	13:40	17:09	12:45	15:33	
Nickel - Ni					
Concentration (μg/dscm)	1.63	2.55	1.36	0.930	**1.62**
Concentration (gr/dscf)	7.14E-07	1.12E-06	5.92E-07	4.06E-07	**7.07E-07**
Emission Rate (lb/hr)	0.000349	0.000588	0.000284	0.000198	**0.000355**
Phosphorous - P					
Concentration (μg/dscm)	18.2	19.6	15.2	13.7	**16.7**
Concentration (gr/dscf)	7.93E-06	8.56E-06	6.66E-06	6.00E-06	**7.29E-06**
Emission Rate (lb/hr)	0.00388	0.00451	0.00319	0.00292	**0.00363**
Selenium - Se					
Concentration (μg/dscm)	0.698	1.17	<0.114	0.160	**0.535**
Concentration (gr/dscf)	3.05E-07	5.10E-07	<4.97E-08	6.98E-08	**2.34E-07**
Emission Rate (lb/hr)	0.000149	0.000269	<0.0000238	0.0000340	**0.0001189**
Silver - Ag					
Concentration (μg/dscm)	<0.109	<0.101	1.61*	<0.111	**<0.482**
Concentration (gr/dscf)	<4.77E-08	<4.42E-08	7.02E-07*	<4.87E-08	**<2.11E-07**
Emission Rate (lb/hr)	<0.0000233	<0.0000233	0.000337*	<0.0000237	**<0.000102**
Thallium - Tl					
Concentration (μg/dscm)	<0.109	<0.101	<0.114	<0.111	**<0.109**
Concentration (gr/dscf)	<4.77E-08	<4.42E-08	<4.97E-08	<4.87E-08	**<4.76E-08**
Emission Rate (lb/hr)	<0.0000233	<0.0000233	<0.0000238	<0.0000237	**<0.0000235**
Zinc - Zn					
Concentration (μg/dscm)	351	345	312	265	**318**
Concentration (gr/dscf)	1.53E-04	1.51E-04	1.36E-04	1.16E-04	**1.39E-04**
Emission Rate (lb/hr)	0.0750	0.0795	0.0654	0.0563	**0.0690**

< Indicates the results of both fractions were below the detection limit of the Method
* Indicates one fraction was below the detection limit of the Method

MONTROSE AIR QUALITY SERVICES

TABLE 2 – 2
SUMMARY OF TSM RESULTS (CONTINUED)

Test Parameters	Run 1	Run 2	Run 4	Run 5	Average
Date	6/13/18	6/13/18	6/14/18	6/14/18	
Start Time	11:49	15:15	10:56	13:45	
Stop Time	13:40	17:09	12:45	15:33	
Mercury - Hg					
Concentration (µg/dscm)	136*	50.6*	176*	11.0*	**93.5**
Concentration (gr/dscf)	5.96E-05*	2.21E-05*	7.68E-05*	4.82E-06*	**4.08E-05**
Emission Rate (lb/hr)	0.0291*	0.0117*	0.0368*	0.00234*	**0.0200**
Total Select Metals					
Emission Rate (lb/hr)	0.112	0.102	0.110	0.0654	**0.0973**

< indicates the results of both fractions were below the detection limit of the Method
* indicates at least one fraction was below the detection limit of the Method

MONTROSE AIR QUALITY SERVICES

3.0 TEST PROCEDURES

3.1 METHOD LISTING

The test methods found in 40 CFR Part 60, Appendix A were referenced for the test program. The following individual methods were referenced:

Method 1	Sample and velocity traverse for stationary sources
Method 2	Determination of stack gas velocity and volumetric flow rate (type S pitot tube)
Method 3A	Determination of oxygen and carbon dioxide concentrations in emissions from stationary sources (Instrumental analyzer procedure)
Method 4	Determination of moisture content in stack gases
Method 5	Determination of particulate emissions from stationary sources
Method 29	Determination of Metals Emissions from Stationary Sources

3.2 METHOD DESCRIPTIONS

3.2.1 Method 1

Method 1 was used to determine the suitability of the test location and to determine the sample points used for the volumetric flow rate determinations. The test location conformed to the minimum requirements of being located at least 2.0 diameters downstream and at least 0.5 diameters upstream from the nearest flow disturbance.

The Hammermill Shredder test location was a round, vertical duct with a diameter of 50.0 inches. Eight points were sampled at each of the two test ports. The test location was approximately 6.0 diameters downstream and approximately 12.0 diameters upstream from the nearest flow disturbances. A cross section of the sampling location, showing the sample points, can be found in Figure 1 of the Appendix.

3.2.2 Method 2

EPA Method 2 was used to determine the gas velocity at the test location using an "S" type pitot tube and incline oil manometer. The manometer was leveled and "zeroed" prior to each test run. The sample trains were leak checked before and after each run by pressurizing the positive or "high" side, of each pitot tube and creating a 3 in. H_2O deflection on the manometer. The leak check was considered valid if the manometer remained stable for 15 seconds. This procedure was repeated on the negative side by generating a vacuum of at least 3 in. H_2O. The velocity head pressure and gas temperature were then determined at each point specified in Method 1. The static pressure of the duct was measured using water filled U-tube manometer. In addition, the barometric pressure was measured and recorded. A diagram of the Method 2 apparatus is shown in Figure 2 as part of the Method 5/29 sampling train.

3.2.3 Method 3A

The carbon dioxide and oxygen contents were determined at the test location using EPA Method 3A. A gas sample was collected into a Tedlar bag from the back of each sample train for the duration of each test run. Analysis was performed using a Servomex 1440 infrared carbon dioxide analyzer/paramagnetic oxygen analyzer. The analyzers were calibrated immediately prior to analysis of the bag samples using the procedures outlined in Method 3A using EPA Protocol calibration gases.

The carbon dioxide content and oxygen content were used to calculate the dry molecular weight of the gas stream. The molecular weight was then used, along with the moisture content determined by EPA Method 4, for the calculation of the volumetric flow rate. For these calculations, the balance of the gas stream was assumed to be nitrogen since the other gas stream components are insignificant for the purposes of calculating molecular weight.

3.2.4 Method 4

The moisture content at the test location was determined using Method 4. A known volume of sample gas was withdrawn from the source and the moisture was condensed and measured. The dry standard volume of the sample gas was then compared to the volume of moisture collected to determine the moisture content of the sample gas. A diagram of the Method 4 apparatus is shown in Figure 2 as part of the Method 5/29 sampling trains.

To condense the water vapor, the gas sample passed through a series of impingers charged as outlined in Methods 29. After exiting the impinger system, the sample train was leak checked prior to the test run by capping the probe tip and pulling a vacuum of at least 15 inches Hg. The sample train was leak checked prior to the test run by capping the probe tip and pulling a vacuum higher than the value expected during the run. A leak check was considered valid if the leak rate was less than 0.02 cubic feet per minute.

The volume of dry gas exiting the gas condenser system was measured with a dry gas meter. After leaving the dry gas meter, the sample stream passed through an orifice used to meter the flow rate through the sample train. The pressure drop across the orifice was measured with an incline plane, oil manometer. The gas meter reading, gas meter inlet and outlet temperatures, gas meter static pressure and pump vacuum were recorded for each sample point.

After the test run, the sample train was leak checked at the highest vacuum encountered during the test run. The tests were considered valid since the leak rate was less than 0.02 cfm. The amount of water collected in the condenser system was measured gravimetrically. The net weight gain of water was converted to a volume of wet gas and then compared to the amount of dry gas sampled to determine the moisture content.

3.2.5 Method 5/29

Methods 5 and 29 were used to determine the PM and TSM concentration in a combined sample train at the test location. A sample of the gas stream was withdrawn isokinetically from the stack and the PM in the sample gas stream was collected in a glass probe liner and on a quartz filter. The metals were collected in the glass probe liner, on the quartz filter and in a series of chilled impingers. A diagram of the Method 5/29 sampling train in shown in Figure 2 of the Appendix.

To prevent contamination, all components of the sample train were glass or Teflon with no metal connections. Prior to testing all components were washed with hot tap water then hot soapy water, rinsed three times with tap water and then rinsed three times with de-ionized, ultra filtered (DIUF) water. All glassware was then soaked for a minimum of four hours in a 10% nitric acid solution. After soaking, the glassware was rinsed three times with DIUF water and then rinsed with acetone. After drying, all components were sealed with parafilm.

The sample probe used consisted of a glass liner and glass nozzle. The liner was housed in a heated sheath maintained at a temperature of 248°F (+/- 25°F). Sample gas passed through the nozzle and probe assembly and then through a quartz fiber filter heated to 248°F (+/- 25°F). After exiting the filter, the sample gas passed through a series of six glass impingers. The first and second impingers contained 100ml of a 5 percent nitric acid (HNO_3)/10 percent hydrogen peroxide (H_2O_2) solution to collect all the metals except mercury. The third impinger remained empty to prevent cross contamination of the separate solutions. The fourth and fifth impingers contained 100ml of a 4 percent potassium permanganate ($KMnO_4$)/10 percent sulfuric acid (H_2SO_4) solution to absorb mercury. The sixth impinger contained a known quantity of silica gel. The dry gas exiting the moisture condenser system then passed through a sample pump and a dry gas meter to measure the gas volume. After leaving the dry gas meter, the sample stream passed through an orifice, which was used to meter the flow rate through the sample train. The pressure drop across the orifice was measured with an incline plane oil manometer.

Prior to the test run the filter was weighed to the nearest 0.0001g until a constant weight was achieved. The weight of the filter was considered constant only when two consecutive weights taken at least six hours apart were within 0.0005g of each other. The filter was then loaded into a glass filter holder with a Teflon support screen that was prepared in the same manner as the other components of the sample train. The probe was thoroughly cleaned with acetone and the probe wash saved as a quality assurance check. The condenser system was then loaded as outlined above. After assembly, the sample train was leak checked prior to the test run by capping the probe tip and pulling a vacuum of at least 15 in.Hg. A leak check was considered valid if the leak rate was below 0.02 cubic feet per minute.

The probe tip was placed at the first of the sample points determined in Method 1. The velocity at the sample point was determined using Method 2 by reading the velocity pressure from the oil manometer. Sample was withdrawn from the source at a rate such that the velocity at the opening of the nozzle matched the velocity of the stack gas at the sample point (isokinetically). During the test run the train was moved to each of the Method 1 sample points. The sample time at each point was calculated based on the number of sample points and the total run time. The run time and sample rate was determined such that a minimum sample volume of 60 dry standard cubic feet (dscf) was collected. The gas velocity pressure (ΔP), stack temperature, gas meter reading, gas meter inlet and outlet temperatures, gas meter orifice pressure (ΔH), probe and filter temperatures, and pump vacuum was recorded for each sample point.

After the test run, the train was leak checked at the highest vacuum encountered during the test run. The sample train was then transferred to the on-site laboratory for recovery. The filter was removed from the holder and placed in a glass petri dish. The front half of the sample train, consisting of the nozzle, probe liner and filter holder, was brushed with a non-metallic brush and rinsed with 0.1 N nitric acid. The rinse was saved in a 250ml trace clean amber glass sample jar. The contents of the first two impingers were recovered and saved in two 500ml sample jars. The impingers were then rinsed with 0.1N nitric acid, and the rinses added to the sample jars. The contents of the third impinger, which was originally empty, was recovered and saved separately in a 500ml sample jar. The impinger was rinsed with nitric acid and the rinse added to the sample jar. The contents of the fourth and fifth impingers was recovered and saved in two 500ml sample jars. The impingers were rinsed with fresh potassium permanganate and the rinse added to the sample jars. If deposits remained on the potassium permanganate impinger surface, the impingers were rinsed with 25 ml of 8 N hydrochloric acid (HCl) and the rinse saved in a separate 250ml sample jar.

Analysis of the samples for particulate and metals followed procedures outlined in EPA Method 29. The front half rinse and filter were digested with HNO_3. This fraction and the sample fraction acquired from the first three impingers were analyzed separately for all the metals listed using ICP and GFAA. These two fractions were also analyzed for mercury using CVAA. The $KMnO_4$ impinger sample, the HCl rinse and the empty impinger sample were then analyzed separately for mercury using CVAA.

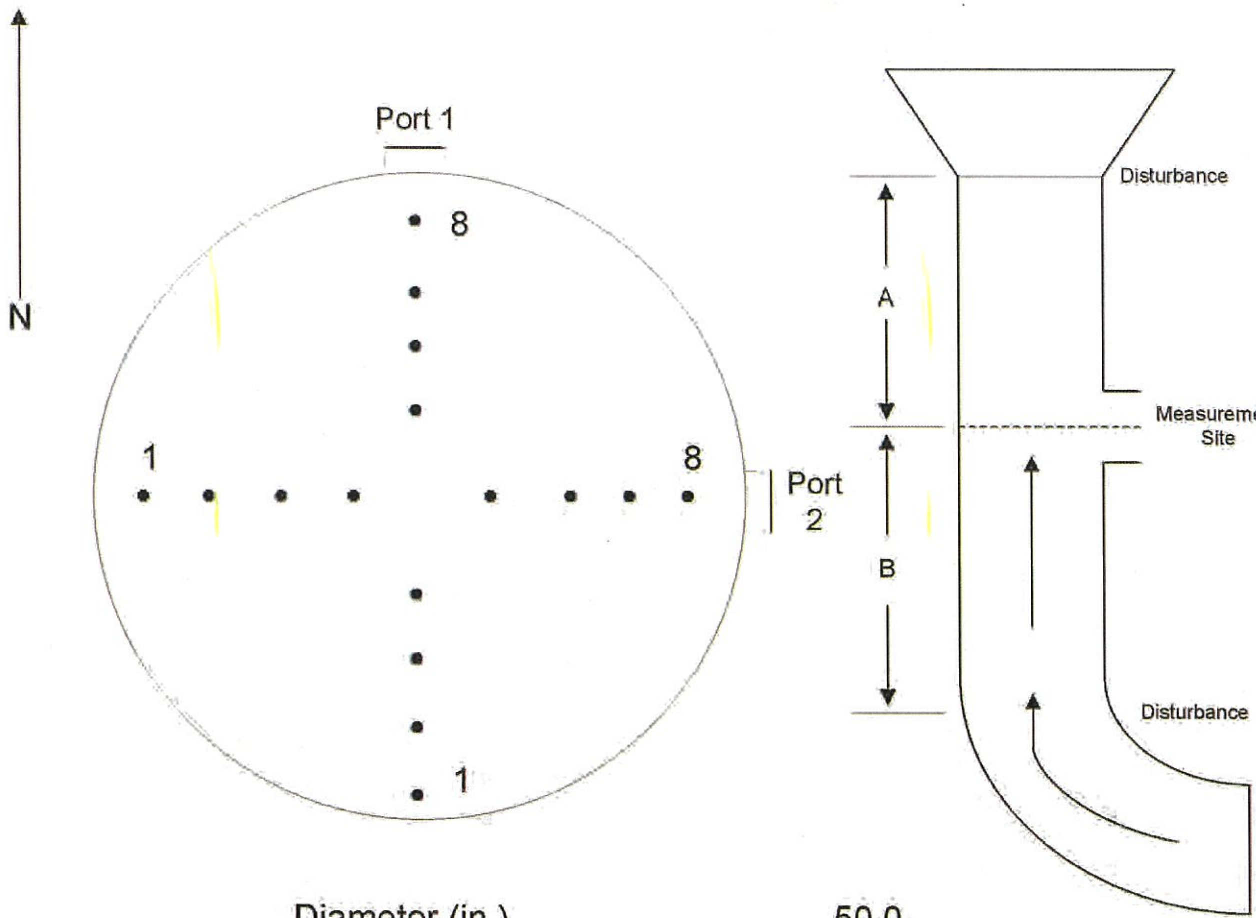
Analysis of the samples for PM and TSM was performed by ElementOne located in Wilmington, North Carolina.

4.0 DESCRIPTION OF INSTALLATION

General Iron Industries, Inc. (General Iron) is an existing scrap metal recycling facility located at 1909 N. Clifton Avenue, Chicago, Illinois (see Figure 1). General Iron receives and shreds mixed scrap metal in various forms to produce uniform grades of ferrous and non-ferrous metals. Existing scrap handling and processing activities include receiving, sorting, shredding, metal separation and recovery of ferrous and nonferrous metals.

Testing was performed in the exhaust duct of the hammermill shredder air handling system, downstream of a cyclone separator, a roll media filter, and the induced draft fan.

APPENDIX A
FIGURES



Diameter (in.)	50.0
Port Length (in.)	14.5
Distance A (Duct Diameters)	12.0
Distance B (Duct Diameters)	6.0

Point	Distance From Wall (in.)
1	1.6
2	5.3
3	9.7
4	16.2
5	33.8
6	40.3
7	44.8
8	48.4

Cross Section of the Hammermill Shredder
Test Location
General Iron Industries Corporation

Figure 1

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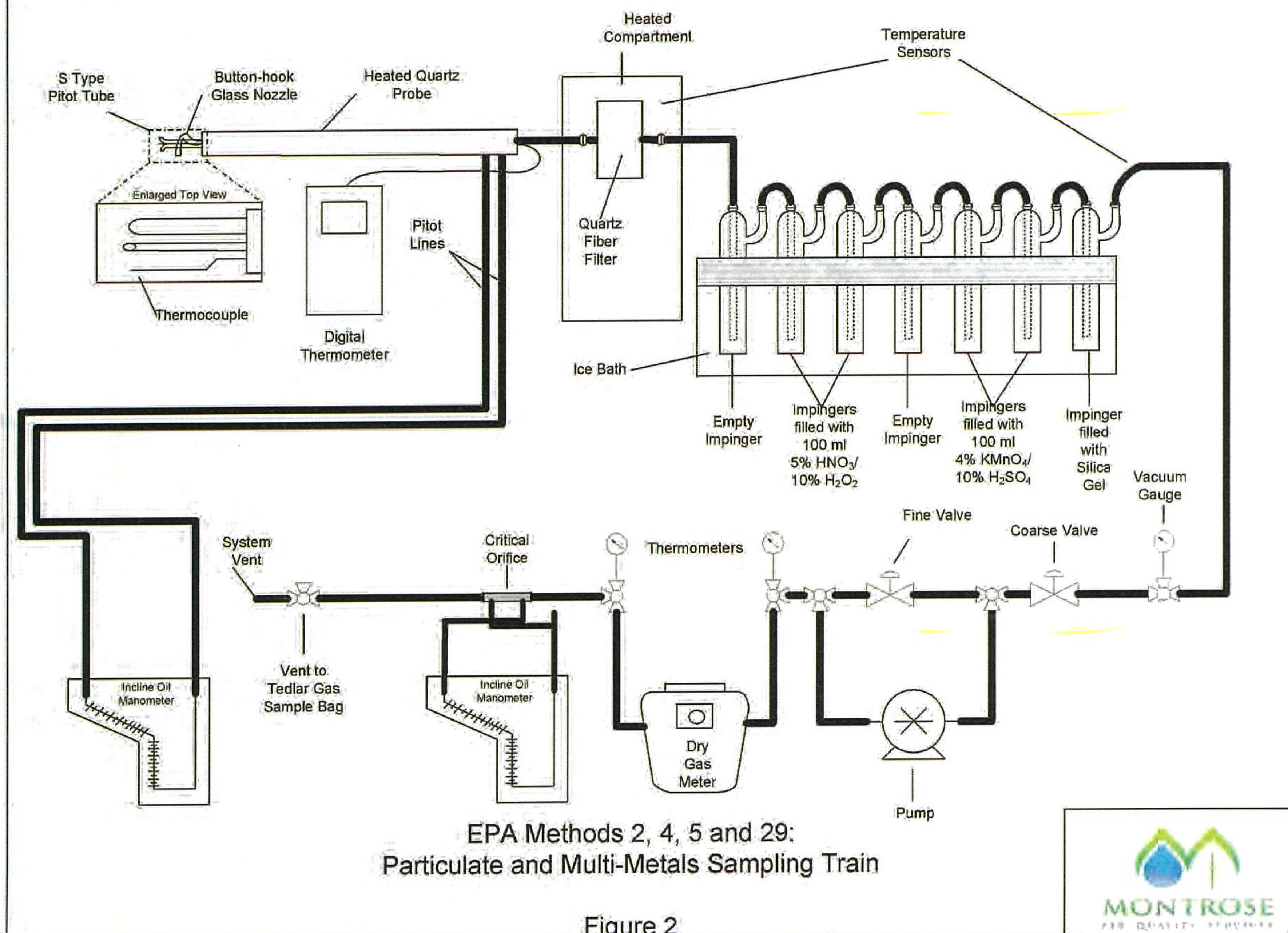

EPA Methods 2, 4, 5 and 29:
Particulate and Multi-Metals Sampling Train

Figure 2

APPENDIX B
SAMPLE CALCULATIONS

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Sample Calculations for Method 5/29, Run 1

Area of Sample Location

$$A_s = (\pi)\left(\frac{d_s}{2\times 12}\right)^2$$

$$A_s = (\pi)\left(\frac{50.0}{2\times 12}\right)^2$$

$$A_s = 13.6 ft^2$$

where:

A_s	= area of stack (ft^2)
D_s	= diameter of stack (in)
12	= conversion factor (in/ft)
2	= conversion factor (diameter to radius)

Stack Pressure Absolute

$$P_a = P_b + \frac{P_s}{13.6}$$

$$P_a = 29.85 + \frac{1.3}{13.6}$$

$$P_a = 29.95 in.Hg$$

where:

P_a	= stack pressure absolute (in. Hg)
P_b	= barometric pressure (in. Hg)
P_s	= static pressure (in. H_2O)
13.6	= conversion factor (in. H_2O/in. Hg)

Volume of Dry Gas Collected Corrected to Standard Conditions

$$V_{m(std)} = \frac{17.64(V_m)(Y_d)\left(P_b + \frac{\Delta H}{13.6}\right)}{(T_m + 460)}$$

$$V_{m(std)} = \frac{17.64(69.19)(0.9987)\left(29.85 + \frac{1.62}{13.6}\right)}{(105 + 460)}$$

$$V_{m(std)} = 64.68scf$$

where:

$V_{m(std)}$	= volume of gas collected at standard conditions (scf)
V_m	= volume of gas sampled at meter conditions (ft^3)
Y_d	= gas meter correction factor (dimensionless)
P_b	= barometric pressure (in. Hg)
ΔH	= average sample pressure (in. H_2O)
T_m	= average gas meter temperature (°F)
13.6	= conversion factor (in. H_2O/in. Hg)
17.64	= ratio of standard temperature over standard pressure (°R/in. Hg)
460	= conversion (°F to °R)

Volume of Water Vapor Collected Corrected to Standard Conditions

$$V_{w(std)} = 0.04715 \times V_{wc} + 0.04715 \times V_{wsg}$$

$$V_{w(std)} = 0.04715 \times 68.5 + 0.04715 \times 12.8$$

$$V_{w(std)} = 3.83scf$$

where:

$V_{w(std)}$	= volume of water vapor at standard conditions (scf)
V_{wc}	= weight of liquid collected (g)
V_{wsg}	= weight gain of silica gel (g)
0.04715	= volume occupied by one gram water at standard conditions (ft^3/g)

Percent Moisture

$$B_{ws} = 100 \times \left[\frac{V_{w(std)}}{\left(V_{m(std)} + V_{w(std)}\right)} \right]$$

$$B_{ws} = 100 \times \left[\frac{3.83}{\left(64.68 + 3.83\right)} \right]$$

$$B_{ws} = 5.59\%$$

where:

B_{ws}	= moisture content of the gas stream (%)
$V_{m(std)}$	= volume of gas collected at standard conditions (scf)
$V_{w(std)}$	= volume of water vapor at standard conditions (scf)
100	= conversion factor

Molecular Weight of Dry Gas Stream[3]

$$M_d = \left(44 \times \frac{\%CO_2}{100}\right) + \left(32 \times \frac{\%O_2}{100}\right) + \left(28 \times \frac{(\%N_2)}{100}\right)$$

$$M_d = \left(44 \times \frac{0.4}{100}\right) + \left(32 \times \frac{20.8}{100}\right) + \left(28 \times \frac{78.8}{100}\right)$$

$$M_d = 28.90 lbs / lb - mole$$

where:

M_d	= molecular weight of the dry gas stream (lb/lb-mole)
$\%CO_2$	= carbon dioxide content of the dry gas stream (%)
44	= molecular weight of carbon dioxide (lb/lb-mole)
$\%O_2$	= oxygen content of the dry gas stream (%)
32	= molecular weight of oxygen (lb/lb-mole)
%CO	= carbon monoxide content of the dry gas stream (%)
$\%N_2$	= nitrogen content of the dry gas stream (%)
28	= molecular weight of nitrogen (lb/lb-mole)
100	= conversion factor

[3] The remainder of the gas stream after subtracting carbon dioxide and oxygen is assumed to be nitrogen.

Molecular Weight of Wet Gas Stream

$$M_s = \left(M_d \times \left(1 - \frac{B_{ws}}{100}\right)\right) + \left(18 \times \frac{B_{ws}}{100}\right)$$

$$M_s = \left(28.90 \times \left(1 - \frac{5.59}{100}\right)\right) + \left(18 \times \frac{5.59}{100}\right)$$

$$M_s = 28.29 lbs / lb - mole$$

where:

M_s	= molecular weight of the wet gas stream (lb/lb-mole)
M_d	= molecular weight of the dry gas stream (lb/lb-mole)
B_{ws}	= moisture content of the gas stream (%)
18	= molecular weight of water (lb/lb-mole)
100	= conversion factor

Velocity of Gas Stream

$$V_s = 85.49\left(C_p\right)\left(\sqrt{\Delta P}\right)\sqrt{\frac{\left(T_s + 460\right)}{\left(M_s\right)\left(P_b + \frac{P_s}{13.6}\right)}}$$

$$V_s = 85.49(0.84)(1.36)\sqrt{\frac{(120 + 460)}{(28.29)\left(29.85 + \frac{1.3}{13.6}\right)}}$$

$$V_s = 81.0 ft / \sec$$

where:

V_s	= average velocity of the gas stream (ft/sec)
C_p	= pitot tube coefficient dimensionless
$\sqrt{\Delta P}$	= average square root of velocity pressures (in. H_2O) $^{1/2}$
T_s	= average stack temperature (°F)
M_s	= molecular weight of the wet gas stream (lb/lbmole)
P_b	= barometric pressure (in. Hg)
P_s	= static pressure of gas stream (in. H_2O)
85.49	= pitot tube constant (ft/sec)([(lb/lbmole)(in. Hg)]/[(°R)(in. H_2O)]) $^{1/2}$
460	= conversion (°F to °R)
13.6	= conversion factor (in. H_2O/in Hg)

Volumetric Flow of Gas Stream - Actual Conditions

$$Q_a = 60(V_s)(A_s)$$
$$Q_a = 60(81.0)(13.6)$$
$$Q_a = 66,269 acfm$$

where:

Q_a	= volumetric flow rate of the gas stream at actual conditions (acfm)
V_s	= average velocity of the gas stream (ft/sec)
A_s	= area of duct or stack (ft^2)
60	= conversion factor (sec/min)

Volumetric Flow of Gas Stream - Standard Conditions

$$Q_{std} = \frac{17.64(Q_a)(P_a)}{(T_s + 460)}$$
$$Q_{std} = \frac{17.64(66,269)(29.95)}{(120 + 460)}$$
$$Q_{std} = 60,368 scfm$$

where:

Q_{std}	= volumetric flow rate of the gas stream at standard conditions (scfm)
Q_a	= volumetric flow rate of the gas stream at actual conditions (acfm)
T_s	= average stack temperature (°F)
P_a	= stack pressure absolute (in. Hg)
17.64	= ratio of standard temperature over standard pressure (°R/in. Hg)
460	= conversion (°F to °R)

Volumetric Flow of Gas Stream - Standard Conditions - Dry Basis

$$Q_{dstd} = Q_{std}\left(1 - \frac{B_{ws}}{100}\right)$$

$$Q_{dstd} = 60,368\left(1 - \frac{5.59}{100}\right)$$

$$Q_{dstd} = 57,013\,dscfm$$

where:

Q_{dstd}	= volumetric flow rate of the dry gas stream at standard conditions (dscfm)
Q_{std}	= volumetric flow rate of the gas stream at standard conditions (scfm)
B_{ws}	= moisture content of the gas stream (%)
100	= conversion factor

Area of Nozzle

$$A_n = \pi \times \left(\frac{d_n}{2 \times 12}\right)^2$$

$$A_n = \pi \times \left(\frac{0.170}{2 \times 12}\right)^2$$

$$A_n = 0.000158\,ft^2$$

where:

A_n	= area of nozzle (ft^2)
d_n	= diameter of nozzle (in)
12	= conversion factor (in/ft)
2	= conversion factor (diameter to radius)

Percent Isokinetic

$$I = \frac{0.0945(T_s + 460)(V_{m(std)})}{\left(P_b + \frac{P_s}{13.6}\right)(v_s)(A_n)(\Theta)\left(1 - \frac{B_{ws}}{100}\right)}$$

$$I = \frac{0.0945(120 + 460)(64.68)}{\left(29.85 + \frac{1.3}{13.6}\right)(81.0)(0.000158)(96)\left(1 - \frac{5.59}{100}\right)}$$

$$I = 102.3\%$$

where:

I	= percent isokinetic (%)
T_s	= average stack temperature (°F)
$V_{m(std)}$	= volume of gas collected at standard temperature and pressure (scf)
P_b	= barometric pressure (in. Hg)
P_s	= static pressure of gas stream (in. H_2O)
V_s	= average velocity of the gas stream (ft/sec)
A_n	= cross sectional area of nozzle (ft^2)
Θ	= sample time (min)
B_{wsat}	= moisture saturation point of the gas stream (%)
0.0945	= constant (°R/in. Hg)
460	= conversion (°F to °R)
13.6	= conversion factor (in. H_2O/in Hg)
100	= conversion factor

Acetone Wash Blank Correction

$$W_a = \frac{(m_{ab})(v_{aw})}{v_{awb}}$$

$$W_a = \frac{(0.0018)(134)}{222}$$

$$W_a = 0.0011g$$

where:

W_a	= maximum allowable particulate mass in acetone wash blank (g)
m_{ab}	= mass collected, acetone wash blank (g)
v_{aw}	= mass of acetone wash (g)
v_{awb}	= mass of acetone wash blank (g)

Particulate Catch

$$M_n = m_f + (m_a - W_a)$$

$$M_n = 0.0052 + (0.0092 - 0.0011)$$

$$M_n = 0.0133g$$

where:

M_n	= particulate catch (g)
m_f	= particulate on filter (g)
m_a	= particulate in wash (g)
W_a	= particulate mass in acetone wash blank (g)

Particulate Concentration, grains/dscf

$$C = \frac{(M_n)(15.43)}{V_{m(std)}}$$

$$C = \frac{(0.0133)(15.43)}{64.68}$$

$$C = 0.00318 gr/dscf$$

where:

C	= particulate concentration (grains/dscf)
M_n	= particulate catch (g)
$V_{m(std)}$	= volume of gas collected at standard temperature and pressure (scf)
15.43	= conversion factor (grains/g)

Particulate Emission Rate (lb/hr)

$$E_{lb/hr} = \frac{(M_n)(Q_{dstd})(60)}{(V_{m(std)})(453.6)}$$

$$E_{lb/hr} = \frac{(0.0133)(57,013)(60)}{(64.68)(453.6)}$$

$$E_{lb/hr} = 1.55 lb/hr$$

where:

$E_{lb/hr}$	= particulate emission rate (lb/hr)
M_n	= particulate catch (g)
$V_{m(std)}$	= volume of dry gas collected at standard temperature and pressure (scf)
Q_{dstd}	= volumetric flow rate of the gas stream at standard conditions, on a dry basis (dscfm)
60	= conversion factor (min/hr)
453.6	= conversion factor (g/lb)

Concentration of Lead in Flue Gas, ug/dscm[4]

$$C_{ug/dscm} = \frac{(M_C)}{(V_{m(std)})}(35.31)$$

$$C_{ug/dscm} = \frac{(9.03)}{(64.68)}(35.31)$$

$$C_{ug/dscm} = 4.93 ug/dscm$$

where:

$C_{ug/dscm}$	= concentration of lead in flue gas (ug/dscm)
M_C	= mass of lead in sample (ug)
$V_{m(std)}$	= volume of gas collected at standard temperature and pressure(scf)
35.31	= conversion factor (ft^3/m^3)

[4] The concentrations of all TSM are calculated in a similar manner.

Concentration of Lead in Flue Gas, gr/dscf[5]

$$C_{gr/dscf} = \frac{(C_{ug/dscm})(15.43)}{(35.32)(10^6)}$$

$$C_{gr/dscf} = \frac{(4.93)(15.43)}{(35.32)(10^6)}$$

$$C_{gr/dscf} = 2.15E^{-6} gr/dscf$$

where:

$C_{gr/dscf}$	= concentration of lead in flue gas (gr/dscf)
$C_{ug/dscm}$	= concentration of lead in flue gas (ug/dscm)
15.43	= conversion factor (grains/g)
35.32	= conversion factor (ft^3/m^3)
10^6	= conversion factor (ug/g)

Lead Emission Rate, lb/hr[6]

$$E_{lb/hr} = \frac{(C_{ug/dscm})(Q_{dstd})(60)}{(35.315)(10^6)(453.6)}$$

$$E_{lb/hr} = \frac{(4.93)(57{,}013)(60)}{(35.315)(10^6)(453.6)}$$

$$E_{lb/hr} = 0.00105 lb/hr$$

where:

$E_{lb/hr}$	= lead emission rate (lb/hr)
$C_{ug/dscm}$	= lead concentration (ug/dscm)
Q_{dstd}	= volumetric flow rate of dry gas stream at standard conditions (dscfm)
10^3	= conversion factor (ug/mg)
35.315	= conversion factor (ft^3/m^3)
60.0	= conversion factor (min/hr)

[5] The concentrations of all TSM are calculated in a similar manner.
[6] The emission rates of all TSM are calculated in a similar manner.

APPENDIX C
PARAMETERS

General Iron Industries, Inc. **Method 5 and 29 Parameters** **Project No. 023AS-451738**
Hammermill Shredder

EPA Methods 1-4 Parameters	**Run 1**	**Run 2**	**Run 4**	**Run 5**
Date	6/13/2018	6/13/2018	6/14/2018	6/14/2018
Start Time	11:49	15:15	10:56	13:45
Stop Time	13:40	17:09	12:45	15:33
Dimensions of Sample Location, D_s (in)	50.0	50.0	50.0	50.0
Velocity Pressure, $\Delta P^{1/2}$ avg (in. $H_2O^{1/2}$)	1.36	1.47	1.35	1.36
Barometric Pressure, P_b (Inches Hg)	29.85	29.79	29.85	29.80
Static Pressure, P_s (Inches H_2O)	1.3	1.0	1.0	1.0
Pitot Coefficient, C_p	0.84	0.84	0.84	0.84
Sample Location Temperature, T_s (°F)	120	117	120	117
Volume Metered, V_m (ft^3)	69.19	75.29	65.49	66.40
Meter Temperature, T_m (°F)	105	109	96.5	91.8
Average Sample Pressure, ΔH_{avg} (in. H_2O)	1.62	1.86	1.51	1.54
Gas Meter Correction Factor, Y_d	0.9987	0.9987	0.9987	0.9987
Carbon Dioxide (% dry)	0.40	0.30	0.39	0.40
Oxygen (% dry)	20.8	20.9	20.8	20.8
Weight of Water Collected, V_{wc} (g)	68.5	64.7	72.6	74.6
Silica Gel Net Weight, V_{wsg} (g)	12.8	19.1	15.1	11.8
Diameter of Nozzle, D_n (in)	0.170	0.170	0.170	0.170
Run Time, θ (minutes)	96	96	96	96

EPA METHODS 1-4 RESULTS				
Area of Sample Location, A_s (ft^2)	13.6	13.6	13.6	13.6
Stack Pressure Absolute (inches Hg)	29.95	29.86	29.92	29.87
Volume Metered Standard, $V_{m(std)}$ (ft^3)	64.68	69.74	62.11	63.41
Volume of Water Vapor, $V_{w(std)}$ (ft^3)	3.83	3.95	4.14	4.07
Percent Moisture, B_{ws} (%)	5.59	5.36	6.24	6.04
Moisture Saturation Point, B_{wsat} (%)	11.5	10.7	11.6	10.7
Dry Molecular Weight, M_d (lbs/lb mole)	28.90	28.88	28.89	28.90
Wet Molecular Weight, M_s (lbs/lb mole)	28.29	28.30	28.21	28.24
Gas Velocity, V_s (ft/sec)	81.0	87.0	80.1	80.8
Average Flowrate, Q_a (acfm)	66,269	71,167	65,533	66,101
Standard Flowrate, Q_{std} (scfm)	60,368	64,946	59,615	60,350
Dry Standard Flowrate, Q_{dstd} (dscfm)	57,013	61,489	55,916	56,729
Area of Nozzle, A_n (ft^2)	0.000158	0.000158	0.000158	0.000158
Isokinetics (%)	102.3	102.3	100.2	100.8
F1/2 Particulate Matter (mg)	14.4	18.7	19.4	15.5
F1/2 Particulate Matter, blank corrected (g)	0.0133	0.0180	0.0185	0.0148
Concentration (gr/dscf)	0.00318	0.00398	0.00460	0.00361
Emission Rate (lb/hr)	1.55	2.10	2.21	1.75

General Iron Industries, Inc.
Hammermill Shredder

Method 5 Parameters

Project No. 023AS-451738

EPA Method 5 Parameters		Blank	Run 1	Run 2	Run 4	Run 5
Filter			31347	31346	31457	31460
Filter tare weight (g)		0.4022	0.4015	0.4031	0.3679	0.3551
Filter final weight (g)		0.4035	0.4067	0.4118	0.3759	0.3618
Filter net weight, m_f (g)		**0.0013**	**0.0052**	**0.0087**	**0.0080**	**0.0067**
Front Half Wash	*Beaker ID*	*895*	*758*	*737*	*597*	*x23*
Beaker tare weight (g)		10.2526	10.8814	11.0158	10.1119	9.9149
Beaker final weight (g)	Average	10.2550	10.8906	11.0258	10.1233	9.9237
Volume of Wash, V_{aw} (ml)		222	134	88	108	84
Beaker net weight, m_a (g)		**0.0018**	**0.0092**	**0.0100**	**0.0114**	**0.0088**

General Iron Industries, Inc. **Method 29 Parameters** **Project No. 023AS-451738**
Hammermill Shredder

EPA METHOD 29 RESULTS	Run 1	Run 2	Run 4	Run 5
Front Half (ug)	0.472	0.6225	0.388	0.326
Back Half (ug)	<0.1	0.127	0.265	<0.1
Antimony - Sb, (µg)	**0.572**	**0.749**	**0.653**	**0.426**
Front Half (ug)	0.157	0.201	<0.1	<0.1
Back Half (ug)	<0.1	<0.1	<0.1	<0.1
Arsenic - As, (µg)	**0.257**	**0.301**	**<0.2**	**<0.2**
Front Half (ug)	3.95	3.96	2.80	2.73
Back Half (ug)	0.774	5.38	1.14	0.741
Barium - Ba, (µg)	**4.724**	**9.34**	**3.94**	**3.47**
Front Half (ug)	<0.025	<0.025	<0.025	<0.025
Back Half (ug)	<0.025	<0.025	<0.025	<0.025
Beryllium - Be, (µg)	**<0.050**	**<0.050**	**<0.050**	**<0.050**
Front Half (ug)	3.31	1.88	1.74	1.49
Back Half (ug)	<0.1	<0.1	0.159	<0.1
Cadmium - Cd, (µg)	**3.41**	**1.98**	**1.90**	**1.59**
Front Half (ug)	2.01	2.14	1.76	1.58
Back Half (ug)	0.460	0.997	0.664	0.404
Chromium - Cr, (µg)	**2.47**	**3.13**	**2.42**	**1.98**
Front Half (ug)	<0.1	<0.1	<0.1	<0.1
Back Half (ug)	<0.1	0.173	<0.1	<0.1
Cobalt - Co, (µg)	**<0.2**	**0.273**	**<0.2**	**<0.2**
Front Half (ug)	1.63	1.79	1.55	1.35
Back Half (ug)	1.07	4.34	1.55	7.87
Copper - Cu, (µg)	**2.70**	**6.13**	**3.100**	**9.22**
Front Half (ug)	7.70	10.7	8.68	5.67
Back Half (ug)	1.33	3.98	0.884	0.471
Lead - Pb, (µg)	**9.03**	**14.7**	**9.56**	**6.14**
Front Half (ug)	4.04	4.52	3.97	4.02
Back Half (ug)	3.31	5.00	5.57	2.22
Manganese - Mn, (µg)	**7.35**	**9.52**	**9.54**	**6.24**
Front Half (ug)	2.54	2.64	0.974	0.864
Back Half (ug)	0.452	2.41	1.41	0.805
Nickel - Ni, (µg)	**2.99**	**5.05**	**2.38**	**1.67**
Front Half (ug)	5.96	8.86	5.22	4.46
Back Half (ug)	27.3	29.9	21.6	20.2
Phosphorous - P, (µg)	**33.3**	**38.7**	**26.8**	**24.7**

General Iron Industries, Inc.
Hammermill Shredder

Method 29 Parameters

Project No. 023AS-451738

EPA METHOD 29 RESULTS	Run 1	Run 2	Run 4	Run 5
Front Half (ug)	0.943	1.74	<0.1	0.186
Back Half (ug)	0.336	0.569	<0.1	0.101
Selenium - Se, (μg)	**1.28**	**2.30**	**<0.2**	**0.287**
Front Half (ug)	<0.1	<0.1	<0.1	<0.1
Back Half (ug)	<0.1	<0.1	2.726	<0.1
Silver - Ag, (μg)	**<0.2**	**<0.2**	**2.83**	**<0.2**
Front Half (ug)	<0.1	<0.1	<0.1	<0.1
Back Half (ug)	<0.1	<0.1	<0.1	<0.1
Thallium - Tl, (μg)	**<0.2**	**<0.2**	**<0.2**	**<0.2**
Front Half (ug)	612	629	524	455
Back Half (ug)	30.9	52.6	25.1	21.0
Zinc - Zn, (μg)	**643**	**682**	**549**	**476**
Mercury - Hg				
Front-Half Trial 1	<0.1	<0.1	<0.1	<0.1
Front-Half Trial 2	<0.1	<0.1	<0.1	<0.1
Front-Half (μg)	<0.1	<0.1	<0.1	<0.1
H_2O_2/HNO_3 Impingers Trial 1	<0.5	<0.3	<0.3	<0.4
H_2O_2/HNO_3 Impingers Trial 2	<0.5	<0.3	<0.3	<0.4
H_2O_2/HNO_3 Impingers (μg)	<0.5	<0.3	<0.3	<0.4
Empty Impinger Trial 1	<0.2	<0.2	<0.2	<0.2
Empty Impinger Trial 2	<0.2	<0.2	<0.2	<0.2
Empty Impinger (μg)	<0.2	<0.2	<0.2	<0.2
$H_2SO_4/KMnO_4$ Impingers Trial 1	232	80.3	205	9.65
$H_2SO_4/KMnO_4$ Impingers Trial 2	233	80.2	211	9.66
$H_2SO_4/KMnO_4$ (μg)	233	80.3	208	9.66
8N HCl Rinse Trial 1	17.5	19.8	101	10.2
8N HCl Rinse Trial 2	17.5	19.6	101	10.2
8N HCl Rinse (μg)	17.5	19.7	101	10.2
Total Mercury - Hg (μg)	**250**	**100**	**309**	**19.8**

EPA METHOD 29 RESULTS	Run 1	Run 2	Run 4	Run 5
Antimony - Sb				
Concentration (μg/dscm)	0.312	0.379	0.371	0.237
Concentration (gr/dscf)	1.36E-07	1.66E-07	1.62E-07	1.04E-07
Emission Rate (lb/hr)	0.0000667	0.0000874	0.0000778	0.0000504
Arsenic - As				
Concentration (μg/dscm)	0.140	0.152	<0.114	<0.111
Concentration (gr/dscf)	6.13E-08	6.66E-08	<4.97E-08	<4.87E-08
Emission Rate (lb/hr)	0.0000300	0.0000351	<0.0000238	<0.0000237
Barium - Ba				
Concentration (μg/dscm)	2.58	4.73	2.24	1.93
Concentration (gr/dscf)	1.13E-06	2.07E-06	9.79E-07	8.45E-07
Emission Rate (lb/hr)	0.000551	0.00109	0.000469	0.000411
Berylium - Be				
Concentration (μg/dscm)	<0.0273	<0.0253	<0.0284	<0.0278
Concentration (gr/dscf)	<1.19E-08	<1.11E-08	<1.24E-08	<1.22E-08
Emission Rate (lb/hr)	<0.00000583	<0.00000583	<0.00000595	<0.00000592
Cadmium - Cd				
Concentration (μg/dscm)	1.86	1.00	1.08	0.886
Concentration (gr/dscf)	8.13E-07	4.38E-07	4.72E-07	3.87E-07
Emission Rate (lb/hr)	0.000398	0.000231	0.000226	0.000188
Chromium - Cr				
Concentration (μg/dscm)	1.35	1.59	1.38	1.10
Concentration (gr/dscf)	5.89E-07	6.93E-07	6.02E-07	4.83E-07
Emission Rate (lb/hr)	0.000288	0.000365	0.000289	0.000235
Cobalt - Co				
Concentration (μg/dscm)	<0.109	0.138	<0.114	<0.111
Concentration (gr/dscf)	<4.77E-08	6.04E-08	<4.97E-08	<4.87E-08
Emission Rate (lb/hr)	<0.0000233	0.0000318	<0.0000238	<0.0000237
Copper - Cu				
Concentration (μg/dscm)	1.47	3.10	1.76	5.14
Concentration (gr/dscf)	6.44E-07	1.36E-06	7.70E-07	2.24E-06
Emission Rate (lb/hr)	0.000315	0.000714	0.000369	0.00109

General Iron Industries, Inc.
Hammermill Shredder

Method 29 Parameters

Project No. 023AS-451738

EPA METHOD 29 RESULTS	Run 1	Run 2	Run 4	Run 5
Lead - Pb				
Concentration (µg/dscm)	4.93	7.43	5.44	3.42
Concentration (gr/dscf)	2.15E-06	3.25E-06	2.38E-06	1.49E-06
Emission Rate (lb/hr)	0.00105	0.00171	0.00114	0.000727
Manganese - Mn				
Concentration (µg/dscm)	4.01	4.82	5.42	3.48
Concentration (gr/dscf)	1.75E-06	2.11E-06	2.37E-06	1.52E-06
Emission Rate (lb/hr)	0.000857	0.001110	0.001136	0.000738
Nickel - Ni				
Concentration (µg/dscm)	1.63	2.55	1.36	0.930
Concentration (gr/dscf)	7.14E-07	1.12E-06	5.92E-07	4.06E-07
Emission Rate (lb/hr)	0.000349	0.000588	0.000284	0.000198
Phosphorous - P				
Concentration (µg/dscm)	18.2	19.6	15.2	13.7
Concentration (gr/dscf)	7.93E-06	8.56E-06	6.66E-06	6.00E-06
Emission Rate (lb/hr)	0.00388	0.00451	0.00319	0.00292
Selenium - Se				
Concentration (µg/dscm)	0.70	1.17	<0.114	0.160
Concentration (gr/dscf)	3.05E-07	5.10E-07	<4.97E-08	6.98E-08
Emission Rate (lb/hr)	0.000149	0.000269	<0.0000238	0.0000340
Silver - Ag				
Concentration (µg/dscm)	<0.109	<0.101	1.61	<0.111
Concentration (gr/dscf)	<4.77E-08	<4.42E-08	7.02E-07	<4.87E-08
Emission Rate (lb/hr)	<0.0000233	<0.0000233	0.000337	<0.0000237
Thallium - Tl				
Concentration (µg/dscm)	<0.109	<0.101	<0.114	<0.111
Concentration (gr/dscf)	<4.77E-08	<4.42E-08	<4.97E-08	<4.87E-08
Emission Rate (lb/hr)	<0.0000233	<0.0000233	<0.0000238	<0.0000237
Zinc - Zn				
Concentration (µg/dscm)	351	345	312	265
Concentration (gr/dscf)	1.53E-04	1.51E-04	1.36E-04	1.16E-04
Emission Rate (lb/hr)	0.0750	0.0795	0.0654	0.0563
Mercury - Hg				
Concentration (µg/dscm)	136	50.6	176	11.0
Concentration (gr/dscf)	5.96E-05	2.21E-05	7.68E-05	4.82E-06
Emission Rate (lb/hr)	0.0291	0.0117	0.0368	0.00234

APPENDIX D
FIELD DATA PRINTOUTS

General Iron Industries, Inc.
Hammermill Shredder

Method 29 Field Data Entry

Project No. 023AS-451738

Project Number	451738
Client	Iron Industries
Plant	Chicago, IL
Location	Hammer Mill Shredder
Date	6/13/2018
Meter ID	M-39
Y_d	0.9987
Pitot C_p	0.84

Nozzle Diameter (in)	0.170
Filter ID	31347
Train Type	IMP
Train ID	IB-18
P_b (inches Hg)	29.85
P_s (inches H_2O)	1.3
Start Time	11:49
Stop Time	13:40

Place an "x" in the appropriate Box

Circular?	x
Rectangular?	
Diameter	50
Length	
Width	

Moisture	Tare Wt (g)	Final Wt (g)	Net Wt (g)
Impinger 1	642.4	681.4	39.0
Impinger 2	713.4	733.9	20.5
Impinger 3	752.7	758.0	5.3
Impinger 4	605.6	607.9	2.3
Impinger 5	630.7	632.1	1.4
Impinger 6	737.2	737.2	0.0
Silica Gel	911.1	923.9	12.8
Weight of Water Collected, V_{wc} (g)			68.5
Silica Gel Net Weight, V_{wsg} (g)			12.8

Analyzer	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$
Trial 1	0.40	NA	20.8
Trial 2	0.40	NA	20.8
Trial 3	0.40	NA	20.8
Average	0.40	NA	20.8

Run 1

Traverse Point	Min/Pt 6 Elapsed Time	Velocity Pressure ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume Initial (ft^3) 807.36	Stack Temp. (°F)	DGM Inlet (°F)	DGM Outlet (°F)	Square Root ΔP	Stack Gas Velocity Vs (ft/sec)	Volume Metered Vmstd (ft^3)	Isokinetics (%)
1-1	6	1.60	1.40	811.55	114	93	89	1.265	74.8	4.013	108.9
1-2	12	1.90	1.60	815.92	119	96	91	1.378	81.8	4.168	104.2
1-3	18	1.80	1.50	820.20	119	101	91	1.342	79.7	4.063	104.4
1-4	24	1.70	1.50	824.50	120	103	93	1.304	77.5	4.067	107.6
1-5	30	1.60	1.40	828.90	121	105	95	1.265	75.2	4.146	113.2
1-6	36	2.20	1.90	832.84	120	107	98	1.483	88.1	3.701	86.1
1-7	42	2.40	2.10	837.60	120	109	100	1.549	92.1	4.457	99.3
1-8	48	2.00	1.70	842.10	121	110	102	1.414	84.1	4.198	102.5
2-1	54	1.50	1.30	846.14	121	107	104	1.225	72.8	3.769	106.3
2-2	60	1.60	1.40	850.25	120	110	104	1.265	75.2	3.825	104.3
2-3	66	1.70	1.50	854.30	120	112	106	1.304	77.5	3.757	99.4
2-4	72	1.60	1.40	858.35	121	115	108	1.265	75.2	3.739	102.1
2-5	78	1.70	1.50	862.45	120	115	109	1.304	77.5	3.783	100.1
2-6	84	2.20	1.90	867.22	123	116	110	1.483	88.4	4.398	102.6
2-7	90	2.20	1.90	871.82	118	116	111	1.483	88.0	4.238	98.4
2-8	96	2.20	1.90	876.55	121	116	111	1.483	88.2	4.357	101.4
Totals and Averages	96		1.62	69.19	120		105	1.36	81.0	64.68	102.3

General Iron Industries, Inc.
Hammermill Shredder

Method 29 Field Data Entry

Project No. 023AS-451738

Project Number	451738
Client	Iron Industries
Plant	Chicago, IL
Location	Hammer Mill Shredder
Date	6/13/2018
Meter ID	M-39
Y_d	0.9987
Pitot C_p	0.84

Nozzle Diameter (in)	0.170
Filter ID	31346
Train Type	IMP
Train ID	IB-16
P_b (Inches Hg)	29.79
P_s (Inches H_2O)	1.0
Start Time	15:15
Stop Time	17:09

Place an "x" in the appropriate Box

Circular?	x
Rectangular?	
Diameter	50
Length	
Width	

Moisture	Tare Wt (g)	Final Wt (g)	Net Wt (g)
Impinger 1	736.9	769.0	32.1
Impinger 2	736.0	753.1	17.1
Impinger 3	661.4	667.8	6.4
Impinger 4	733.7	741.5	7.8
Impinger 5	735.8	737.1	1.3
Silica Gel	946.1	965.2	19.1
Weight of Water Collected, V_{wc} (g)			64.7
Silica Gel Net Weight, V_{wsg} (g)			19.1

Analyzer	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$
Trial 1	0.30	NA	20.9
Trial 2	0.30	NA	20.9
Trial 3	0.30	NA	20.9
Average	0.30	NA	20.9

Run 2

Traverse Point	Min/Pt 6 Elapsed Time	Velocity Pressure ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume Initial (ft^3) 878.51	Stack Temp. (°F)	DGM Inlet (°F)	DGM Outlet (°F)	Square Root ΔP	Stack Gas Velocity Vs (ft/sec)	Volume Metered Vmstd (ft^3)	Isokinetics (%)
1-1	6	2.90	2.60	883.75	113	107	106	1.703	100.7	4.886	98.3
1-2	12	2.70	2.30	888.90	115	109	106	1.643	97.3	4.790	100.0
1-3	18	2.50	2.20	893.95	116	111	106	1.581	93.7	4.687	101.8
1-4	24	2.10	1.80	899.08	117	113	107	1.449	86.0	4.744	112.6
1-5	30	2.40	2.10	903.60	118	115	108	1.549	92.0	4.172	92.7
1-6	36	2.00	1.70	908.45	118	115	108	1.414	84.0	4.472	108.8
1-7	42	2.10	1.80	913.30	115	117	110	1.449	85.8	4.458	105.6
1-8	48	1.90	1.60	917.70	119	118	111	1.378	81.9	4.035	100.8
2-1	54	2.70	2.30	923.25	120	107	109	1.643	97.8	5.157	108.2
2-2	60	2.10	1.80	928.05	119	108	108	1.449	86.1	4.455	105.9
2-3	66	1.60	1.40	932.16	122	109	107	1.265	75.4	3.811	104.0
2-4	72	2.00	1.70	936.50	118	110	107	1.414	84.0	4.023	97.9
2-5	78	1.90	1.60	940.72	117	109	106	1.378	81.8	3.918	97.7
2-6	84	2.00	1.70	945.15	117	110	106	1.414	83.9	4.110	99.9
2-7	90	1.90	1.60	949.45	116	110	106	1.378	81.7	3.989	99.4
2-8	96	1.80	1.50	953.80	116	109	105	1.342	79.5	4.041	103.5
Totals and Averages	96		1.86	75.29	117	109		1.47	87.0	69.74	102.3

General Iron Industries, Inc.
Hammermill Shredder

Method 29 Field Data Entry

Project No. 023AS-451738

Project Number	451738
Client	Iron Industries
Plant	Chicago, IL
Location	Hammer Mill Shredder
Date	6/14/2018
Meter ID	M-39
Y_d	0.9987
Pitot C_p	0.84

Nozzle Diameter (in)	0.170
Filter ID	31457
Train Type	IMP
Train ID	IB-16
P_b (inches Hg)	29.85
P_s (inches H_2O)	1.0
Start Time	10:56
Stop Time	12:45

Place an "x" in the appropriate Box

Circular?	x
Rectangular?	
Diameter	50
Length	
Width	

Moisture	Tare Wt (g)	Final Wt (g)	Net Wt (g)
Impinger 1	687.8	741.5	53.7
Impinger 2	765.2	777.6	12.4
Impinger 3	609.1	611.4	2.3
Impinger 4	622.8	624.3	1.5
Impinger 5	732.8	735.5	2.7
Silica Gel	848.0	863.1	15.1
Weight of Water Collected, V_{wc} (g)			72.6
Silica Gel Net Weight, V_{wsg} (g)			15.1

Analyzer	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$
Trial 1	0.39	NA	20.79
Trial 2	0.39	NA	20.79
Trial 3	0.39	NA	20.79
Average	0.39	NA	20.79

Run 4

Traverse Point	Min/Pt 6 Elapsed Time	Velocity Pressure ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume Initial (ft^3) 1,058.74	Stack Temp. (°F)	DGM Inlet (°F)	DGM Outlet (°F)	Square Root ΔP	Stack Gas Velocity Vs (ft/sec)	Volume Metered Vmstd (ft^3)	Isokinetics (%)
1-1	6	1.90	1.60	1062.82	111	89	86	1.378	81.4	3.934	98.3
1-2	12	2.00	1.70	1067.10	119	95	87	1.414	84.1	4.102	100.6
1-3	18	1.80	1.50	1071.25	120	99	88	1.342	79.9	3.957	102.4
1-4	24	1.90	1.60	1075.42	121	100	89	1.378	82.1	3.970	100.0
1-5	30	1.70	1.40	1079.45	122	100	90	1.304	77.7	3.832	102.2
1-6	36	1.90	1.60	1083.66	121	101	90	1.378	82.1	4.001	100.8
1-7	42	1.70	1.40	1087.90	123	102	92	1.304	77.8	4.017	107.2
1-8	48	2.10	1.70	1092.17	119	102	93	1.449	86.2	4.045	96.8
2-1	54	1.40	1.20	1095.70	120	98	94	1.183	70.4	3.349	98.2
2-2	60	1.50	1.20	1099.30	121	100	94	1.225	73.0	3.409	96.7
2-3	66	1.50	1.20	1103.05	123	102	94	1.225	73.1	3.545	100.7
2-4	72	1.50	1.20	1106.80	122	103	95	1.225	73.0	3.538	100.4
2-5	78	2.00	1.70	1111.11	123	104	96	1.414	84.4	4.064	100.0
2-6	84	1.80	1.50	1115.35	120	105	97	1.342	79.9	3.989	103.2
2-7	90	2.20	1.80	1119.75	120	105	97	1.483	88.3	4.143	96.9
2-8	96	2.20	1.80	1124.23	119	105	97	1.483	88.2	4.218	98.6

Totals and Averages

	96		1.51	65.49	120		96.5	1.35	80.1	62.11	100.2

Project Number	451738
Client	Iron Industries
Plant	Chicago, IL
Location	Hammer Mill Shredder
Date	6/14/2018
Meter ID	M-39
Y_d	0.9987
Pitot C_p	0.84

Nozzle Diameter (in)	0.170
Filter ID	31460
Train Type	IMP
Train ID	IB-18
P_b (Inches Hg)	29.80
P_s (Inches H_2O)	1.0
Start Time	13:45
Stop Time	15:33

Place an "x" in the appropriate Box

Circular?	x
Rectangular?	
Diameter	60
Length	
Width	

Moisture	Tare Wt (g)	Final Wt (g)	Net Wt (g)
Impinger 1	743.2	800.3	57.1
Impinger 2	738.0	749.5	11.5
Impinger 3	665.9	668.9	3.0
Impinger 4	746.9	748.7	1.8
Impinger 5	744.2	745.4	1.2
Silica Gel	964.4	976.2	11.8
Weight of Water Collected, V_{wc} (g)			74.6
Silica Gel Net Weight, V_{wsg} (g)			11.8

Analyzer	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$
Trial 1	0.40	NA	20.80
Trial 2	0.40	NA	20.80
Trial 3	0.40	NA	20.80
Average	0.40	NA	20.80

Run 5

Traverse Point	Min/Pt 6 Elapsed Time	Velocity Pressure ΔP (in. H_2O)	Orifice Setting ΔH (in. H_2O)	Gas Sample Volume Initial (ft^3) 124.86	Stack Temp. (°F)	DGM Inlet (°F)	DGM Outlet (°F)	Square Root ΔP	Stack Gas Velocity Vs (ft/sec)	Volume Metered Vmstd (ft^3)	Isokinetics (%)
1-1	6	2.00	1.70	129.10	107	88	88	1.414	83.3	4.089	99.1
1-2	12	1.70	1.40	133.10	116	93	88	1.304	77.4	3.828	101.4
1-3	18	1.50	1.20	136.92	120	95	88	1.225	72.9	3.647	103.3
1-4	24	1.50	1.20	140.68	119	95	89	1.225	72.9	3.587	101.5
1-5	30	1.70	1.40	144.66	118	95	89	1.304	77.5	3.798	100.8
1-6	36	1.90	1.60	148.86	119	95	89	1.378	82.0	4.010	100.8
1-7	42	2.00	1.70	153.05	116	95	89	1.414	83.9	4.002	97.8
1-8	48	2.10	1.70	157.50	118	95	89	1.449	86.1	4.250	101.5
2-1	54	1.90	1.60	161.67	117	94	89	1.378	81.9	3.985	100.0
2-2	60	1.90	1.60	165.93	117	95	89	1.378	81.9	4.068	102.1
2-3	66	1.80	1.50	169.40	118	96	89	1.342	79.8	3.309	85.4
2-4	72	1.80	1.50	174.20	117	97	89	1.342	79.7	4.574	117.9
2-5	78	1.60	1.30	178.05	119	96	89	1.265	75.3	3.670	100.5
2-6	84	1.90	1.60	182.20	119	95	90	1.378	82.0	3.959	99.5
2-7	90	2.20	1.80	186.71	119	96	90	1.483	88.2	4.301	100.4
2-8	96	2.20	1.80	191.25	116	96	89	1.483	88.0	4.333	100.9
Totals and Averages											
	96		1.54	66.40	117	91.8		1.36	80.8	63.41	100.8

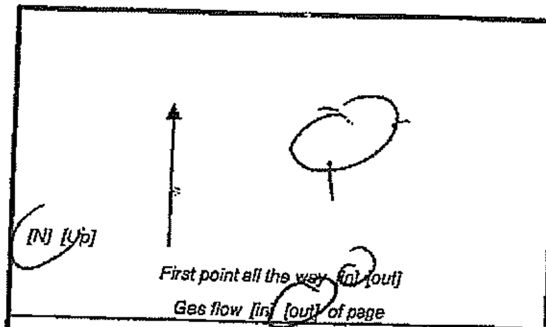
APPENDIX E
FIELD DATA

MONTROSE AIR QUALITY SERVICES, LLC

EPA Method 1

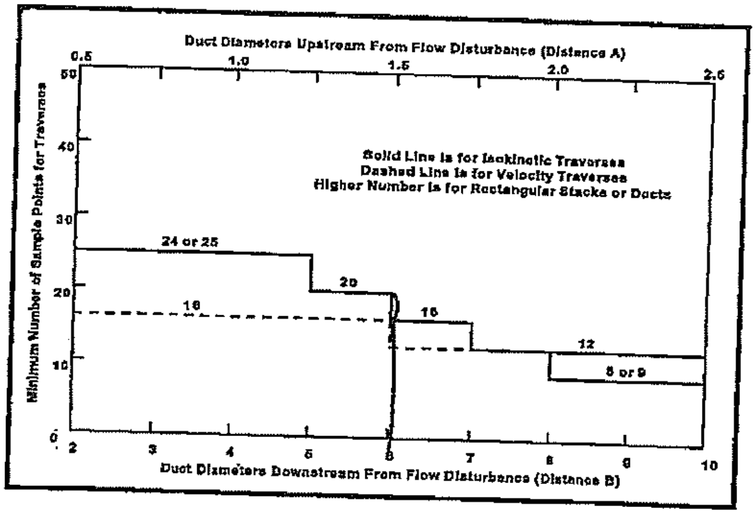
LOCATION Hammond, IN Sample and Velocity Traverses Datasheet

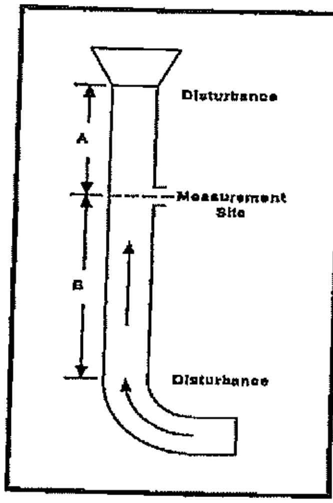
Client	Fran Industries Inc
Project No:	451738
Plant	Chicago IC
Date	6-13-18
Technician	CS
Duct Diameter (in.)	50
Port Diameter (in.)	4 in
Port Length (in.)	14.5
Port Type	Nipple
Distance A (ft)	~~3~~ 50
Distance B (ft)	25
Distance A (Duct Diameters)	~~3~~ 12
Distance B (Duct Diameters)	6



Cross Section of Duct

For rectangular ducts $ED = \frac{2LW}{(L+W)}$





Location Schematic and Notes

Distance B includes 17" of a 12° ~~curve~~, per EPA guidance document "Guidlines for sampling in tapered stacks" anything less than 15° is considered a non disturbance.

Indicate sample ports, height from grade, types of disturbances, access, unistrut configuration, etc.

Distance to point must include length of port

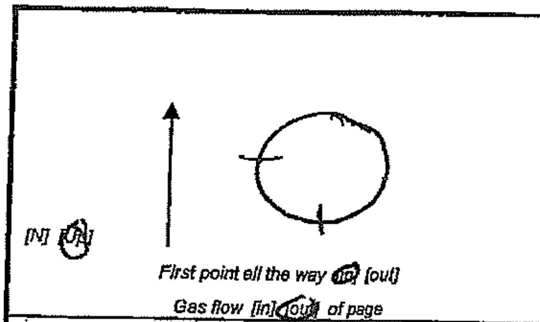
Traverse Point	Distance (in.)
1	16.11
2	19.74
3	24.19
4	30.66
5	48.34
6	54.81
7	59.26
8	62.89
9	
10	
11	
12	
13	
14	
15	
16	

MONTROSE AIR QUALITY SERVICES, LLC

EPA Method 1

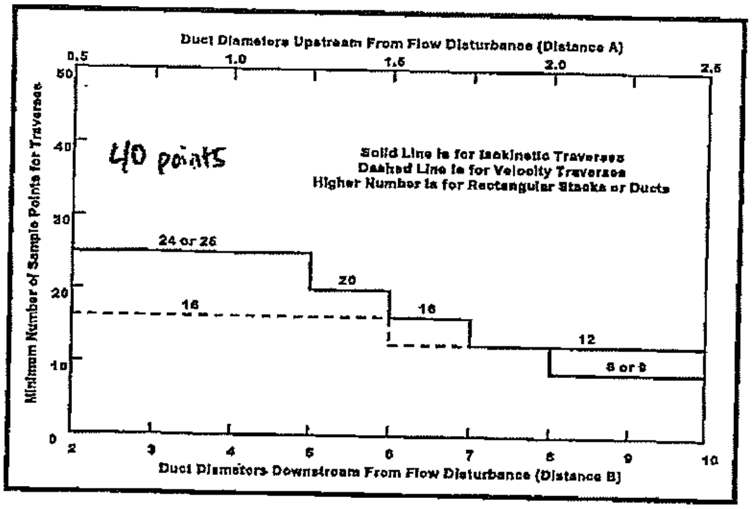
LOCATION Hammer Mill Shredder Sample and Velocity Traverses Datasheet

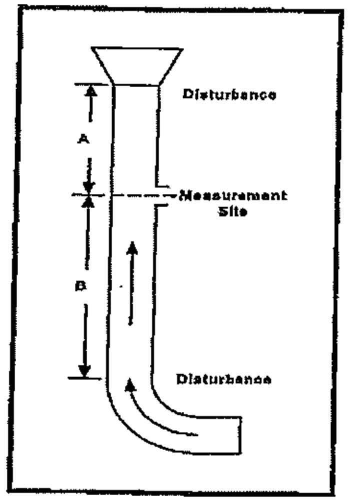
Client	Iron Industries
Project No:	451738
Plant	Chicago, IL
Date	6/14/18
Technician	BH
Duct Diameter (in.)	50
Port Diameter (in.)	4
Port Length (in.)	8
Port Type	M - Nipple
Distance A (ft)	<50
Distance B (ft)	25
Distance A (Duct Diameters)	<12
Distance B (Duct Diameters)	6



Cross Section of Duct

For rectangular ducts $ED = \frac{2LW}{(L+W)}$





30 FLOW POINTS

Location Schematic and Notes A=13.6354

Dist

Indicate sample ports, height from grade, types of disturbances, access, unistrut configuration, etc.
Distance to point must include length of port

Traverse Point	Distance (in.)
1	8.63
2	9.95
3	11.35
4	12.84
5	14.46
6	16.23
7	18.21
8	20.50
9	23.32
10	27.41
11	38.99
12	42.68
13	45.50
14	47.79
15	49.77
16	51.54
17	53.16
18	54.65
19	56.05
20	57.37

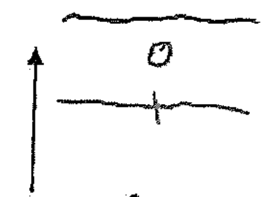
MONTROSE AIR QUALITY SERVICES, LLC

EPA Method 2

Cyclonic Flow Traverse Datasheet

Page	1	of	1

Client	Iron Industries Inc.		
Project No.	451738		
Plant	Chicago, IL		
Location	Hammer Mill Shredder	Duct size (in)	50
Date	6/13/18	Port Length (in)	8
Probe ID	AE2-6-6	Pitot Cp	.84



[N] (Up)

First point all the way (in) [out]

Gas flow [in] or (out) of page

Cross Section of Duct

Run Number	1
Start Time	~~9:30~~ 956
Stop Time	10:06
Barometric (inHg)	29.85
Static (inH_2O)	1.3
Probe Operator	CS
Data Recorder	ZM
Pre Leak Check	✓
Post Leak Check	✓

Traverse Point	Pressure ΔP @ 0° (in H_2O)	Angle α (< 20°)	Notes
1-1	.02	2.8	
2	-.02	0.2	
3	-.01	0.3	
4	.01	4.5	
5	.02	6.2	
6	.02	13.5	
7	.02	15.5	
8	.02	17.2	
2-1	-.01	5.0	
2	.01	5.0	
3	-.01	7.0	
4	-.01	10.0	
5	0.0	0.0	
6	-.01	5.0	
7	.01	15.0	
8	.01	0.0	
Total		107.2	
Average		6.7	

Run Number	
Start Time	
Stop Time	
Barometric (inHg)	
Static (inH_2O)	
Probe Operator	
Data Recorder	
Pre Leak Check	
Post Leak Check	

Traverse Point	Pressure ΔP @ 0° (in H_2O)	Angle α (< 20°)	Notes
Total			
Average			

Run Number	
Start Time	
Stop Time	
Barometric (inHg)	
Static (inH_2O)	
Probe Operator	
Data Recorder	
Pre Leak Check	
Post Leak Check	

Traverse Point	Pressure ΔP @ 0° (in H_2O)	Angle α (< 20°)	Notes
Total			
Average			

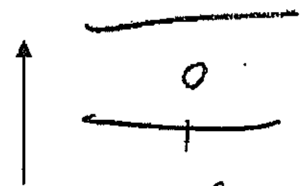
MONTROSE AIR QUALITY SERVICES, LLC

General Testing Datasheet

TESTING TYPE: PM / Metals

RUN NO. 1 **METHOD NO.** 5/29 **Page** 1 **of** 2

Client	Iron Industries Inc.			
Plant	Chicago, IL			
Location	Hammer Mill Shredder			
Date	6/13/18	Project No.	451738	
Meter Operator	ZM			
Probe Operator	CS			
Meter ID	M-39	Yd	.9987	Pitot Cp .84
ΔH@	1.899	Kf	.86	Leak check ✓
Pre Leak Check	0.000	[cfm] [lpm] @	15	(inHg)
Post Leak Check	0.000	[cfm] [lpm] @	15	(inHg)



[IN] [Up]

First point all the way [in] [out]

Gas flow [in] [out] of page

Cross Section of Duct

Barometric (in. Hg)	29.85	Water (ml) (g)	68.5
Ambient Temp. (°F)	80	Silica gel (g)	12.8
Static (in. H_2O)	ZM ~~-1.0~~ -1.3	Total Vlc	81.3
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	.170	Nozzle Dia (in.)	.170
Filter ID	31347	—	—
Train ID	18-18 ~~CB-3~~	Train Type	Imp
Duct Dim. (in.)	50	Port Lgth. (in.)	8.14.5
			~~12.4~~
Start Time	11:49	Stop Time	13:40

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial [ft³] [l] ~~804.15~~	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
1-1	6	1.6	1.4	811.55	114	250	256	63	93	89	6	N/A	Initial Vol = ~~807.05~~ .36 ZM
2	12	1.9	1.6	815.92	119	252	250	62	96	91	6		
3	18	1.8	1.5	820.20	119	253	257	60	101	91	6		
4	24	~~1.9~~	~~1.6~~	824.50	120	250	250	62	103	93	6		1.7 = ΔP , 1.5 ΔH
5	30	1.6	1.4	828.90	121	252	250	63	105	95	6		
6	36	2.2	1.9	832.84	120	250	250	63	107	98	6		
7	42	2.4	2.1	837.60	120	251	253	62	109	100	6		
8	48	2.0	1.7	842.10	121	253	252	62	116	102	6		
2-1	54	1.5	1.3	846.14	121	251	250	61	107	104	6		
2	60	1.6	1.4	850.25	120	252	252	60	110	104	6		
3	66	1.7	1.5	854.30	120	253	253	56	112	106	6		
4	72	1.6	1.4	858.35	121	250	250	54	115	108	6		
Total	96	21.8123	18.7	69.19	1436				1268	1181			
Average		1.3633	1.6		119.9				104.8				

1.619 ZM

Circle correct bracketed [ ] units
Train Type denotes impingers, knockouts, etc.

B-133

R 001443

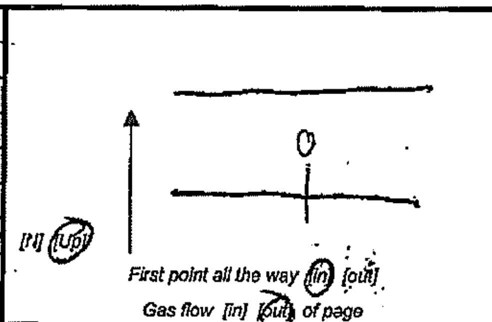
GI0000310

MONTROSE AIR QUALITY SERVICES, LLC
General Testing Datasheet

TESTING TYPE: PM / Metals

RUN NO. 1 (Cont'd) METHOD NO. 5/29

Client	Iron Industries Inc.		
Plant	Chicago, IL		
Location	Hammer Mill Shredder		
Date	6/13/18	Project No.	45L738
Meter Operator	ZM		
Probe Operator	CS		
Meter ID	M-39	Yd	.9987
Pitot Cp	.84		
ΔH@	1.899	Kf	.86
Leak check	✓		
Pre Leak Check	0.000 [cfm] [lpm] @ 15 (inHg)		
Post Leak Check	0.000 [cfm] [lpm] @ 15 (inHg)		



Cross Section of Duct

Barometric (in. Hg)	29.85	Water (ml) (g)	68.5
Ambient Temp. (°F)	80	Silica gel (g)	12.8
Static (in. H_2O)	1.3	Total Vlc	81.3
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	.170	Nozzle Dia (in.)	.170
Filter ID	31347		
Train ID	~~1B-10~~ CB-3	Train Type	Imp
Duct Dim. (in.)	50	Port Lgth. (in.)	~~8~~ ZM 14.8 * BH
Start Time	11:49	Stop Time	13:40

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial [ft³] [L] ~~807.03~~	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
2-5	78	~~2.2~~	~~1.9~~	862.45	120	253	253	57	115	109	6	N/A	Initial Vol = 807.36
6	84	2.2	1.9	867.22	123	251	251	56	116	110	6		ΔP = 1.7, ΔH = 1.5
7	90	~~2.4~~	~~1.8~~	871.82	118	254	255	57	116	117	6		ΔP = 2.2, ΔH = 1.9
8	96	2.2	1.9	876.58	121	254	254	58	116	111	6		
				ZM	~~122~~	~~253~~	~~252~~	~~58~~	~~116~~	~~111~~	~~6~~		
Total	96	21.8/23	7.2	69.19	482				463	441			
Average		1.3633	1.6		119.9				109.8				

Circle correct bracketed [ ] units
Train Type denotes impingers, knockouts, etc.

B-134

R 001444

GI0000311

MONTROSE AIR QUALITY SERVICES, LLC

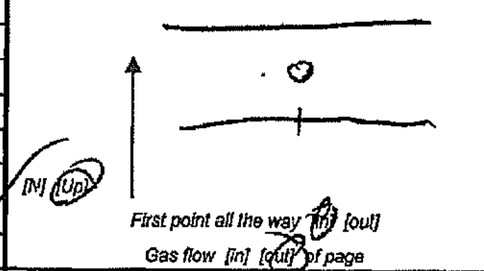
General Testing Datasheet

TESTING TYPE: PM / Metals

RUN NO. 2

METHOD NO. 5/29

Client	Iron Industries Inc		
Plant	Chicago, IL		
Location	Hammer Mill Shredder		
Date	6/13/18	Project No.	451738
Meter Operator	ZM		
Probe Operator	CS		
Meter ID	M-39	Yd	.9987
Pitot Cp	.84		
ΔH@	1.899	Kf	.87
Leak check	✓		
Pre Leak Check	0.000	[cfm] [lpm] @ 18	(inHg)
Post Leak Check	0.000	[cfm] [lpm] @ 15	(inHg)



Cross Section of Duct

Barometric (in. Hg)	29.79	Water (ml) (g)	64.2
Ambient Temp. (°F)	80	Silica gel (g)	19.1
Static (in. H_2O)	1.0	Total Vlc	83.3
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	.170	Nozzle Dia (in.)	.170
Filter ID	31348		
Train ID	18-16 ~~BB-3~~	Train Type	Imp
Duct Dim. (in.)	50	Port Lgth. (in.)	~~8~~ 14
Start Time	1516	Stop Time	17:59

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial [ft³] [l] 878.51	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
1-1	6	2.9	~~2.58~~	883.78	113	250	250	62	107	106	11	N/A	ΔH = 2.6
2	12	2.7	2.3	888.90	115	253	250	54	109	~~109~~	11		DGM out = 106
3	18	2.5	2.2	893.95	116	253	250	53	111	106	11		
4	24	2.1	1.8	899.08	~~114~~	251	250	57	113	107	11		Stack temp = 117
5	30	2.4	2.1	903.60	~~115~~	251	251	59	115	108	11		Stack temp = 118
6	36	2.0	1.7	908.45	118	251	250	61	115	108	11		New Kf = .85
7	42	2.1	1.8	913.30	115	251	251	61	117	110	11		
8	48	1.9	1.6	917.70	119	250	251	62	118	111	11		Resume 16:20
2-1	54	2.7	2.3	923.25	120	250	250	60	107	109	~~11~~ ZM		vacuum 10
2	60	2.1	1.8	928.05	119	250	250	53	108	108	~~7~~ ZM		Vacuum = 11
3	66	1.6	1.4	932.16	122	250	250	58	109	107	9		Kf = .86
4	72	2.0	1.7	936.50	118	250	250	59	110	107	9		
Total	96	23.4514	23.3	75.29	1410				1339	1293			
Average		1.4657	1.85625		117.25				109.15				

Circle correct bracketed [] units
Train Type denotes impingers, knockouts, etc.

B-135

GI0000312

R 001445

MONTROSE AIR QUALITY SERVICES, LLC

General Testing Datasheet

TESTING TYPE: PM / Metals

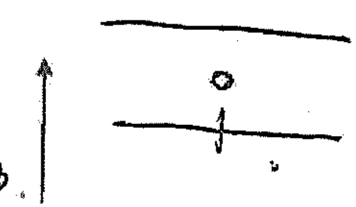
RUN NO. 2 (cont.)

METHOD NO. 5/29

Client	Iron Industries Inc.		
Plant	Chicago, IL		
Location	Hammermill Shredder		
Date	6/13/18	Project No.	145738
Meter Operator	ZM		
Probe Operator	CS		

Meter ID	M-39	Yd	.9987	Pitot Cp	.84
ΔH@	1.899	Kf	.86	Leak check	✓
Pre Leak Check	0.000	[cfm] [lpm] @	18	(inHg)	
Post Leak Check	0.000	[cfm] [lpm] @	15	(inHg)	

[IN] [UA]



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Gas flow [in] [out] of page

Cross Section of Duct

Barometric (in. Hg)	29.79	Water (ml) (g)	64.2
Ambient Temp. (°F)	80	Silica gel (g)	19.1
Static (in. H_2O)	1.0	Total Vlc	83.8
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	.170	Nozzle Dia (in.)	.170
Filter ID	31348	—	—
Train ID 18-16	~~G8-3~~ KBH	Train Type	Imp
Duct Dim. (in.)	30	Port Lgth. (in.)	~~8~~ 14.8 KBH
Start Time	1515	Stop Time	17:09

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial [ft³] [l] 878.51	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
2-5	78	1.9	1.6	940.72	117	250	250	61	109	106	9	N/A	
6	84	2.0	1.7	945.15	119	250	250	62	110	106	9		
7	90	1.9	1.6	949.45	116	250	250	63	110	106	9		
8	96	1.8	1.5	953.80	116	250	250	64	109	105	9		
Total	96	23.4514	6.4	75.29	466				438	423			
Average		1.4657	1.85625		117.28				109.15				

Circle correct bracketed [] units

Train Type denotes impingers, knockouts, etc.

B-136

R 001446

GI000313

MONTROSE AIR QUALITY SERVICES, LLC

General Testing Datasheet

TESTING TYPE: PM/Metals

RUN NO. 4

METHOD NO. 5/29

Client	Iron Industries Inc.		
Plant	Chicago IL		
Location	Hammer Mill Shredder		
Date	6/14/18	Project No.	451738
Meter Operator	ZM		
Probe Operator	CS		

Meter ID	M-39	Yd	.9987	Pitot Cp	.84
ΔH@	1.899	Kf	.83	Leak check	✓
Pre Leak Check	0.008 [cfm] [lpm] @	20	(inHg)		
Post Leak Check	0.006 [cfm] [lpm] @	15	(inHg)		

[IN] [Up]

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0

First point all the way [in] [out]

Gas flow [in] [out] of page

Cross Section of Duct

Barometric (in. Hg)	29.85	Water (ml) (g)	72.6
Ambient Temp. (°F)	85	Silica gel (g)	15.1
Static (in. H_2O)	1.0	Total Vlc	87.7
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	.170	Nozzle Dia (in.)	.170
Filter ID	31457	—	—
Train ID	ZM 3B-36	Train Type	Imp
Duct Dim. (in.)	50	Port Lgth. (in.)	14.5
			RBH
Start Time	1053	Stop Time	1245

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial [ft³] [l] 1058.79	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
1-1	6	1.9	1.6	1062.82	111	250	250	65	89	86	7	N/A	
2	12	2.0	1.7	~~1066.~~ ZM	119	250	250	65	95	87	9		1067.10 ZVol.
3	18	1.8	1.5	1071.25	120	250	250	65	99	88	8		
4	24	1.4	1.6	1075.42	121	250	250	65	100	89	8		
5	30	1.7	1.4	1079.95	122	250	250	65	100	90	8		
6	36	1.9	1.6	1083.66	121	250	250	65	101	90	8		
7	42	1.7	1.4	1087.90	123	250	250	60	102	92	8		
8	48	2.1	1.7	1092.17	119	251	251	54	102	93	9		
2-1	54	1.4	1.2	1095.70	120	252	253	65	98	94	6		~~Resume~~ 1144 Pause Port Change
2	60	1.5	1.2	1099.30	121	250	250	57	100	94	6		
3	66	1.5	1.2	1103.05	123	250	250	58	102	94	6		
4	72	1.5	1.2	1106.80	122	251	250	61	103	95	6		
Total	96	21.5277	17.3	65.49	1442				1191	1092			
Average		1.3455	1.50625		120.25				96.5				

Circle correct bracketed [] units

Train Type denotes impingers, knockouts, etc.

B-137

R 001447

GI000314

MONTROSE AIR QUALITY SERVICES, LLC

General Testing Datasheet

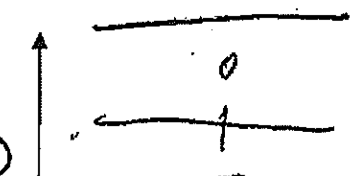
TESTING TYPE: PM / Metals

RUN NO. 4

METHOD NO. 5/29

Client	Iron Industries Inc.		
Plant	Chicago, IL		
Location	Hammer Mill Shredder		
Date	6/14/18	Project No.	451738
Meter Operator	ZM		
Probe Operator	CS		
Meter ID	M-39	Yd	.9987
Pitot Cp	.84		
ΔH@	1.899	Kf	.83
Leak check	✓		
Pre Leak Check	0.000	[cfm] [lpm] @	20 (inHg)
Post Leak Check	0.005	[cfm] [lpm] @	15 (inHg)

[N] [Up]



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Gas flow [in] [out] of page

Cross Section of Duct

Barometric (in. Hg)	29.85	Water (ml) (g)	72.6
Ambient Temp. (°F)	85	Silica gel (g)	15.1
Static (in. H_2O)	1.0	Total Vlc	87.7
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	.170	Nozzle Dia (in.)	.170
Filter ID	31457		
Train ID	IB16 ~~CP-3~~ ZM	Train Type	Imp
Duct Dim. (in.)	52	Port Lgth. (in.)	8 14.5
Start Time	1056	Stop Time	1295

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial [ft³] [l] 1058.74	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
2-5	78	2.0	1.7	1111.11	123	250	250	63	104	96	10	N/A	
6	84	1.8	1.5	1115.35	120	250	250	63	105	97	10		
7	90	2.2	1.8	1119.75	120	251	251	65	105	97	10		
8	96	2.2	1.8	1124.23	~~116~~ 119	250	250	65	105	97	10		Stack @ 119
Total	96	26.5277	6.8	65.49	482				419	387			
Average		1.3455	1.50628		120.28				96.5				

Circle correct bracketed [ ] units

Train Type denotes impingers, knockouts, etc.

B-138

GI0000315

R 001448

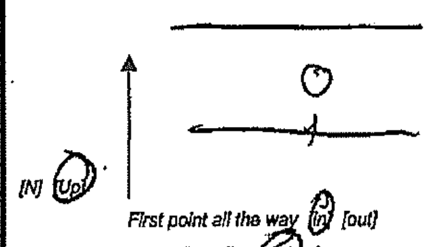
MONTROSE AIR QUALITY SERVICES, LLC

General Testing Datasheet

TESTING TYPE: PM/Metals

RUN NO. 5 **METHOD NO.** 5/29

Client	Sims Industries Inc.		
Plant	Chicago, IL		
Location	Hammer Mill Shredder		
Date	6/14/18	Project No.	W51738
Meter Operator	ZM		
Probe Operator	CS		
Meter ID	M-39	Yd	.9987
Pitot Cp	.84		
ΔH@	1.899	Kf	.83
Leak check	✓		
Pre Leak Check	0.000 [cfm] [lpm] @	22	(inHg)
Post Leak Check	0.000 [cfm] [lpm] @	14	(inHg)



Cross Section of Duct

Barometric (in. Hg)	29.80	Water (ml) (g)	74.6
Ambient Temp. (°F)	88	Silica gel (g)	11.8
Static (in. H_2O)	1.0	Total Vlc	86.4
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	.170	Nozzle Dia (in.)	.170
Filter ID	31460		
Train ID	IB-18	Train Type	Imp
Duct Dim. (in.)	50	Port Lgth. (in.)	8" 14.5
			*B4
Start Time	1345	Stop Time	1533

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial: [ft³] [l] ~~121.67~~	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
1-1	6	2.0	1.7	129.10	107	250	250	55	88	88	7	N/A	124.85
2	12	1.7	1.4	133.10	116	250	251	53	93	88	7		
3	18	1.5	1.2	136.92	120	250	250	52	95	88	7		
4	24	1.5	1.2	140.68	119	250	250	54	95	89	7		
5	30	1.7	1.4	144.66	118	252	252	54	95	89	7		
6	36	1.9	1.6	148.86	119	250	250	55	95	89	7		
7	42	2.0	1.7	153.05	116	259	252	53	95	89	7		
8	48	2.1	1.7	157.50	118	253	252	54	95	89	7		Resume 1445
2-1	54	1.9	1.6	161.67	117	250	250	63	94	89	8		
2	60	1.9	1.6	165.93	117	250	251	52	95	89	9		
3	66	1.8	1.5	~~169.40~~	118	251	255	52	96	89	9		169.40 ZM
4	72	1.8	1.5	174.20	117	253	255	52	97	89	9		
Total	98	21.763	18.1	~~19.24~~	1402				1133	1065			
Average		1.3602	1.53757	66.40	117.1875				91.8				

Circle correct bracketed [ ] units

Train Type denotes impingers, knockouts, etc.

B-139

GI0000316

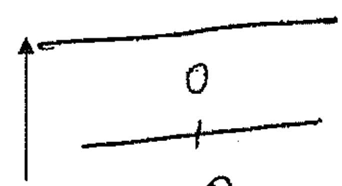
MONTROSE AIR QUALITY SERVICES, LLC

General Testing Datasheet

TESTING TYPE: PM / Metal

RUN NO. 5 **METHOD NO.** 5/29

Client	Ervin Industries Inc		
Plant	Chicago, IL		
Location	Hammer Mill Shredder		
Date	6/14/18	Project No.	451738
Meter Operator	ZM		
Probe Operator	CS		
Meter ID	M-39	Yd	.9967
Pitot Cp	.84		
ΔH@	1.799	Kf	483
Leak check	✓		
Pre Leak Check	0.000 [cfm] [lpm] @	22	(inHg)
Post Leak Check	0.000 [cfm] [lpm] @	14	(inHg)



[IN] [Up]

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Gas flow [in] [out] of page

Cross Section of Duct

Barometric (in. Hg)	29.80	Water (ml) (g)	74.6
Ambient Temp. (°F)	85	Silica gel (g)	11.8
Static (in. H_2O)	1.0	Total Vlc	86.4
Probe ID	5-6-7	Liner Type	Glass
Nozzle ID	*170	Nozzle Dia (in.)	.170
Filter ID	31460	—	—
Train ID	IB-18	Train Type	Imp
Duct Dim. (in.)	50	Port Lgth. (in.)	~~8~~ 14.5 *5U
Start Time	1345	Stop Time	1533

Traverse Point	Min/Point 6 Elapsed Time	Velocity Pressure ΔP (in H_2O)	Orifice Setting ΔH (in H_2O)	Gas Sample Volume Initial [ft³] [l] ~~124.85~~	Stack Temp (°F)	Probe Temp (°F) 250	Filter Temp (°F) 250	Impinger Outlet Temp (°F)	DGM Inlet Temp (°F)	DGM Outlet Temp (°F)	Pump Vacuum (in Hg)	Auxiliary Temp (°F)	Notes
2-5	78	1.6	1.3	178.05	119	252	250	52	96	89	10	N/A	Initial Vol. = 124.85
6	84	1.9	~~1.5~~	182.20	119	253	250	53	95	90	10		ΔH = 1.6
7	90	2.2	1.8	186.71	119	250	251	53	96	90	10		
8	96	2.2	1.8	191.25	116	250	252	53	96	89	10		
Total	96	21.763	6.5	66.40	473				383	358			
Average		1.3602	1.5375		117.1875				91.8				

Circle correct bracketed [ ] units
Train Type denotes impingers, knockouts, etc.

B-140

R 001450

GI0000317

MONTROSE AIR QUALITY SERVICES, LLC

Impinger Weights Datasheet

PROJECT NO. 451738

Client	Iron Industries Inc.
Plant	Chicago, IL
Location	Hammer Mill Shredder
Date	6/13/18 — Unit
Operator	BH

Run No.	1				
Method No.	5/29	Train ID	18-18	Filter No.	31347
	Contents	Tare with Contents (g)	Final (g)	Total (g)	Notes
Impinger No. 1	Empty	642.4	681.4	39.0	
Impinger No. 2	10% H_2O_2 5% HNO_3	713.4	733.9	20.5	
Impinger No. 3	10% H_2O_2 5% HNO_3	752.7	758.0	5.3	
Impinger No. 4	Empty	605.6	607.9	2.3	
Impinger No. 5	10% H_2SO_4 4% $KMnO_4$	630.7	632.1	1.4	
Impinger No. 6	10% H_2SO_4 4% $KMnO_4$	737.2	737.2	0.0	
Impinger No. 7	Silica	911.1	923.9	12.8	
Additional Rinse					
			Net Weight (g)	81.3	

Run No.	2				
Method No.	5/29	Train ID	18-16	Filter No.	31346
	Contents	Tare with Contents (g)	Final (g)	Total (g)	Notes
Impinger No. 1	10% H_2O_2 5% HNO_3	736.9	769.0	32.1	Low Moisture,
Impinger No. 2	10% H_2O_2 5% HNO_3	736.0	753.1	17.1	decided to eliminate
Impinger No. 3	Empty	661.4	667.8	6.4	first "empty imp"
Impinger No. 4	10% H_2SO_4 4% $KMnO_4$	733.7	741.5	7.8	BH
Impinger No. 5	10% H_2SO_4 4% $KMnO_4$	735.8	737.1	1.3	
Impinger No. 6	Silica	946.1	965.2	19.1	
Impinger No. 7					
Additional Rinse					
			Net Weight (g)	83.8	

Run No.	3				
Method No.	5/21	Train ID	18-18	Filter No.	31345
	Contents	Tare with Contents (g)	Final (g)	Total (g)	Notes
Impinger No. 1	10% H_2O_2 5% HNO_3	716.4	739.0	22.6	
Impinger No. 2	10% H_2O_2 5% HNO_3	756.0	759.4	3.4	
Impinger No. 3	Empty	608.9	610.0	1.0	
Impinger No. 4	10% H_2SO_4 4% $KMnO_4$	624.3	625.0	.70	
Impinger No. 5	10% H_2SO_4 4% $KMnO_4$	734.1	735.3	1.2	
Impinger No. 6	Silica	923.1	940.0	16.9	
Impinger No. 7					
Additional Rinse					
			Net Weight (g)	~~42.8~~ 45.9	

MONTROSE AIR QUALITY SERVICES, LLC
Impinger Weights Datasheet

PROJECT NO. 451738

Page 2 of 2

Client	Iron Industries
Plant	Chicago, IL
Location	Hammer Mill Shredder
Date	6/13/18 Unit
Operator	BH

Run No.	FB				
Method No.	5/29	Train ID	18-16	Filter No.	31344
	Contents	Tare with Contents (g)	Final (g)	Total (g)	Notes
Impinger No. 1	10% H_2O_2 5% HNO_3	743.1	743.2	.10	
Impinger No. 2	10% H_2O_2 5% HNO_3	738.0	737.8	-.20	
Impinger No. 3	Empty	665.6	665.6	0.0	
Impinger No. 4	10% H_2SO_4 4% $KMnO_4$	738.4	738.1	-.30	
Impinger No. 5	10% H_2SO_4 4% $KMnO_4$	738.6	737.8	.20	
Impinger No. 6	Silica	964.2	964.2	0.0	
Impinger No. 7					
Additional Rinse					
			Net Weight (g)	-.20	

Run No.	4				
Method No.	5/29	Train ID	18-16	Filter No.	31457
	Contents	Tare with Contents (g)	Final (g)	Total (g)	Notes
Impinger No. 1	10% H_2O_2 5% HNO_3	~~746.6~~	741.5	53.7	687.8 mH
964.8 Impinger No. 2	10% H_2O_2 5% HNO_3	~~765.2~~	777.6	12.4	765.2
Impinger No. 3	Empty	609.1	611.4	2.3	
Impinger No. 4	10% H_2SO_4 4% $KMnO_4$	622.8	624.3	1.5	
Impinger No. 5	10% H_2SO_4 4% $KMnO_4$	732.8	735.5	2.7	
Impinger No. 6	Si	848.0	863.1	15.1	
Impinger No. 7					
Additional Rinse					
			Net Weight (g)	87.7	

Run No.	5				
Method No.	5/29	Train ID	18-18	Filter No.	31460
	Contents	Tare with Contents (g)	Final (g)	Total (g)	Notes
Impinger No. 1	10% H_2O_2 5% HNO_3	743.2	800.3	57.1	
Impinger No. 2	10% H_2O_2 5% HNO_3	738.0	749.5	11.5	
Impinger No. 3	Empty	665.9	668.9	3.0	
Impinger No. 4	10% H_2SO_4 4% $KMnO_4$	746.9	748.7	1.8	
Impinger No. 5	10% H_2SO_4 4% $KMnO_4$	744.2	745.4	1.2	
Impinger No. 6	Silica	964.4	976.2	11.8	
Impinger No. 7					
Additional Rinse					
			Net Weight (g)	86.4	

MONTROSE AIR QUALITY SERVICES, LLC
EPAMethod 3B
Orsat Analyzer Datasheet

Page 1 of 1

Client	Iron Industries	Project No.	451738
Plant	Chicago, IL	Pre Leak Check	
Location	Hammer Mill Shredder	Post Leak Check	

% Difference = ABS[Orsat Avg.-Cal Gas] / Cal Gas X 100

Cal Gas	Trial No.	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$	Analyst	Date	Time
	1	4.82	NA	20.85	BH/ML	6/13/18	9:40
	2	9.86		9.96	$\%O_2$ Difference	$\%CO_2$ Difference	
	3	0.00		0.00			
	Average						

Run No.	Trial No.	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$	Analyst	Date	Time
1	1	.40	NA	20.8	BH	6/13/18	13:50
	2						
	3						
	Average	.40		20.8			
2	1	.30	NA	20.9	BH	6/13/18	17:20
	2						
	3						
	Average	.30	—	20.9			
3	1				~~BH~~	~~6/13/18~~	
	2						
	3				RUN VOIDED, Failed Leak Check		
	Average						

Cal Gas	Trial No.	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$	Analyst	Date	Time
	1	10.1		20.95	MH	6/14/18	13:00
	2	4.9		9.96	$\%O_2$ Difference	$\%CO_2$ Difference	
	3	0.00		0.00			
	Average						

Run No.	Trial No.	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$	Analyst	Date	Time
4	1	.39		20.79	BH	6/14/18	14:15
	2						
	3						
	Average	0.39		20.79			
5	1	.80		20.80	BH	6/14/18	1540
	2						
	3						
	Average	.40		20.80			
	1						
	2						
	3						
	Average						

Cal Gas	Trial No.	$\%CO_2$	$\%CO_2+\%O_2$	$\%O_2$	Analyst	Date	Time
	1						
	2				$\%O_2$ Difference	$\%CO_2$ Difference	
	3						
	Average						

Cylinder Number				
Concentration (%)		$\%O_2$		$\%CO_2$

20.95-O2/4.885-CO2: XL0251718
9.971-O2/9.854-CO2: CC167397
Cylinder Numbers

Notes:
Run an ambient air check to verify Oxsorb.
Measurements must be made to the nearest 0.2%.
Three different trails should be performed for each sample.
The differences between the trials must not be greater than 0.2% overall.

Expected F_o Ranges

Wood Bark	1.000-1.120	Residual Oil	1.210-1.370
Anthracite/Lignite	1.015-1.130	Distillate Oil	1.260-1.413
Municipal Waste	1.043-1.177	Nat. Gas	1.600-1.836
Bituminous	1.083-1.230		

APPENDIX F
LABORATORY DATA

Montrose Air Quality Services, LLC

1371 Brummel Avenue
Elk Grove, IL 60007

Project Number: 451738

Particulate Matter, Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Nickel, Phosphorus, Selenium, Silver, Thallium, Zinc & Mercury

EPA Methods 5 & 29 Analyses

Analytical Report
31368

el1
Element One, Inc.
6319-D Carolina Beach Rd., Wilmington, NC 28412
910-793-0128 FAX: 910-792-6853 e1lab@e1lab.com

The following data for Analytical Report 31368
has been reviewed for completeness, accuracy,
adherence to method protocol,
and compliance with quality assurance guidelines.

Review by:

Katie Gattis, B.S. Chemist
June 21, 2018

Report Reviewed and Finalized By:

Ken Smith, Laboratory Director
June 21, 2018

SUMMARY OF RESULTS

Summary of Analysis

Hammermill Shredder - Summary of Method 29 Mercury Analysis

Run Number		Average Total Catch, µg	Front Half µg	H_2O_2 /HNO_3 µg	Empty Impinger µg	$KMnO_4$ µg	HCl µg
M29/5-R1	#1	250	< 0.1	< 0.5	< 0.2	232	17.5
	#2		< 0.1	< 0.5	< 0.2	233	17.5
M29/5-R2	#1	100	< 0.1	< 0.3	< 0.2	80.3	19.8
	#2		< 0.1	< 0.3	< 0.2	80.2	19.6
M29/5-R4	#1	309	< 0.1	< 0.3	< 0.2	205	101
	#2		< 0.1	< 0.3	< 0.2	211	101
M29/5-R5	#1	19.8	< 0.1	< 0.4	< 0.2	9.65	10.2
	#2		< 0.1	< 0.4	< 0.2	9.66	10.2
Field Blank	#1	< 0.5	< 0.1	< 0.2	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.2	< 0.2	< 0.5	< 0.4
Reagent Blank	#1	< 0.5	< 0.1	< 0.2	< 0.2	< 0.5	< 0.4
	#2		< 0.1	< 0.2	< 0.2	< 0.5	< 0.4

Hammermill Shredder - Summary of Method 5 Particulate Analysis

Fraction	M29/5-R1 e31368-1 Catch, mg	M29/5-R2 e31368-2 Catch, mg	M29/5-R4 e31368-3 Catch, mg	M29/5-R5 e31368-4 Catch, mg
Filter	5.2	8.7	8.0	6.7
Rinse	9.2	10.0	11.4	8.8
Total PM	14.4	18.7	19.4	15.5

Fraction	Field Blank e31368-5 Catch, mg	Reagent Blank e31368-6 Catch, mg
Filter	1.3	---
Rinse	1.8	2.4
Total PM	3.1	2.4

Summary of Analysis

Front Half - Hammermill Shredder- Summary of Method 29 Metals Analysis

Element	M29/5-R1 e31368-1 FH Total µg	M29/5-R2 e31368-2 FH Total µg	M29/5-R2 e31368-2 FH dup Total µg	M29/5-R4 e31368-3 FH Total µg	M29/5-R5 e31368-4 FH Total µg
Antimony	0.472	0.621	0.624	0.388	0.326
Arsenic	0.157	0.194	0.208	< 0.1	< 0.1
Barium	3.95	4.04	3.88	2.80	2.73
Beryllium	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Cadmium	3.31	1.97	1.79	1.74	1.49
Chromium	2.01	2.16	2.11	1.76	1.58
Cobalt	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Copper	1.63	1.82	1.76	1.55	1.35
Lead	7.70	10.8	10.6	8.68	5.67
Manganese	4.04	4.64	4.40	3.97	4.02
Nickel	2.54	2.68	2.59	0.974	0.864
Phosphorus	5.96	8.88	8.83	5.22	4.46
Selenium	0.943	1.70	1.77	< 0.1	0.186
Silver	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Zinc	612	630	628	524	455

Back Half - Hammermill Shredder- Summary of Method 29 Metals Analysis

Element	M29/5-R1 e31368-1 BH Total µg	M29/5-R2 e31368-2 BH Total µg	M29/5-R2 e31368-2 BH dup Total µg	M29/5-R4 e31368-3 BH Total µg	M29/5-R5 e31368-4 BH Total µg
Antimony	< 0.1	0.123	0.130	0.265	< 0.1
Arsenic	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Barium	0.774	5.49	5.26	1.14	0.741
Beryllium	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Cadmium	< 0.1	< 0.1	< 0.1	0.159	< 0.1
Chromium	0.460	1.022	0.972	0.664	0.404
Cobalt	< 0.1	0.177	0.169	< 0.1	< 0.1
Copper	1.07	4.44	4.23	1.55	7.87
Lead	1.33	4.01	3.94	0.884	0.471
Manganese	3.31	5.05	4.95	5.57	2.22
Nickel	0.452	2.44	2.38	1.41	0.805
Phosphorus	27.3	30.1	29.6	21.6	20.2
Selenium	0.336	0.593	0.545	< 0.1	0.101
Silver	< 0.1	< 0.1	< 0.1	2.726	< 0.1
Thallium	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Zinc	30.9	52.5	52.7	25.1	21.0

Summary of Analysis

Blanks - Summary of Method 29 Metals Analysis

Element	Field Blank Front Half e31368-5 FH Total µg	Reagent Blank Front Half e31368-6 FH Total µg	Field Blank Back Half e31368-5 BH Total µg	Reagent Blank Back Half e31368-6 BH Total µg
Antimony	< 0.1	< 0.1	< 0.1	0.135
Arsenic	< 0.1	< 0.1	< 0.1	< 0.1
Barium	3.14	3.09	0.567	< 0.1
Beryllium	< 0.025	< 0.025	< 0.025	< 0.025
Cadmium	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	1.21	1.21	0.318	0.371
Cobalt	< 0.1	< 0.1	< 0.1	< 0.1
Copper	0.375	0.220	0.539	0.394
Lead	0.346	0.216	0.348	< 0.1
Manganese	0.714	0.671	5.31	0.354
Nickel	2.00	2.14	0.324	0.257
Phosphorus	< 2	< 2	16.2	19.8
Selenium	1.11	< 0.1	< 0.1	< 0.1
Silver	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	< 0.1	< 0.1	< 0.1	< 0.1
Zinc	6.02	2.70	7.57	3.38

SUMMARY OF AUDITS

ERA
A Waters Company

31368

Stationary Source Audit Testing Data Reporting Form
Project #: 061318S

Lab Name: Element One Inc

ERA Customer Number: E533235

INSTRUCTIONS:
Please fill in the results, methods references and analysis dates for the analyte(s) you wish to report for Project #061318S. Questions? See the Data Reporting Instructions section of your Data Package or call ERA at 1-800-372-0122. Please photocopy this form if you are reporting multiple methods.

Stationary Source Audit Testing Metals on Filter Paper (cat# 1425)

Method Description: EPA 29 | Rev/Ed:

Analysis Date (mm-dd): 06-19 | Analyst: DMR | Workgroup:

TNI Code	Analyte	Units	PTRL	Concentration Range	Reported Value
1005	Antimony	µg/Filter	19.0	25.0 to 250	40.7
1010	Arsenic	µg/Filter	15.0	20.0 to 250	38.7
1015	Barium	µg/Filter	15.0	20.0 to 250	39.7
1020	Beryllium	µg/Filter	7.50	10.0 to 250	21.7
1030	Cadmium	µg/Filter	8.00	10.0 to 250	16.0
1040	Chromium	µg/Filter	12.0	15.0 to 250	26.7
1050	Cobalt	µg/Filter	7.50	10.0 to 250	23.1
1055	Copper	µg/Filter	7.50	10.0 to 250	30.2
1075	Lead	µg/Filter	16.0	20.0 to 350	35.9
1090	Manganese	µg/Filter	7.00	10.0 to 250	41.6
1105	Nickel	µg/Filter	14.0	20.0 to 250	38.6
1140	Selenium	µg/Filter	14.0	20.0 to 250	38.7
1150	Silver	µg/Filter	21.0	30.0 to 250	59.5
1165	Thallium	µg/Filter	22.0	30.0 to 250	53.8
1190	Zinc	µg/Filter	14.0	20.0 to 250	45.9

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Stationary Source Audit Testing Data Reporting Form
Project #: 061318S

Lab Name: Element One Inc

ERA Customer Number: E533235

INSTRUCTIONS:
Please fill in the results, methods references and analysis dates for the analyte(s) you wish to report for Project #061318S. Questions? See the Data Reporting Instructions section of your Data Package or call ERA at 1-800-372-0122. Please photocopy this form if you are reporting multiple methods.

Stationary Source Audit Testing Metals in Impinger Solution (cat# 1426)

Method Description: EPA 29 Rev/Ed:

Analysis Date (mm-dd): 06-19 Analyst: DMR Workgroup:

TNI Code	Analyte	Units	PTRL	Concentration Range	Reported Value
1005	Antimony	µg/mL	0.190	0.250 to 20.0	0.896
1010	Arsenic	µg/mL	0.150	0.200 to 20.0	1.13
1015	Barium	µg/mL	0.110	0.150 to 25.0	3.28
1020	Beryllium	µg/mL	0.0350	0.0500 to 20.0	1.41
1030	Cadmium	µg/mL	0.0800	0.100 to 20.0	1.07
1040	Chromium	µg/mL	0.160	0.200 to 20.0	4.05
1050	Cobalt	µg/mL	0.0750	0.100 to 25.0	2.02
1055	Copper	µg/mL	0.150	0.200 to 20.0	3.74
1075	Lead	µg/mL	0.150	0.200 to 20.0	2.96
1090	Manganese	µg/mL	0.0750	0.100 to 20.0	1.86
1105	Nickel	µg/mL	0.120	0.150 to 30.0	2.65
1140	Selenium	µg/mL	0.110	0.150 to 25.0	1.90
1150	Silver	µg/mL	0.380	0.500 to 20.0	4.71
1165	Thallium	µg/mL	0.110	0.150 to 25.0	3.02
1190	Zinc	µg/mL	0.110	0.150 to 25.0	2.86

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Stationary Source Audit Testing Data Reporting Form
Project #: 061318S

Lab Name: Element One Inc

ERA Customer Number: E533235

INSTRUCTIONS:
Please fill in the results, methods references and analysis dates for the analyte(s) you wish to report for Project #061318S. Questions? See the Data Reporting Instructions section of your Data Package or call ERA at 1-800-372-0122. Please photocopy this form if you are reporting multiple methods.

Stationary Source Audit Testing Mercury on Filter Paper (cat# 1427)

Method Description: EPA 29 Rev/Ed:

Analysis Date (mm-dd): 06 - 20 Analyst: MMP Workgroup:

TNI Code	Analyte	Units	PTRL	Concentration Range	Reported Value
1095	Mercury	µg/Filter	0.750	1.00 to 75.0	16.2

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Stationary Source Audit Testing Data Reporting Form
Project #: 061318S

Lab Name: Element One Inc

ERA Customer Number: E533235

INSTRUCTIONS:
Please fill in the results, methods references and analysis dates for the analyte(s) you wish to report for Project #061318S. Questions? See the Data Reporting Instructions section of your Data Package or call ERA at 1-800-372-0122. Please photocopy this form if you are reporting multiple methods.

Stationary Source Audit Testing Mercury in Impinger Solution (cat# 1428)

Method Description: EPA 29 Rev/Ed:

Analysis Date (mm-dd): 06-19 Analyst: MMP Workgroup:

TNI Code	Analyte	Units	PTRL	Concentration Range	Reported Value
1095	Mercury	mg/mL	0.680	0.900 to 200	3.3

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ANALYTICAL NARRATIVE

Element One Analytical Narrative

Client:	Montrose Air Quality Services, LLC	Element One #:	31368
Client ID:	451738 General Iron	Analyst:	JGP, MMP, DMR
Method:	Methods 5 & 29	Dates Received:	06/15/18
Analytes:	PM, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, P, Se, Ag, Tl, Zn & Hg	Dates Analyzed:	06/18-21/18

Summary of Analysis
The Method 5 particulate samples were analyzed in accordance with EPA Method 5 guidelines. Particulate samples were weighed to a constant weight of ±0.5mg and reported to the nearest 0.1mg. The Method 29 samples were digested, prepared, and analyzed according to Method 29 protocol. Samples were analyzed for mercury on a PerkinElmer FIMS-100 CVAA mercury analyzer. The samples were analyzed for metals on a PerkinElmer NexIon 350X ICP-MS.

Detection Limits
The FIMS-100 CVAA instrument reporting limit for mercury was 0.004 µg per aliquot analyzed. The ICP-MS instrument reporting limits were 0.25µg/L for beryllium, 20.0µg/L for phosphorus and 1.0µg/L for the other metals.

Analysis QA/QC
Duplicate analyses relative percent difference (RPD), spike sample recovery, and second source calibration verification data are summarized in the Quality Control Section.
*Ref. page 17; Hammermill Shredder-R4 spike recoveries for arsenic and selenium were outside of laboratory guidelines of 75-125% with 63% and 59%, respectively. Sample was reanalyzed at a five-fold dilution resulting in recoveries of 85% for arsenic and 83% for selenium.
All other QA/QC data was within the criteria of the method.

The audit results for the Stationary Source Audit Program have been reported to ERA for Project #061318S. Copies of the audit reporting forms are included in the Summary of Audits section of this report.

Additional Comments
The reported results have not been corrected for any blank values or spike recovery values. The Method 5 blank correction factor has not been implemented. The reported results relate only to the items tested or calibrated.

The ICP analysis of the blank samples revealed detectable traces of metals. The unprepared back half, c9 fraction was analyzed with similar results to the prepared fraction. The unprepared 0.1N HNO_3, c8a fraction was analyzed with detectable traces of selenium and zinc, suggesting the other metals were in the filter portion of the prepared front half sample.

QUALITY CONTROL SUMMARY

Summary of Quality Control Data

Hammermill Shredder - Mercury Duplicate Analysis RPD

(Method 29 QC limits: < 10% for RPD)

Run Number	Front Half	H_2O_2/HNO_3	Empty Imp	$KMnO_4$	HCl
M29/5-R1	NA	NA	NA	0.5%	0.3%
M29/5-R2	NA	NA	NA	0.2%	0.9%
M29/5-R4	NA	NA	NA	3.1%	0.0%
M29/5-R5	NA	NA	NA	0.1%	0.2%
Field Blank	NA	NA	NA	NA	NA
Reagent Blank	NA	NA	NA	NA	NA

Hammermill Shredder - Mercury Spike Recoveries

(Method 29 QC limits: 75-125% for Spike Recoveries)

Run Number		Front Half	H_2O_2/HNO_3	Empty Imp	$KMnO_4$	HCl
M29/5-R4	#1	119%	99%	98%	90%	103%
	#2	118%	98%	97%	92%	101%

Summary of Quality Control Data

Hammermill Shredder - Metals Duplicate Analysis RPD

(Method 29 QC limits: < 20% for RPD)

Element	M29/5-R2 Front Half RPD	M29/5-R2 Back Half RPD
Antimony	0.5%	6.0%
Arsenic	7.0%	NA
Barium	4.2%	4.3%
Beryllium	NA	NA
Cadmium	9.7%	NA
Chromium	2.4%	5.0%
Cobalt	NA	4.5%
Copper	3.2%	4.8%
Lead	1.8%	1.6%
Manganese	5.4%	2.1%
Nickel	3.2%	2.1%
Phosphorus	0.6%	1.7%
Selenium	3.9%	8.4%
Silver	NA	NA
Thallium	NA	NA
Zinc	0.3%	0.4%

Summary of Quality Control Data

Hammermill Shredder - Metals Analysis Spike Recoveries

(Method 29 QC limits: 75-125% for Spike Recoveries)

Element	M29/5-R4 Front Half Recovery	M29/5-R4 Back Half Recovery
Antimony	106%	111%
Arsenic	79%	63%*
Barium	102%	104%
Beryllium	94%	84%
Cadmium	100%	99%
Chromium	100%	96%
Cobalt	101%	100%
Copper	101%	101%
Lead	100%	103%
Manganese	100%	92%
Nickel	99%	99%
Phosphorus	94%	83%
Selenium	76%	59%*
Silver	108%	107%
Thallium	98%	100%
Zinc	99%	97%

*See Analytical Narrative, page 13.

Summary of Quality Control Data

Second Source Calibration Check Recoveries

(Method 29 QC limits: ±10% for Second Source Continuing Check Standard)*

Element	0.25 ppb	1 ppb	50 ppb	100 ppb*	250 ppb
Antimony		102%	107%	101%	101%
Arsenic		118%	98%	100%	99%
Barium		92%	98%	100%	100%
Beryllium	101%	105%	102%	101%	101%
Cadmium		81%	98%	98%	98%
Chromium		101%	98%	101%	101%
Cobalt		97%	98%	100%	100%
Copper		102%	98%	101%	101%
Lead		97%	100%	98%	98%
Manganese		95%	100%	100%	100%
Nickel		110%	96%	99%	99%
Selenium		85%	103%	101%	99%
Silver		103%	100%	102%	102%
Thallium		100%	98%	100%	100%
Zinc		119%	104%	102%	101%

Element	21 ppb	250 ppb	1100 ppb*	2500 ppb
Phosphorus	113%	98%	103%	99%

SAMPLE CUSTODY

R 001474

GI0000341

MONTROSE AIR QUALITY SERVICES, LLC
Chain of Custody

31368

Project Number	451738	Location	Hammermill Shredder	Analysis Requested	Page 1 of 4
Client	General Iron	Date	6/14/2018		
Plant	Chicago, IL	Completed By	Michael Hess		

FH/BH Separate. Don't combine FH and BH Samples Please. 3DD TAT!!! TSM-Sb, As, Ba, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, P, Se, Tl, Ag, Zn, Be FRB 6-15-18

ID No.	Run No.	Date	Sample Description	Method 29								Notes
R1-IMP-1-3	1	6/13/2018	Method 29 Back Half 5% HNO_3/10% H_2O_2 Impinger Contents	X								
R2-IMP-1-3	2	6/13/2018	Method 29 Back Half 5% HNO_3/10% H_2O_2 Impinger Contents	X								
R4-IMP-1-3	4	6/14/2018	Method 29 Back Half 5% HNO_3/10% H_2O_2 Impinger Contents	X								
R5-IMP-1-3	5	6/14/2018	Method 29 Back Half 5% HNO_3/10% H_2O_2 Impinger Contents	X								
FB-IMP-1-3	FB	6/14/2018	Method 29 Back Half 5% HNO_3/10% H_2O_2 Impinger Contents	X								
RB	RB	6/14/2018	Method 29 Back Half 5% HNO_3/10% H_2O_2 Impinger Contents	X								
R1-MTI-29	1	6/13/2018	Method 29 Back Half Empty Impinger	X								
R2-MTI-29	2	6/13/2018	Method 29 Back Half Empty Impinger	X								
R4-MTI-29	4	6/14/2018	Method 29 Back Half Empty Impinger	X								
R5-MTI-29	5	6/14/2018	Method 29 Back Half Empty Impinger	X								
FB-MTI-29	FB	6/14/2018	Method 29 Back Half Empty Impinger	X								

Relinquished By (signature)	[signature]	Relinquished By (signature)	[signature]	Carrier	
(printed)	Michael Hess	(printed)	Ben Hilgendorf	Laboratory	
Date/Time	6/14/18	Date/Time	6/14/18 1930	Contact	
Accepted By (signature)	[signature]	Accepted By (signature)	[signature]	Address	
(printed)	Ben Hilgendorf	(printed)	Lisa Braton	Phone	
Date/Time	6/14/18 1720	Date/Time	6-15-18 0955	Fax	
				Date/Time	

MONTROSE AIR QUALITY SERVICES

Montrose Air Quality Services, LLC
1371 Brummel Ave
Elk Grove Village, IL 60007
Phone: (630) 860-4740

Samples received in good condition. No empty container.

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31368 MAQS M5 29 Report Packet

31368

MONTROSE AIR QUALITY SERVICES, LLC

CHAIN OF CUSTODY

Project Number	451738	Location	Hammermill Shredder	Page 2 of 4
Client	General Iron	Date	6/14/2018	
Plant	Chicago, IL	Completed By	Michael Hess	

FH/BH Separate. Don't combine FH and BH Samples Please. 3BD TAT!!! TSM-Sb, As, Be, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, P, Se, Tl, Ag, Zn, Bc 2?6 6.15.18

Analysis Requested

ID No.	Run No.	Date	Sample Description	Method 29								Notes
R1-FHR-29	1	6/13/2018	Method 29 Front Half 0.1 N HNO_3 Rinse	X								
R2-FHR-29	2	6/13/2018	Method 29 Front Half 0.1 N HNO3 Rinse	X								
R4-FHR-29	4	6/14/2018	Method 29 Front Half 0.1 N HNO3 Rinse	X								
R5-FHR-29	5	6/14/2018	Method 29 Front Half 0.1 N HNO3 Rinse	X								
RB	RB	6/14/2018	Method 29 Front Half 0.1 N HNO3 Rinse	X								
FB-FHR-29	FB	6/14/2018	Method 29 Front Half 0.1 N HNO3 Rinse	X								

Relinquished By (signature)	[signature]	Relinquished By (signature)	[signature]	Carrier	
(printed)	Michael Hess	(printed)	Ben Higendorf	Laboratory	
Date/Time	6/14/18	Date/Time	6/14/18 1930	Contact	
Accepted By (signature)	[signature]	Accepted By (signature)	[signature]	Address	
(printed)	Ben Higendorf	(printed)	Lisa Braton	Phone	
				Fax	
Date/Time	6/14/18 1750	Date/Time	6.15.18 0755	Date/Time	

R 001476

GI000343

31368

MONTROSE AIR QUALITY SERVICES, LLC

CHAIN OF CUSTODY

Project Number	451738	Location	Hammermill Shredder	Analysis Requested	Page 3 of 4
Client	General Iron	Date	6/14/2018		
Plant	Chicago, IL	Completed By	Michael Hess		

FH/BH Separate. Don't combine FH and BH Samples Please. 3BD TAT!!! TSM-Sb, As, Ba, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, P, Se, Tl, Ag, Zn, Be. LLB 6.15.18

ID No.	Run No.	Date	Sample Description	Method 29								Notes
R1-IMP-5-6	1	6/13/2018	Method 29 Back Half H2SO4/KMnO4 Impinger Contents	X								
R2-IMP-5-6	2	6/13/2018	Method 29 Back Half H2SO4/KMnO4 Impinger Contents	X								
R4-IMP-5-6	4	6/14/2018	Method 29 Back Half H2SO4/KMnO4 Impinger Contents	X								
R5-IMP-5-6	5	6/14/2018	Method 29 Back Half H2SO4/KMnO4 Impinger Contents	X								
RB	RB	6/14/2018	Method 29 Back Half H2SO4/KMnO4 Impinger Contents	X								
FB-IMP-5-6	FB	6/14/2018	Method 29 Back Half H2SO4/KMnO4 Impinger Contents	X								
R1-8N-Rinse	1	6/13/2018	Method 29 Back Half HCl Rinse	X								
R2-8N-Rinse	2	6/13/2018	Method 29 Back Half HCl Rinse	X								
R4-8N-Rinse	4	6/14/2018	Method 29 Back Half HCl Rinse	X								
R5-8N-Rinse	5	6/14/2018	Method 29 Back Half HCl Rinse	X								
FB-HCl-29	FB	6/14/2018	Method 29 Back Half HCl Rinse	X								
RB	RB	6/14/2018	Method 29 Back Half HCl Rinse									

Relinquished By (signature)	[signature]	Relinquished By (signature)	[signature]	Carrier	
				Laboratory	
(printed)	Michael Hess	(printed)	Ben Hilgendorf	Contact	
Date/Time	6/14/18	Date/Time	6/14/18 1930	Address	
Accepted By (signature)	[signature]	Accepted By (signature)	Lisa Braton	Phone	
(printed)	Ben hilgendorf	(printed)	Lisa Braton	Fax	
Date/Time	6/14/18 1730	Date/Time	6.15.18 0955	Date/Time	

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31368 MAQS M5 29 Report Packet
Page 22 of 64
B-166

ANALYTICAL DATA

Analytical Calculations

Metals-

$$\text{Element Results } (\mu g) = \text{ICP Results } (\mu g/L) * \text{Dilution} * \text{Final Volume } (L)$$

Where-

ICP Results= Raw sample concentration (ppb)--*ICP-Data Sheet*

Dilution= $\frac{\text{Diluted Volume}}{\text{Aliquot}}$--*ICP-MS Run Sheet*

Final Volume=FH=Final Volume (FV)--*Sample Submission*
BH=$\frac{\text{Received Volume (BV)}}{\text{Aliquot (Used)}}$*Final Volume (FV)--*Sample Submission*

Mercury-

$$\text{Mercury Results } (\mu g) = \frac{\text{CVAA Results } (\mu g)}{\text{Aliquot (ml)}} * \text{Final Volume (ml)}$$

Where-

CVAA Results= Raw sample reading (µg)--*Hg-Data Sheet*

Aliquot= Sample Aliquot (Alq.)--*Hg-Data Sheet*

Final Volume=Final Volume (FV)*--*Sample Submission*
* With the exception of the BH fraction where-
=Received Volume (BV)--*Sample Submission*

Analytical Calculations

Spike Recovery-

$$\text{Spike (\%)} = \frac{\text{(Spiked Result (µg/L) – Sample Result (µg/L))}}{\text{Spike Amount (µg/L)}} \times 100$$

Where-

Spike Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Sample Result = Raw sample concentration (ppb)--*ICP-Data Sheet*

Spike Amount--*ICP-MS Spike Table*

Duplicate Analysis RPD-

$$\text{RPD (\%)} = \frac{\text{(Duplicate Result (µg/L) - Sample Result (µg/L))}}{\text{Average (µg/L)}} \times 100$$

Where-

Sample Result and Duplicate Results=Raw sample concentration (ppb)--*ICP-Data Sheet*

$$\text{Average} = \frac{\textit{(Duplicate + Sample Results)}}{2}$$

elementOne **AIR TESTING SAMPLE SUBMISSION FORM** **Lab ID 31368**

FH/BH Separate
RUSH—3 DAY TAT

Analysis Due Date 06.18.18
QA/QC Report Due Date 06.19.18

Client	Montrose Air Quality Services, LLC (Airtech)	Date Rec	06.15.18
Project No	451738	Time Rec	0955
HNO_3 Lot: 117100	HF Lot: 5116072	HCl Lot: 4117040	**Ref. Method:**
Volume Marked Y / N	Volume Loss Y / N / ?	Acetone: 56515	**29 / 5**

Sample Identification

1	Hammermill Shredder-M29/5-R1	5	Field Blank	7	061318S-Cat 1425 Fil
2	Hammermill Shredder-M29/5-R2	6	Reagent Blank	8	061318S-Cat 1426 Imp
	Hammermill Shredder-M29/5-R2 Duplicate			9	061318S-Cat 1427 Fil& Imp
3	Hammermill Shredder-M29/5-R4			10	061318S-Cat 1428 Imp
	Hammermill Shredder-M29/5-R4 Spike				
4	Hammermill Shredder-M29/5-R5				

Analyses Requested	Samples 1-8	Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn Ni, P, Se, Tl, Ag, Zn
	Samples 1-6, 9-10	Hg
	Samples 1-6	PM

Runs / FB	Fil / Ace (FH)		HNO_3 (FH)		5% HNO_3/10% H_2O_2 (BH)			HNO_3 (A)		$KMnO_4$ (B)		HCl (C)	
			pH <2.0 Y / N		pH <2.0 Y / N			pH <2.0 Y / N		pH <2.0 Y / N		pH <2.0 Y / N	
Lab ID	Fil ID	BV ml	BV ml	FV ml	BV ml	Used	FV ml	BV ml	FV ml	BV ml	FV ml	BV ml	FV ml
1	31347	134	80	100	505	253	50	95	300	405	500	210	400
2.D	31346	89	118		310	155		100		400		240	
3.S	31457	108	56		325	163		116		375		220	
4	31460	84	62		350	175		104		390		225	
5	31344	102	60		230	115		110		380		225	

M-29 Reagent Blank

Lab ID	Fraction			BV, ml	FV, ml	Comments
6	C 7	FH	Acetone Blank	222	100	
	C 8A	FH	0.1N HNO_3	335	100	used 100 mls 8AA
	C 8A	A	0.1N HNO_3	336	—	combined 100ml C8A + 300ml 56G 336
	C 8B	B	DI H_2O	—	—	
	C 9	BH	5% HNO_3/10% H_2O_2	305	50	
	C 10	B	4% $KMnO_4$/10% H_2SO_4	300	—	used 100ml C10 & 33 ml DI TAD
	C 11	C	8N HCl DI H_2O	225	400	
	C 12	FH	Filter			

Audits **See Attached Audit Instructions**

Sample ID		Analyses Requested	Prep By / Date
7	061318S-Cat 1425 Fil	Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn Ni, P, Se,	DMR 6/19/18
8	061318S-Cat 1426 Imp	Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn Ni, P, Se,	DMR 6/19/18
9	061318S-Cat 1427 Fil& Imp	Hg FV=100	MMP 6/19/18
10	061318S-Cat 1428 Imp	Hg	MMP 6/19/18

Lab Communications UCB + spiked w/ 0.1mls 25ppm Stds A, B, C & F (021418-A,B,C,F)

Fractions Received: Runs: C1,C2, C3, C4, C5A, C5B, C5C; RB: C12, C7, C8A, C9, C10, C11; 4 Audits—06.15.18 LLB Hg spiked w/ 0.2mls 25ppm Hg Std (H02-149-3)

SS Page 1 of 1
6/16/2018 11:04:42 AM
SS Form By LLB
Labeled By/Date DCH 6/15/18

FH Prep By/Date MMP 6/19/18 A Prep By/Date DCH 6/15/18
BH Prep By/Date MMP 6/19/18 B Prep By/Date TAD 6/18/18
BH/FH Prep By/Date MMP 6/19/18 C Prep By/Date TAD 6/19/18
PM Prep By/Date JGP 6.15.18 ID Verification By / Date JGP 6.15.18

Hg prep DCH 6/15/18

ERA
A Waters Company

31368

Instructions for Catalog # 1425
Stationary Source Audit Program
Air and Emissions Metals on Filter Paper
Revision 051517

Description:
- This standard is packaged in a 50mm polystyrene petri dish containing a single 47mm glass fiber filter.
- This standard is designed for use with EPA Method 29.
- This standard is not preserved.
- This standard can be stored at room temperature.
- This standard will contain the following analytes in the concentration ranges shown;

Antimony .... 25 – 250 µg/filter	Lead .... 20 – 350 µg/filter
Arsenic .... 20 – 250 µg/filter	Manganese .... 10 – 250 µg/filter
Barium .... 20 – 250 µg/filter	Nickel .... 20 – 250 µg/filter
Beryllium .... 10 – 250 µg/filter	Selenium .... 20 – 250 µg/filter
Cadmium .... 10 – 250 µg/filter	Silver .... 30 – 250 µg/filter
Chromium .... 15 – 250 µg/filter	Thallium .... 30 – 250 µg/filter
Cobalt .... 10 – 250 µg/filter	Zinc .... 20 – 250 µg/filter
Copper .... 10 – 250 µg/filter	

- This standard is stable, unopened, for 1 year from receipt of the standard.
- NOTE: This standard MUST be analyzed at the same time, using the same personnel, and the same procedures as the test samples.

Before you begin:
- This standard must be prepared and analyzed following the procedure specified in EPA Method 29.
- This standard should be analyzed as soon as possible after it is prepared.

Instructions:
1. Carefully open the Metals on Filter Paper standard and using tweezers or a gloved hand place the filter into your digestion vessel.
2. Digest & analyze the standard following the procedure specified in EPA Method 29.
3. Report your results as µg/filter for each of the metals.
4. Report your results to 3 significant figures.

Safety:
ERA products may be hazardous and are intended for use by professional laboratory personnel trained in the competent handling of such materials. Responsibility for the safe use of these products rests entirely with the buyer and/or user. Material Safety Data Sheets (MSDS) for all ERA products are available by calling 1-800-372-0122.

ERA
A Waters Company

31368

Instructions for Catalog # 1426
Stationary Source Audit Program
Air and Emissions Metals in Impinger Solution
Revision 051517

Description:

- This standard is packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate.
- This standard is designed for use with EPA Method 29.
- This standard is preserved with approximately 2% (v/v) nitric acid and 1% (w/v) tartaric acid.
- This standard can be stored at room temperature.
- This standard will contain the following analytes in the concentration ranges shown:

Antimony .... 0.25 – 20 µg/mL	Lead .... 0.2 – 20 µg/mL
Arsenic .... 0.2 – 20 µg/mL	Manganese .... 0.1 – 20 µg/mL
Barium .... 0.15 – 25 µg/mL	Nickel .... 0.15 – 30 µg/mL
Beryllium .... 0.05 – 20 µg/mL	Selenium .... 0.15 – 25 µg/mL
Cadmium .... 0.1 – 20 µg/mL	Silver .... 0.5 – 20 µg/mL
Chromium .... 0.2 – 20 µg/mL	Thallium .... 0.15 – 25 µg/mL
Cobalt .... 0.1 – 25 µg/mL	Zinc .... 0.15 – 25 µg/mL
Copper .... 0.2 – 20 µg/mL	

- This standard is stable, unopened, for 1 year from receipt of the standard.
- NOTE: This standard MUST be analyzed at the same time, using the same personnel, and the same procedures as the test samples.

Before you begin:

- The sample resulting from the dilution described below will have a nitric acid concentration of approximately 0.02% before any acid is added. You may add a volume of acid different from the 4 to 10 mL of HNO_3 suggested in order to matrix match your calibration standards or meet any other method criteria.
- This standard must be prepared and analyzed following the procedure specified in EPA Method 29.
- This standard should be analyzed as soon as possible after the concentrate is diluted.

Instructions:

1. Add 100-200 mL of deionized water and approximately 4 to 10 mL of nitric acid to a clean 1000 mL class A volumetric flask.
2. Shake the Metals in Impinger Solution vial prior to opening.
3. Using a clean, dry, class A pipet, volumetrically pipet 5.0 mL of the concentrate into the 1000 mL volumetric flask.
4. Dilute the flask to final volume with deionized water.
5. Cap the flask and mix well.
6. Immediately analyze the diluted sample by the procedures specified in EPA Method 29.
7. Report your results as µg/mL for the diluted sample.
8. Report your results to 3 significant figures.

Safety:

ERA products may be hazardous and are intended for use by professional laboratory personnel trained in the competent handling of such materials. Responsibility for the safe use of these products rests entirely with the

ERA
A Waters Company

31368

Instructions for Catalog # 1427
Stationary Source Audit Program
Mercury on Filter Paper
Revision 051517

Description:

- This standard is packaged in a 2 mL flame-sealed ampule containing approximately 2 mL of standard concentrate and a 50 mm polystyrene petri dish containing a single 47 mm glass fiber filter.
- This standard is designed for use with EPA Method 29.
- The standard concentrate is preserved with 2% (v/v) HNO_3.
- This standard can be stored at room temperature.
- This standard will contain Mercury in the range of 1-75 µg/filter.
- This standard is stable, unopened, for 1 year from receipt of the standard.
- NOTE: This standard MUST be analyzed at the same time, using the same personnel, and the same procedures as the test samples.

Helpful Hints:

- This standard has been prepared as a concentrate intended for spiking onto the supplied glass fiber filter and must be prepared prior to use.
- This standard must be prepared and analyzed following the procedure specified in EPA Method 29.
- This standard should be digested and analyzed as soon as possible after it is prepared using these instructions.

Instructions:

1. Open the container and using tweezers or a gloved hand, place the glass fiber filter onto a clean surface for spiking.
2. Carefully snap the top off the Mercury on Filter ampule.
3. Using a clean, dry, class A pipet or syringe, transfer 100 µL of concentrate onto the glass fiber filter.
4. Place the spiked filter into your digestion vessel.
5. Digest & analyze the standard following the procedure specified in EPA Method 29.
6. Report your results as µg/filter.
7. Report your results to 3 significant figures.

Safety:

ERA products may be hazardous and are intended for use by professional laboratory personnel trained in the competent handling of such materials. Responsibility for the safe use of these products rests entirely with the buyer and/or user. Material Safety Data Sheets (MSDS) for all ERA products are available by calling 1-800-372-0122.

ERA
A Waters Company

31568

Instructions for Catalog # 1428
Stationary Source Audit Program
Mercury in Impinger Solution
Revision 051517

Description:
- This standard is packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate.
- This standard is designed for use with EPA Method 29 and EPA Method 101A.
- This standard is preserved with approximately 2% (v/v) nitric acid.
- This standard can be stored at room temperature.
- The diluted standard will contain Mercury in the range of 0.9-200 ng/mL.
- This standard is stable, unopened, for 1 year from receipt of the standard.
- NOTE: This standard MUST be analyzed at the same time, using the same personnel, and the same procedures as the test samples.

Before you begin:
- This standard has been prepared as a concentrate and must be diluted prior to analysis.
- Mercury is present as a mixture of organic and inorganic forms and must, therefore, be analyzed as Total Mercury.
- This standard must be prepared and analyzed following the procedure specified in EPA Method 29 or EPA Method 101A.
- This standard should be analyzed as soon as possible after the concentrate is diluted.

Instructions:
1. Add 100-200 mL of deionized water and approximately 4 to 10 mL of nitric acid to a clean 1000 mL class A volumetric flask.
2. Shake the Mercury in Impinger Solution vial prior to opening.
3. Using a clean, dry, class A pipet, volumetrically pipet 5.0 mL of the concentrate into the 1000 mL volumetric flask.
4. Dilute the flask to final volume with deionized water.
5. Cap the flask and mix well.
6. Immediately analyze the diluted sample by the procedure specified in EPA Method 29 or EPA Method 101A.
7. Report your results as ng/mL for the diluted sample.
8. Report your results to 3 significant figures.

Safety:
ERA products may be hazardous and are intended for use by professional laboratory personnel trained in the competent handling of such materials. Responsibility for the safe use of these products rests entirely with the buyer and/or user. Material Safety Data Sheets (MSDS) for all ERA products are available by calling 1-800-372-0122.

elementOne | **Method 5 Particulate** | Lab # 31368

Client Air Tech | Page 1 of 1

Balance checks Date: 06.18.18 2g = 2.0000
Date: 2g =
Date: 2g =

Acetone Concentration 1.37E-05 mg/mg

Filters

Sample ID #	Filter ID	Tin ID	A	B		B		B		Catch Description and Loading
			Filter Tare, g	Date - 06.18.18 Initials - JGP		Date - 06.18.18 Initials - JGP		Date Initials		
				Time	Filter Weight, g	Time	Filter Weight, g	Time	Filter Weight, g	
31368-1	31347	1	0.4015	820	0.4067	1420	0.4069			
31368-2	31346	2	0.4031	820	0.4118	1420	0.4121			
31368-3	31457	3	0.3679	820	0.3759	1420	0.3761			
31368-4	31450	4	0.3551	820	0.3618	1420	0.3619			
31368-5	31344	5	0.4022	820	0.4035	1420	0.4037			
Client Blk										
E1 Blank										

Acetone Rinses

Sample ID #	Sample Volume, ml	Bag ID	C	D		D		B		Catch Description and Loading
			Bag Tare, g	Date - 06.18.18 Initials - JGP		Date - 06.18.18 Initials - JGP		Date Initials		
				Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	Time	Bag & Sample Weight, g	
31368-1	134	758	10.8814	820	10.8907	1420	10.8906			Oily Residue
31368-2	88	737	11.0158	820	11.0258	1420	11.0260			Oily Residue
31368-3	108	597	10.1119	820	10.1235	1420	10.1233			Oily Residue
31368-4	84	x23	9.9149	820	9.9237	1420	9.9238			Oily Residue
31368-5	102	528	9.8710	820	9.8728	1420	9.8728			Oily Residue
Client Ace Blk	222	895	10.2526	820	10.2553	1420	10.2550			Oily Residue
E1 Acetone Blank	100	987	9.9053	820	9.9057	1420	9.9054			

Total Catches

Sample ID #	Filter ID	Filter Tare, g	Final Filter + Catch, g	Filter Catch, mg		Acetone Bag ID	Bag Tare, g	Final Bag + Ace Catch, g	Acetone Catch, mg	Total Catch, mg
31368-1	31347	0.4015	0.4067	5.2		758	10.8814	10.8906	9.2	14.4
31368-2	31346	0.4031	0.4118	8.7		737	11.0158	11.0258	10.0	18.7
31368-3	31457	0.3679	0.3759	8.0		597	10.1119	10.1233	11.4	19.4
31368-4	31450	0.3551	0.3618	6.7		x23	9.9149	9.9237	8.8	15.5
31368-5	31344	0.4022	0.4035	1.3		528	9.871	9.8728	1.8	3.1
Client Blk						895	10.2526	10.2550	2.4	2.4
E1 Blank						987	9.9053	9.9054	0.1	0.1

Element One, Inc. Form 100 R 0

elementOne **Method 29 Microwave Worksheet** Lab ID # e 31368

Client: Montrose

Date Digested: 6/19/18 Initials: JGO Worksheet Prepared by: MMP

Auto Sample Loc.	Sample Lab ID	# of filters digested	Spike	Prep Volume (ml)	Comments
1	LRB+		.1mL A,B,C,F	100	
2	LRB				
3	31368-1	1			
5	-2				
6	-3				
7	-4				
9	-5				
10	-6				
11	-9audit				
13	M29 Clean				
14					
15					

HNO_3 Lot #:	1117100	mLs Used:	6
HF Lot #:	5116072	mLs Used:	2

LRB+ spiked w/ 0.1mls 25ppm stds A, B, C & F (021418-A,B,C,F)
MMP

Element One, Inc. F214 R1 Microwave Sheet M29

Sample/Batch Report

Daniel Bod
6/20/18

User Name: r2d2
Computer Name: PESERVICE-PC
Sample File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Sample\c2.sam
Report Date/Time: Wednesday, June 20, 2018 10:49:07

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant.	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
5		QC Std 2		Sample					
1		QC Std 1		Sample					
401		LRB FH		Sample					
402	s	LRB FH		Spike - 1 of 3					
403		31368-1 FH		Sample					
404		31368-2 FH		Sample					
405	d	31368-2 FH		Duplicate of 6					
406		31368-3 FH		Sample					
407	s	31368-3 FH		Spike - 1 of 8					
408		31368-4 FH		Sample					
409		31368-5 FH		Sample					
410		31368-6 FH		Sample					
411		LRB BH		Sample					
412	s	LRB BH		Spike - 1 of 13					
413		31368-1 BH		Sample					
414		31368-2 BH		Sample					
415	d	31368-2 BH		Duplicate of 16					
416		31368-3 BH		Sample					
417	s	31368-3 BH		Spike - 1 of 18					
418		31368-4 BH		Sample					
419		31368-5 BH		Sample					
420		31368-6 BH		Sample					
421	x10	31368-7		Sample					
422	x10s	31368-7		Spike - 1 of 23					
423	x500	31368-8		Sample					
424	x500s	31368-8		Spike - 1 of 25					
425	x50x50	31368-8		Sample					
426	x50x50s	31368-8		Spike - 1 of 27					
1		QC Std 1		Sample					
5		QC Std 2		Sample					
3		QC Std 3		Spike - 3 of 29					
5		QC Std 2		Sample					

Dataset Report

6/20/18

User Name: r2d2
Computer Name: PESERVICE-PC
Dataset File Path: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\061918-5a\
Report Date/Time: Wednesday, June 20, 2018 10:11:41

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol.	Aliquot Vol.	Diluted Vol.
16:45:11 Tue 19-Jun-18	Blank		Blank					
16:48:17 Tue 19-Jun-18	Standard 1		Standard #1					
16:51:24 Tue 19-Jun-18	Standard 2		Standard #2					
16:54:30 Tue 19-Jun-18	Standard 3		Standard #3					
16:57:37 Tue 19-Jun-18	QC Std 1		QC Std #1					
17:00:44 Tue 19-Jun-18	QC Std 2		QC Std #2					
17:03:50 Tue 19-Jun-18	QC Std 3		QC Std #3					
17:06:57 Tue 19-Jun-18	QC Std 4		QC Std #4					
17:10:05 Tue 19-Jun-18	QC Std 5		QC Std #5					
17:13:12 Tue 19-Jun-18	QC Std 6		QC Std #6					
17:16:19 Tue 19-Jun-18	QC Std 7		QC Std #7					
17:19:25 Tue 19-Jun-18	QC Std 8		QC Std #8					
17:22:32 Tue 19-Jun-18	QC Std 2		Sample					
17:25:20 Tue 19-Jun-18	QC Std 1		Sample					
17:28:27 Tue 19-Jun-18	LRB FH		Sample					
17:31:34 Tue 19-Jun-18	LRB FH	s	Spike - 1 of 15					
17:34:40 Tue 19-Jun-18	31368-1 FH		Sample					
17:37:46 Tue 19-Jun-18	31368-2 FH		Sample					
17:40:53 Tue 19-Jun-18	31368-2 FH	d	Duplicate of 18					
17:43:59 Tue 19-Jun-18	31368-3 FH		Sample					
17:47:05 Tue 19-Jun-18	31368-3 FH	s	Spike - 1 of 20					
17:50:12 Tue 19-Jun-18	31368-4 FH		Sample					
17:53:20 Tue 19-Jun-18	QC Std 1		QC Std #1					
17:56:26 Tue 19-Jun-18	QC Std 4		QC Std #4					
17:59:35 Tue 19-Jun-18	31368-5 FH		Sample					
18:02:41 Tue 19-Jun-18	31368-6 FH		Sample					
18:05:48 Tue 19-Jun-18	LRB BH		Sample					
18:08:55 Tue 19-Jun-18	LRB BH	s	Spike - 1 of 27					
18:12:02 Tue 19-Jun-18	31368-1 BH		Sample					
18:15:09 Tue 19-Jun-18	31368-2 BH		Sample					
18:18:15 Tue 19-Jun-18	31368-2 BH	d	Duplicate of 30					
18:21:22 Tue 19-Jun-18	31368-3 BH		Sample					
18:24:28 Tue 19-Jun-18	31368-3 BH	s	Spike - 1 of 32					
18:27:34 Tue 19-Jun-18	31368-4 BH		Sample					
18:30:43 Tue 19-Jun-18	QC Std 1		QC Std #1					
18:33:49 Tue 19-Jun-18	QC Std 4		QC Std #4					
18:36:57 Tue 19-Jun-18	31368-5 BH		Sample					
18:40:04 Tue 19-Jun-18	31368-6 BH		Sample					
18:43:10 Tue 19-Jun-18	31368-7	x10	Sample					
18:46:17 Tue 19-Jun-18	31368-7	x10s	Spike - 1 of 39					
18:49:23 Tue 19-Jun-18	31368-8	x500	Sample					
18:52:30 Tue 19-Jun-18	31368-8	x500s	Spike - 1 of 41					
18:55:37 Tue 19-Jun-18	31368-8	x50x50	Sample					
18:58:43 Tue 19-Jun-18	31368-8	x50x50s	Spike - 1 of 43					
19:01:51 Tue 19-Jun-18	QC Std 1		Sample					
19:04:58 Tue 19-Jun-18	QC Std 2		Sample					
19:08:05 Tue 19-Jun-18	QC Std ~~2~~ 2+4 DAR 6/20/18		Spike - 3 of 45					
19:11:12 Tue 19-Jun-18	QC Std 1		QC Std #1					
19:14:19 Tue 19-Jun-18	QC Std 4		QC Std #4					

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 3

Sample Date/Time: Tuesday, June 19, 2018 16:54:30
Sample Description:
Number of Replicates: 3
Batch ID:
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\061918-5a\Standard 3.004
Sample Prep Volume (mL):
Initial Sample Quantity (mg):
Aliquot Volume (mL):
Diluted To Volume (mL):
Autosampler Position: 4

Calibration

Analyte	Curve Type	Slope	Correlation Coefficient	Intercept
Li	Linear Thru Zero			
Be	Linear Thru Zero	0.004	0.999911	0.00
P	Linear Thru Zero	0.002	0.999991	0.00
Sc	Linear Thru Zero			
Cr	Linear Thru Zero	0.032	0.999967	0.00
Cr	Linear Thru Zero	0.004	0.999982	0.00
Mn	Linear Thru Zero	0.054	0.999996	0.00
Co	Linear Thru Zero	0.036	0.999998	0.00
Ni	Linear Thru Zero	0.008	0.999996	0.00
Cu	Linear Thru Zero	0.019	0.999996	0.00
Cu	Linear Thru Zero	0.008	0.999984	0.00
Zn	Linear Thru Zero	0.004	0.999994	0.00
Zn	Linear Thru Zero	0.001	0.999985	0.00
Zn	Linear Thru Zero	0.003	0.999997	0.00
As	Linear Thru Zero	0.004	0.999988	0.00
Se	Linear Thru Zero	0.000	0.999447	0.00
Se	Linear Thru Zero	0.000	0.999775	0.00
Rh	Linear Thru Zero			
Ag	Linear Thru Zero	0.019	0.999998	0.00
Ag	Linear Thru Zero			
Cd	Linear Thru Zero	0.007	0.999993	0.00
Cd	Linear Thru Zero	0.026	0.999998	0.00
Sb	Linear Thru Zero			
Sb	Linear Thru Zero	0.004	0.999995	0.00
Ba	Linear Thru Zero			
Ba	Linear Thru Zero	0.004	1.000000	0.00
Ho	Linear Thru Zero			
Tl	Linear Thru Zero	0.028	0.999999	0.00
Pb	Linear Thru Zero	0.037	1.000000	0.00
Kr	Linear Thru Zero			

elementOne
Analyst:--DMR--

ICP-MS RUN SHEET
6/20/2018

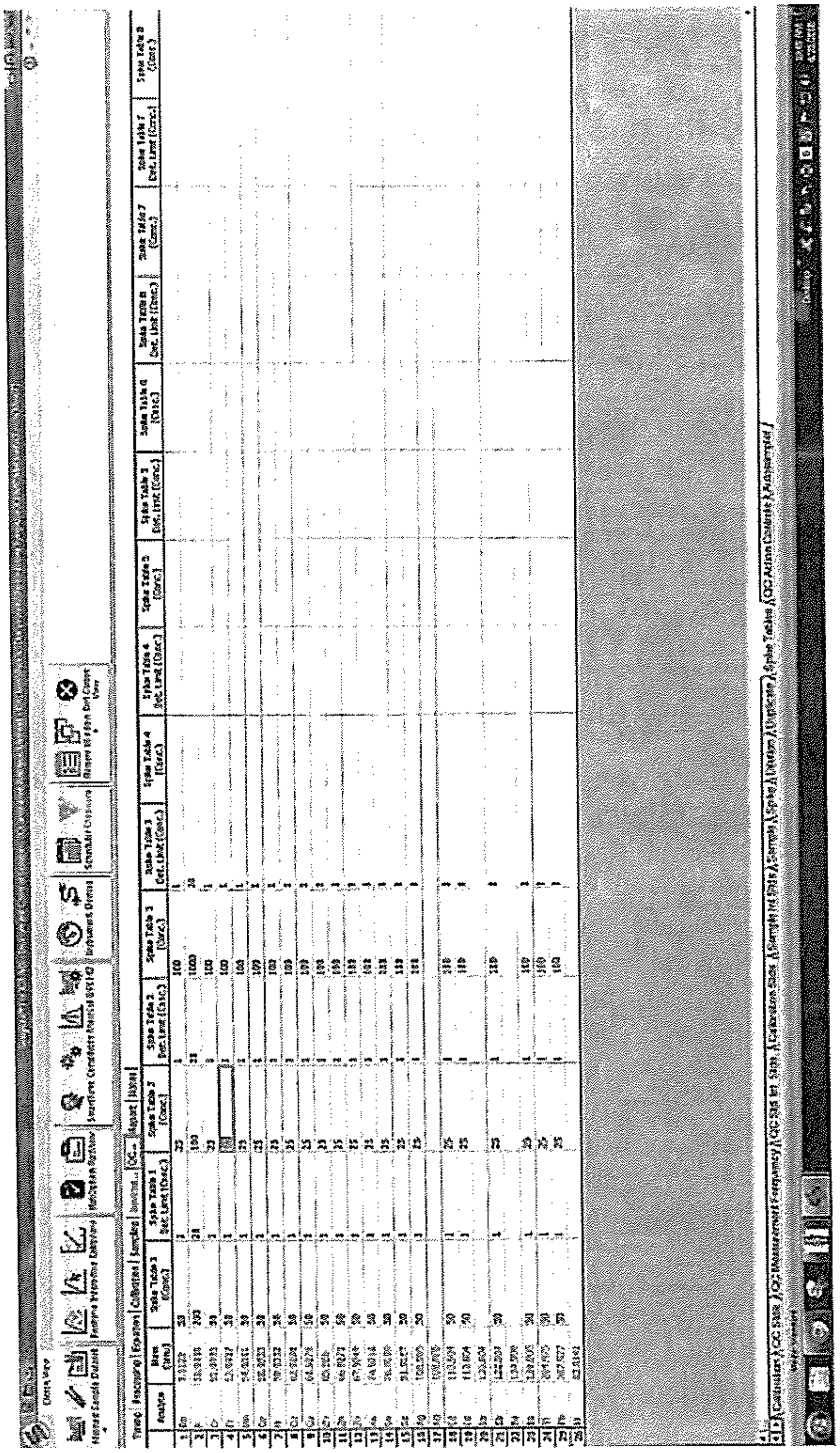
Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2		Sample		
401		LRB FH		Sample		100
402	s	LRB FH		Spike - 1 of 3		100
403		31368-1 FH		Sample		100
404		31368-2 FH		Sample		100
405	d	31368-2 FH		Duplicate of 6		100
406		31368-3 FH		Sample		100
407	s	31368-3 FH		Spike - 1 of 8		100
408		31368-4 FH		Sample		100
409		31368-5 FH		Sample		100
410		31368-6 FH		Sample		100
411		LRB BH		Sample		50x2
412	s	LRB BH		Spike - 1 of 13		50x2
413		31368-1 BH		Sample		50x2
414		31368-2 BH		Sample		50x2
415	d	31368-2 BH		Duplicate of 16		50x2
416		31368-3 BH		Sample		50x2
417	s	31368-3 BH		Spike - 1 of 18		50x2
418		31368-4 BH		Sample		50x2
419		31368-5 BH		Sample		50x2
420		31368-6 BH		Sample		50x2
421	x10	31368-7		Sample		50
422	x10s	31368-7		Spike - 1 of 23		50
423	x500	31368-8		Sample		5/1000/1000
424	x500s	31368-8		Spike - 1 of 25		5/1000/1000
425	x50x50	31368-8		Sample		5/1000/1000
426	x50x50s	31368-8		Spike - 1 of 27		5/1000/1000

Spikes are post at 0.02mL of 25ppm spiking solutions lot 021418-ABC&F in a final volume of 10mL

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
DMR	6/20/18 10:50		KLG	6/20/18 @ 1640	
Re-Test Required:	No:	Yes: ✓	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:

S:\Forms\Blank Forms\F208 R2 ICP-MS Run Sheet



Wednesday, Jun 20, 2018 10:49 AM

Sample/Batch Report

Daniel Foster
6/20/18

User Name: r2d2
Computer Name: PESERVICE-PC
Sample File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Sample\c3.sam
Report Date/Time: Wednesday, June 20, 2018 16:38:31

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
5		QC Std 2		Sample					
421	x10	31368-7		Sample					
422	x10s	31368-7		Spike - 1 of 2					
423	x50	31368-7		Sample					
424	x50s	31368-7		Spike - 1 of 4					
425	x50x50	31368-8		Sample					
426	x50x50s	31368-8		Spike - 1 of 6					
427	x50x100	31368-8		Sample					
428	x50x100s	31368-8		Spike - 1 of 8					
429		31368-5 FH		Sample					
430		31368-6 FH		Sample					
431		31368-6 C8A		Sample					
432		31368-5 BH		Sample					
433		31368-5 BH Unprep		Sample					
434		31368-6 BH		Sample					
435		31368-6 C8A-C9		Sample					

Dataset Report

Dontle Boat 6/20/18

User Name: r2d2
Computer Name: PESERVICE-PC
Dataset File Path: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\062018-1a\
Report Date/Time: Wednesday, June 20, 2018 16:37:53

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol.	Aliquot Vol.	Diluted Vol
12:11:56 Wed 20-Jun-18	Blank		Blank					
12:14:57 Wed 20-Jun-18	Standard 1		Standard #1					
12:17:57 Wed 20-Jun-18	Standard 2		Standard #2					
12:20:58 Wed 20-Jun-18	Standard 3		Standard #3					
12:23:59 Wed 20-Jun-18	QC Std 1		QC Std #1					
12:27:00 Wed 20-Jun-18	QC Std 2		QC Std #2					
12:30:01 Wed 20-Jun-18	QC Std 3		QC Std #3					
12:33:01 Wed 20-Jun-18	QC Std 4		QC Std #4					
12:36:03 Wed 20-Jun-18	QC Std 5		QC Std #5					
12:39:03 Wed 20-Jun-18	QC Std 6		QC Std #6					
12:42:04 Wed 20-Jun-18	QC Std 7		QC Std #7					
12:45:04 Wed 20-Jun-18	QC Std 8		QC Std #8					
12:48:05 Wed 20-Jun-18	QC Std 2		Sample					
12:50:44 Wed 20-Jun-18	31368-7	x10	Sample					
12:53:44 Wed 20-Jun-18	31368-7	x10s	Sample					
12:56:45 Wed 20-Jun-18	31368-7	x50	Sample					
12:59:45 Wed 20-Jun-18	31368-7	x50s	Sample					
13:02:46 Wed 20-Jun-18	31368-8	x50x50	Sample					
13:05:47 Wed 20-Jun-18	31368-8	x50x50s	Sample					
13:08:47 Wed 20-Jun-18	31368-8	x50x100	Sample					
13:11:48 Wed 20-Jun-18	31368-8	x50x100s	Sample					
13:14:49 Wed 20-Jun-18	31368-5 FH		Sample					
13:17:51 Wed 20-Jun-18	QC Std 1		QC Std #1					
13:20:51 Wed 20-Jun-18	QC Std 4		QC Std #4					
13:23:53 Wed 20-Jun-18	31368-6 FH		Sample					
13:26:54 Wed 20-Jun-18	31368-6 CBA		Sample					
13:29:54 Wed 20-Jun-18	31368-5 BH		Sample					
13:32:55 Wed 20-Jun-18	31368-5 BH Unprep		Sample					
13:35:55 Wed 20-Jun-18	31368-6 BH		Sample					
13:38:56 Wed 20-Jun-18	31368-6 CBA-C9		Sample					
13:41:58 Wed 20-Jun-18	Blank		Sample					
13:44:58 Wed 20-Jun-18	Standard 1		Sample					
13:47:59 Wed 20-Jun-18	Standard 2		Sample					
13:51:00 Wed 20-Jun-18	QC Std 1		QC Std #1					
13:54:00 Wed 20-Jun-18	QC Std 2		QC Std #2					
13:57:01 Wed 20-Jun-18	QC Std 4		QC Std #4					
14:00:48 Wed 20-Jun-18	Blank		Blank					

No P, Cr, As, Se, Zn, Cd DWR 6/20/18

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 3

Sample Date/Time: Wednesday, June 20, 2018 12:20:58
Sample Description:
Number of Replicates: 3
Batch ID:
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\062018-1a\Standard 3.004
Sample Prep Volume (mL):
Initial Sample Quantity (mg):
Aliquot Volume (mL):
Diluted To Volume (mL):
Autosampler Position: 4

Calibration

Analyte	Curve Type	Slope	Correlation Coefficient	Intercept
Li	Linear Thru Zero			
Be	Linear Thru Zero	0.005	0.999959	0.00
P	Linear Thru Zero	0.002	0.989600	0.00
Sc	Linear Thru Zero			
Cr	Linear Thru Zero	0.030	0.999981	0.00
Cr	Linear Thru Zero	0.003	0.999946	0.00
Mn	Linear Thru Zero	0.048	0.999991	0.00
Ni	Linear Thru Zero	0.008	0.999994	0.00
Cu	Linear Thru Zero	0.018	0.999994	0.00
Cu	Linear Thru Zero	0.008	0.999967	0.00
Zn	Linear Thru Zero	0.004	0.999861	0.00
Zn	Linear Thru Zero	0.001	0.999895	0.00
Zn	Linear Thru Zero	0.003	0.999781	0.00
As	Linear Thru Zero	0.005	0.999994	0.00
Se	Linear Thru Zero	0.000	0.997326	0.00
Se	Linear Thru Zero	0.000	0.999923	0.00
Rh	Linear Thru Zero			
Ag	Linear Thru Zero	0.020	0.999995	0.00
Ag	Linear Thru Zero			
Cd	Linear Thru Zero	0.007	0.999996	0.00
Cd	Linear Thru Zero	0.026	1.000000	0.00
Sb	Linear Thru Zero			
Sb	Linear Thru Zero	0.004	0.999990	0.00
Ba	Linear Thru Zero			
Ba	Linear Thru Zero	0.004	0.999988	0.00
Ho	Linear Thru Zero			
Pb	Linear Thru Zero	0.038	1.000000	0.00
Kr	Linear Thru Zero			

elementOne
Analyst:--DMR--

ICP-MS RUN SHEET
6/20/2018

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2		Sample		
421	x10	31368-7		Sample		50
422	x10s	31368-7		Spike - 1 of 2		50
423	x50	31368-7		Sample		50
424	x50s	31368-7		Spike - 1 of 4		50
425	x50x50	31368-8		Sample		5/1000/1000
426	x50x50s	31368-8		Spike - 1 of 6		5/1000/1000
427	x50x100	31368-8		Sample		5/1000/1000
428	x50x100s	31368-8		Spike - 1 of 8		5/1000/1000
429		31368-5 FH		Sample		100
430		31368-6 FH		Sample		100
431		31368-6 C8A		Sample		
432		31368-5 BH		Sample		50x2
433		31368-5 BH Unprep		Sample		
434		31368-6 BH		Sample		50x2
435		31368-6 C8A-C9		Sample		

Spikes are post at 0.02mL of 25ppm spiking solutions lot 021418-ABC in a final volume of 10mL

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
DMR	6/20/18 16:39		KLG	6/21/18 @ 1100	
Re-Test Required:	No:	Yes: ✓	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:

S:\Forms\Blank Forms\F208 R2 ICP-MS Run Sheet

Sample/Batch Report

Daniel ... 6/21/18

User Name: r2d2
Computer Name: PESERVICE-PC
Sample File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Sample\c4.sam
Report Date/Time: Thursday, June 21, 2018 14:08:50

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
5		QC Std 2		Sample					
1		QC Std 1		Sample					
401		LRB FH		Sample					
402	s	LRB FH		Spike - 1 of 3					
411		LRB BH		Sample					
412	s	LRB BH		Spike - 1 of 5					
436	x50	31368-1 FH		Sample					
437	x50	31368-2 FH		Sample					
438	x50d	31368-2 FH		Duplicate of 8					
439	x50	31368-3 FH		Sample					
440	x50s	31368-3 FH		Spike - 1 of 10					
441	x50	31368-4 FH		Sample					
442	x10	31368-2 BH		Sample					
443	x10d	31368-2 BH		Duplicate of 13					
444	x5	31368-3 BH		Sample					
445	x5s	31368-3 BH		Spike - 1 of 15					
421	x10	31368-7		Sample					
422	x10s	31368-7		Spike - 1 of 17					
423	x50	31368-7		Sample					
424	x50s	31368-7		Spike - 1 of 19					
425	x50x50	31368-8		Sample					
426	x50x50s	31368-8		Spike - 1 of 21					
403		31368-1 FH		Sample					
404		31368-2 FH		Sample					
405	d	31368-2 FH		Duplicate of 24					
406		31368-3 FH		Sample					
407	s	31368-3 FH		Spike - 1 of 26					
408		31368-4 FH		Sample					
413		31368-1 BH		Sample					
414		31368-2 BH		Sample					
415	d	31368-2 BH		Duplicate of 30					
416		31368-3 BH		Sample					
417	s	31368-3 BH		Spike - 1 of 32					
418		31368-4 BH		Sample					
449	x5	31368-1 BH		Sample					
418		31368-4 BH		Sample					
450	x5	31368-2 BH		Sample					
451	x5d	31368-2 BH		Duplicate of 37					
421	x10	31368-7		Sample					
422	x10s	31368-7		Spike - 1 of 39					
425	x50x50	31368-8		Sample					
426	x50x50s	31368-8		Spike - 1 of 41					
452		31368-6 BH		Sample					
427	x50x100	31368-8		Sample					
428	x50x100s	31368-8		Sample					

Sample/Batch Report

Dannett Ward
6/21/18

User Name: r2d2
Computer Name: PESERVICE-PC
Sample File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Sample\c9.sam
Report Date/Time: Thursday, June 21, 2018 15:02:45

A/S Loc.	Batch ID	Sample ID	Description	Sample Type	Init. Quant.	Prep. Vol.	Aliquot Vol.	Diluted Vol.	Solids Ratio
1		QC Std 1		Sample					
3		QC Std 4		Spike - 3 of 1					
201		31369-5 FH		Sample					
202		31369-6 FH		Sample					
203		31369-5 BH		Sample					
204		31369-6 FH		Sample					

Dataset Report

Denault 6/21/18

User Name: r2d2
Computer Name: PESERVICE-PC
Dataset File Path: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\062118-1a\
Report Date/Time: Thursday, June 21, 2018 14:22:11

The Dataset

Time	Sample ID	Batch ID	Read Type	Description	Init. Quant	Prep. Vol.	Aliquot Vol.	Diluted Vol.
11:05:25 Thu 21-Jun-18	Blank		Blank					
11:07:22 Thu 21-Jun-18	Standard 1		Standard #1					
11:09:20 Thu 21-Jun-18	Standard 2		Standard #2					
11:11:17 Thu 21-Jun-18	Standard 3		Standard #3					
11:13:15 Thu 21-Jun-18	QC Std 1		QC Std #1					
11:15:12 Thu 21-Jun-18	QC Std 2		QC Std #2					
11:17:09 Thu 21-Jun-18	QC Std 3		QC Std #3					
11:19:07 Thu 21-Jun-18	QC Std 4		QC Std #4					
11:21:04 Thu 21-Jun-18	QC Std 5		QC Std #5					
11:23:01 Thu 21-Jun-18	QC Std 6		QC Std #6					
11:24:58 Thu 21-Jun-18	QC Std 7		QC Std #7					
11:26:55 Thu 21-Jun-18	QC Std 8		QC Std #8					
11:28:53 Thu 21-Jun-18	QC Std 2		Sample					
11:30:30 Thu 21-Jun-18	QC Std 1		Sample					
11:33:00 Thu 21-Jun-18	Blank		Blank					
11:34:57 Thu 21-Jun-18	Standard 1		Standard #1					
11:36:55 Thu 21-Jun-18	Standard 2		Standard #2					
11:38:52 Thu 21-Jun-18	Standard 3		Standard #3					
11:40:50 Thu 21-Jun-18	QC Std 1		QC Std #1					
11:42:48 Thu 21-Jun-18	QC Std 2		QC Std #2					
11:44:45 Thu 21-Jun-18	QC Std 3		QC Std #3					
11:46:43 Thu 21-Jun-18	QC Std 4		QC Std #4					
11:48:41 Thu 21-Jun-18	QC Std 5		QC Std #5					
11:50:38 Thu 21-Jun-18	QC Std 6		QC Std #6					
11:52:36 Thu 21-Jun-18	QC Std 7		QC Std #7					
11:54:33 Thu 21-Jun-18	QC Std 8		QC Std #8					
11:56:31 Thu 21-Jun-18	QC Std 2		Sample					
11:58:08 Thu 21-Jun-18	QC Std 1		Sample — use this Blank. DMR 6/21/18					
12:00:05 Thu 21-Jun-18	LRB FH		Sample					
12:02:04 Thu 21-Jun-18	LRB FH	s	Spike - 1 of 29					
12:04:02 Thu 21-Jun-18	LRB BH		Sample					
12:05:59 Thu 21-Jun-18	LRB BH	s	Spike - 1 of 31					
12:07:58 Thu 21-Jun-18	31368-1 FH	x50	Sample					
12:09:55 Thu 21-Jun-18	31368-2 FH	x50	Sample					
12:11:53 Thu 21-Jun-18	31368-2 FH	x50d	Duplicate of 34					
12:13:50 Thu 21-Jun-18	31368-3 FH	x50	Sample					
12:15:48 Thu 21-Jun-18	31368-3 FH	x50s	Spike - 1 of 36					
12:17:47 Thu 21-Jun-18	QC Std 1		QC Std #1					
12:19:44 Thu 21-Jun-18	QC Std 4		QC Std #4					
12:21:43 Thu 21-Jun-18	31368-4 FH	x50	Sample					
12:23:40 Thu 21-Jun-18	31368-2 BH	x10	Sample					
12:25:38 Thu 21-Jun-18	31368-2 BH	x10d	Duplicate of 41					
12:27:35 Thu 21-Jun-18	31368-3 BH	x5	Sample					
12:29:33 Thu 21-Jun-18	31368-3 BH	x5s	Spike - 1 of 43					
12:31:31 Thu 21-Jun-18	31368-7	x10	Sample					
12:33:28 Thu 21-Jun-18	31368-7	x10s	Spike - 1 of 45					
12:35:26 Thu 21-Jun-18	31368-7	x50	Sample					
12:37:23 Thu 21-Jun-18	31368-7	x50s	Spike - 1 of 47					
12:39:20 Thu 21-Jun-18	31368-8	x50x50	Sample					

12:41:18 Thu 21-Jun-18	31368-8	x50x50s	Spike - 1 of 49
12:43:17 Thu 21-Jun-18	QC Std 1		QC Std #1
12:45:14 Thu 21-Jun-18	QC Std 4		QC Std #4
12:47:13 Thu 21-Jun-18	31368-1 FH		Sample
12:49:10 Thu 21-Jun-18	31368-2 FH		Sample
12:51:07 Thu 21-Jun-18	31368-2 FH	d	Duplicate of 54
12:53:05 Thu 21-Jun-18	31368-3 FH		Sample
12:55:02 Thu 21-Jun-18	31368-3 FH	s	Spike - 1 of 56
12:57:00 Thu 21-Jun-18	31368-4 FH		Sample
12:58:58 Thu 21-Jun-18	31368-1 BH		Sample
13:00:55 Thu 21-Jun-18	31368-2 BH		Sample
13:02:53 Thu 21-Jun-18	31368-2 BH	d	Duplicate of 60
13:04:51 Thu 21-Jun-18	31368-3 BH		Sample
13:06:49 Thu 21-Jun-18	31368-3 BH	s	Spike - 1 of 62
13:08:47 Thu 21-Jun-18	QC Std 1		QC Std #1
13:10:45 Thu 21-Jun-18	QC Std 4		QC Std #4
13:13:22 Thu 21-Jun-18	31368-1 BH	x5	Sample
13:15:20 Thu 21-Jun-18	31368-4 BH		Sample
13:17:18 Thu 21-Jun-18	31368-2 BH	x5	Sample
13:19:16 Thu 21-Jun-18	31368-2 BH	x5d	Duplicate of 68
13:21:15 Thu 21-Jun-18	QC Std 1		QC Std #1
13:23:12 Thu 21-Jun-18	QC Std 2		QC Std #2
13:25:10 Thu 21-Jun-18	QC Std 4		QC Std #4
13:27:10 Thu 21-Jun-18	QC Std 4		Sample
13:29:17 Thu 21-Jun-18	Blank		Blank
13:31:08 Thu 21-Jun-18	Standard 1		Standard #1
13:32:59 Thu 21-Jun-18	Standard 2		Standard #2
13:34:50 Thu 21-Jun-18	Standard 3		Standard #3
13:36:42 Thu 21-Jun-18	QC Std 1		QC Std #1
13:38:34 Thu 21-Jun-18	QC Std 2		QC Std #2
13:40:25 Thu 21-Jun-18	QC Std 3		QC Std #3
13:42:17 Thu 21-Jun-18	QC Std 4		QC Std #4
13:44:08 Thu 21-Jun-18	QC Std 5		QC Std #5
13:45:59 Thu 21-Jun-18	QC Std 6		QC Std #6
13:47:50 Thu 21-Jun-18	QC Std 7		QC Std #7
13:49:43 Thu 21-Jun-18	31368-7	x10	Sample
13:51:34 Thu 21-Jun-18	31368-7	x10s	Spike - 1 of 85
13:53:27 Thu 21-Jun-18	31368-8	x50x50	Sample
13:55:18 Thu 21-Jun-18	31368-8	x50x50s	Spike - 1 of 87
13:57:11 Thu 21-Jun-18	31368-6 BH		Sample
13:59:46 Thu 21-Jun-18	31368-8	x50x100	Sample
14:01:37 Thu 21-Jun-18	31368-8	x50x100s	Spike - 1 of 90
14:13:08 Thu 21-Jun-18	31368-8	x50x100	Sample
14:15:00 Thu 21-Jun-18	31368-8	x50x100s	Spike - 1 of 92
14:16:53 Thu 21-Jun-18	QC Std 1		QC Std #1
14:18:44 Thu 21-Jun-18	QC Std 2		QC Std #2
14:20:36 Thu 21-Jun-18	QC Std 4		QC Std #4
14:43:20 Thu 21-Jun-18	QC Std 1		Sample
14:44:45 Thu 21-Jun-18	QC Std 4		Spike - 3 of 97
14:46:31 Thu 21-Jun-18	31368-5 FH		Sample
14:48:17 Thu 21-Jun-18	31368-6 FH		Sample
14:50:02 Thu 21-Jun-18	31368-5 BH		Sample
14:51:45 Thu 21-Jun-18	31368-6 FH		Sample
14:53:35 Thu 21-Jun-18	QC Std 1		QC Std #1
14:55:20 Thu 21-Jun-18	QC Std 2		QC Std #2
14:57:05 Thu 21-Jun-18	QC Std 4		QC Std #4

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 3

Sample Date/Time: Thursday, June 21, 2018 11:38:52
Sample Description:
Number of Replicates: 3
Batch ID:
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\062118-1a\Standard 3.018
Sample Prep Volume (mL):
Initial Sample Quantity (mg):
Aliquot Volume (mL):
Diluted To Volume (mL):
Autosampler Position: 4

Calibration

Analyte	Curve Type	Slope	Correlation Coefficient	Intercept
Li	Linear Thru Zero			
Be	Linear Thru Zero	0.004	1.000000	0.00
P	Linear Thru Zero	0.003	0.999962	0.00
Sc	Linear Thru Zero			
Zn	Linear Thru Zero	0.004	0.999969	0.00
Zn	Linear Thru Zero	0.001	0.999989	0.00
Zn	Linear Thru Zero	0.003	0.999989	0.00
As	Linear Thru Zero	0.004	1.000000	0.00
Se	Linear Thru Zero	0.000	0.999930	0.00
Se	Linear Thru Zero	0.000	0.999998	0.00
Rh	Linear Thru Zero			
Ho	Linear Thru Zero			
Kr	Linear Thru Zero			

Method 6020 & 200.8 Metals Summary Report

Sample ID: Standard 3

Sample Date/Time: Thursday, June 21, 2018 13:34:50
Sample Description:
Number of Replicates: 3
Batch ID:
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\062118-1a\Standard 3.077
Sample Prep Volume (mL):
Initial Sample Quantity (mg):
Aliquot Volume (mL):
Diluted To Volume (mL):
Autosampler Position: 4

Calibration

Analyte	Curve Type	Slope	Correlation Coefficient	Intercept
Li	Linear Thru Zero			
Sc	Linear Thru Zero			
Rh	Linear Thru Zero			
Ag	Linear Thru Zero	0.022	0.999965	0.00
Ag	Linear Thru Zero			
Cd	Linear Thru Zero	0.013	0.999981	0.00
Cd	Linear Thru Zero	0.041	0.999981	0.00
Ho	Linear Thru Zero			
Kr	Linear Thru Zero			

elementOne
Analyst:--DMR--

ICP-MS RUN SHEET
6/21/2018

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
5		QC Std 2		Sample		
401		LRB FH		Sample		100
402	s	LRB FH		Spike - 1 of 3		100
411		LRB BH		Sample		50x2
412	s	LRB BH		Spike - 1 of 5		50x2
436	x50	31368-1 FH		Sample		100
437	x50	31368-2 FH		Sample		100
438	x50d	31368-2 FH		Duplicate of 8		100
439	x50	31368-3 FH		Sample		100
440	x50s	31368-3 FH		Spike - 1 of 10		100
441	x50	31368-4 FH		Sample		100
442	x10	31368-2 BH		Sample		50x2
443	x10d	31368-2 BH		Duplicate of 13		50x2
444	x5	31368-3 BH		Sample		50x2
445	x5s	31368-3 BH		Spike - 1 of 15		50x2
421	x10	31368-7		Sample		50
422	x10s	31368-7		Spike - 1 of 17		50
423	x50	31368-7		Sample		50
424	x50s	31368-7		Spike - 1 of 19		50
425	x50x50	31368-8		Sample		5/1000/1000
426	x50x50s	31368-8		Spike - 1 of 21		5/1000/1000
403		31368-1 FH		Sample		100
404		31368-2 FH		Sample		100
405	d	31368-2 FH		Duplicate of 24		100
406		31368-3 FH		Sample		100
407	s	31368-3 FH		Spike - 1 of 26		100
408		31368-4 FH		Sample		100
413		31368-1 BH		Sample		50x2
414		31368-2 BH		Sample		50x2
415	d	31368-2 BH		Duplicate of 30		50x2
416		31368-3 BH		Sample		50x2
417	s	31368-3 BH		Spike - 1 of 32		50x2
418		31368-4 BH		Sample		50x2
449	x5	31368-1 BH		Sample		50x2
418		31368-4 BH		Sample		50x2
450	x5	31368-2 BH		Sample		50x2
451	x5d	31368-2 BH		Duplicate of 37		50x2
452		31368-6 BH		Sample		50x2
427	x50x100	31368-8		Sample		5/1000/1000
428	x50x100s	31368-8		Spike - 1 of 44		5/1000/1000

Spikes are post at 0.02mL of 25ppm spiking solutions lot 021418-ABC&F in a final volume of 10mL

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
DMR	6/21/18 13:59		VWT	6/21/18 @1500	
Re-Test Required:	No:	Yes: ✓	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:

S:\Jobs\! Jobs - Active\31368 MAQS Airtech General Iron M29-5 4R, FB, RB, Audits---RUSH\062118-1a ICP-MS Run Sheet

elementOne
Analyst:--DMR--

ICP-MS RUN SHEET
6/21/2018

Job Number:
14

A/S Loc.	Dilution	Sample ID	Client	Type	Weight (g)	Prep Vol (ml)
201		31369-5 FH		Sample		100
202		31369-6 FH		Sample		100
203		31369-5 BH		Sample		50x2
204		31369-6 FH		Sample		50x2

Submitted for QC by:	Date/Time:		QC Review By:	Date/Time:	
DMR	6/21/18 15:03		[illegible]	6/21/18 @ 1500	
Re-Test Required:	No: ✓	Yes:	Comments:		
Resubmitted for QC by:	Date/Time:		QC Review:	By:	Date/Time:

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ICP-MS QC Values Table

Element or Test	ICP Element Mass	Element symbol	Lowest Reported Value (ug)	Upper Reported Value (ug)	Reporting Unit	QC #1	QC #2	QC #3	QC #4	QC #5	QC #6 A	QC #7 AS	QC #8 .25	QC #9 LRB	QC #10 LRB+	QC #11 LRB+
Lithium	6	Li														
Lithium	7	Li	1	500	mg/L	0	1	250	100	50				0	50	100
Beryllium	9	Be	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Boron	10	B	5	500	mg/L	0	1	250	100	50				0	50	100
Boron	11	B	5	500	mg/L	0	1	250	100	50				0	50	100
Sodium	23	Na	20	5500	mg/L	0	21	2500	1100	250	5000	5000		0	715	
Magnesium	24	Mg	20	5500	mg/L	0	21	2500	1100	250	5000	5000		0	550	
Magnesium	25	Mg	20	5500	mg/L	0	21	2500	1100	250				0	550	
Aluminum	27	Al	1	500	mg/L	0	1	250	100	50	5000	5000		0	50	100
Phosphorus	31	P	20	5000	mg/L	0	20	2500	1000	250	5000	5000		0	200	
Potassium	39	K	20	5500	mg/L	0	20	2000	1000	200	5000	5000		0	500	
Calcium	44	Ca	50	5500	mg/L	0	21	2500	1100	250	5000	5000		0	550	
Scandium	45															
Titanium	47	Ti	1	500	mg/L	0	1	250	100	50	100	100	0.25	0	50	100
Titanium	49	Ti	1	500	mg/L	0	1	250	100	50	100	100	0.25	0	50	100
Vanadium	51	V	1	500	mg/L	0	1	250	100	50	0	2	0.25	0	50	100
Vanadium	51	V	1	500	mg/L	0	1	250	100	50	0	2	0.25	0	50	100
Chromium	52	Cr	1	500	mg/L	0	1	250	100	50	0	1	0.25	0	50	100
Chromium	53	Cr	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Iron	54	Fe	20	5500	mg/L	0	21	2500	1100	250	5000	0		0		
Manganese	55	Mn	1	500	mg/L	0	1	250	100	50	0	1	0.25	0	50	100
Iron	57	Fe	20	5500	mg/L	0	21	2500	1100	250	5000	0		0		
Cobalt	59	Co	1	500	mg/L	0	1	250	100	50	0	2	0.25	0	50	100
Nickel	60	Ni	1	500	mg/L	0	1	250	100	50	0	2	0.25	0	50	100
Copper	63	Cu	1	500	mg/L	0	1	250	100	50	0	1	0.25	0	50	100
Copper	65	Cu	1	500	mg/L	0	1	250	100	50	0	1	0.25	0	50	100
Zinc	66	Zn	1	500	mg/L	0	1	250	100	50	0	1	0.25	0	50	100
Zinc	67	Zn	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Zinc	68	Zn	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Germanium	72	Ge	1	500	mg/L	0	1	250	100	50				0	50	100
Arsenic	75	As	1	500	mg/L	0	1	250	100	50	0	1	0.25	0	50	100
Selenium	77	Se	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Selenium	82	Se	1	500	mg/L	0	1	250	100	50	0	1	0.25	0	50	100
Strontium	88	Sr	1	500	mg/L	0	1	250	100	50				0	50	100
Molybdenum	95	Mo	1	500	mg/L	0	1	250	100	50	100	100	0.25	0	50	100
Molybdenum	97	Mo	1	500	mg/L	0	1	250	100	50	100	100	0.25	0	50	100
Molybdenum	98	Mo	1	500	mg/L	0	1	250	100	50	100	100	0.25	0	50	100
Rhodium	103															
Silver	107	Ag	1	500	mg/L	0	1	250	100	50	0	1		0	50	100
Silver	109	Ag	1	500	mg/L	0	1	250	100	50				0	50	100
Cadmium	111	Cd	1	500	mg/L	0	1	250	100	50	0	0.5	0.25	0	50	100
Cadmium	114	Cd	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Tin	118	Sn	1	500	mg/L	0	1	250	100	50				0	50	100
Antimony	121	Sb	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Antimony	123	Sb	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Tellurium	125	Te	1	500	mg/L	0	1	250	100	50				0	50	100
Cesium	133															
Barium	135	Ba	1	500	mg/L	0	1	250	100	50				0	50	100
Barium	137	Ba	1	500	mg/L	0	1	250	100	50				0	50	100
Lanthanum	139	La	1	500	mg/L	0	1	250	100	50				0	50	100
Tantalum	159	Ta	1	500	mg/L	0	1	250	100	50				0	50	100
Platinum	195	Pt	1	500	mg/L	0	1	250	100	50				0	50	100
Gold	181	Au	1	500	mg/L	0	1	250	100	50				0	50	100
Thallium	205	Tl	1	500	mg/L	0	1	250	100	50				0	50	100
Lead	208	Pb	1	500	mg/L	0	1	250	100	50			0.25	0	50	100
Bismuth	209	Bi	1	500	mg/L	0	1	250	100	50				0	50	100
Thorium	232	Th	1	500	mg/L	0	1	250	100	50				0	50	100
Uranium	238	U	1	500	mg/L	0	1	250	100	50				0	50	100
Krypton	83															

MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 06/18/18 Prep By: MMP/TAD SIF File #: 061818-1
Block #1 Temperature: 98.87 Start Time: 8:52 A.M. Machine ID: 2
Block #2 Temperature: 94.75 Stop Time: 9:52 A.M. Batch Analyst: MMP
Block #3 Temperature: — Typed By: TAD Verified By: MMP

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 4705145
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg3-012-1 by: MMP
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg3-012-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg3-012-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: MMP

Initial Review By: MMP Date: 6/18/18 Time: ~~12:3~~ 1:15
Final QC Review By: LAW Date: 06-18-18 Time: 5:34
Comments: 31368-10 @ 0.05 31350-12@0.025 31350-11@0.5

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	30811-31QC ✓	7470A			0.05	5	TV=9.88
10	L/C ✓	↓			1	1	TV=0.008
11	31368-10 ✓	M29			0.05	5	
12	-10				0.1		
13	-10				0.2	↓	
14	31368-1BH ✓				4	505	
15	-2BH					310	
16	-2BHD					↓	
17	-3BH					325	
18	-3BH+					↓	
19	-4BH	↓			↓	350	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml...... HNO_3 @ 1.0ml....... Persulfate @ 3.2ml......... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 177436 *HNO_3 Lot #* 1117100 *HCl Lot #:* 4117040

Persulfate Lot # Hg3-002-5 *$KMnO_4$ Lot #* Hg3-008-10 *Hydrox Lot#:* Hg3-002-15

Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 Page 1 of 63

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 061818-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
20	31368-5BH ✓	M29			4	230	
21	-6BH					205	
22	-1A					200	
23	-2A						
24	-2AD						
25	-3A						
26	-3A+						
27	-4A						
28	-5A						
29	-6A ✓						
30	31339-1B ✓					500	
31	-2C					400	
32	-2CD						
33	31350-12				0.05	5	
34	-12				0.1		
35	-12				0.2		
36	31350-LRBFH ✓				4	100	
37	-LRBFH+				1.6		
38	-1FH				4		
39	-2FH						
40	-2FHD						
41	-3FH						
42	-3FH+						
43	-4FH						
44	-5FH						
45	-5FHD						
46	-6FH						
47	-6FH+						
48	-7FH						
49	-8FH						
50	-11				1		
51	-11				2		
52	-11				4		
53	-11amp				1	100	
54	-11amp				2		

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 061818-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
55	31350-11amp	7471			4	100	
56	31351-1 FH				0.1		
57	-2 FH						
58	-2 FH D						
59	-3 FH						
60	-3 FH+						
61	-4 FH						
62	-9 FH						
63	-10 FH						
64	-10 FH D						
65	-11 FH						
66	-11 FH+						
67	-12 FH						
68	-17 FH						
69	-18 FH						
70	-18 FH D						
71	-19 FH						
72	-19 FH+						
73	-20 FH						
74							
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87							
88							
89							

MERCURY BATCH DIGESTION - RUN WORKSHEET

Date Prepared/Digested: 06/18/18 Prep By: MMP SIF File #: 061918-1
Block #1 Temperature: 97.84 Start Time: 5:45a Machine ID: 1
Block #2 Temperature: 92.19 Stop Time: 8:00a Batch Analyst: MMP
Block #3 Temperature: ~95 Typed By: MMP Verified By: DKH

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 4705145
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg3-012-1 by: MMP
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg3-012-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg3-012-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: DKH

Initial Review By: MMP Date: 6/19/18 Time: 7:55
Final QC Review By: LAW Date: 06.19.18 Time: 3:57
Comments: 31364-BLK+SPK 31364-2@5+10 31368-1B+3B@0.4 31368-4B@10|1 31368-2B@0.5

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	30811-31QC	7470A			0.05	5	TV=9.88
10	4L	↓			1	1	TV=0.008
11	31368-10	M29			0.05	5	
12	-10D						
13	-10+				↓	↓	
14	31368-1B				4	500	
15	-2B						
16	-2BD						
17	-3B						
18	-3B+						
19	-4B	↓			↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion
"+" Denotes spike for Hg. Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.
H_2SO_4 @ 2.0ml...... HNO_3 @ 1.0ml...... Persulfate @ 3.2ml......... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 177434 *HNO_3 Lot #* 1117100 *HCl Lot #:* 4117040
Persulfate Lot # Hg3-012-6 *$KMnO_4$ Lot #* Hg3-008-8 *Hydrox Lot#:* Hg3-009-2
Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 Page 1 of 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 061918-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
20	31368-5B ✓	M29			4	500	
21	-6B				↓	↓	
22	31350-12				0.025	5	
23	-12D						
24	-12+				↓	↓	
25	31350-11 ✓				0.5	100	
26	-11D						
27	-11+				↓	↓	
28	-1B				4	500	
29	-2B						
30	-2BD						
31	-3B						
32	-3B+						
33	-4B						
34	-5B						
35	-5BD						
36	-6B						
37	-6B+						
38	-7B						
39	-8B				↓	↓	
40	-1C				4	400	
41	-2C						
42	-2CD						
43	-3C						
44	-3C+						
45	-4C						
46	-5C						
47	-5CD						
48	-6C						
49	-6C+						
50	-7C						
51	-8C	↓			↓	↓	
52	31364/370-LRB	tot 7470A			4	1	
53	-LRBtot +				0.2		TV: 0.100
54	31364-1 tot ✓	↓	0.5053/50	4	0.0404	↓	

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 061918-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
55	31364-1 D++	7470A	0.5093/50	4	0.0404	1	
56	31370-1 tot		0.5055/50		0.0404		
57	-1 tot+						
58	31360-1	7470A			0.4		
59	-2						
60	-2D						
61	-3						
62	-3+						
63	-4						
64	-5						
65	31364-SRP-BLK	7470A			20	1	
66	-BLK+						
67	31364-1						
68	-10						
69	31364-BLK						
70	-BLK+						
71	31364-~~2~~						
72	-2+						
73							
74							
75							
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MERCURY BATCH DIGESTION - RUN WORKSHEET

06 2018-1

Date Prepared/Digested: 06/19/18 | Prep By: MMP | SIF File #: 06-18 (MMP)
Block #1 Temperature: 99.49 | Start Time: 5:45a | Machine ID: 1
Block #2 Temperature: ~95 | Stop Time: 8:00a | Batch Analyst: MMP
Block #3 Temperature: 93.84 | Typed By: MMP | Verified By: DKH

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
1	Lab BLK (3/ batch)	0		40	40	Standard #1 (for working std) Lot #: 4705145
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg3-012-1 by: MMP
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg3-012-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg3-012-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: MMP

Initial Review By: MMP | Date: 6/20/18 | Time: 1:31
Final QC Review By: KLG | Date: 6/20/18 | Time: 900

Comments: 31368-1B-4B were typed in wrong → initial volume needs to be changed
31351-29 @ 0.5mls 31367-1 audit

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	31306-17 QC	7470A			0.05	5	TV=11.1
10	L/L	↓			1	1	TV=0.008
11	31368-9	M29			1	100	
12	-9R				2		
13	-9				4	↓	
14	31368-1C					400	
15	-2C						
16	-2CD						
17	-3C						
18	-3C+						
19	-4C	↓			↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion
"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.
H_2SO_4 @ 2.0ml...... HNO_3 @ 1.0ml....... Persulfate @ 3.2ml......... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 177436 *HNO_3 Lot #* 117100 *HCl Lot #:* 417040
Persulfate Lot # Hg3-002-8 *$KMnO_4$ Lot #* Hg3-013-6 *Hydrox Lot#:* Hg3-009-2

Clear samples after digestion with 2.4 ml of Hydroxylamine solution.

Element One, Inc F209 R9 — Page 1 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 062018-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
✓ 20	31368-5C	M29			4	400	
21	-6C				↓	↓	
22	-1B				0.4	500	
23	-2B				0.5		
24	-2BD				↓		
25	-3B				0.4		
26	-3B+				↓		
27	-4B					↓	
28	-URBFH				4	100	
29	-URBFH+				1.6		
30	-1FH				4		
31	-2FH						
32	-2FHD						
33	-3FH						
34	-3FH+						
35	-4FH						
36	-5FH						
37	-6FH				↓	↓	
✓ 38	31351-29				1	1000	
39	-29D						
40	-29+				↓	↓	
41	-9BH				0.5	570	
42	-17BH				0.5	112	
43	-19BH				0.5	118	
44	-19BH+				↓	↓	
45	31367-6				4	100	
46	-6D						
47	-6+	← missed tube			↓	↓	
48	-1BH				4	900	
49	-2BH					935	
50	-2BHD					↓	
51	-3BH					970	
52	-3BH+					↓	
53	-4BH					330	
54	-5BH	↓			↓	220	

Element One, Inc F209 R9

Page 2 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 062018-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
√ 55	31367-7	m29			0.05	5	
56	-7'	↓			0.1	↓	
57	-7	↓			0.2	↓	
√ 58	31354-2Blk	7470A			20	1	
59	-Blk+	↓			↓	↓	
√ 60	31354-2	↓			↓	↓	
√ 61	31364-Blk	7470A			20	1	
62	-Blk+	↓			↓	↓	
√ 63	31364-2	↓			10	↓	
64	-2+	↓			10	↓	
65	-2	↓			5	↓	
√ 66	-2+	↓			5	↓	
√ 67	31351-13BH	m29			4	715	
√ 68	313108-9	↓			0.5	100	
69	-9D	↓			↓	↓	
70	-9+	↓			↓	↓	
71	-2C	↓			2	400	2x dil
72	-2CD	↓			2	400	2x dil
73	-3C	↓			0.4	↓	
74	-3C+	↓			0.4	↓	
75							
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MERCURY BATCH DIGESTION - RUN WORKSHEET

ed/Digested:	06/20/18	Prep By:	mmp	SIF File #:	062118-1
Block #1 Temperature:	94.4	Start Time:	5:45a	Machine ID:	2
Block #2 Temperature:	92.7	Stop Time:	8:00a	Batch Analyst:	mmp
Block #3 Temperature:	~95	Typed By:	MMP	Verified By:	DKH

A/S	Curve & QC's	0.4ug/ml working std		BV, ml	FV, ml	Standard Lot Numbers
						Standard #1 (for working std)
1	Lab BLK (3/ batch)	0		40	40	Lot #: 4705145
2	0.004 ug	0.01ml		40	40	Working Standard
3	0.04 ug	0.10ml		40	40	Lot #: Hg3-012-1 by: mmp
4	0.08 ug	0.20ml		40	40	Standard #2 (QC #2):
5	0.16 ug	0.40ml		40	40	Lot #: Hg3-012-2
6	0.20ug	0.50ml		40	40	Standard #3 (QC #3):
						Lot #: Hg3-012-3
7	QC #2= 0.08ug	0.2ml #2 std		40	40	
8	QC #3= 0.08ug	0.2ml #3 std		40	40	Curve prepared by: DKH

Initial Review By: mmp Date: 6/21/18 Time:

Final QC Review By: KLG Date: ↓ Time:

Comments:

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
9	31306-17QC	7470A			0.05	5	TV= 11.1
10	↓	↓			1	1	TV= 0.008
11	31368-69	M29			0.5	100	
12	-9D				1 4	↓	
13	-9+				↓	↓	
14	31368-4A				4	200	
15	31367-6				1	100	
16	-6D						
17	-6+				↓	↓	
18	31367-1A				4	200	
19	-2A	↓			↓	↓	

NOTES: Lab blanks and spikes must be prepared with each batch digestion

"+" Denotes spike for Hg, Use calibration working 0.4ug/ml standard at the rate of 0.20ml per 40ml sample, unless otherwise noted.

Digestion chemicals to be added in order at the following rate per 40ml volumes.

H_2SO_4 @ 2.0ml...... HNO_3 @ 1.0ml....... Persulfate @ 3.2ml......... $KMnO_4$ @ 6.0ml

H_2SO_4 Lot # 177436 *HNO_3 Lot #* 1117100 *HCl Lot #:* 4117040

Persulfate Lot # Hg3-002-8 *$KMnO_4$ Lot #* Hg3-013-7 *Hydrox Lot#:* Hg3-009-1

Clear samples after digestion with 2.4 ml of Hydroxylamine solution. ↓

Element One, Inc F209 R9

Page 1 of ~~5~~ 3

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 062118-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
20	31367-2AD	M29			4	200	
21	-3A						
22	-3A+						
23	-4A						
24	-5A						
25	-1B					~~500~~ 600	
26	-2B						
27	-2BD						
28	-3B					500	
29	-3B+						
30	-4B						
31	-5B						
32	31367-1C				4	~~500~~ 400	
33	-2C						
34	-2CD						
35	-3C						
36	-3C+						
37	-4C						
38	-5C						
39	31367-7				0.05	5	
40	-7D						
41	-7+						
42	31351-3A				4	200	
43	-3A+						
44	31351-29				0.5	1000	
45	-29D						
46	-29+						
47	31366/370-BLK	7470A			20	1	
48	-BLK+						
49	31366						
50	31370-1						
51	-2						
52	-2D						
53	-3						
54	-3+						

Element One, Inc F209 R9

elementOne **MERCURY BATCH DIGESTION - RUN WORKSHEET**

SIF File #: 062118-1

A/S	LAB #	Method	Wt (g)/ FV (mL)	Prep Aliquot Used, mL	Aliquot or Calc Mass	FV, mL or "1" for conc.	Comments
55	31370-4	7470A			20	1	
56	-5						
57	-6						
58	-6+						
59	-7						
60	-8						
61	-9						
62	-9+						
63	-10						
64	31371-1						
65	-1D						
66	-2						
67	-2+			MMP			
68	31368-1B	m29		0.02	~~2~~ 2	500	
69	-3B* MM						
70	-3B+						
71							
72							
73							
74							
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Element One, Inc F209 R9

PerkinElmer Nexlon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Blank
Sample Dal Tuesday, June 19, 2018 16:45:11
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3934.1		ppb
|-	Be	9	1.7		ppb
|-	P	31	1596.7		ppb
|>	Sc	45	6083.1		ppb
|	Cr	52	575		ppb
|-	Cr	53	432.7		ppb
|-	Mn	55	107		ppb
|	Co	59	17.3		ppb
|	Ni	60	10.3		ppb
|	Cu	63	54.3		ppb
|	Cu	65	24.7		ppb
|	Zn	66	24.7		ppb
|	Zn	67	16		ppb
|	Zn	68	99.7		ppb
|	As	75	38.1		ppb
|	Se	77	60.3		ppb
|	Se	82	0.8		ppb
|>	Rh	103	4735.1		ppb
|	Ag	107	16		ppb
|	Ag	109	17		ppb
|	Cd	111	11.3		ppb
|-	Cd	114	12.1		ppb
|-	Sb	121	43.7		ppb
|	Sb	123	28.2		ppb
|	Ba	135	20.7		ppb
|	Ba	137	31		ppb
|>	Ho	165	45790.2		ppb
|	Tl	205	87.3		ppb
|-	Pb	208	218.7		ppb
	Kr	83	25.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample Dal Tuesday, June 19, 2018 16:48:17
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4121.4		ppb
|-	Be	9	17.3	0.86067	ppb
|-	P	31	1782.1	8.46315	ppb
|>	Sc	45	6380.8		ppb
|	Cr	52	766	0.78793	ppb
|-	Cr	53	507.3	2.23881	ppb
|-	Mn	55	362.3	0.96919	ppb
|	Co	59	185.7	0.94774	ppb
|	Ni	60	42.7	0.83734	ppb
|	Cu	63	151	1.04471	ppb
|	Cu	65	64.3	0.96039	ppb
|	Zn	66	44.3	0.91436	ppb
|	Zn	67	14.7	-0.54654	ppb
|	Zn	68	115.7	0.9504	ppb
|	As	75	62.9	1.13953	ppb
|	Se	77	59.7	-2.06343	ppb
|	Se	82	3.1	1.45291	ppb
|>	Rh	103	4853.1		ppb
|	Ag	107	100.7	0.9166	ppb
|	Ag	109	91.7		ppb
|	Cd	111	35.8	0.73273	ppb
|-	Cd	114	135.1	0.98013	ppb
|-	Sb	121	242.7		ppb
|	Sb	123	198.7	0.97724	ppb
|	Ba	135	104		ppb
|	Ba	137	208.7	0.90205	ppb
|>	Ho	165	47377.2		ppb
|	Tl	205	1413.4	0.9841	ppb
|-	Pb	208	1907.7	0.95205	ppb
	Kr	83	27		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample DatTuesday, June 19, 2018 16:51:24
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4349.8		ppb
|-	Be	9	1788.4	93.33241	ppb
|-	P	31	15679.9	1017.6585	ppb
|>	Sc	45	6866.6		ppb
|	Cr	52	22294.3	97.43378	ppb
|-	Cr	53	2985.2	97.28293	ppb
|-	Mn	55	27976	98.55799	ppb
|	Co	59	19038.2	99.09757	ppb
|	Ni	60	4104	98.52348	ppb
|	Cu	63	9804.6	98.54359	ppb
|	Cu	65	4314.4	97.21147	ppb
|	Zn	66	2248.1	98.34052	ppb
|	Zn	67	347	97.72093	ppb
|	Zn	68	1624.4	98.73451	ppb
|	As	75	2232.6	97.51044	ppb
|	Se	77	165	83.64266	ppb
|	Se	82	152.8	89.39875	ppb
|>	Rh	103	5261.6		ppb
|	Ag	107	9888.3	99.05469	ppb
|	Ag	109	9205.4		ppb
|	Cd	111	3527.9	98.1012	ppb
|-	Cd	114	13725.1	100.94902	ppb
|-	Sb	121	24311.8		ppb
|	Sb	123	18578.8	101.50503	ppb
|	Ba	135	10810.3		ppb
|	Ba	137	20644.5	99.87348	ppb
|>	Ho	165	49950.5		ppb
|	Tl	205	142946.2	100.80089	ppb
|-	Pb	208	186272.9	99.90119	ppb
	Kr	83	30.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample DatTuesday, June 19, 2018 16:54:30
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4266.3		ppb
|-	Be	9	9409.4	501.3338	ppb
|-	P	31	67535.4	4996.5145	ppb
|>	Sc	45	6630.9		ppb
|	Cr	52	107988.7	500.51367	ppb
|-	Cr	53	12878	500.54094	ppb
|-	Mn	55	138399.4	500.28846	ppb
|	Co	59	93893.7	500.18059	ppb
|	Ni	60	20336.6	500.29563	ppb
|	Cu	63	48440.2	500.29119	ppb
|	Cu	65	21615	500.55779	ppb
|	Zn	66	11076.5	500.33207	ppb
|	Zn	67	1667.1	500.45891	ppb
|	Zn	68	7607.8	500.2532	ppb
|	As	75	11035.4	500.49763	ppb
|	Se	77	642	503.2776	ppb
|	Se	82	834.8	502.11935	ppb
|>	Rh	103	5145.5		ppb
|	Ag	107	48763.2	500.18923	ppb
|	Ag	109	46576		ppb
|	Cd	111	17546.3	500.38029	ppb
|-	Cd	114	66410.7	499.81024	ppb
|-	Sb	121	119188.1		ppb
|	Sb	123	89452.1	499.69904	ppb
|	Ba	135	52099.6		ppb
|	Ba	137	101099.7	500.0255	ppb
|>	Ho	165	48910.8		ppb
|	Tl	205	693784	499.83985	ppb
|-	Pb	208	912049	500.01986	ppb
	Kr	83	31.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalTuesday, June 19, 2018 16:57:37
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3944		ppb
|-	Be	9	3	0.07531	ppb
|-	P	31	1411.4	-17.95806	ppb
|>	Sc	45	6223.4		ppb
|	Cr	52	638.3	0.24874	ppb
|-	Cr	53	485.3	1.82359	ppb
|-	Mn	55	113	0.01533	ppb
|	Co	59	24.7	0.03981	ppb
|	Ni	60	14.3	0.10015	ppb
|	Cu	63	62.3	0.0771	ppb
|	Cu	65	23.3	-0.04416	ppb
|	Zn	66	24	-0.05617	ppb
|	Zn	67	11.3	-1.60861	ppb
|	Zn	68	104.7	0.22266	ppb
|	As	75	79.7	1.98229	ppb
|	Se	77	51.7	-9.12114	ppb
|	Se	82	3.8	1.92323	ppb
|>	Rh	103	4824.5		ppb
|	Ag	107	48	0.34669	ppb
|	Ag	109	52		ppb
|	Cd	111	8.1	-0.10624	ppb
|-	Cd	114	18.1	0.04679	ppb
|-	Sb	121	45.7		ppb
|	Sb	123	38.3	0.05787	ppb
|	Ba	135	28		ppb
|	Ba	137	32	0.0038	ppb
|>	Ho	165	46260.1		ppb
|	Tl	205	146	0.04407	ppb
|-	Pb	208	284	0.03661	ppb
	Kr	83	23.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DalTuesday, June 19, 2018 17:00:44
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4003.5		ppb
|-	Be	9	18.7	0.96418	ppb
|-	P	31	1607.7	-5.27464	ppb
|>	Sc	45	6380.5		ppb
|	Cr	52	811.3	1.00869	ppb
|-	Cr	53	529.3	3.15843	ppb
|-	Mn	55	354.7	0.95042	ppb
|	Co	59	187.3	0.96597	ppb
|	Ni	60	52.3	1.09982	ppb
|	Cu	63	147.3	1.01768	ppb
|	Cu	65	72	1.16214	ppb
|	Zn	66	33.7	0.41493	ppb
|	Zn	67	13	-1.06245	ppb
|	Zn	68	113	0.82913	ppb
|	As	75	101.5	3.04992	ppb
|	Se	77	60.7	-0.64747	ppb
|	Se	82	0.1	-0.46167	ppb
|>	Rh	103	4815.5		ppb
|	Ag	107	110.3	1.0315	ppb
|	Ag	109	110		ppb
|	Cd	111	38	0.80585	ppb
|-	Cd	114	141.2	1.03705	ppb
|-	Sb	121	268.3		ppb
|	Sb	123	200.6	1.01706	ppb
|	Ba	135	107.3		ppb
|	Ba	137	207.7	0.92342	ppb
|>	Ho	165	46229.4		ppb
|	Tl	205	1397.4	0.99814	ppb
|-	Pb	208	1893.4	0.9704	ppb
	Kr	83	29.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample DalTuesday, June 19, 2018 17:03:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4093.3		ppb
|-	Be	9	4409.7	244.55514	ppb
|-	P	31	31783.9	2365.4739	ppb
|>	Sc	45	6406.8		ppb
|	Cr	52	53092.3	253.20892	ppb
|-	Cr	53	6506.5	252.65596	ppb
|-	Mn	55	66895.7	249.11229	ppb
|	Co	59	45660.7	250.76455	ppb
|	Ni	60	9739.6	246.92187	ppb
|	Cu	63	23647.2	251.51075	ppb
|	Cu	65	10485.9	250.0511	ppb
|	Zn	66	5337.6	248.00151	ppb
|	Zn	67	818	250.56926	ppb
|	Zn	68	3885.3	260.03341	ppb
|	As	75	5418	252.44451	ppb
|	Se	77	354	261.40207	ppb
|	Se	82	414.4	256.83518	ppb
|>	Rh	103	4990.5		ppb
|	Ag	107	24018.2	253.90043	ppb
|	Ag	109	22916.8		ppb
|	Cd	111	8363.4	245.80421	ppb
|-	Cd	114	31938.5	247.81755	ppb
|-	Sb	121	57797.7		ppb
|	Sb	123	43843.4	251.70458	ppb
|	Ba	135	25556.7		ppb
|	Ba	137	49021.7	249.18015	ppb
|>	Ho	165	47579.9		ppb
|	Tl	205	337372.2	249.83664	ppb
|-	Pb	208	435317.1	245.28197	ppb
	Kr	83	30.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DalTuesday, June 19, 2018 17:06:57
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4248.1		ppb
|-	Be	9	1766.4	94.35078	ppb
|-	P	31	14896.1	989.18781	ppb
|>	Sc	45	6687.9		ppb
|	Cr	52	22171.8	99.56037	ppb
|-	Cr	53	2937.8	98.47395	ppb
|-	Mn	55	27802.1	97.60709	ppb
|	Co	59	18955.2	98.32578	ppb
|	Ni	60	4040	96.6452	ppb
|	Cu	63	9596.2	96.10669	ppb
|	Cu	65	4277.4	96.05555	ppb
|	Zn	66	2252.8	98.197	ppb
|	Zn	67	338.3	94.79465	ppb
|	Zn	68	1635.7	99.12493	ppb
|	As	75	2335.2	101.70176	ppb
|	Se	77	179	95.05403	ppb
|	Se	82	163.4	95.35152	ppb
|>	Rh	103	5279.6		ppb
|	Ag	107	9990	99.72632	ppb
|	Ag	109	9480.8		ppb
|	Cd	111	3603.4	99.87654	ppb
|-	Cd	114	13363.9	97.9512	ppb
|-	Sb	121	23929.4		ppb
|	Sb	123	17940	100.09717	ppb
|	Ba	135	10647.3		ppb
|	Ba	137	20170.8	99.65189	ppb
|>	Ho	165	48903.5		ppb
|	Tl	205	139052.4	100.14122	ppb
|-	Pb	208	183756.7	100.66229	ppb
	Kr	83	32.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample DatTuesday, June 19, 2018 17:10:05
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mean	Report Unit
|>	Li	6	4288		ppb
|-	Be	9	956.4	50.54924	ppb
|-	P	31	3918.3	159.09649	ppb
|>	Sc	45	6777.9		ppb
|	Cr	52	11421.6	49.17767	ppb
|-	Cr	53	1740.1	49.67159	ppb
|-	Mn	55	14026.6	49.76277	ppb
|	Co	59	9303.1	48.91934	ppb
|	Ni	60	1978.1	47.87503	ppb
|	Cu	63	4861.5	49.10553	ppb
|	Cu	65	2187.1	49.52918	ppb
|	Zn	66	1114.7	48.70211	ppb
|	Zn	67	179	48.43047	ppb
|	Zn	68	871	50.23273	ppb
|	As	75	1228.6	53.42694	ppb
|	Se	77	120.7	46.96166	ppb
|	Se	82	99.4	58.67938	ppb
|>	Rh	103	5202.9		ppb
|	Ag	107	4961.5	50.16929	ppb
|	Ag	109	4702.1		ppb
|	Cd	111	1740	48.76041	ppb
|-	Cd	114	6688.9	49.69685	ppb
|-	Sb	121	12810.6		ppb
|	Sb	123	9681.5	53.46226	ppb
|	Ba	135	5328.9		ppb
|	Ba	137	10058.4	49.16867	ppb
|>	Ho	165	49339.6		ppb
|	Tl	205	69021.2	49.2335	ppb
|-	Pb	208	91853.5	49.80823	ppb
	Kr	83	29		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample DatTuesday, June 19, 2018 17:13:12
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mean	Report Unit
|>	Li	6	5735.5		ppb
|-	Be	9	3	0.02235	ppb
|-	P	31	91832	4889.4066	ppb
|>	Sc	45	9211.7		ppb
|	Cr	52	664.3	-0.69201	ppb
|-	Cr	53	710.3	1.59725	ppb
|-	Mn	55	142.7	-0.0405	ppb
|	Co	59	20.3	-0.02045	ppb
|	Ni	60	11.7	-0.06498	ppb
|	Cu	63	60.3	-0.1517	ppb
|	Cu	65	22	-0.24624	ppb
|	Zn	66	47	0.35162	ppb
|	Zn	67	27.7	0.88748	ppb
|	Zn	68	122.3	-1.21254	ppb
|	As	75	101.2	1.51213	ppb
|	Se	77	86.7	-1.59502	ppb
|	Se	82	-3.6	-2.11544	ppb
|>	Rh	103	6996		ppb
|	Ag	107	27.7	0.03048	ppb
|	Ag	109	18.7		ppb
|	Cd	111	4.9	-0.24549	ppb
|-	Cd	114	11	-0.03764	ppb
|-	Sb	121	67		ppb
|	Sb	123	47.5	0.02498	ppb
|	Ba	135	21.7		ppb
|	Ba	137	29	-0.05908	ppb
|>	Ho	165	66983.6		ppb
|	Tl	205	45.3	-0.04336	ppb
|-	Pb	208	195.3	-0.04986	ppb
	Kr	83	33.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample DatTuesday, June 19, 2018 17:16:19
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	5704		ppb
|-	Be	9	3.7	0.05143	ppb
|-	P	31	90387.8	4850.1443	ppb
|>	Sc	45	9135		ppb
|	Cr	52	948	0.28738	ppb
|-	Cr	53	892.7	7.10172	ppb
|-	Mn	55	477.3	0.84262	ppb
|	Co	59	511.3	1.89166	ppb
|	Ni	60	136.7	2.18454	ppb
|	Cu	63	202	0.91701	ppb
|	Cu	65	82	0.76898	ppb
|	Zn	66	73.3	1.216	ppb
|	Zn	67	26.7	0.64647	ppb
|	Zn	68	158.3	0.50203	ppb
|	As	75	112.6	1.86546	ppb
|	Se	77	94.3	2.9861	ppb
|	Se	82	-2.9	-1.80809	ppb
|>	Rh	103	7035		ppb
|	Ag	107	11849.1	88.75013	ppb
|	Ag	109	11313.2		ppb
|	Cd	111	19.9	0.06306	ppb
|-	Cd	114	97.9	0.44047	ppb
|-	Sb	121	50.7		ppb
|	Sb	123	39.9	-0.00374	ppb
|	Ba	135	19.3		ppb
|	Ba	137	22.7	-0.08085	ppb
|>	Ho	165	66166.8		ppb
|	Tl	205	21.7	-0.05566	ppb
|-	Pb	208	160	-0.06322	ppb
	Kr	83	31.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 8
Sample DatTuesday, June 19, 2018 17:19:25
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	8218.3		ppb
|-	Be	9	9	0.15295	ppb
|-	P	31	1228.4	-85.2174	ppb
|>	Sc	45	13182.1		ppb
|	Cr	52	826	-0.98221	ppb
|-	Cr	53	1221.4	5.77839	ppb
|-	Mn	55	352.3	0.22225	ppb
|	Co	59	103	0.17625	ppb
|	Ni	60	85.3	0.78319	ppb
|	Cu	63	336	1.14177	ppb
|	Cu	65	153	1.16783	ppb
|	Zn	66	323	6.16031	ppb
|	Zn	67	68.3	5.18515	ppb
|	Zn	68	334	4.00481	ppb
|	As	75	66.7	-0.35473	ppb
|	Se	77	108.3	-9.5545	ppb
|	Se	82	3.1	0.42285	ppb
|>	Rh	103	10203.7		ppb
|	Ag	107	18	-0.08528	ppb
|	Ag	109	18.7		ppb
|	Cd	111	27.8	0.04938	ppb
|-	Cd	114	75	0.18606	ppb
|-	Sb	121	196		ppb
|	Sb	123	143.2	0.24707	ppb
|	Ba	135	51		ppb
|	Ba	137	90	0.06738	ppb
|>	Ho	165	94191.1		ppb
|	Tl	205	665.3	0.18173	ppb
|-	Pb	208	1699.4	0.35585	ppb
	Kr	83	28		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DalTuesday, June 19, 2018 17:22:32
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3790.7		ppb
|-	Be	9	20.3	1.12141	ppb
|-	P	31	1433	-15.75893	ppb
|>	Sc	45	6202.4		ppb
|	Cr	52	833	1.23039	ppb
|-	Cr	53	680.7	10.33551	ppb
|-	Mn	55	347.3	0.89487	ppb
|	Co	59	191	0.9652	ppb
|	Ni	60	49	0.98683	ppb
|	Cu	63	146.3	0.97332	ppb
|	Cu	65	48.7	0.55949	ppb
|	Zn	66	39.3	0.65076	ppb
|	Zn	67	13.7	-0.93629	ppb
|	Zn	68	109	0.38648	ppb
|	As	75	89.7	2.39872	ppb
|	Se	77	71	7.65715	ppb
|	Se	82	-3.3	-2.59239	ppb
|>	Rh	103	4915.1		ppb
|	Ag	107	108.3	0.98527	ppb
|	Ag	109	104		ppb
|	Cd	111	35.3	0.7035	ppb
|-	Cd	114	126.9	0.90152	ppb
|-	Sb	121	261		ppb
|	Sb	123	189	0.98757	ppb
|	Ba	135	110.7		ppb
|	Ba	137	181	0.8156	ppb
|>	Ho	165	44718		ppb
|	Tl	205	1385.4	1.02475	ppb
|-	Pb	208	1754.7	0.92439	ppb
	Kr	83	36.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalTuesday, June 19, 2018 17:25:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3896.8		ppb
|-	Be	9	2.3	0.04001	ppb
|-	P	31	1150.7	-38.59908	ppb
|>	Sc	45	6194.1		ppb
|	Cr	52	611	0.12805	ppb
|-	Cr	53	674	10.09758	ppb
|-	Mn	55	86.3	-0.08584	ppb
|	Co	59	11.7	-0.03359	ppb
|	Ni	60	6.7	-0.10069	ppb
|	Cu	63	46	-0.10104	ppb
|	Cu	65	17	-0.19938	ppb
|	Zn	66	28.7	0.17807	ppb
|	Zn	67	13	-1.05406	ppb
|	Zn	68	99.7	-0.09574	ppb
|	As	75	65.4	1.31523	ppb
|	Se	77	68.3	6.71819	ppb
|	Se	82	1.1	0.19959	ppb
|>	Rh	103	4800.5		ppb
|	Ag	107	10.3	-0.0646	ppb
|	Ag	109	12.7		ppb
|	Cd	111	2.2	-0.2846	ppb
|-	Cd	114	9	-0.02613	ppb
|-	Sb	121	31		ppb
|	Sb	123	24.9	-0.01869	ppb
|	Ba	135	8.3		ppb
|	Ba	137	15	-0.08344	ppb
|>	Ho	165	45181.8		ppb
|	Tl	205	14.7	-0.05578	ppb
|-	Pb	208	83.3	-0.0786	ppb
	Kr	83	27.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB FH
Sample DatTuesday, June 19, 2018 17:28:27
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3959.4		ppb
|-	Be	9	4.3	0.15124	ppb
|-	P	31	1240	-33.40788	ppb
|>	Sc	45	6322.1		ppb
|	Cr	52	587	-0.05127	ppb
|-	Cr	53	112.3	-14.27394	ppb
|-	Mn	55	250.3	0.52874	ppb
|	Co	59	8.7	-0.05184	ppb
|	Ni	60	13.7	0.07389	ppb
|	Cu	63	103	0.5053	ppb
|	Cu	65	41.7	0.39145	ppb
|	Zn	66	54	1.34679	ppb
|	Zn	67	14	-0.77699	ppb
|	Zn	68	136	2.27747	ppb
|	As	75	74	1.64652	ppb
|	Se	77	13	-45.25413	ppb
|	Se	82	-4.3	-3.20133	ppb
|>	Rh	103	4912.1		ppb
|	Ag	107	11.3	-0.05709	ppb
|	Ag	109	10		ppb
|	Cd	111	4.4	-0.21794	ppb
|-	Cd	114	6.8	-0.04472	ppb
|-	Sb	121	46.3		ppb
|	Sb	123	39.5	0.07035	ppb
|	Ba	135	14		ppb
|	Ba	137	16.7	-0.0744	ppb
|>	Ho	165	45166.8		ppb
|	Tl	205	11.3	-0.0584	ppb
|-	Pb	208	205.7	-0.0059	ppb
	Kr	83	34		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB FH
Sample DatTuesday, June 19, 2018 17:31:34
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4169.8		ppb
|-	Be	9	855	46.46178	ppb
|-	P	31	3574.3	149.65171	ppb
|>	Sc	45	6387.1		ppb
|	Cr	52	10797.7	49.34288	ppb
|-	Cr	53	1260.7	33.7458	ppb
|-	Mn	55	13183.8	48.57766	ppb
|	Co	59	8781.9	47.95939	ppb
|	Ni	60	1865.1	46.89031	ppb
|	Cu	63	4547.4	47.68644	ppb
|	Cu	65	2072.8	48.75726	ppb
|	Zn	66	1088	49.40012	ppb
|	Zn	67	177	49.9005	ppb
|	Zn	68	840	50.35116	ppb
|	As	75	1040.8	46.79297	ppb
|	Se	77	72.3	7.53232	ppb
|	Se	82	71.1	43.54737	ppb
|>	Rh	103	5009.8		ppb
|	Ag	107	4870.1	51.13864	ppb
|	Ag	109	4648.1		ppb
|	Cd	111	1651.4	48.05175	ppb
|-	Cd	114	6199.5	47.82784	ppb
|-	Sb	121	11793.8		ppb
|	Sb	123	8834.1	52.02147	ppb
|	Ba	135	5056.2		ppb
|	Ba	137	9618.5	50.14534	ppb
|>	Ho	165	46265.8		ppb
|	Tl	205	64148.2	48.79891	ppb
|-	Pb	208	86757.6	50.17135	ppb
	Kr	83	31.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-1 FH
Sample DatTuesday, June 19, 2018 17:34:40
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4113.7		ppb
|-	Be	9	3.7	0.10539	ppb
|-	P	31	1986.7	21.21745	ppb
|>	Sc	45	6528.2		ppb
|	Cr	52	4847.5	20.05214	ppb
|-	Cr	53	572.7	4.46069	ppb
|-	Mn	55	11099.8	40.37435	ppb
|	Co	59	150.3	0.71376	ppb
|	Ni	60	1026.7	25.3962	ppb
|	Cu	63	1614.4	16.3456	ppb
|	Cu	65	727	16.49885	ppb
|	Zn	66	136597.5	6281.9616	ppb
|	Zn	67	19983.3	6153.6025	ppb
|	Zn	68	92528.6	6262.7792	ppb
|	As	75	125.3	3.91513	ppb
|	Se	77	27.3	-32.99427	ppb
|	Se	82	21.8	12.79795	ppb
|>	Rh	103	5065.2		ppb
|	Ag	107	36.7	0.20346	ppb
|	Ag	109	48.7		ppb
|	Cd	111	1155.1	33.13585	ppb
|-	Cd	114	4208.1	32.08141	ppb
|-	Sb	121	1165		ppb
|	Sb	123	849.3	4.72213	ppb
|	Ba	135	4107.3		ppb
|	Ba	137	7788.2	39.54644	ppb
|>	Ho	165	47459		ppb
|	Tl	205	162.7	0.05359	ppb
|-	Pb	208	136426.6	76.97321	ppb
	Kr	83	31		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 FH
Sample DatTuesday, June 19, 2018 17:37:46
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4078.5		ppb
|-	Be	9	2.3	0.0338	ppb
|-	P	31	2437.5	59.19231	ppb
|>	Sc	45	6413.5		ppb
|	Cr	52	5096.9	21.64156	ppb
|-	Cr	53	590.3	5.59574	ppb
|-	Mn	55	12667.9	46.44633	ppb
|	Co	59	201.3	0.99585	ppb
|	Ni	60	1074.4	26.75632	ppb
|	Cu	63	1780.1	18.21636	ppb
|	Cu	65	784.3	17.97803	ppb
|	Zn	66	141363.2	6544.8223	ppb
|	Zn	67	20719.9	6423.4359	ppb
|	Zn	68	95361.9	6498.2276	ppb
|	As	75	98.9	2.71497	ppb
|	Se	77	36	-25.11006	ppb
|	Se	82	28.7	17.13755	ppb
|>	Rh	103	5031.8		ppb
|	Ag	107	38	0.21984	ppb
|	Ag	109	34.7		ppb
|	Cd	111	687.2	19.70545	ppb
|-	Cd	114	2561.7	19.62546	ppb
|-	Sb	121	1472.4		ppb
|	Sb	123	1094.6	6.21039	ppb
|	Ba	135	4132		ppb
|	Ba	137	7870.2	40.43765	ppb
|>	Ho	165	46909.3		ppb
|	Tl	205	119.7	0.02266	ppb
|-	Pb	208	189356.1	108.14814	ppb
	Kr	83	34.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 FH
Sample DalTuesday, June 19, 2018 17:40:53
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3996.1		ppb
|-	Be	9	3.7	0.11261	ppb
|-	P	31	2322.4	50.28091	ppb
|>	Sc	45	6410.5		ppb
|	Cr	52	4986.2	21.12833	ppb
|-	Cr	53	558	4.25545	ppb
|-	Mn	55	12113.3	43.99032	ppb
|	Co	59	191.3	0.933	ppb
|	Ni	60	1050.4	25.92538	ppb
|	Cu	63	1741.7	17.64218	ppb
|	Cu	65	782.7	17.76982	ppb
|	Zn	66	140192	6432.5081	ppb
|	Zn	67	20282.2	6231.0752	ppb
|	Zn	68	94346.4	6370.8553	ppb
|	As	75	108.3	3.11969	ppb
|	Se	77	34.3	-26.85585	ppb
|	Se	82	33.1	19.67719	ppb
|>	Rh	103	5077.2		ppb
|	Ag	107	40.7	0.24524	ppb
|	Ag	109	23.3		ppb
|	Cd	111	630.6	17.8882	ppb
|-	Cd	114	2482.4	18.83838	ppb
|-	Sb	121	1487.7		ppb
|	Sb	123	1103.8	6.23845	ppb
|	Ba	135	4050.3		ppb
|	Ba	137	7571.5	38.75605	ppb
|>	Ho	165	47079.3		ppb
|	Tl	205	124	0.02562	ppb
|-	Pb	208	186670.7	106.23288	ppb
	Kr	83	31.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 FH
Sample DalTuesday, June 19, 2018 17:43:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3956.1		ppb
|-	Be	9	4.3	0.15254	ppb
|-	P	31	1928.4	21.37242	ppb
|>	Sc	45	6325.1		ppb
|	Cr	52	4196.7	17.58583	ppb
|-	Cr	53	435.7	-0.59411	ppb
|-	Mn	55	10546.9	39.67355	ppb
|	Co	59	152.3	0.75265	ppb
|	Ni	60	387.3	9.73932	ppb
|	Cu	63	1478.4	15.45744	ppb
|	Cu	65	636.3	14.8926	ppb
|	Zn	66	113721.4	5410.3323	ppb
|	Zn	67	16580.8	5281.8948	ppb
|	Zn	68	76645	5365.8812	ppb
|	As	75	107.2	3.23127	ppb
|	Se	77	12.3	-45.96379	ppb
|	Se	82	5.4	2.86974	ppb
|>	Rh	103	4898.5		ppb
|	Ag	107	21.7	0.05565	ppb
|	Ag	109	18		ppb
|	Cd	111	591	17.36972	ppb
|-	Cd	114	2194.5	17.25599	ppb
|-	Sb	121	837.3		ppb
|	Sb	123	687.7	3.87962	ppb
|	Ba	135	2827.2		ppb
|	Ba	137	5398.2	27.97325	ppb
|>	Ho	165	46424.4		ppb
|	Tl	205	86.7	-0.00136	ppb
|-	Pb	208	150535	86.84033	ppb
	Kr	83	29.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 FH
Sample DaiTuesday, June 19, 2018 17:47:05
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3969.5		ppb
|-	Be	9	897.7	51.26987	ppb
|-	P	31	4405.7	215.69977	ppb
|>	Sc	45	6376.5		ppb
|	Cr	52	14512.5	67.42324	ppb
|-	Cr	53	1650.4	50.20846	ppb
|-	Mn	55	23774.3	89.6743	ppb
|	Co	59	9052	50.41179	ppb
|	Ni	60	2304.4	59.13747	ppb
|	Cu	63	6153.8	66.04698	ppb
|	Cu	65	2788.8	67.1096	ppb
|	Zn	66	116231.6	5511.27	ppb
|	Zn	67	16976.4	5389.7622	ppb
|	Zn	68	78397.7	5470.2629	ppb
|	As	75	1132	52.10587	ppb
|	Se	77	56.7	-5.40683	ppb
|	Se	82	78.1	48.80033	ppb
|>	Rh	103	4912.5		ppb
|	Ag	107	5019.2	53.7641	ppb
|	Ag	109	4707.1		ppb
|	Cd	111	2260.9	67.24434	ppb
|-	Cd	114	8665	68.2298	ppb
|-	Sb	121	12989.7		ppb
|	Sb	123	9772.1	57.07894	ppb
|	Ba	135	8133.3		ppb
|	Ba	137	15249.7	78.95236	ppb
|>	Ho	165	46653.8		ppb
|	Tl	205	65121.4	49.12765	ppb
|-	Pb	208	237758.6	136.5811	ppb
	Kr	83	34.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-4 FH
Sample DaiTuesday, June 19, 2018 17:50:12
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4186.2		ppb
|-	Be	9	3.7	0.10262	ppb
|-	P	31	1818.4	5.38715	ppb
|>	Sc	45	6656.9		ppb
|	Cr	52	4037.3	15.82462	ppb
|-	Cr	53	409.7	-2.56297	ppb
|-	Mn	55	11293.2	40.19191	ppb
|	Co	59	99.7	0.42737	ppb
|	Ni	60	364.3	8.63824	ppb
|	Cu	63	1370.4	13.4721	ppb
|	Cu	65	603.3	13.28406	ppb
|	Zn	66	102218.9	4599.7897	ppb
|	Zn	67	15087.9	4544.9711	ppb
|	Zn	68	68895.8	4560.7237	ppb
|	As	75	114.5	3.3065	ppb
|	Se	77	15	-44.18829	ppb
|	Se	82	3.7	1.77442	ppb
|>	Rh	103	5177.2		ppb
|	Ag	107	20.3	0.02848	ppb
|	Ag	109	21		ppb
|	Cd	111	538.4	14.92327	ppb
|-	Cd	114	2138.8	15.90671	ppb
|-	Sb	121	763		ppb
|	Sb	123	600.5	3.26202	ppb
|	Ba	135	2859.5		ppb
|	Ba	137	5431.3	27.29864	ppb
|>	Ho	165	47855.8		ppb
|	Tl	205	84.3	-0.00515	ppb
|-	Pb	208	101437.4	56.72952	ppb
	Kr	83	35.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DaiTuesday, June 19, 2018 17:53:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4118.3		ppb
|-	Be	9	1.7	-0.00454	ppb
|-	P	31	1201.7	-39.22355	ppb
|>	Sc	45	6510.2		ppb
|	Cr	52	609	-0.03085	ppb
|-	Cr	53	770	12.61333	ppb
|-	Mn	55	108.7	-0.02588	ppb
|	Co	59	7	-0.06301	ppb
|	Ni	60	8.3	-0.06987	ppb
|	Cu	63	55.7	-0.02911	ppb
|	Cu	65	18.3	-0.19162	ppb
|	Zn	66	46.3	0.89478	ppb
|	Zn	67	18.7	0.42942	ppb
|	Zn	68	119.7	0.82452	ppb
|	As	75	69.4	1.28436	ppb
|	Se	77	72.3	6.45517	ppb
|	Se	82	-6.6	-4.49673	ppb
|>	Rh	103	5111.2		ppb
|	Ag	107	7.3	-0.10308	ppb
|	Ag	109	14.3		ppb
|	Cd	111	2.4	-0.28322	ppb
|-	Cd	114	10.6	-0.01786	ppb
|-	Sb	121	29.3		ppb
|	Sb	123	21.6	-0.04117	ppb
|	Ba	135	13.3		ppb
|	Ba	137	22	-0.04886	ppb
|>	Ho	165	46279.5		ppb
|	Tl	205	18	-0.05348	ppb
|-	Pb	208	101.3	-0.06936	ppb
	Kr	83	30		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DaiTuesday, June 19, 2018 17:56:26
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4331.2		ppb
|-	Be	9	1781.7	93.38763	ppb
|-	P	31	14785	957.0674	ppb
|>	Sc	45	6833.9		ppb
|	Cr	52	22324	98.04267	ppb
|-	Cr	53	3246.2	108.04207	ppb
|-	Mn	55	28024	96.75223	ppb
|	Co	59	18969.5	96.76946	ppb
|	Ni	60	4159.7	97.86528	ppb
|	Cu	63	9833.9	96.85152	ppb
|	Cu	65	4323.4	95.45555	ppb
|	Zn	66	2333.4	100.05253	ppb
|	Zn	67	350.7	96.6773	ppb
|	Zn	68	1600.7	95.11075	ppb
|	As	75	2285.9	97.86007	ppb
|	Se	77	181.3	94.50433	ppb
|	Se	82	155.7	89.37705	ppb
|>	Rh	103	5368.6		ppb
|	Ag	107	10288.5	101.01014	ppb
|	Ag	109	9675.9		ppb
|	Cd	111	3582.3	97.63305	ppb
|-	Cd	114	13356.1	96.26622	ppb
|-	Sb	121	24219.4		ppb
|	Sb	123	18236	100.87648	ppb
|	Ba	135	10808.7		ppb
|	Ba	137	20418.3	100.00695	ppb
|>	Ho	165	49325.3		ppb
|	Tl	205	139942.3	99.92099	ppb
|-	Pb	208	183299.3	99.54492	ppb
	Kr	83	35		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-5 FH
Sample DatTuesday, June 19, 2018 17:59:35
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3970.1		ppb
|-	Be	9	5.3	0.20932	ppb
|-	P	31	1467.4	-12.53805	ppb
|>	Sc	45	6176.8		ppb
|	Cr	52	3002.5	12.10634	ppb
|-	Cr	53	373	-2.87376	ppb
|-	Mn	55	1956.1	7.13912	ppb
|	Co	59	55.7	0.21543	ppb
|	Ni	60	772.3	20.04224	ppb
|	Cu	63	394.3	3.74538	ppb
|	Cu	65	160.3	3.34859	ppb
|	Zn	66	1411.4	67.08136	ppb
|	Zn	67	200.3	59.71646	ppb
|	Zn	68	1003	64.26601	ppb
|	As	75	90.3	2.49893	ppb
|	Se	77	27.3	-31.7177	ppb
|	Se	82	26.1	16.20108	ppb
|>	Rh	103	4817.5		ppb
|	Ag	107	24.7	0.0917	ppb
|	Ag	109	21		ppb
|	Cd	111	8.9	-0.07934	ppb
|-	Cd	114	25.9	0.11047	ppb
|-	Sb	121	181.7		ppb
|	Sb	123	137	0.66281	ppb
|	Ba	135	3065.9		ppb
|	Ba	137	5878.7	31.3927	ppb
|>	Ho	165	45077.6		ppb
|	Tl	205	39.7	-0.03618	ppb
|-	Pb	208	6034.9	3.46329	ppb
	Kr	83	28.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 FH
Sample DatTuesday, June 19, 2018 18:02:41
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4001.8		ppb
|-	Be	9	4.3	0.14964	ppb
|-	P	31	1483.7	-14.22008	ppb
|>	Sc	45	6332.8		ppb
|	Cr	52	3082.9	12.12088	ppb
|-	Cr	53	339.3	-4.6933	ppb
|-	Mn	55	2345.4	8.28522	ppb
|	Co	59	37.7	0.10639	ppb
|	Ni	60	859.3	21.42683	ppb
|	Cu	63	275.7	2.31069	ppb
|	Cu	65	117.7	2.17697	ppb
|	Zn	66	706	31.56517	ppb
|	Zn	67	126	33.94115	ppb
|	Zn	68	572	31.8998	ppb
|	As	75	92.9	2.43784	ppb
|	Se	77	12.7	-45.91554	ppb
|	Se	82	11.1	6.26181	ppb
|>	Rh	103	5017.8		ppb
|	Ag	107	16.7	-0.00263	ppb
|	Ag	109	11		ppb
|	Cd	111	15.8	0.11439	ppb
|-	Cd	114	16.2	0.02568	ppb
|-	Sb	121	161		ppb
|	Sb	123	120.9	0.53978	ppb
|	Ba	135	3279.2		ppb
|	Ba	137	5999.7	30.93802	ppb
|>	Ho	165	46678.2		ppb
|	Tl	205	22	-0.05054	ppb
|-	Pb	208	3987.1	2.16344	ppb
	Kr	83	25		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB BH
Sample DatTuesday, June 19, 2018 18:05:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mean	Report Unit
|>	Li	6	4059.8		ppb
|-	Be	9	3	0.07318	ppb
|-	P	31	1325.7	-26.41223	ppb
|>	Sc	45	6322.1		ppb
|	Cr	52	639.7	0.20575	ppb
|-	Cr	53	65.7	-16.24241	ppb
|-	Mn	55	175.7	0.25059	ppb
|	Co	59	13.3	-0.02515	ppb
|	Ni	60	10.7	0.0013	ppb
|	Cu	63	81.7	0.28221	ppb
|	Cu	65	32.7	0.18075	ppb
|	Zn	66	221	9.38225	ppb
|	Zn	67	28.3	3.83411	ppb
|	Zn	68	246	10.1423	ppb
|	As	75	68.5	1.41994	ppb
|	Se	77	9.3	-48.64826	ppb
|	Se	82	0.8	0.04222	ppb
|>	Rh	103	4866.8		ppb
|	Ag	107	12.7	-0.04082	ppb
|	Ag	109	9.7		ppb
|	Cd	111	7.4	-0.12665	ppb
|-	Cd	114	9	-0.02705	ppb
|-	Sb	121	21		ppb
|	Sb	123	15.5	-0.07489	ppb
|	Ba	135	22		ppb
|	Ba	137	38	0.03921	ppb
|>	Ho	165	45291		ppb
|	Tl	205	19.3	-0.05215	ppb
|-	Pb	208	287.7	0.04227	ppb
	Kr	83	30.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB BH
Sample DatTuesday, June 19, 2018 18:08:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mean	Report Unit
|>	Li	6	3991.6		ppb
|-	Be	9	910	51.66258	ppb
|-	P	31	3638.9	164.39813	ppb
|>	Sc	45	6179.8		ppb
|	Cr	52	10903	51.60859	ppb
|-	Cr	53	1202	33.0178	ppb
|-	Mn	55	13524	51.31677	ppb
|	Co	59	9002	50.61945	ppb
|	Ni	60	1910.4	49.45226	ppb
|	Cu	63	4726.8	51.07394	ppb
|	Cu	65	2100.4	50.88181	ppb
|	Zn	66	1248.7	58.59084	ppb
|	Zn	67	196.7	57.84853	ppb
|	Zn	68	948.7	59.71224	ppb
|	As	75	1110.9	51.58923	ppb
|	Se	77	60.7	-1.14364	ppb
|	Se	82	77.7	48.94389	ppb
|>	Rh	103	4866.8		ppb
|	Ag	107	4780.8	51.6907	ppb
|	Ag	109	4548.7		ppb
|	Cd	111	1625.4	48.69714	ppb
|-	Cd	114	6084.2	48.32564	ppb
|-	Sb	121	12135.3		ppb
|	Sb	123	9314	55.91584	ppb
|	Ba	135	5151.5		ppb
|	Ba	137	9971	52.99289	ppb
|>	Ho	165	45395.5		ppb
|	Tl	205	64384.5	49.92703	ppb
|-	Pb	208	86061.4	50.72366	ppb
	Kr	83	32		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-1 BH
Sample DalTuesday, June 19, 2018 18:12:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3988.3		ppb
|-	Be	9	3.7	0.11216	ppb
|-	P	31	4917.8	263.58449	ppb
|>	Sc	45	6257.8		ppb
		Cr	52	1518.7	4.59635	ppb
|-	Cr	53	146.3	-12.77076	ppb
|-	Mn	55	8628.5	33.11626	ppb
		Co	59	155.3	0.78881	ppb
		Ni	60	181.3	4.52093	ppb
		Cu	63	1015.7	10.67507	ppb
		Cu	65	455.7	10.73162	ppb
		Zn	66	6381.8	309.25617	ppb
		Zn	67	944.7	302.67267	ppb
		Zn	68	4383.1	306.80325	ppb
		As	75	88.9	2.45257	ppb
		Se	77	15	-43.17188	ppb
		Se	82	11.1	6.66633	ppb
|>	Rh	103	4789.8		ppb
		Ag	107	77	0.67053	ppb
		Ag	109	57		ppb
		Cd	111	37.3	0.79002	ppb
|-	Cd	114	113.3	0.81755	ppb
|-	Sb	121	165.7		ppb
		Sb	123	124.2	0.58721	ppb
		Ba	135	782.7		ppb
		Ba	137	1466.4	7.73901	ppb
|>	Ho	165	44906.3		ppb
		Tl	205	42	-0.03421	ppb
|-	Pb	208	22511	13.31728	ppb
	Kr	83	30.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 BH
Sample DalTuesday, June 19, 2018 18:15:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3959.4		ppb
|-	Be	9	3.7	0.1146	ppb
|-	P	31	5270.2	300.05335	ppb
|>	Sc	45	6139.4		ppb
		Cr	52	2609.8	10.21721	ppb
|-	Cr	53	280.3	-6.81524	ppb
|-	Mn	55	12886	50.53794	ppb
		Co	59	320.7	1.76746	ppb
		Ni	60	915.4	24.3565	ppb
		Cu	63	3983.7	44.42098	ppb
		Cu	65	1723.4	43.06206	ppb
		Zn	66	11491.6	567.60381	ppb
		Zn	67	1711.7	562.38745	ppb
		Zn	68	7688.8	553.46142	ppb
		As	75	126	4.38107	ppb
		Se	77	17.7	-40.37433	ppb
		Se	82	22.4	14.23524	ppb
|>	Rh	103	4707.1		ppb
		Ag	107	82.3	0.74568	ppb
		Ag	109	84		ppb
		Cd	111	34.7	0.73013	ppb
|-	Cd	114	131.3	0.98132	ppb
|-	Sb	121	305.3		ppb
		Sb	123	225.2	1.22741	ppb
		Ba	135	5139.5		ppb
		Ba	137	10030	54.88303	ppb
|>	Ho	165	44089.2		ppb
		Tl	205	46.7	-0.02991	ppb
|-	Pb	208	66114.8	40.09176	ppb
	Kr	83	30		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 BH
Sample DatTuesday, June 19, 2018 18:18:15
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3947.6		ppb
|-	Be	9	2.7	0.05733	ppb
|-	P	31	5197.2	295.18599	ppb
|>	Sc	45	6123.1		ppb
|	Cr	52	2504.5	9.71967	ppb
|-	Cr	53	287	-6.4875	ppb
|-	Mn	55	12599.8	49.50448	ppb
|	Co	59	306.7	1.68915	ppb
|	Ni	60	894.7	23.84043	ppb
|	Cu	63	3792.3	42.33158	ppb
|	Cu	65	1729.1	43.31103	ppb
|	Zn	66	11251.9	556.68399	ppb
|	Zn	67	1650.7	543.05207	ppb
|	Zn	68	7624.5	549.59344	ppb
|	As	75	70.6	1.62035	ppb
|	Se	77	21.3	-36.93827	ppb
|	Se	82	3.4	1.61215	ppb
|>	Rh	103	4700.4		ppb
|	Ag	107	87	0.79889	ppb
|	Ag	109	80		ppb
|	Cd	111	39.8	0.89528	ppb
|-	Cd	114	122	0.90762	ppb
|-	Sb	121	291.7		ppb
|	Sb	123	238.6	1.30299	ppb
|	Ba	135	5193.9		ppb
|	Ba	137	9661.2	52.59664	ppb
|>	Ho	165	44311.9		ppb
|	Tl	205	45.3	-0.0312	ppb
|-	Pb	208	65372.7	39.44154	ppb
	Kr	83	31.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 BH
Sample DatTuesday, June 19, 2018 18:21:22
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3974.1		ppb
|-	Be	9	3.3	0.09374	ppb
|-	P	31	4062	198.37903	ppb
|>	Sc	45	6187.8		ppb
|	Cr	52	1914.4	6.64036	ppb
|-	Cr	53	203.3	-10.23923	ppb
|-	Mn	55	14377.1	55.74108	ppb
|	Co	59	121	0.59591	ppb
|	Ni	60	542	14.12729	ppb
|	Cu	63	1446	15.53039	ppb
|	Cu	65	661	15.92209	ppb
|	Zn	66	5153.9	250.77432	ppb
|	Zn	67	772	247.58774	ppb
|	Zn	68	3559.9	249.14481	ppb
|	As	75	72	1.64332	ppb
|	Se	77	10	-47.80896	ppb
|	Se	82	1.8	0.61826	ppb
|>	Rh	103	4766.1		ppb
|	Ag	107	2476.8	27.26241	ppb
|	Ag	109	2363.8		ppb
|	Cd	111	63	1.58549	ppb
|-	Cd	114	280.8	2.18336	ppb
|-	Sb	121	589		ppb
|	Sb	123	462	2.64777	ppb
|	Ba	135	1144		ppb
|	Ba	137	2143.4	11.40168	ppb
|>	Ho	165	44861.2		ppb
|	Tl	205	22.3	-0.04966	ppb
|-	Pb	208	15004.4	8.84468	ppb
	Kr	83	29.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 BH
Sample DatTuesday, June 19, 2018 18:24:28
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4079.8		ppb
|-	Be	9	835	46.3609	ppb
|-	P	31	6359.5	370.6895	ppb
|>	Sc	45	6367.8		ppb
|	Cr	52	11833.8	54.5186	ppb
|-	Cr	53	1291.7	35.23022	ppb
|-	Mn	55	26531.4	101.81348	ppb
|	Co	59	8811.6	49.90566	ppb
|	Ni	60	2441.1	63.72608	ppb
|	Cu	63	6057.7	66.1076	ppb
|	Cu	65	2663.1	65.15669	ppb
|	Zn	66	6229.1	299.23003	ppb
|	Zn	67	919.4	291.82658	ppb
|	Zn	68	4238.7	293.91091	ppb
|	As	75	1054.3	49.23399	ppb
|	Se	77	54.3	-6.73169	ppb
|	Se	82	61.5	38.91039	ppb
|>	Rh	103	4831.1		ppb
|	Ag	107	7424.1	80.95906	ppb
|	Ag	109	7068.7		ppb
|	Cd	111	1690.6	51.03568	ppb
|-	Cd	114	6360.1	50.89424	ppb
|-	Sb	121	12313.7		ppb
|	Sb	123	9415.4	57.93191	ppb
|	Ba	135	6306.5		ppb
|	Ba	137	11648	63.47998	ppb
|>	Ho	165	44287.2		ppb
|	Tl	205	63094.2	50.14103	ppb
|-	Pb	208	99672.5	60.23544	ppb
	Kr	83	27.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-4 BH
Sample DatTuesday, June 19, 2018 18:27:34
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4122		ppb
|-	Be	9	3	0.07032	ppb
|-	P	31	4002	190.81045	ppb
|>	Sc	45	6238.8		ppb
|	Cr	52	1405	4.03935	ppb
|-	Cr	53	135.3	-13.22339	ppb
|-	Mn	55	5915.4	22.24029	ppb
|	Co	59	73	0.3118	ppb
|	Ni	60	319.3	8.04776	ppb
|	Cu	63	7243.7	78.71967	ppb
|	Cu	65	3191.9	77.74452	ppb
|	Zn	66	4410.4	210.24945	ppb
|	Zn	67	684.3	214.61487	ppb
|	Zn	68	3091.5	211.14891	ppb
|	As	75	92.2	2.55994	ppb
|	Se	77	12.7	-45.53938	ppb
|	Se	82	3.8	1.8968	ppb
|>	Rh	103	4859.1		ppb
|	Ag	107	30	0.14716	ppb
|	Ag	109	30		ppb
|	Cd	111	9.7	-0.05833	ppb
|-	Cd	114	51.8	0.31509	ppb
|-	Sb	121	80.3		ppb
|	Sb	123	56.7	0.17742	ppb
|	Ba	135	731.3		ppb
|	Ba	137	1400	7.40556	ppb
|>	Ho	165	44757.7		ppb
|	Tl	205	22.7	-0.04938	ppb
|-	Pb	208	8065.5	4.70522	ppb
	Kr	83	28.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatTuesday, June 19, 2018 18:30:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4431.2		ppb
|-	Be	9	2	0.00529	ppb
|-	P	31	1195.4	-43.80503	ppb
|>	Sc	45	6813.6		ppb
|	Cr	52	625	-0.08588	ppb
|-	Cr	53	892.7	16.02609	ppb
|-	Mn	55	104.7	-0.05577	ppb
|	Co	59	12	-0.03894	ppb
|	Ni	60	8	-0.08618	ppb
|	Cu	63	47.7	-0.1372	ppb
|	Cu	65	19	-0.19792	ppb
|	Zn	66	27.3	-0.02494	ppb
|	Zn	67	13	-1.51458	ppb
|	Zn	68	108.7	-0.24919	ppb
|	As	75	102.5	2.57735	ppb
|	Se	77	68.3	0.18122	ppb
|	Se	82	5.5	2.49242	ppb
|>	Rh	103	5350.2		ppb
|	Ag	107	11	-0.0698	ppb
|	Ag	109	13		ppb
|	Cd	111	12	-0.01889	ppb
|-	Cd	114	9.2	-0.03173	ppb
|-	Sb	121	21		ppb
|	Sb	123	18.9	-0.0639	ppb
|	Ba	135	14		ppb
|	Ba	137	16.3	-0.08378	ppb
|>	Ho	165	49444.5		ppb
|	Tl	205	24	-0.05011	ppb
|-	Pb	208	86.7	-0.08109	ppb
	Kr	83	27.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatTuesday, June 19, 2018 18:33:49
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4697.5		ppb
|-	Be	9	1934.4	93.41292	ppb
|-	P	31	15420.4	916.13984	ppb
|>	Sc	45	7406.8		ppb
|	Cr	52	23891.4	96.78163	ppb
|-	Cr	53	3592.3	110.71271	ppb
|-	Mn	55	29819.4	96.25475	ppb
|	Co	59	20495.1	97.75759	ppb
|	Ni	60	4362	95.93971	ppb
|	Cu	63	10444.2	96.17252	ppb
|	Cu	65	4717.8	97.4091	ppb
|	Zn	66	2413.1	96.69249	ppb
|	Zn	67	366	94.22938	ppb
|	Zn	68	1772.1	98.69976	ppb
|	As	75	2546.7	102.01122	ppb
|	Se	77	199	98.51068	ppb
|	Se	82	176.7	94.8386	ppb
|>	Rh	103	5742		ppb
|	Ag	107	11102.1	101.91101	ppb
|	Ag	109	10498.5		ppb
|	Cd	111	3804.8	96.95633	ppb
|-	Cd	114	14234.8	95.92249	ppb
|-	Sb	121	25526		ppb
|	Sb	123	19420	101.20321	ppb
|	Ba	135	11597.4		ppb
|	Ba	137	21839.5	100.77668	ppb
|>	Ho	165	52358.8		ppb
|	Tl	205	148812.3	100.09923	ppb
|-	Pb	208	194759.6	99.64289	ppb
	Kr	83	33.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-5 BH
Sample DalTuesday, June 19, 2018 18:36:57
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4107.8		ppb
|-	Be	9	2.3	0.03149	ppb
|-	P	31	3392.6	147.24713	ppb
|>	Sc	45	6113.1		ppb
|	Cr	52	1207.4	3.1835	ppb
|-	Cr	53	192.7	-10.59615	ppb
|-	Mn	55	13820.2	53.06848	ppb
|	Co	59	57	0.22463	ppb
|	Ni	60	133.3	3.2356	ppb
|	Cu	63	542	5.38757	ppb
|	Cu	65	239.3	5.31208	ppb
|	Zn	66	1587.1	75.675	ppb
|	Zn	67	240.3	72.738	ppb
|	Zn	68	1150.4	74.87212	ppb
|	As	75	47.1	0.40135	ppb
|	Se	77	14	-44.20179	ppb
|	Se	82	-5.2	-3.91302	ppb
|>	Rh	103	4809.8		ppb
|	Ag	107	15.7	-0.00673	ppb
|	Ag	109	16.3		ppb
|	Cd	111	7.7	-0.11475	ppb
|-	Cd	114	48.9	0.29562	ppb
|-	Sb	121	63.7		ppb
|	Sb	123	50.3	0.14121	ppb
|	Ba	135	557		ppb
|	Ba	137	1070.4	5.66988	ppb
|>	Ho	165	44403.4		ppb
|	Tl	205	41	-0.03473	ppb
|-	Pb	208	5969.9	3.47832	ppb
	Kr	83	30		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 BH
Sample DalTuesday, June 19, 2018 18:40:04
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3961		ppb
|-	Be	9	2.3	0.0368	ppb
|-	P	31	3860.3	191.0782	ppb
|>	Sc	45	6013.7		ppb
|	Cr	52	1290	3.70803	ppb
|-	Cr	53	148.3	-12.43361	ppb
|-	Mn	55	1007.4	3.54334	ppb
|	Co	59	24	0.03901	ppb
|	Ni	60	106.3	2.56701	ppb
|	Cu	63	404.3	3.93775	ppb
|	Cu	65	186	4.06665	ppb
|	Zn	66	737.3	35.08458	ppb
|	Zn	67	108.3	30.48297	ppb
|	Zn	68	554	32.96347	ppb
|	As	75	61.5	1.18686	ppb
|	Se	77	10.3	-47.44129	ppb
|	Se	82	-4.9	-3.68903	ppb
|>	Rh	103	4733.1		ppb
|	Ag	107	13.3	-0.02932	ppb
|	Ag	109	13.7		ppb
|	Cd	111	8.6	-0.08361	ppb
|-	Cd	114	43.8	0.25704	ppb
|-	Sb	121	385.3		ppb
|	Sb	123	286.5	1.64979	ppb
|	Ba	135	49.7		ppb
|	Ba	137	89.7	0.33973	ppb
|>	Ho	165	43074.4		ppb
|	Tl	205	25.3	-0.04651	ppb
|-	Pb	208	710	0.31404	ppb
	Kr	83	34.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DatTuesday, June 19, 2018 18:43:10
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4652.3		ppb
|-	Be	9	866.3	42.20833	ppb
|-	P	31	2302.8	31.89704	ppb
|>	Sc	45	7070		ppb
|	Cr	52	12900	53.47189	ppb
|-	Cr	53	5657.3	195.0241	ppb
|-	Mn	55	23159.7	83.20925	ppb
|	Co	59	8708.2	46.2165	ppb
|	Ni	60	3155.5	77.27087	ppb
|	Cu	63	5915.7	60.45465	ppb
|	Cu	65	2589.1	59.33643	ppb
|	Zn	66	1997.1	89.06516	ppb
|	Zn	67	327	93.68904	ppb
|	Zn	68	1442.7	88.83992	ppb
|	As	75	1816.4	80.7037	ppb
|	Se	77	448.7	333.60688	ppb
|	Se	82	121.7	72.7355	ppb
|>	Rh	103	5154.9		ppb
|	Ag	107	11957.2	122.30326	ppb
|	Ag	109	11509		ppb
|	Cd	111	1171.2	33.01941	ppb
|-	Cd	114	4705.2	35.26124	ppb
|-	Sb	121	18741.7		ppb
|	Sb	123	14150.1	81.34657	ppb
|	Ba	135	7877.6		ppb
|	Ba	137	15586.2	79.32334	ppb
|>	Ho	165	47449.3		ppb
|	Tl	205	145012.4	107.64233	ppb
|-	Pb	208	127400.9	71.88585	ppb
	Kr	83	38.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DatTuesday, June 19, 2018 18:46:17
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4760.5		ppb
|-	Be	9	1944.7	92.6501	ppb
|-	P	31	4379.4	170.82102	ppb
|>	Sc	45	7278.7		ppb
|	Cr	52	24357.5	100.53587	ppb
|-	Cr	53	6901.6	234.71591	ppb
|-	Mn	55	37183.3	130.17454	ppb
|	Co	59	18218.3	94.14251	ppb
|	Ni	60	5230.2	124.71276	ppb
|	Cu	63	10945.4	109.28361	ppb
|	Cu	65	4882.1	109.26679	ppb
|	Zn	66	3040.2	132.43505	ppb
|	Zn	67	504.3	143.24223	ppb
|	Zn	68	2223.1	136.75507	ppb
|	As	75	2969.7	129.38565	ppb
|	Se	77	475.3	345.92608	ppb
|	Se	82	226.4	131.90979	ppb
|>	Rh	103	5300.9		ppb
|	Ag	107	17450.1	173.67026	ppb
|	Ag	109	16864		ppb
|	Cd	111	2697	74.37253	ppb
|-	Cd	114	10808.1	78.88638	ppb
|-	Sb	121	30837.7		ppb
|	Sb	123	23517.6	132.40468	ppb
|	Ba	135	12801.6		ppb
|	Ba	137	25415.6	126.68594	ppb
|>	Ho	165	48483.6		ppb
|	Tl	205	214199.8	155.63319	ppb
|-	Pb	208	218389.7	120.68731	ppb
	Kr	83	28		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DaiTuesday, June 19, 2018 18:55:37
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4581.2		ppb
|-	Be	9	2228.1	110.34054	ppb
|-	P	31	4144.7	160.85891	ppb
|>	Sc	45	7121.3		ppb
|	Cr	52	75274.2	323.78666	ppb
|-	Cr	53	9058.3	321.24513	ppb
|-	Mn	55	44996.8	148.45118	ppb
|	Co	59	33121.9	161.28235	ppb
|	Ni	60	9435.4	212.09576	ppb
|	Cu	63	31662.7	298.82222	ppb
|	Cu	65	14192.4	300.27455	ppb
|	Zn	66	5562	229.08559	ppb
|	Zn	67	814	220.51669	ppb
|	Zn	68	3905.6	231.05191	ppb
|	As	75	2381.7	97.29162	ppb
|	Se	77	257.7	148.42239	ppb
|	Se	82	288.8	158.5942	ppb
|>	Rh	103	5628.3		ppb
|	Ag	107	39185.2	367.71917	ppb
|	Ag	109	39783.3		ppb
|	Cd	111	3284.2	85.35729	ppb
|-	Cd	114	12078.6	83.04527	ppb
|-	Sb	121	17821		ppb
|	Sb	123	13454.6	71.71829	ppb
|	Ba	135	29517.1		ppb
|	Ba	137	56252.2	266.00547	ppb
|>	Ho	165	51164		ppb
|	Tl	205	351123.3	241.85028	ppb
|-	Pb	208	451736.5	236.73493	ppb
	Kr	83	29.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DaiTuesday, June 19, 2018 18:58:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4500.6		ppb
|-	Be	9	3214.2	162.09	ppb
|-	P	31	6693.9	353.82527	ppb
|>	Sc	45	6936		ppb
|	Cr	52	84843.4	375.20853	ppb
|-	Cr	53	10071	369.3922	ppb
|-	Mn	55	59033.3	200.22139	ppb
|	Co	59	42651	213.40015	ppb
|	Ni	60	11209.8	258.98676	ppb
|	Cu	63	36043	349.58092	ppb
|	Cu	65	16069.8	349.43329	ppb
|	Zn	66	6586.5	279.01526	ppb
|	Zn	67	985.7	275.80753	ppb
|	Zn	68	4547.1	277.75561	ppb
|	As	75	3487.8	147.28989	ppb
|	Se	77	294	184.01902	ppb
|	Se	82	350.8	197.84587	ppb
|>	Rh	103	5476.6		ppb
|	Ag	107	44116.7	425.02865	ppb
|	Ag	109	44534		ppb
|	Cd	111	4974.3	133.01699	ppb
|-	Cd	114	18827.3	133.04396	ppb
|-	Sb	121	30618.4		ppb
|	Sb	123	23383.2	126.14758	ppb
|	Ba	135	34626.3		ppb
|	Ba	137	64827.9	309.89653	ppb
|>	Ho	165	50600.5		ppb
|	Tl	205	414450.8	288.61392	ppb
|-	Pb	208	535021	283.52104	ppb
	Kr	83	31.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatTuesday, June 19, 2018 19:01:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4337.7		ppb
|-	Be	9	3.3	0.07846	ppb
|-	P	31	1124.7	-46.79813	ppb
|>	Sc	45	6631.9		ppb
|	Cr	52	651	0.11266	ppb
|-	Cr	53	531.7	2.42379	ppb
|-	Mn	55	124.3	0.01863	ppb
|	Co	59	23.7	0.02284	ppb
|	Ni	60	13	0.03622	ppb
|	Cu	63	60	-0.00461	ppb
|	Cu	65	20.7	-0.15328	ppb
|	Zn	66	23	-0.19662	ppb
|	Zn	67	17	-0.23781	ppb
|	Zn	68	106.3	-0.29682	ppb
|	As	75	66.4	1.06652	ppb
|	Se	77	58.3	-7.49203	ppb
|	Se	82	1.8	0.52086	ppb
|>	Rh	103	5268.2		ppb
|	Ag	107	390.7	3.73792	ppb
|	Ag	109	305.7		ppb
|	Cd	111	5.8	-0.18963	ppb
|-	Cd	114	8.6	-0.03516	ppb
|-	Sb	121	130.7		ppb
|	Sb	123	96.6	0.3838	ppb
|	Ba	135	21		ppb
|	Ba	137	36.7	0.02182	ppb
|>	Ho	165	47817.4		ppb
|	Tl	205	123.3	0.02365	ppb
|-	Pb	208	227.7	-0.00037	ppb
	Kr	83	28.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatTuesday, June 19, 2018 19:04:58
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4399.3		ppb
|-	Be	9	21	0.98463	ppb
|-	P	31	1391.4	-26.59712	ppb
|>	Sc	45	6636.2		ppb
|	Cr	52	829.3	0.94005	ppb
|-	Cr	53	555.3	3.36137	ppb
|-	Mn	55	382.7	0.93017	ppb
|	Co	59	226.7	1.07778	ppb
|	Ni	60	47	0.85404	ppb
|	Cu	63	159.7	1.00116	ppb
|	Cu	65	61.3	0.769	ppb
|	Zn	66	51	1.03799	ppb
|	Zn	67	14.7	-0.92453	ppb
|	Zn	68	113.3	0.15204	ppb
|	As	75	94.3	2.30335	ppb
|	Se	77	65	-1.85517	ppb
|	Se	82	4.5	2.1271	ppb
|>	Rh	103	5273.2		ppb
|	Ag	107	224.3	2.06824	ppb
|	Ag	109	361		ppb
|	Cd	111	42.6	0.83546	ppb
|-	Cd	114	147.1	0.98178	ppb
|-	Sb	121	344.3		ppb
|	Sb	123	262.9	1.32549	ppb
|	Ba	135	124.7		ppb
|	Ba	137	216.7	0.92671	ppb
|>	Ho	165	48084.9		ppb
|	Tl	205	1424.4	0.97682	ppb
|-	Pb	208	1948.7	0.95899	ppb
	Kr	83	25.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatTuesday, June 19, 2018 19:08:05
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4583		ppb
|-	Be	9	1898.7	93.99634	ppb
|-	P	31	15064.9	912.49343	ppb
|>	Sc	45	7261.1		ppb
|	Cr	52	23680.5	97.87472	ppb
|-	Cr	53	3148.2	96.97962	ppb
|-	Mn	55	29348.9	96.27599	ppb
|	Co	59	20091.7	97.38815	ppb
|	Ni	60	4259.7	95.20792	ppb
|	Cu	63	10404.8	97.38966	ppb
|	Cu	65	4569.4	95.88193	ppb
|	Zn	66	2455.5	100.05807	ppb
|	Zn	67	366.3	95.97632	ppb
|	Zn	68	1771.1	100.35827	ppb
|	As	75	2480.9	100.98401	ppb
|	Se	77	177.3	83.79766	ppb
|	Se	82	165.8	90.43155	ppb
|>	Rh	103	5650		ppb
|	Ag	107	10835.7	101.08189	ppb
|	Ag	109	10584.6		ppb
|	Cd	111	3774.2	97.74347	ppb
|-	Cd	114	14184.8	97.1412	ppb
|-	Sb	121	25708.5		ppb
|	Sb	123	19326.7	101.55461	ppb
|	Ba	135	11619.7		ppb
|	Ba	137	21866.6	101.73	ppb
|>	Ho	165	51932.9		ppb
|	Tl	205	146847.4	99.59099	ppb
|-	Pb	208	192474.7	99.27889	ppb
	Kr	83	29.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatWednesday, June 20, 2018 12:23:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2430.2		ppb
|-	Be	9	3.3		ppb
|-	P	31	5423.6		ppb
|>	Sc	45	3683.3		ppb
|	Cr	52	490		ppb
|-	Cr	53	330.7		ppb
|-	Mn	55	82.7		ppb
|	Ni	60	8.3		ppb
|	Cu	63	60.7		ppb
|	Cu	65	23.3		ppb
|	Zn	66	75.7		ppb
|	Zn	67	22.3		ppb
|	Zn	68	102.3		ppb
|	As	75	53		ppb
|	Se	77	47		ppb
|	Se	82	-0.2		ppb
|>	Rh	103	2965.5		ppb
|	Ag	107	28		ppb
|	Ag	109	24.3		ppb
|	Cd	111	5.5		ppb
|-	Cd	114	14.2		ppb
|-	Sb	121	67.7		ppb
|	Sb	123	56.7		ppb
|	Ba	135	12.7		ppb
|	Ba	137	18		ppb
|>	Ho	165	26296.2		ppb
|-	Pb	208	194.3		ppb
	Kr	83	20.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample DatWednesday, June 20, 2018 13:44:58
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2801		ppb
|-	Be	9	18	1.01847	ppb
|-	P	31	1539.4	-521.9543	ppb
|>	Sc	45	3929.3		ppb
|	Cr	52	556.3	0.28477	ppb
|-	Cr	53	295.7	-4.23904	ppb
|-	Mn	55	219	0.89855	ppb
|	Ni	60	26.3	0.77147	ppb
|	Cu	63	90	0.50075	ppb
|	Cu	65	37	0.53481	ppb
|	Zn	66	34.3	-3.4237	ppb
|	Zn	67	13.7	-5.02413	ppb
|	Zn	68	81.3	-2.85072	ppb
|	As	75	85.4	2.07538	ppb
|	Se	77	31.3	-30.91776	ppb
|	Se	82	0.5	0.76234	ppb
|>	Rh	103	3077.9		ppb
|	Ag	107	70.3	0.66619	ppb
|	Ag	109	64.3		ppb
|	Cd	111	29	1.06555	ppb
|-	Cd	114	94.4	0.98581	ppb
|-	Sb	121	164.3		ppb
|	Sb	123	126.4	0.6171	ppb
|	Ba	135	60.7		ppb
|	Ba	137	114.3	0.91508	ppb
|>	Ho	165	28395.8		ppb
|-	Pb	208	1161	0.8818	ppb
	Kr	83	21.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample DatWednesday, June 20, 2018 13:47:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2918.8		ppb
|-	Be	9	1385.4	95.49706	ppb
|-	P	31	10216.4	504.63693	ppb
|>	Sc	45	4061.3		ppb
|	Cr	52	13248.5	103.02362	ppb
|-	Cr	53	1757.1	99.10782	ppb
|-	Mn	55	15531.5	97.83602	ppb
|	Ni	60	2440.8	98.35558	ppb
|	Cu	63	5753	98.28759	ppb
|	Cu	65	2565.5	97.51925	ppb
|	Zn	66	1367	92.87956	ppb
|	Zn	67	219	95.82645	ppb
|	Zn	68	955.4	90.22896	ppb
|	As	75	1609.3	101.41533	ppb
|	Se	77	100.7	80.96985	ppb
|	Se	82	103.8	106.20265	ppb
|>	Rh	103	3284.5		ppb
|	Ag	107	6536.5	98.3948	ppb
|	Ag	109	6434.5		ppb
|	Cd	111	2304.6	98.66696	ppb
|-	Cd	114	8703.4	100.41982	ppb
|-	Sb	121	14668		ppb
|	Sb	123	10946.2	97.77022	ppb
|	Ba	135	5604.6		ppb
|	Ba	137	11225.9	102.45829	ppb
|>	Ho	165	29936.2		ppb
|-	Pb	208	114429	100.35868	ppb
	Kr	83	21.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample Dat Wednesday, June 20, 2018 12:20:58
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2630.7		ppb
|-	Be	9	6538.5	500.90055	ppb
|-	P	31	48652.6	5101.2404	ppb
|>	Sc	45	4046		ppb
|	Cr	52	61913.9	499.39671	ppb
|-	Cr	53	7363.4	500.18891	ppb
|-	Mn	55	74862.3	500.433	ppb
|	Ni	60	11722.1	500.32934	ppb
|	Cu	63	27474.8	500.34348	ppb
|	Cu	65	12366.1	500.49708	ppb
|	Zn	66	6638.5	501.43294	ppb
|	Zn	67	984.7	500.84676	ppb
|	Zn	68	4545.1	501.96191	ppb
|	As	75	7293.9	499.71478	ppb
|	Se	77	336.7	503.86987	ppb
|	Se	82	463.8	498.75995	ppb
|>	Rh	103	3109.5		ppb
|	Ag	107	31359.3	500.32171	ppb
|	Ag	109	30360.8		ppb
|	Cd	111	11041.2	500.26648	ppb
|-	Cd	114	40983	499.91607	ppb
|-	Sb	121	69843.1		ppb
|	Sb	123	52971.9	500.44672	ppb
|	Ba	135	25811.7		ppb
|	Ba	137	51912.8	499.50851	ppb
|>	Ho	165	28437.5		ppb
|-	Pb	208	540655.7	499.9285	ppb
	Kr	83	24		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Wednesday, June 20, 2018 12:23:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2430.2		ppb
|-	Be	9	3.3	-0.00029	ppb
|-	P	31	5423.6	0.55212	ppb
|>	Sc	45	3683.3		ppb
|	Cr	52	490	0.00457	ppb
|-	Cr	53	330.7	-0.0042	ppb
|-	Mn	55	82.7	0.00019	ppb
|	Ni	60	8.3	0.0006	ppb
|	Cu	63	60.7	-0.00026	ppb
|	Cu	65	23.3	-0.00025	ppb
|	Zn	66	75.7	-0.00088	ppb
|	Zn	67	22.3	-0.00917	ppb
|	Zn	68	102.3	0.0022	ppb
|	As	75	53	-0.00095	ppb
|	Se	77	47	0.04247	ppb
|	Se	82	-0.2	-0.00763	ppb
|>	Rh	103	2965.5		ppb
|	Ag	107	28	-0.00002	ppb
|	Ag	109	24.3		ppb
|	Cd	111	5.5	0.0001	ppb
|-	Cd	114	14.2	0.00001	ppb
|-	Sb	121	67.7		ppb
|	Sb	123	56.7	-0.00002	ppb
|	Ba	135	12.7		ppb
|	Ba	137	18	-0.00019	ppb
|>	Ho	165	26296.2		ppb
|-	Pb	208	194.3	-0.00005	ppb
	Kr	83	20.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DaiWednesday, June 20, 2018 12:27:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2558.5		ppb
|-	Be	9	16	0.98256	ppb
|-	P	31	4854.5	-101.0308	ppb
|>	Sc	45	3843		ppb
|	Cr	52	567	0.47789	ppb
|-	Cr	53	371.7	2.02069	ppb
|-	Mn	55	216	0.88646	ppb
|	Ni	60	23	0.62114	ppb
|	Cu	63	108.3	0.84363	ppb
|	Cu	65	40.3	0.66457	ppb
|	Zn	66	68	-0.80795	ppb
|	Zn	67	22.7	-0.21527	ppb
|	Zn	68	112.7	0.79154	ppb
|	As	75	37.7	-1.21284	ppb
|	Se	77	52.3	6.44325	ppb
|	Se	82	-4.5	-4.77262	ppb
|>	Rh	103	3069.5		ppb
|	Ag	107	77	0.77724	ppb
|	Ag	109	67.7		ppb
|	Cd	111	28.3	1.0349	ppb
|-	Cd	114	97.5	1.02317	ppb
|-	Sb	121	194.7		ppb
|	Sb	123	156.2	0.97013	ppb
|	Ba	135	62.7		ppb
|	Ba	137	119.7	1.01948	ppb
|>	Ho	165	27127		ppb
|-	Pb	208	1178.3	0.9484	ppb
	Kr	83	23		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample DaiWednesday, June 20, 2018 12:30:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2598.3		ppb
|-	Be	9	3259.2	252.67229	ppb
|-	P	31	24904.1	2326.8386	ppb
|>	Sc	45	3961.3		ppb
|	Cr	52	31635	258.46822	ppb
|-	Cr	53	3839	254.13358	ppb
|-	Mn	55	37749.8	247.10575	ppb
|	Ni	60	5795.7	242.27234	ppb
|	Cu	63	13791.8	245.61576	ppb
|	Cu	65	6255.1	247.70743	ppb
|	Zn	66	3348.6	244.94608	ppb
|	Zn	67	508.3	247.32578	ppb
|	Zn	68	2333.4	246.62345	ppb
|	As	75	3605	240.03694	ppb
|	Se	77	193.7	246.259	ppb
|	Se	82	221.5	233.42068	ppb
|>	Rh	103	3173.2		ppb
|	Ag	107	15771.3	246.47865	ppb
|	Ag	109	16064.8		ppb
|	Cd	111	5595.9	248.38575	ppb
|-	Cd	114	20853.8	249.25154	ppb
|-	Sb	121	34752.1		ppb
|	Sb	123	25979.7	246.37689	ppb
|	Ba	135	12842.3		ppb
|	Ba	137	25902.4	250.3653	ppb
|>	Ho	165	28298.7		ppb
|-	Pb	208	267069	248.0635	ppb
	Kr	83	26		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DaiWednesday, June 20, 2018 12:33:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2717.2		ppb
|-	Be	9	1306.4	96.67848	ppb
|-	P	31	12388.1	775.41356	ppb
|>	Sc	45	4026		ppb
|	Cr	52	13188.5	103.43365	ppb
|-	Cr	53	1789.4	102.50745	ppb
|-	Mn	55	15519.8	99.12972	ppb
|	Ni	60	2378.1	97.203	ppb
|	Cu	63	5637.6	97.65254	ppb
|	Cu	65	2552.1	98.4089	ppb
|	Zn	66	1352.4	93.23026	ppb
|	Zn	67	223.7	99.61459	ppb
|	Zn	68	968.4	93.05026	ppb
|	As	75	1522.3	97.04986	ppb
|	Se	77	121	117.46595	ppb
|	Se	82	96.1	99.13598	ppb
|>	Rh	103	3239.9		ppb
|	Ag	107	6462.8	98.57794	ppb
|	Ag	109	6385.8		ppb
|	Cd	111	2363.6	102.69775	ppb
|-	Cd	114	8623.1	100.86115	ppb
|-	Sb	121	14547.9		ppb
|	Sb	123	10963.6	99.86155	ppb
|	Ba	135	5452.9		ppb
|	Ba	137	10824	100.73444	ppb
|>	Ho	165	29358.6		ppb
|-	Pb	208	111471.9	99.69004	ppb
	Kr	83	24.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample DaiWednesday, June 20, 2018 12:36:03
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2635.6		ppb
|-	Be	9	650.7	49.53112	ppb
|-	P	31	4952.5	-118.7098	ppb
|>	Sc	45	4038.3		ppb
|	Cr	52	6676.9	50.05687	ppb
|-	Cr	53	1086.7	51.83937	ppb
|-	Mn	55	7694.2	49.62266	ppb
|	Ni	60	1204	49.76658	ppb
|	Cu	63	2827.8	49.16536	ppb
|	Cu	65	1306.4	50.67235	ppb
|	Zn	66	702.3	46.2827	ppb
|	Zn	67	123.3	50.41663	ppb
|	Zn	68	538	47.20256	ppb
|	As	75	803.8	50.25026	ppb
|	Se	77	85.3	59.26702	ppb
|	Se	82	47.8	50.30527	ppb
|>	Rh	103	3189.5		ppb
|	Ag	107	3170.5	48.90124	ppb
|	Ag	109	3020.5		ppb
|	Cd	111	1150.4	50.58969	ppb
|-	Cd	114	4207.7	49.87985	ppb
|-	Sb	121	7626.8		ppb
|	Sb	123	5727.8	53.12434	ppb
|	Ba	135	2564.8		ppb
|	Ba	137	5327.6	50.64648	ppb
|>	Ho	165	28687.5		ppb
|-	Pb	208	54787.8	50.04939	ppb
	Kr	83	23.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample DatWednesday, June 20, 2018 12:39:03
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	3055.1		ppb
|-	Be	9	2	-0.14493	ppb
|-	P	31	50233.8	4700.5543	ppb
|>	Sc	45	4488.1		ppb
|	Cr	52	514	-0.60995	ppb
|-	Cr	53	373.3	-1.89406	ppb
|-	Mn	55	97.3	-0.00145	ppb
|	Ni	60	8	-0.07066	ppb
|	Cu	63	54.3	-0.28334	ppb
|	Cu	65	21	-0.23708	ppb
|	Zn	66	46.7	-2.91032	ppb
|	Zn	67	18.3	-3.72203	ppb
|	Zn	68	88.3	-3.29374	ppb
|	As	75	41.8	-1.2598	ppb
|	Se	77	52.3	-5.20261	ppb
|	Se	82	0.8	0.98851	ppb
|>	Rh	103	3510.6		ppb
|	Ag	107	15	-0.25764	ppb
|	Ag	109	17		ppb
|	Cd	111	8.1	0.06526	ppb
|-	Cd	114	13	-0.04244	ppb
|-	Sb	121	64.7		ppb
|	Sb	123	59.2	-0.07677	ppb
|	Ba	135	13		ppb
|	Ba	137	13.7	-0.06923	ppb
|>	Ho	165	31649.7		ppb
|-	Pb	208	136.7	-0.08078	ppb
	Kr	83	21.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample DatWednesday, June 20, 2018 12:42:04
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2833.9		ppb
|-	Be	9	2	-0.13357	ppb
|-	P	31	49138.6	4765.0735	ppb
|>	Sc	45	4336.7		ppb
|	Cr	52	603	0.19892	ppb
|-	Cr	53	409.3	1.35283	ppb
|-	Mn	55	259.3	0.96522	ppb
|	Ni	60	71	2.32781	ppb
|	Cu	63	123.7	0.84874	ppb
|	Cu	65	53.3	0.93264	ppb
|	Zn	66	61.7	-1.87304	ppb
|	Zn	67	17	-4.30906	ppb
|	Zn	68	107.3	-1.32818	ppb
|	As	75	46.9	-0.95833	ppb
|	Se	77	49	-9.94595	ppb
|	Se	82	3.8	3.89319	ppb
|>	Rh	103	3493.6		ppb
|	Ag	107	6482.2	91.67444	ppb
|	Ag	109	6216.8		ppb
|	Cd	111	17.4	0.44133	ppb
|-	Cd	114	67.5	0.55087	ppb
|-	Sb	121	59.7		ppb
|	Sb	123	50.9	-0.14135	ppb
|	Ba	135	14		ppb
|	Ba	137	17	-0.03844	ppb
|>	Ho	165	31192.4		ppb
|-	Pb	208	152.3	-0.06595	ppb
	Kr	83	21		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 8
Sample DatWednesday, June 20, 2018 12:45:04
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	4356.4		ppb
|-	Be	9	11.3	0.24822	ppb
|-	P	31	2494.1	-523.3384	ppb
|>	Sc	45	6401.2		ppb
|	Cr	52	571.3	-1.44017	ppb
|-	Cr	53	810.7	10.64832	ppb
|-	Mn	55	183	0.15883	ppb
|	Ni	60	38.3	0.61692	ppb
|	Cu	63	153	0.5246	ppb
|	Cu	65	70.3	0.73061	ppb
|	Zn	66	162.3	1.43025	ppb
|	Zn	67	41	0.69388	ppb
|	Zn	68	170	-0.5372	ppb
|	As	75	16	-3.17502	ppb
|	Se	77	89.3	8.11884	ppb
|	Se	82	-3.5	-2.13081	ppb
|>	Rh	103	5152.9		ppb
|	Ag	107	16.3	-0.31166	ppb
|	Ag	109	12.3		ppb
|	Cd	111	12.1	0.0716	ppb
|-	Cd	114	44.6	0.14512	ppb
|-	Sb	121	134.7		ppb
|	Sb	123	86	-0.0802	ppb
|	Ba	135	22		ppb
|	Ba	137	40.3	0.05126	ppb
|>	Ho	165	46240.4		ppb
|-	Pb	208	868	0.29962	ppb
	Kr	83	23.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatWednesday, June 20, 2018 12:48:05
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2585.7		ppb
|-	Be	9	12.7	0.71302	ppb
|-	P	31	2491.1	-393.7418	ppb
|>	Sc	45	3792		ppb
|	Cr	52	564.3	0.52726	ppb
|-	Cr	53	533.3	14.75403	ppb
|-	Mn	55	223.3	0.93957	ppb
|	Ni	60	28.3	0.85866	ppb
|	Cu	63	100.3	0.70303	ppb
|	Cu	65	46.3	0.91957	ppb
|	Zn	66	44.7	-2.58795	ppb
|	Zn	67	20.3	-1.43304	ppb
|	Zn	68	97.7	-0.90666	ppb
|	As	75	63.1	0.60312	ppb
|	Se	77	53.3	8.65925	ppb
|	Se	82	2.8	3.3476	ppb
|>	Rh	103	3058.2		ppb
|	Ag	107	70.3	0.67471	ppb
|	Ag	109	75		ppb
|	Cd	111	26.9	0.9753	ppb
|-	Cd	114	93.5	0.97803	ppb
|-	Sb	121	193		ppb
|	Sb	123	131.3	0.71015	ppb
|	Ba	135	66.3		ppb
|	Ba	137	110	0.91206	ppb
|>	Ho	165	27411.7		ppb
|-	Pb	208	1104.3	0.86581	ppb
	Kr	83	21.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DaiWednesday, June 20, 2018 12:56:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2623.3		ppb
|-	Be	9	117	8.69477	ppb
|-	P	31	2052.1	-454.578	ppb
|>	Sc	45	3858.3		ppb
|	Cr	52	1853.1	11.42703	ppb
|-	Cr	53	1068.7	54.10754	ppb
|-	Mn	55	2532.5	16.52215	ppb
|	Ni	60	352	14.82061	ppb
|	Cu	63	729.3	12.28057	ppb
|	Cu	65	324.7	12.29774	ppb
|	Zn	66	264.7	14.33885	ppb
|	Zn	67	67	23.01253	ppb
|	Zn	68	245.7	15.87264	ppb
|	As	75	250.2	13.63158	ppb
|	Se	77	112.3	112.59571	ppb
|	Se	82	6.1	6.91613	ppb
|>	Rh	103	3084.5		ppb
|	Ag	107	1391.7	21.97691	ppb
|	Ag	109	1438		ppb
|	Cd	111	175.7	7.77852	ppb
|-	Cd	114	685.9	8.25886	ppb
|-	Sb	121	2429.1		ppb
|	Sb	123	1829.9	17.04967	ppb
|	Ba	135	863		ppb
|	Ba	137	1723.1	16.7078	ppb
|>	Ho	165	27917.2		ppb
|-	Pb	208	15826.9	14.71905	ppb
	Kr	83	24.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DaiWednesday, June 20, 2018 12:59:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2558.8		ppb
|-	Be	9	765	59.9978	ppb
|-	P	31	2004.7	-451.8508	ppb
|>	Sc	45	3732.6		ppb
|	Cr	52	7681.2	63.39811	ppb
|-	Cr	53	1614.1	99.12903	ppb
|-	Mn	55	9704.6	67.31403	ppb
|	Ni	60	1481	65.7537	ppb
|	Cu	63	3346.6	62.68768	ppb
|	Cu	65	1508.4	62.94066	ppb
|	Zn	66	876.3	63.97697	ppb
|	Zn	67	150.7	69.89105	ppb
|	Zn	68	675.7	67.74766	ppb
|	As	75	916.8	62.31557	ppb
|	Se	77	134.7	160.46985	ppb
|	Se	82	50.8	57.2412	ppb
|>	Rh	103	2974.8		ppb
|	Ag	107	4395.1	72.90748	ppb
|	Ag	109	4330.4		ppb
|	Cd	111	1262.8	59.56197	ppb
|-	Cd	114	4658.7	59.24315	ppb
|-	Sb	121	9486.1		ppb
|	Sb	123	7165.6	69.8084	ppb
|	Ba	135	3401.6		ppb
|	Ba	137	6644.9	66.2427	ppb
|>	Ho	165	27381.3		ppb
|-	Pb	208	66984	64.1628	ppb
	Kr	83	23		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DatWednesday, June 20, 2018 13:02:46
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2563.8		ppb
|-	Be	9	1439.4	112.91286	ppb
|-	P	31	3636.6	-257.1303	ppb
|>	Sc	45	3868.6		ppb
|	Cr	52	39395	331.11088	ppb
|-	Cr	53	4905.5	340.8911	ppb
|-	Mn	55	22430.7	152.25599	ppb
|	Ni	60	5045.2	219.06618	ppb
|	Cu	63	16351.3	302.71473	ppb
|	Cu	65	7341.4	302.1569	ppb
|	Zn	66	2876.2	217.79353	ppb
|	Zn	67	471.7	237.8691	ppb
|	Zn	68	2049.8	223.8922	ppb
|	As	75	1378.2	92.96486	ppb
|	Se	77	150.3	182.06869	ppb
|	Se	82	118.8	130.11527	ppb
|>	Rh	103	3054.9		ppb
|	Ag	107	20093.5	325.81454	ppb
|	Ag	109	21237.4		ppb
|	Cd	111	1836.8	84.52797	ppb
|-	Cd	114	6845.3	84.8372	ppb
|-	Sb	121	9260.4		ppb
|	Sb	123	6879.1	67.20207	ppb
|	Ba	135	13141.5		ppb
|	Ba	137	26192.7	262.4112	ppb
|>	Ho	165	27303.9		ppb
|-	Pb	208	245854.7	236.6859	ppb
	Kr	83	21.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DatWednesday, June 20, 2018 13:05:47
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2613.1		ppb
|-	Be	9	2118.1	163.21367	ppb
|-	P	31	3525.2	-257.112	ppb
|>	Sc	45	3748.3		ppb
|	Cr	52	46052.7	400.01939	ppb
|-	Cr	53	5488.3	397.20459	ppb
|-	Mn	55	30359.1	210.30097	ppb
|	Ni	60	6177.1	273.56903	ppb
|	Cu	63	18988.2	358.72504	ppb
|	Cu	65	8546.1	358.91459	ppb
|	Zn	66	3543.3	275.26302	ppb
|	Zn	67	576.3	299.39954	ppb
|	Zn	68	2515.1	283.27419	ppb
|	As	75	2079.7	145.21436	ppb
|	Se	77	172.7	227.91252	ppb
|	Se	82	190.8	212.9626	ppb
|>	Rh	103	2996.2		ppb
|	Ag	107	25673.5	425.11821	ppb
|	Ag	109	25047.6		ppb
|	Cd	111	3025.9	142.14183	ppb
|-	Cd	114	11265.5	142.56984	ppb
|-	Sb	121	17017.1		ppb
|	Sb	123	12824.4	123.98967	ppb
|	Ba	135	15648.6		ppb
|	Ba	137	31811.6	314.29404	ppb
|>	Ho	165	27688.7		ppb
|-	Pb	208	301006.5	285.76807	ppb
	Kr	83	23.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-5 FH
Sample DalWednesday, June 20, 2018 13:14:49
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2683.1		ppb
|-	Be	9	2.3	-0.10174	ppb
|-	P	31	1842.1	-481.0837	ppb
|>	Sc	45	3861		ppb
|	Cr	52	1950.1	12.24534	ppb
|-	Cr	53	279	-5.04725	ppb
|-	Mn	55	1164.4	7.3131	ppb
|	Ni	60	497.7	21.17518	ppb
|	Cu	63	274.3	3.91638	ppb
|	Cu	65	131.3	4.4025	ppb
|	Zn	66	855	60.21956	ppb
|	Zn	67	131.7	57.21068	ppb
|	Zn	68	632.3	60.35312	ppb
|	As	75	77.3	1.6045	ppb
|	Se	77	21	-49.11776	ppb
|	Se	82	10.8	12.20081	ppb
|>	Rh	103	3068.9		ppb
|	Ag	107	118	1.44405	ppb
|	Ag	109	282		ppb
|	Cd	111	6.9	0.05258	ppb
|-	Cd	114	19.6	0.06035	ppb
|-	Sb	121	208.3		ppb
|	Sb	123	165.5	1.02087	ppb
|	Ba	135	1573		ppb
|	Ba	137	3217.9	31.47037	ppb
|>	Ho	165	27823.1		ppb
|-	Pb	208	3954.5	3.54409	ppb
	Kr	83	22		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalWednesday, June 20, 2018 13:17:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2681		ppb
|-	Be	9	2.7	-0.07607	ppb
|-	P	31	1657.4	-499.4706	ppb
|>	Sc	45	3775		ppb
|	Cr	52	439.3	-0.54946	ppb
|-	Cr	53	313.7	-1.90818	ppb
|-	Mn	55	89.3	0.0493	ppb
|	Ni	60	7.3	-0.04288	ppb
|	Cu	63	47.3	-0.25265	ppb
|	Cu	65	18.7	-0.19547	ppb
|	Zn	66	25	-4.05594	ppb
|	Zn	67	12	-5.6097	ppb
|	Zn	68	77	-2.97615	ppb
|	As	75	44.8	-0.59802	ppb
|	Se	77	31.7	-28.0043	ppb
|	Se	82	-1.2	-1.2265	ppb
|>	Rh	103	2954.5		ppb
|	Ag	107	17.3	-0.17678	ppb
|	Ag	109	11		ppb
|	Cd	111	4.7	-0.04391	ppb
|-	Cd	114	11.7	-0.03138	ppb
|-	Sb	121	49.7		ppb
|	Sb	123	42.9	-0.15449	ppb
|	Ba	135	9		ppb
|	Ba	137	11	-0.07614	ppb
|>	Ho	165	27078		ppb
|-	Pb	208	104.7	-0.09279	ppb
	Kr	83	22.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DalWednesday, June 20, 2018 13:20:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2733.2		ppb
|-	Be	9	1335.4	98.23644	ppb
|-	P	31	10055.4	494.56135	ppb
|>	Sc	45	4029		ppb
|	Cr	52	12886.7	100.92171	ppb
|-	Cr	53	1776.1	101.47747	ppb
|-	Mn	55	15033.5	100.04532	ppb
|	Ni	60	2385.8	101.56631	ppb
|	Cu	63	5477.9	98.84819	ppb
|	Cu	65	2511.1	100.85127	ppb
|	Zn	66	1291.7	92.72703	ppb
|	Zn	67	214.3	99.56354	ppb
|	Zn	68	947.7	95.04831	ppb
|	As	75	1469.1	97.55665	ppb
|	Se	77	95	80.34799	ppb
|	Se	82	85.5	92.01556	ppb
|>	Rh	103	3109.5		ppb
|	Ag	107	6268.1	99.65985	ppb
|	Ag	109	6166.8		ppb
|	Cd	111	2326.2	105.17532	ppb
|-	Cd	114	8273.1	100.78372	ppb
|-	Sb	121	13692.4		ppb
|	Sb	123	10416.4	97.75169	ppb
|	Ba	135	5279.9		ppb
|	Ba	137	10506.5	100.74262	ppb
|>	Ho	165	28493.9		ppb
|-	Pb	208	107952.2	99.46842	ppb
	Kr	83	25		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 FH
Sample DalWednesday, June 20, 2018 13:23:53
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2558.1		ppb
|-	Be	9	1.3	-0.17107	ppb
|-	P	31	1745.4	-488.5891	ppb
|>	Sc	45	3780.6		ppb
|	Cr	52	1907.1	12.22374	ppb
|-	Cr	53	263.3	-5.81213	ppb
|-	Mn	55	1015	6.71079	ppb
|	Ni	60	473.3	21.33558	ppb
|	Cu	63	171.3	2.19972	ppb
|	Cu	65	67.7	1.94914	ppb
|	Zn	66	403	27.00435	ppb
|	Zn	67	58	20.23902	ppb
|	Zn	68	333.3	28.32865	ppb
|	As	75	37.1	-1.09111	ppb
|	Se	77	13	-61.95975	ppb
|	Se	82	-0.5	-0.34678	ppb
|>	Rh	103	2896.8		ppb
|	Ag	107	14	-0.22831	ppb
|	Ag	109	28.3		ppb
|	Cd	111	6.9	0.06982	ppb
|-	Cd	114	11.1	-0.0351	ppb
|-	Sb	121	131		ppb
|	Sb	123	91.9	0.35153	ppb
|	Ba	135	1532.7		ppb
|	Ba	137	3119.5	31.98244	ppb
|>	Ho	165	26536.4		ppb
|-	Pb	208	2372	2.15725	ppb
	Kr	83	23		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 C8A
Sample DaWednesday, June 20, 2018 13:26:54
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2704.8		ppb
|-	Be	9	2.7	-0.07781	ppb
|-	P	31	1535	-502.0593	ppb
|>	Sc	45	3539.9		ppb
|	Cr	52	466.7	-0.03966	ppb
|-	Cr	53	69.7	-20.26539	ppb
|-	Mn	55	116.7	0.22626	ppb
|	Ni	60	6.3	-0.09407	ppb
|	Cu	63	62.7	0.02002	ppb
|	Cu	65	36	0.5152	ppb
|	Zn	66	91	1.11867	ppb
|	Zn	67	18.3	-2.33765	ppb
|	Zn	68	119.3	1.79898	ppb
|	As	75	52.3	-0.11146	ppb
|	Se	77	7.7	-72.51584	ppb
|	Se	82	5.2	5.95857	ppb
|>	Rh	103	3011.2		ppb
|	Ag	107	9.7	-0.30952	ppb
|	Ag	109	10		ppb
|	Cd	111	5.4	-0.00757	ppb
|-	Cd	114	9.5	-0.06274	ppb
|-	Sb	121	41.7		ppb
|	Sb	123	38.5	-0.20394	ppb
|	Ba	135	13.7		ppb
|	Ba	137	14.7	-0.04133	ppb
|>	Ho	165	27580.9		ppb
|-	Pb	208	122	-0.07803	ppb
	Kr	83	16.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-5 BH
Sample DaWednesday, June 20, 2018 13:29:54
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2517.9		ppb
|-	Be	9	3.7	0.01725	ppb
|-	P	31	2968.5	-309.6197	ppb
|>	Sc	45	3568.9		ppb
|	Cr	52	778.3	2.80615	ppb
|-	Cr	53	105	-17.46464	ppb
|-	Mn	55	7614.2	56.01999	ppb
|	Ni	60	92	3.99325	ppb
|	Cu	63	334	5.60901	ppb
|	Cu	65	142	5.40529	ppb
|	Zn	66	945.4	74.20965	ppb
|	Zn	67	126.7	61.0906	ppb
|	Zn	68	700	75.81444	ppb
|	As	75	55.2	0.38702	ppb
|	Se	77	9.7	-67.53684	ppb
|	Se	82	2.2	2.68922	ppb
|>	Rh	103	2800.2		ppb
|	Ag	107	14.3	-0.21441	ppb
|	Ag	109	17.3		ppb
|	Cd	111	4.4	-0.04304	ppb
|-	Cd	114	35.6	0.3001	ppb
|-	Sb	121	64.3		ppb
|	Sb	123	52.7	-0.02167	ppb
|	Ba	135	274.3		ppb
|	Ba	137	514.3	5.37038	ppb
|>	Ho	165	25329.5		ppb
|-	Pb	208	3502.4	3.4425	ppb
	Kr	83	21.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-5 BH Unprep
Sample DaiWednesday, June 20, 2018 13:32:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2527.7		ppb
|-	Be	9	3.3	-0.01171	ppb
|-	P	31	2094.8	-417.1667	ppb
|>	Sc	45	3439.9		ppb
|	Cr	52	626.7	1.61883	ppb
|-	Cr	53	77.3	-19.44092	ppb
|-	Mn	55	3523.2	26.67416	ppb
|	Ni	60	39	1.55423	ppb
|	Cu	63	164.3	2.30511	ppb
|	Cu	65	65	2.05648	ppb
|	Zn	66	427.7	31.70198	ppb
|	Zn	67	67	28.06098	ppb
|	Zn	68	320.3	29.73482	ppb
|	As	75	43.4	-0.39181	ppb
|	Se	77	8	-70.26333	ppb
|	Se	82	-4.2	-5.0791	ppb
|>	Rh	103	2690.8		ppb
|	Ag	107	20.7	-0.08655	ppb
|	Ag	109	15.7		ppb
|	Cd	111	6.4	0.07251	ppb
|-	Cd	114	27.4	0.20691	ppb
|-	Sb	121	43.7		ppb
|	Sb	123	38.7	-0.16135	ppb
|	Ba	135	126		ppb
|	Ba	137	258.7	2.66583	ppb
|>	Ho	165	24827		ppb
|-	Pb	208	1612.7	1.5141	ppb
	Kr	83	22.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 BH
Sample DaiWednesday, June 20, 2018 13:35:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2554.6		ppb
|-	Be	9	1.3	-0.17249	ppb
|-	P	31	3350.2	-245.7817	ppb
|>	Sc	45	3476.6		ppb
|	Cr	52	815.3	3.34123	ppb
|-	Cr	53	90	-18.45506	ppb
|-	Mn	55	486.3	3.1343	ppb
|	Ni	60	59	2.50375	ppb
|	Cu	63	255	4.15165	ppb
|	Cu	65	108.7	4.03735	ppb
|	Zn	66	456.3	33.75822	ppb
|	Zn	67	74.7	32.22678	ppb
|	Zn	68	362.3	34.65079	ppb
|	As	75	46.1	-0.21379	ppb
|	Se	77	7.7	-71.06822	ppb
|	Se	82	-1.5	-1.67176	ppb
|>	Rh	103	2723.8		ppb
|	Ag	107	14.3	-0.20793	ppb
|	Ag	109	11.3		ppb
|	Cd	111	8.9	0.1987	ppb
|-	Cd	114	33.2	0.28169	ppb
|-	Sb	121	244		ppb
|	Sb	123	180	1.34862	ppb
|	Ba	135	29		ppb
|	Ba	137	49.3	0.3508	ppb
|>	Ho	165	25109.6		ppb
|-	Pb	208	467	0.29483	ppb
	Kr	83	19.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 C8A-C9
Sample DalWednesday, June 20, 2018 13:38:56
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2494.1		ppb
|-	Be	9	3.3	-0.0066	ppb
|-	P	31	1965.7	-440.0187	ppb
|>	Sc	45	3498.2		ppb
|	Cr	52	518.3	0.50122	ppb
|-	Cr	53	61	-20.9097	ppb
|-	Mn	55	245	1.26029	ppb
|	Ni	60	20.7	0.62026	ppb
|	Cu	63	71.3	0.30059	ppb
|	Cu	65	33.7	0.54082	ppb
|	Zn	66	91.7	1.79539	ppb
|	Zn	67	17.3	-2.07134	ppb
|	Zn	68	118	2.84673	ppb
|	As	75	63.3	1.05322	ppb
|	Se	77	7	-72.60078	ppb
|	Se	82	10.5	12.7856	ppb
|>	Rh	103	2770.8		ppb
|	Ag	107	10.3	-0.28436	ppb
|	Ag	109	11.7		ppb
|	Cd	111	2.4	-0.1421	ppb
|-	Cd	114	18.1	0.06588	ppb
|-	Sb	121	30.3		ppb
|	Sb	123	25.7	-0.30329	ppb
|	Ba	135	12		ppb
|	Ba	137	17.3	0.00335	ppb
|>	Ho	165	24961.1		ppb
|-	Pb	208	125	-0.06261	ppb
	Kr	83	16.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalWednesday, June 20, 2018 13:51:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2712.1		ppb
|-	Be	9	1.7	-0.15152	ppb
|-	P	31	1313	-543.0006	ppb
|>	Sc	45	3761.3		ppb
|	Cr	52	464	-0.31515	ppb
|-	Cr	53	314.3	-1.7921	ppb
|-	Mn	55	83	0.00539	ppb
|	Ni	60	4.7	-0.1646	ppb
|	Cu	63	39.3	-0.40495	ppb
|	Cu	65	17.7	-0.2408	ppb
|	Zn	66	23.7	-4.17764	ppb
|	Zn	67	13.3	-4.8498	ppb
|	Zn	68	77.3	-2.92364	ppb
|	As	75	59.4	0.47357	ppb
|	Se	77	32.3	-27.05931	ppb
|	Se	82	-6.2	-6.86418	ppb
|>	Rh	103	2957.2		ppb
|	Ag	107	10.3	-0.29434	ppb
|	Ag	109	13.7		ppb
|	Cd	111	4.7	-0.04092	ppb
|-	Cd	114	8.8	-0.06918	ppb
|-	Sb	121	30.3		ppb
|	Sb	123	28.6	-0.29935	ppb
|	Ba	135	11.3		ppb
|	Ba	137	12	-0.06743	ppb
|>	Ho	165	27399		ppb
|-	Pb	208	91.3	-0.10678	ppb
	Kr	83	26		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatWednesday, June 20, 2018 13:54:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2822		ppb
|-	Be	9	20.3	1.17321	ppb
|-	P	31	1525.4	-520.1207	ppb
|>	Sc	45	3848.6		ppb
|	Cr	52	573.7	0.52842	ppb
|-	Cr	53	328	-1.30311	ppb
|-	Mn	55	227.7	0.97038	ppb
|	Ni	60	28.3	0.85971	ppb
|	Cu	63	94.3	0.59276	ppb
|	Cu	65	41.7	0.72322	ppb
|	Zn	66	30	-3.72174	ppb
|	Zn	67	13.3	-5.11178	ppb
|	Zn	68	80.7	-2.82	ppb
|	As	75	62.4	0.58595	ppb
|	Se	77	36.3	-21.67855	ppb
|	Se	82	3.2	3.79257	ppb
|>	Rh	103	3052.5		ppb
|	Ag	107	209	2.8836	ppb
|	Ag	109	204.3		ppb
|	Cd	111	130.9	5.68363	ppb
|-	Cd	114	218.3	2.49361	ppb
|-	Sb	121	321.7		ppb
|	Sb	123	255.2	1.96665	ppb
|	Ba	135	201		ppb
|	Ba	137	260.3	2.46337	ppb
|>	Ho	165	27356.6		ppb
|-	Pb	208	1552	1.31055	ppb
	Kr	83	18.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatWednesday, June 20, 2018 13:57:01
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	2848.1		ppb
|-	Be	9	1380	97.59129	ppb
|-	P	31	9822.9	505.27079	ppb
|>	Sc	45	3902.3		ppb
|	Cr	52	12615.8	102.04487	ppb
|-	Cr	53	1710.7	100.79465	ppb
|-	Mn	55	14933.1	98.76724	ppb
|	Ni	60	2353.8	99.58932	ppb
|	Cu	63	5498.9	98.62733	ppb
|	Cu	65	2469.8	98.57443	ppb
|	Zn	66	1301.7	92.8727	ppb
|	Zn	67	206	94.48057	ppb
|	Zn	68	922.7	91.62049	ppb
|	As	75	1447.9	95.52689	ppb
|	Se	77	91.7	73.29576	ppb
|	Se	82	83.8	89.75496	ppb
|>	Rh	103	3128.2		ppb
|	Ag	107	6190.8	97.81248	ppb
|	Ag	109	6057.7		ppb
|	Cd	111	2305.4	103.63002	ppb
|-	Cd	114	8297.2	100.46649	ppb
|-	Sb	121	14012.3		ppb
|	Sb	123	10387.5	97.40339	ppb
|	Ba	135	5374.6		ppb
|	Ba	137	10826.7	103.73964	ppb
|>	Ho	165	28516.6		ppb
|-	Pb	208	108872.2	100.23947	ppb
	Kr	83	20.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalThursday, June 21, 2018 11:58:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	143958		ppb
|-	Be	9	3.7		ppb
|-	P	31	2822.5		ppb
|>	Sc	45	93878.6		ppb
|-	Zn	66	216.3		ppb
|	Zn	67	103		ppb
|	Zn	68	280.7		ppb
|	As	75	141.3		ppb
|	Se	77	410.7		ppb
|	Se	82	-0.4		ppb
|>	Rh	103	74251.8		ppb
	Ho	165	557874.5		ppb
	Kr	83	51.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample DalThursday, June 21, 2018 11:34:57
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	167105		ppb
|-	Be	9	654	0.94169	ppb
|-	P	31	9710.9	21.38375	ppb
|>	Sc	45	106329.4		ppb
|-	Zn	66	631	1.14371	ppb
|	Zn	67	150	0.58154	ppb
|	Zn	68	526	0.8828	ppb
|	As	75	489.4	1.01847	ppb
|	Se	77	439	-2.29917	ppb
|	Se	82	29.6	1.00692	ppb
|>	Rh	103	87413.2		ppb
	Ho	165	607499.7		ppb
	Kr	83	56.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample DalThursday, June 21, 2018 11:36:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	165761.6		ppb
|-	Be	9	68418.8	99.96597	ppb
|-	P	31	321261.1	1045.4818	ppb
|>	Sc	45	106205.8		ppb
|-	Zn	66	32183.4	100.72754	ppb
|	Zn	67	4903.8	100.32401	ppb
|	Zn	68	21785.8	100.59638	ppb
|	As	75	30799.3	100.15484	ppb
|	Se	77	2425.5	105.05005	ppb
|	Se	82	2909.8	101.10746	ppb
|>	Rh	103	84244		ppb
	Ho	165	616939.9		ppb
	Kr	83	45		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample DatThursday, June 21, 2018 11:38:52
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	160840.4		ppb
|-	Be	9	332032	500.00692	ppb
|-	P	31	1544265.3	4990.8981	ppb
|>	Sc	45	107812.7		ppb
|-	Zn	66	160440.6	499.8542	ppb
|	Zn	67	24231.1	499.93604	ppb
|	Zn	68	108152.1	499.88096	ppb
|	As	75	154753.8	499.969	ppb
|	Se	77	9880	498.99659	ppb
|	Se	82	14539.5	499.77849	ppb
|>	Rh	103	85154.4		ppb
	Ho	165	632755.7		ppb
	Kr	83	50.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatThursday, June 21, 2018 11:40:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	143507.3		ppb
|-	Be	9	33.7	0.05063	ppb
|-	P	31	3100.2	0.84599	ppb
|>	Sc	45	95435.5		ppb
|-	Zn	66	247	0.09785	ppb
|	Zn	67	89	-0.36135	ppb
|	Zn	68	273.3	-0.06029	ppb
|	As	75	210.6	0.24593	ppb
|	Se	77	586.7	10.21472	ppb
|	Se	82	12.6	0.5048	ppb
|>	Rh	103	75333		ppb
	Ho	165	553104.8		ppb
	Kr	83	50		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatThursday, June 21, 2018 11:42:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	156716.6		ppb
|-	Be	9	682.7	1.04901	ppb
|-	P	31	9508.8	22.65735	ppb
|>	Sc	45	100132.1		ppb
|-	Zn	66	601.3	1.27358	ppb
|	Zn	67	162	1.21463	ppb
|	Zn	68	523.7	1.15722	ppb
|	As	75	482.4	1.17993	ppb
|	Se	77	723	16.86353	ppb
|	Se	82	22.3	0.85331	ppb
|>	Rh	103	78041		ppb
	Ho	165	582788.2		ppb
	Kr	83	47		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample DatThursday, June 21, 2018 11:44:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	148477.6		ppb
|-	Be	9	154283.3	251.72184	ppb
|-	P	31	699270.8	2468.828	ppb
|>	Sc	45	98456.9		ppb
|-	Zn	66	73775.4	252.16548	ppb
|	Zn	67	11067.8	249.69769	ppb
|	Zn	68	48895.1	247.5903	ppb
|	As	75	70085.7	248.55395	ppb
|	Se	77	4754.5	252.12397	ppb
|	Se	82	6540.1	246.96811	ppb
|>	Rh	103	77497.3		ppb
	Ho	165	579451.4		ppb
	Kr	83	52.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatThursday, June 21, 2018 11:46:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	157892.1		ppb
|-	Be	9	66019.7	101.27188	ppb
|-	P	31	309993.7	1033.139	ppb
|>	Sc	45	103702.1		ppb
|-	Zn	66	31188.4	102.42146	ppb
|	Zn	67	4804.8	103.19642	ppb
|	Zn	68	21094.9	102.21322	ppb
|	As	75	29420	100.35171	ppb
|	Se	77	2420.1	111.1521	ppb
|	Se	82	2781.7	101.38656	ppb
|>	Rh	103	80308.8		ppb
	Ho	165	610751.3		ppb
	Kr	83	53		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample DatThursday, June 21, 2018 11:48:41
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	154290.5		ppb
|-	Be	9	32585.9	51.14989	ppb
|-	P	31	58772.7	195.43836	ppb
|>	Sc	45	99645.2		ppb
|-	Zn	66	15292.7	51.78785	ppb
|	Zn	67	2338.4	50.96542	ppb
|	Zn	68	10180.4	50.49869	ppb
|	As	75	13852.4	48.82491	ppb
|	Se	77	1578	67.20415	ppb
|	Se	82	1365.6	51.72072	ppb
|>	Rh	103	77302.7		ppb
	Ho	165	587508.8		ppb
	Kr	83	50		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample DalThursday, June 21, 2018 11:50:38
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	167268.4		ppb
|-	Be	9	22.3	0.02618	ppb
|-	P	31	1626655.9	4934.1557	ppb
|>	Sc	45	114837.5		ppb
|-	Zn	66	431.3	0.53736	ppb
|	Zn	67	188.3	1.36103	ppb
|	Zn	68	378	0.21503	ppb
|	As	75	136.1	-0.0929	ppb
|	Se	77	535.7	2.70017	ppb
|	Se	82	-5.1	-0.15326	ppb
|>	Rh	103	87399.2		ppb
	Ho	165	675252.9		ppb
	Kr	83	50		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample DalThursday, June 21, 2018 11:52:36
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	166694.4		ppb
|-	Be	9	3.7	-0.00084	ppb
|-	P	31	1629531.5	4946.0963	ppb
|>	Sc	45	114759.2		ppb
|-	Zn	66	987.4	2.1918	ppb
|	Zn	67	293.7	3.41179	ppb
|	Zn	68	806.3	2.10642	ppb
|	As	75	492.7	1.00929	ppb
|	Se	77	584	4.84155	ppb
|	Se	82	27.9	0.93852	ppb
|>	Rh	103	88461.9		ppb
	Ho	165	676120		ppb
	Kr	83	52		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 8
Sample DalThursday, June 21, 2018 11:54:33
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	279600.9		ppb
|-	Be	9	297.7	0.25171	ppb
|-	P	31	4149.7	-2.51245	ppb
|>	Sc	45	181439.4		ppb
|-	Zn	66	3488.9	6.03593	ppb
|	Zn	67	600	5.33275	ppb
|	Zn	68	2393.1	5.44762	ppb
|	As	75	321.8	0.12626	ppb
|	Se	77	978.4	7.48231	ppb
|	Se	82	15.9	0.35834	ppb
|>	Rh	103	136129.3		ppb
	Ho	165	1046807		ppb
	Kr	83	51.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatThursday, June 21, 2018 11:56:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	150100		ppb
|-	Be	9	646	1.0362	ppb
|-	P	31	9133	21.16916	ppb
|>	Sc	45	100685		ppb
|-	Zn	66	578	1.18502	ppb
|	Zn	67	162	1.20012	ppb
|	Zn	68	514	1.09615	ppb
|	As	75	442.3	1.03071	ppb
|	Se	77	441.7	0.47121	ppb
|	Se	82	23	0.87365	ppb
|>	Rh	103	78380		ppb
	Ho	165	590990.5		ppb
	Kr	83	46		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatThursday, June 21, 2018 11:58:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	143958		ppb
|-	Be	9	3.7	-0.00001	ppb
|-	P	31	2822.5	0.00122	ppb
|>	Sc	45	93878.6		ppb
|-	Zn	66	216.3	0.00006	ppb
|	Zn	67	103	0.00015	ppb
|	Zn	68	280.7	0.00011	ppb
|	As	75	141.3	-0.00004	ppb
|	Se	77	410.7	0.00315	ppb
|	Se	82	-0.4	-0.00023	ppb
|>	Rh	103	74251.8		ppb
	Ho	165	557874.5		ppb
	Kr	83	51.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB FH
Sample DatThursday, June 21, 2018 12:00:06
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	155595.4		ppb
|-	Be	9	1.3	-0.00409	ppb
|-	P	31	3744.6	2.11362	ppb
|>	Sc	45	103687.9		ppb
|-	Zn	66	769.3	1.41857	ppb
|	Zn	67	124.7	-0.08854	ppb
|	Zn	68	617.7	1.12274	ppb
|	As	75	159.1	-0.05425	ppb
|	Se	77	35.7	-23.25084	ppb
|	Se	82	6.9	0.23412	ppb
|>	Rh	103	93230.2		ppb
	Ho	165	602025		ppb
	Kr	83	52		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB FH
Sample DalThursday, June 21, 2018 12:02:04
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	161061.1		ppb
|-	Be	9	30546	45.93023	ppb
|-	P	31	57658.7	178.23308	ppb
|>	Sc	45	106652.7		ppb
|-	Zn	66	14707.3	40.89717	ppb
|	Zn	67	2273.8	40.36159	ppb
|	Zn	68	9949.3	40.39204	ppb
|	As	75	13851.7	40.15649	ppb
|	Se	77	833.3	15.15623	ppb
|	Se	82	1266.9	39.56179	ppb
|>	Rh	103	93776.2		ppb
	Ho	165	614930.4		ppb
	Kr	83	60.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB BH
Sample DalThursday, June 21, 2018 12:04:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	189515.8		ppb
|-	Be	9	3.7	-0.00149	ppb
|-	P	31	5987.7	6.82158	ppb
|>	Sc	45	120701.4		ppb
|-	Zn	66	2954.8	6.41419	ppb
|	Zn	67	439	4.64619	ppb
|	Zn	68	2144.1	6.25702	ppb
|	As	75	131.2	-0.19308	ppb
|	Se	77	24	-23.9842	ppb
|	Se	82	-1.1	-0.01481	ppb
|>	Rh	103	109228.4		ppb
	Ho	165	676666.5		ppb
	Kr	83	58.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: LRB BH
Sample DalThursday, June 21, 2018 12:05:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	196662.8		ppb
|-	Be	9	35489.5	43.70419	ppb
|-	P	31	63540.7	173.1261	ppb
|>	Sc	45	120797.8		ppb
|-	Zn	66	16871	40.0239	ppb
|	Zn	67	2585.8	39.09717	ppb
|	Zn	68	11565	40.06096	ppb
|	As	75	14221.4	35.1155	ppb
|	Se	77	770	6.68975	ppb
|	Se	82	1163.5	30.98238	ppb
|>	Rh	103	109911.8		ppb
	Ho	165	689560.9		ppb
	Kr	83	65.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-1 FH
Sample DatThursday, June 21, 2018 12:07:58
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	158741		ppb
|-	Be	9	4.3	0.00044	ppb
|-	P	31	3337.9	0.91491	ppb
|>	Sc	45	102123.5		ppb
|-	Zn	66	39492.2	122.43805	ppb
|	Zn	67	5814.3	118.06895	ppb
|	Zn	68	26026.5	119.13127	ppb
|	As	75	167.9	0.01709	ppb
|	Se	77	312.3	-8.43106	ppb
|	Se	82	10	0.35898	ppb
|>	Rh	103	85186.9		ppb
	Ho	165	610579		ppb
	Kr	83	48.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 FH
Sample DatThursday, June 21, 2018 12:09:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	161364.6		ppb
|-	Be	9	4	-0.00017	ppb
|-	P	31	3549.9	1.70484	ppb
|>	Sc	45	101584		ppb
|-	Zn	66	40689.1	125.92311	ppb
|	Zn	67	5942	120.49295	ppb
|	Zn	68	26620.8	121.66997	ppb
|	As	75	171.2	0.02823	ppb
|	Se	77	305	-8.83748	ppb
|	Se	82	25.3	0.88742	ppb
|>	Rh	103	85335.1		ppb
	Ho	165	612084.2		ppb
	Kr	83	45.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 FH
Sample DatThursday, June 21, 2018 12:11:53
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	161418.3		ppb
|-	Be	9	2.7	-0.00216	ppb
|-	P	31	3451.9	1.33465	ppb
|>	Sc	45	101860.4		ppb
|-	Zn	66	40950.8	125.52844	ppb
|	Zn	67	5978.4	120.07176	ppb
|	Zn	68	26788	121.26454	ppb
|	As	75	137.8	-0.08344	ppb
|	Se	77	304	-9.03721	ppb
|	Se	82	-0.8	-0.01116	ppb
|>	Rh	103	86148.9		ppb
	Ho	165	609097.3		ppb
	Kr	83	57.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 FH
Sample Dat Thursday, June 21, 2018 12:13:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	162679.9		ppb
|-	Be	9	4	-0.00021	ppb
|-	P	31	3298.6	0.93885	ppb
|>	Sc	45	100719.5		ppb
|-	Zn	66	34094.9	104.78132	ppb
|	Zn	67	4907.8	98.51143	ppb
|	Zn	68	22270.2	100.94223	ppb
|	As	75	133.2	-0.09718	ppb
|	Se	77	288.3	-9.80374	ppb
|	Se	82	-4.7	-0.14726	ppb
|>	Rh	103	85822.7		ppb
	Ho	165	612398.1		ppb
	Kr	83	52.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 FH
Sample Dat Thursday, June 21, 2018 12:15:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	154259		ppb
|-	Be	9	31542.9	49.52161	ppb
|-	P	31	56923.8	192.78655	ppb
|>	Sc	45	97740.4		ppb
|-	Zn	66	47383.5	154.36081	ppb
|	Zn	67	7017.3	150.23223	ppb
|	Zn	68	31143.1	149.98017	ppb
|	As	75	14026.1	47.05976	ppb
|	Se	77	1146.7	38.78819	ppb
|	Se	82	1365.6	49.26072	ppb
|>	Rh	103	81189		ppb
	Ho	165	590131.9		ppb
	Kr	83	50		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample Dat Thursday, June 21, 2018 12:17:47
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	149761.3		ppb
|-	Be	9	12.3	0.01379	ppb
|-	P	31	2870.5	0.31351	ppb
|>	Sc	45	92722		ppb
|-	Zn	66	227.3	-0.00311	ppb
|	Zn	67	85.3	-0.52519	ppb
|	Zn	68	256.7	-0.19811	ppb
|	As	75	105.3	-0.15506	ppb
|	Se	77	272.3	-9.28533	ppb
|	Se	82	9	0.3529	ppb
|>	Rh	103	78353		ppb
	Ho	165	568198.3		ppb
	Kr	83	46.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DaiThursday, June 21, 2018 12:19:44
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	154910.5		ppb
|-	Be	9	61804.3	96.64489	ppb
|-	P	31	280509.9	1004.9433	ppb
|>	Sc	45	96425		ppb
|-	Zn	66	28810.6	93.17313	ppb
|	Zn	67	4445.1	93.83881	ppb
|	Zn	68	19260.1	91.81443	ppb
|	As	75	27106.1	91.08014	ppb
|	Se	77	2022.4	87.10264	ppb
|	Se	82	2682.1	96.34575	ppb
|>	Rh	103	81491		ppb
	Ho	165	604856.6		ppb
	Kr	83	44.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-4 FH
Sample DaiThursday, June 21, 2018 12:21:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	147740.4		ppb
|-	Be	9	10.7	0.01132	ppb
|-	P	31	3211.5	1.63299	ppb
|>	Sc	45	92435.6		ppb
|-	Zn	66	27434.7	91.03863	ppb
|	Zn	67	3907.6	84.4463	ppb
|	Zn	68	17888.7	87.45782	ppb
|	As	75	152.1	0.00205	ppb
|	Se	77	311	-7.28221	ppb
|	Se	82	-7.4	-0.26121	ppb
|>	Rh	103	79392.2		ppb
	Ho	165	577561.6		ppb
	Kr	83	56		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 BH
Sample DaiThursday, June 21, 2018 12:23:40
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	151725.6		ppb
|-	Be	9	6.3	0.00394	ppb
|-	P	31	12459.4	34.56154	ppb
|>	Sc	45	96546.8		ppb
|-	Zn	66	16511.8	52.4517	ppb
|	Zn	67	2434.5	49.69462	ppb
|	Zn	68	10910.4	50.76084	ppb
|	As	75	121.7	-0.11748	ppb
|	Se	77	313	-7.83388	ppb
|	Se	82	26	0.93736	ppb
|>	Rh	103	82427.3		ppb
	Ho	165	591948		ppb
	Kr	83	44.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 BH
Sample Dat Thursday, June 21, 2018 12:25:38
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	155497.8		ppb
|-	Be	9	5.3	0.00214	ppb
|-	P	31	12580.8	34.4922	ppb
|>	Sc	45	97623.9		ppb
|-	Zn	66	16710.6	52.65052	ppb
|	Zn	67	2491.1	50.46827	ppb
|	Zn	68	11092.8	51.19787	ppb
|	As	75	85.6	-0.23953	ppb
|	Se	77	301	-8.61927	ppb
|	Se	82	29.3	1.04754	ppb
|>	Rh	103	83117.3		ppb
	Ho	165	600917.6		ppb
	Kr	83	46.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 BH
Sample Dat Thursday, June 21, 2018 12:27:35
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	162208.7		ppb
|-	Be	9	3.7	-0.0007	ppb
|-	P	31	17411.1	48.95686	ppb
|>	Sc	45	102255.1		ppb
|-	Zn	66	14798	44.49029	ppb
|	Zn	67	2207.4	42.41883	ppb
|	Zn	68	9799.3	43.04518	ppb
|	As	75	135.1	-0.09492	ppb
|	Se	77	253	-11.80652	ppb
|	Se	82	-2.8	-0.08285	ppb
|>	Rh	103	86876		ppb
	Ho	165	616940.5		ppb
	Kr	83	57		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 BH
Sample Dat Thursday, June 21, 2018 12:29:33
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	163358.9		ppb
|-	Be	9	31949.1	47.36451	ppb
|-	P	31	71387.8	230.78318	ppb
|>	Sc	45	103296.3		ppb
|-	Zn	66	28406.1	86.66489	ppb
|	Zn	67	4090.3	81.21158	ppb
|	Zn	68	18763	84.31071	ppb
|	As	75	13460.8	42.41731	ppb
|	Se	77	1003.7	27.53739	ppb
|	Se	82	1218.6	41.33102	ppb
|>	Rh	103	86323.5		ppb
	Ho	165	614041.6		ppb
	Kr	83	50.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DalThursday, June 21, 2018 12:31:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	166518.3		ppb
|-	Be	9	29901.9	43.49039	ppb
|-	P	31	18203	56.55662	ppb
|>	Sc	45	94763.6		ppb
|-	Zn	66	23148.7	91.76749	ppb
|	Zn	67	3634.9	94.09572	ppb
|	Zn	68	15358	89.73018	ppb
|	As	75	18796.2	77.3551	ppb
|	Se	77	2518.8	146.19415	ppb
|	Se	82	1755.7	77.32069	ppb
|>	Rh	103	66473.6		ppb
	Ho	165	566229.8		ppb
	Kr	83	49.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DalThursday, June 21, 2018 12:33:28
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	172186.1		ppb
|-	Be	9	67047.5	94.30926	ppb
|-	P	31	18659.3	56.47624	ppb
|>	Sc	45	97258.5		ppb
|-	Zn	66	35668.1	139.64115	ppb
|	Zn	67	5511.6	141.72751	ppb
|	Zn	68	23887.1	138.223	ppb
|	As	75	30319.4	123.18302	ppb
|	Se	77	3236.5	191.5665	ppb
|	Se	82	2880.8	124.94146	ppb
|>	Rh	103	67494.7		ppb
	Ho	165	573951		ppb
	Kr	83	41.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DalThursday, June 21, 2018 12:39:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	156064.1		ppb
|-	Be	9	70408.7	109.27587	ppb
|-	P	31	60490.1	215.05302	ppb
|>	Sc	45	93626.3		ppb
|-	Zn	66	62714.6	205.94217	ppb
|	Zn	67	9504.5	205.70842	ppb
|	Zn	68	42575.9	206.98819	ppb
|	As	75	26587.9	90.30722	ppb
|	Se	77	2944.8	140.02309	ppb
|	Se	82	4192.3	152.24311	ppb
|>	Rh	103	80618.8		ppb
	Ho	165	590306.2		ppb
	Kr	83	49.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DaiThursday, June 21, 2018 12:41:18
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	151016.9		ppb
|-	Be	9	97719.3	156.72004	ppb
|-	P	31	59256.5	210.3908	ppb
|>	Sc	45	93656.4		ppb
|-	Zn	66	75231	252.30254	ppb
|	Zn	67	11351.2	251.27509	ppb
|	Zn	68	50769.2	252.26231	ppb
|	As	75	39066.7	135.69011	ppb
|	Se	77	3611.3	181.50145	ppb
|	Se	82	5345.8	198.10778	ppb
|>	Rh	103	78982.6		ppb
	Ho	165	583556.5		ppb
	Kr	83	53.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DaiThursday, June 21, 2018 12:43:17
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	145146		ppb
|-	Be	9	29.7	0.04321	ppb
|-	P	31	2653.5	-0.3162	ppb
|>	Sc	45	90989.3		ppb
|-	Zn	66	218.3	-0.00925	ppb
|	Zn	67	77.3	-0.64779	ppb
|	Zn	68	261.7	-0.12951	ppb
|	As	75	127.3	-0.06197	ppb
|	Se	77	251	-10.02138	ppb
|	Se	82	-0.7	-0.01121	ppb
|>	Rh	103	75801.1		ppb
	Ho	165	560669.3		ppb
	Kr	83	46.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DaiThursday, June 21, 2018 12:45:14
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	151839.2		ppb
|-	Be	9	61492.9	98.11273	ppb
|-	P	31	272095.3	997.07193	ppb
|>	Sc	45	94284.9		ppb
|-	Zn	66	27466.4	97.86353	ppb
|	Zn	67	4209	97.95786	ppb
|	Zn	68	18388.1	96.61411	ppb
|	As	75	25763.5	95.3629	ppb
|	Se	77	1956.7	94.45269	ppb
|	Se	82	2506	99.12571	ppb
|>	Rh	103	74014.4		ppb
	Ho	165	597006.9		ppb
	Kr	83	53.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-1 FH
Sample DaI Thursday, June 21, 2018 12:47:13
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	178084.1		ppb
|-	Be	9	64	0.08075	ppb
|-	P	31	21295.1	59.55813	ppb
|>	Sc	45	106117.4		ppb
|-	Zn	66	1656898.3	4649.3139	ppb
|	Zn	67	245293.7	4571.7301	ppb
|	Zn	68	1099866.9	4584.6518	ppb
|	As	75	719.6	1.56907	ppb
|	Se	77	237	-13.67144	ppb
|	Se	82	304.6	9.43231	ppb
|>	Rh	103	94674.3		ppb
	Ho	165	647362.3		ppb
	Kr	83	52.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 FH
Sample DaI Thursday, June 21, 2018 12:49:10
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	172419.6		ppb
|-	Be	9	33.7	0.04115	ppb
|-	P	31	29498.1	88.77444	ppb
|>	Sc	45	103739.1		ppb
|-	Zn	66	1810497.4	5222.8203	ppb
|	Zn	67	265124.4	5080.386	ppb
|	Zn	68	1190212	5100.5951	ppb
|	As	75	823.6	1.94108	ppb
|	Se	77	380.7	-6.30629	ppb
|	Se	82	535.2	17.03136	ppb
|>	Rh	103	92094.3		ppb
	Ho	165	629962.1		ppb
	Kr	83	59.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 FH
Sample DaI Thursday, June 21, 2018 12:51:07
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	177322.8		ppb
|-	Be	9	36.3	0.04351	ppb
|-	P	31	29996.3	88.28029	ppb
|>	Sc	45	106020.4		ppb
|-	Zn	66	1800710.2	5077.3281	ppb
|	Zn	67	267701.3	5013.7591	ppb
|	Zn	68	1187635.7	4974.5281	ppb
|	As	75	892.1	2.08291	ppb
|	Se	77	380	-6.76114	ppb
|	Se	82	569.6	17.70826	ppb
|>	Rh	103	94218.9		ppb
	Ho	165	648929.9		ppb
	Kr	83	49.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 FH
Sample DaI Thursday, June 21, 2018 12:53:05
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	184846.5		ppb
|-	Be	9	31.3	0.03485	ppb
|-	P	31	19558	52.20774	ppb
|>	Sc	45	108887.3		ppb
|-	Zn	66	1455734.1	3949.7912	ppb
|	Zn	67	214111.4	3858.5921	ppb
|	Zn	68	948947.1	3824.6013	ppb
|	As	75	378.2	0.53954	ppb
|	Se	77	24	-23.87145	ppb
|	Se	82	0.9	0.0457	ppb
|>	Rh	103	97919.4		ppb
	Ho	165	665254		ppb
	Kr	83	54.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 FH
Sample DaI Thursday, June 21, 2018 12:55:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	179351.2		ppb
|-	Be	9	34748.8	46.92214	ppb
|-	P	31	76441	240.61277	ppb
|>	Sc	45	106271.1		ppb
|-	Zn	66	1437798.2	4041.8217	ppb
|	Zn	67	212304.8	3964.0104	ppb
|	Zn	68	945521.8	3948.4183	ppb
|	As	75	13657.8	39.27404	ppb
|	Se	77	785	12.54075	ppb
|	Se	82	1230.7	38.13596	ppb
|>	Rh	103	94504.6		ppb
	Ho	165	642834		ppb
	Kr	83	47.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-4 FH
Sample DaI Thursday, June 21, 2018 12:57:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	177917.9		ppb
|-	Be	9	36	0.04287	ppb
|-	P	31	16547.5	44.57939	ppb
|>	Sc	45	104889.3		ppb
|-	Zn	66	1245602.8	3529.8765	ppb
|	Zn	67	181332.6	3412.8287	ppb
|	Zn	68	819970.2	3451.4174	ppb
|	As	75	475.5	0.87364	ppb
|	Se	77	59.7	-22.10143	ppb
|	Se	82	58.9	1.85785	ppb
|>	Rh	103	93754.8		ppb
	Ho	165	643643.4		ppb
	Kr	83	58		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-1 BH
Sample DatThursday, June 21, 2018 12:58:58
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	229405.9		ppb
|-	Be	9	11	0.00547	ppb
|-	P	31	98905.3	272.51945	ppb
|>	Sc	45	122018.8		ppb
|-	Zn	66	81249.2	190.16531	ppb
|	Zn	67	11873.2	182.97369	ppb
|	Zn	68	53613.4	185.707	ppb
|	As	75	361.3	0.35506	ppb
|	Se	77	95.3	-21.16755	ppb
|	Se	82	129.3	3.3575	ppb
|>	Rh	103	113065.1		ppb
	Ho	165	715585.2		ppb
	Kr	83	52		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 BH
Sample DatThursday, June 21, 2018 13:00:56
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	217680.7		ppb
|-	Be	9	15.7	0.01124	ppb
|-	P	31	106766.5	301.2354	ppb
|>	Sc	45	119579.7		ppb
|-	Zn	66	145141.8	347.84863	ppb
|	Zn	67	21242	336.57314	ppb
|	Zn	68	95220.3	338.31044	ppb
|	As	75	499.4	0.71901	ppb
|	Se	77	150.3	-18.83978	ppb
|	Se	82	223.5	5.92839	ppb
|>	Rh	103	110620.2		ppb
	Ho	165	703141.6		ppb
	Kr	83	61.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-2 BH
Sample DatThursday, June 21, 2018 13:02:53
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	212921.8		ppb
|-	Be	9	16.7	0.01281	ppb
|-	P	31	104054.8	296.28412	ppb
|>	Sc	45	118405.1		ppb
|-	Zn	66	143473.5	344.47103	ppb
|	Zn	67	21113.6	335.13282	ppb
|	Zn	68	95566.3	340.18369	ppb
|	As	75	373.7	0.40793	ppb
|	Se	77	170	-18.02499	ppb
|	Se	82	204.9	5.4503	ppb
|>	Rh	103	110419		ppb
	Ho	165	696678.6		ppb
	Kr	83	49.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 BH
Sample DaiThursday, June 21, 2018 13:04:51
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	202535.5		ppb
|-	Be	9	5.7	0.00059	ppb
|-	P	31	74607.5	215.62928	ppb
|>	Sc	45	115181.7		ppb
|-	Zn	66	64927.5	163.6739	ppb
|	Zn	67	9351.1	154.94794	ppb
|	Zn	68	42058	156.8156	ppb
|	As	75	186.6	-0.03335	ppb
|	Se	77	28	-23.77067	ppb
|	Se	82	14.3	0.41222	ppb
|>	Rh	103	104911.7		ppb
	Ho	165	688561.6		ppb
	Kr	83	49.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-3 BH
Sample DaiThursday, June 21, 2018 13:06:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	202405.2		ppb
|-	Be	9	35147	42.06419	ppb
|-	P	31	128467.2	381.42791	ppb
|>	Sc	45	114428.6		ppb
|-	Zn	66	75495.2	189.46152	ppb
|	Zn	67	10989.7	181.56363	ppb
|	Zn	68	49851	185.18592	ppb
|	As	75	12338.9	31.71304	ppb
|	Se	77	688.3	4.51941	ppb
|	Se	82	1055	29.32131	ppb
|>	Rh	103	105451.3		ppb
	Ho	165	687342.9		ppb
	Kr	83	48.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DaiThursday, June 21, 2018 13:08:47
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	156929.3		ppb
|-	Be	9	6.3	0.00362	ppb
|-	P	31	2571.8	-0.7061	ppb
|>	Sc	45	91708.6		ppb
|-	Zn	66	202.3	-0.07157	ppb
|	Zn	67	76.3	-0.68755	ppb
|	Zn	68	257	-0.16589	ppb
|	As	75	117.8	-0.09986	ppb
|	Se	77	228	-11.52677	ppb
|	Se	82	1.3	0.06441	ppb
|>	Rh	103	76506.9		ppb
	Ho	165	581944.2		ppb
	Kr	83	41.7		ppb

PerkinElmer Nexlon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatThursday, June 21, 2018 13:10:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	163638.6		ppb
|-	Be	9	64904.2	96.06968	ppb
|-	P	31	281076.7	1000.6377	ppb
|>	Sc	45	97059.8		ppb
|-	Zn	66	27723.4	90.05582	ppb
|	Zn	67	4153.7	87.97966	ppb
|	Zn	68	18519.9	88.66044	ppb
|	As	75	26931.2	90.9227	ppb
|	Se	77	1856.7	78.41039	ppb
|	Se	82	2642.1	95.37193	ppb
|>	Rh	103	81104.7		ppb
	Ho	165	621335.1		ppb
	Kr	83	48.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-4 BH
Sample DatThursday, June 21, 2018 13:15:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	219150.9		ppb
|-	Be	9	5	-0.00065	ppb
|-	P	31	72978.7	201.65602	ppb
|>	Sc	45	120092.8		ppb
|-	Zn	66	55146.4	130.59026	ppb
|	Zn	67	8144.7	126.471	ppb
|	Zn	68	36489.3	127.65142	ppb
|	As	75	303.4	0.22518	ppb
|	Se	77	47.3	-23.06058	ppb
|	Se	82	37.9	1.00934	ppb
|>	Rh	103	111542.3		ppb
	Ho	165	716024.7		ppb
	Kr	83	60		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatThursday, June 21, 2018 13:21:15
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	148886.5		ppb
|-	Be	9	2.7	-0.00182	ppb
|-	P	31	2407.8	-0.87314	ppb
|>	Sc	45	87348.3		ppb
|-	Zn	66	204.3	-0.02773	ppb
|	Zn	67	68.7	-0.78271	ppb
|	Zn	68	218	-0.30927	ppb
|	As	75	103	-0.13389	ppb
|	Se	77	222	-11.19678	ppb
|	Se	82	-2	-0.06861	ppb
|>	Rh	103	72755.4		ppb
	Ho	165	562227.7		ppb
	Kr	83	47.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatThursday, June 21, 2018 13:23:12
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	155852.2		ppb
|-	Be	9	610.7	0.94289	ppb
|-	P	31	8164.7	20.63553	ppb
|>	Sc	45	91552.3		ppb
|-	Zn	66	481.7	0.88911	ppb
|	Zn	67	117.3	0.24389	ppb
|	Zn	68	430.3	0.71556	ppb
|	As	75	334.4	0.67377	ppb
|	Se	77	212.7	-12.49772	ppb
|	Se	82	20.6	0.80059	ppb
|>	Rh	103	76942.6		ppb
	Ho	165	586059		ppb
	Kr	83	48.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatThursday, June 21, 2018 13:25:10
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	154843.8		ppb
|-	Be	9	62068.6	97.07677	ppb
|-	P	31	266341.8	992.03153	ppb
|>	Sc	45	92742.8		ppb
|-	Zn	66	26233.1	88.76075	ppb
|	Zn	67	4032.7	89.00826	ppb
|	Zn	68	17745	88.47886	ppb
|	As	75	25613.8	90.07591	ppb
|	Se	77	1814.7	80.28936	ppb
|	Se	82	2590.1	97.3871	ppb
|>	Rh	103	77847.7		ppb
	Ho	165	603963.4		ppb
	Kr	83	44.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatThursday, June 21, 2018 13:27:10
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
|>	Li	6	151109.6		ppb
|-	Be	9	60957.6	97.70412	ppb
|-	P	31	257884.3	980.28517	ppb
|>	Sc	45	90865.8		ppb
|-	Zn	66	25910.1	96.81333	ppb
|	Zn	67	3894	94.99477	ppb
|	Zn	68	17234.3	94.95524	ppb
|	As	75	24193.6	93.9302	ppb
|	Se	77	1816.4	91.31162	ppb
|	Se	82	2317.1	96.15107	ppb
|>	Rh	103	70546.1		ppb
	Ho	165	592682.2		ppb
	Kr	83	45.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Blank
Sample DalThursday, June 21, 2018 13:29:17
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	146502.1		ppb
	Sc	45	84260.1		ppb
|>	Rh	103	67604.6		ppb
|	Ag	107	115.3		ppb
|	Ag	109	109		ppb
|	Cd	111	26		ppb
|-	Cd	114	73.5		ppb
	Ho	165	548864.6		ppb
	Kr	83	41.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample DalThursday, June 21, 2018 13:31:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	154808		ppb
	Sc	45	89451.8		ppb
|>	Rh	103	71154.5		ppb
|	Ag	107	1699.4	1.01611	ppb
|	Ag	109	1764.1		ppb
|	Cd	111	938.2	1.02355	ppb
|-	Cd	114	3105.3	1.04307	ppb
	Ho	165	583082.3		ppb
	Kr	83	39.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample DalThursday, June 21, 2018 13:32:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	156832.1		ppb
	Sc	45	92777.2		ppb
|>	Rh	103	72559.1		ppb
|	Ag	107	165067	104.15659	ppb
|	Ag	109	177212.9		ppb
|	Cd	111	93551.2	103.04509	ppb
|-	Cd	114	305327.6	103.09996	ppb
	Ho	165	604535		ppb
	Kr	83	36.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample DalThursday, June 21, 2018 13:34:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	154065.5		ppb
	Sc	45	94144.6		ppb
|>	Rh	103	70726.2		ppb
|	Ag	107	770579.8	499.16865	ppb
|	Ag	109	802246.5		ppb
|	Cd	111	441790.5	499.39093	ppb
|-	Cd	114	1441153.1	499.37992	ppb
	Ho	165	608044		ppb
	Kr	83	38.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DaiThursday, June 21, 2018 13:36:42
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	145200.9		ppb
	Sc	45	86158.5		ppb
|>	Rh	103	65168.2		ppb
|	Ag	107	942.4	0.58479	ppb
|	Ag	109	903.7		ppb
|	Cd	111	126	0.12367	ppb
|-	Cd	114	413.2	0.12862	ppb
	Ho	165	551514.8		ppb
	Kr	83	38.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DaiThursday, June 21, 2018 13:38:34
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	150053.8		ppb
	Sc	45	87194.8		ppb
|>	Rh	103	65320.6		ppb
|	Ag	107	1713.1	1.12371	ppb
|	Ag	109	1747.4		ppb
|	Cd	111	883.5	1.05075	ppb
|-	Cd	114	2910.9	1.0656	ppb
	Ho	165	561879.2		ppb
	Kr	83	36		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample DaiThursday, June 21, 2018 13:40:25
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	138190.8		ppb
	Sc	45	84318.3		ppb
|>	Rh	103	62201		ppb
|	Ag	107	337722.7	248.77938	ppb
|	Ag	109	348936.4		ppb
|	Cd	111	197709.5	254.08201	ppb
|-	Cd	114	648308.1	255.43595	ppb
	Ho	165	546642.5		ppb
	Kr	83	34.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DaiThursday, June 21, 2018 13:42:17
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	148726.8		ppb
	Sc	45	90252.6		ppb
|>	Rh	103	66161.4		ppb
|	Ag	107	152772.8	105.72726	ppb
|	Ag	109	160486		ppb
|	Cd	111	85529.2	103.32465	ppb
|-	Cd	114	287218	106.36492	ppb
	Ho	165	580957.9		ppb
	Kr	83	47.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample DatThursday, June 21, 2018 13:44:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	142098.1		ppb
	Sc	45	84237		ppb
|>	Rh	103	63200.8		ppb
|	Ag	107	70739.9	51.21627	ppb
|	Ag	109	72460.5		ppb
|	Cd	111	40259.4	50.90615	ppb
|-	Cd	114	134003	51.94159	ppb
	Ho	165	548744.5		ppb
	Kr	83	37.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample DatThursday, June 21, 2018 13:45:59
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	155192.7		ppb
	Sc	45	96451.1		ppb
|>	Rh	103	70087.4		ppb
|	Ag	107	140.7	0.01384	ppb
|	Ag	109	139.7		ppb
|	Cd	111	25.6	-0.00155	ppb
|-	Cd	114	88.7	0.00435	ppb
	Ho	165	627691.3		ppb
	Kr	83	37		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample DatThursday, June 21, 2018 13:47:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	156307.8		ppb
	Sc	45	98834		ppb
|>	Rh	103	71351.7		ppb
|	Ag	107	152240.5	97.68816	ppb
|	Ag	109	157706.9		ppb
|	Cd	111	499	0.52834	ppb
|-	Cd	114	1590.4	0.51966	ppb
	Ho	165	640133.5		ppb
	Kr	83	48		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DatThursday, June 21, 2018 13:49:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	152251.2		ppb
	Sc	45	84467.5		ppb
|>	Rh	103	53823.6		ppb
|	Ag	107	139869.6	118.99567	ppb
|	Ag	109	141788		ppb
|	Cd	111	21532.2	31.96142	ppb
|-	Cd	114	87737.1	39.92709	ppb
	Ho	165	508096.7		ppb
	Kr	83	38.7		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-7
Sample DatThursday, June 21, 2018 13:51:34
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	163211.3		ppb
	Sc	45	87895.6		ppb
|>	Rh	103	55802.2		ppb
|	Ag	107	210606.1	172.88748	ppb
|	Ag	109	212408.9		ppb
|	Cd	111	53619.4	76.80042	ppb
|-	Cd	114	211361	92.81371	ppb
	Ho	165	529561.8		ppb
	Kr	83	41.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 BH
Sample DatThursday, June 21, 2018 13:57:11
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	197221.1		ppb
	Sc	45	114200.3		ppb
|>	Rh	103	104510		ppb
|	Ag	107	3659.3	1.52628	ppb
|	Ag	109	3708.9		ppb
|	Cd	111	75	0.02655	ppb
|-	Cd	114	-2123.5	-0.52469	ppb
	Ho	165	689629		ppb
	Kr	83	55		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DatThursday, June 21, 2018 14:13:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	147171.6		ppb
	Sc	45	86151.2		ppb
|>	Rh	103	66372		ppb
|	Ag	107	272894.3	188.29844	ppb
|	Ag	109	291655.9		ppb
|	Cd	111	36382.6	43.80073	ppb
|-	Cd	114	120521.1	44.48606	ppb
	Ho	165	570332.6		ppb
	Kr	83	35		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-8
Sample DatThursday, June 21, 2018 14:15:00
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	145334.6		ppb
	Sc	45	85740.8		ppb
|>	Rh	103	65954.2		ppb
|	Ag	107	350615.9	243.50278	ppb
|	Ag	109	369606.8		ppb
|	Cd	111	36613.2	44.34943	ppb
|-	Cd	114	120894.8	44.8946	ppb
	Ho	165	561550.1		ppb
	Kr	83	46.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatThursday, June 21, 2018 14:16:53
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	148600.2		ppb
	Sc	45	84422.3		ppb
|>	Rh	103	69775.5		ppb
|	Ag	107	432.3	0.2054	ppb
|	Ag	109	380.7		ppb
|	Cd	111	57.2	0.03513	ppb
|-	Cd	114	163.7	0.03069	ppb
	Ho	165	563634.7		ppb
	Kr	83	41.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatThursday, June 21, 2018 14:18:44
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	152424.9		ppb
	Sc	45	84899.3		ppb
|>	Rh	103	72768.8		ppb
|	Ag	107	1878.7	1.10478	ppb
|	Ag	109	2113.1		ppb
|	Cd	111	1050.6	1.12317	ppb
|-	Cd	114	3200.1	1.05119	ppb
	Ho	165	575807.2		ppb
	Kr	83	45		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatThursday, June 21, 2018 14:20:36
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	147390.2		ppb
	Sc	45	88611.4		ppb
|>	Rh	103	66226.3		ppb
|	Ag	107	152187.7	105.24755	ppb
|	Ag	109	160841.7		ppb
|	Cd	111	88362.8	106.67043	ppb
|-	Cd	114	293878.3	108.78983	ppb
	Ho	165	580843.6		ppb
	Kr	83	37.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DatThursday, June 21, 2018 11:58:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	143958		ppb
|-	P	31	2822.5		ppb
|>	Sc	45	93878.6		ppb
|-	As	75	141.3		ppb
|	Se	77	410.7		ppb
|	Se	82	-0.4		ppb
|>	Rh	103	74251.8		ppb
	Ho	165	557874.5		ppb
	Kr	83	51.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 1
Sample DalThursday, June 21, 2018 11:34:57
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	167105		ppb
|-	P	31	9710.9	21.38375	ppb
|>	Sc	45	106329.4		ppb
|-	As	75	489.4	1.01847	ppb
|	Se	77	439	-2.29917	ppb
|	Se	82	29.6	1.00692	ppb
|>	Rh	103	87413.2		ppb
	Ho	165	607499.7		ppb
	Kr	83	56.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 2
Sample DalThursday, June 21, 2018 11:36:55
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	165761.6		ppb
|-	P	31	321261.1	1045.4818	ppb
|>	Sc	45	106205.8		ppb
|-	As	75	30799.3	100.15484	ppb
|	Se	77	2425.5	105.05005	ppb
|	Se	82	2909.8	101.10746	ppb
|>	Rh	103	84244		ppb
	Ho	165	616939.9		ppb
	Kr	83	45		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: Standard 3
Sample DalThursday, June 21, 2018 11:38:52
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	160840.4		ppb
|-	P	31	1544265.3	4990.8981	ppb
|>	Sc	45	107812.7		ppb
|-	As	75	154753.8	499.969	ppb
|	Se	77	9880	498.99659	ppb
|	Se	82	14539.5	499.77849	ppb
|>	Rh	103	85154.4		ppb
	Ho	165	632755.7		ppb
	Kr	83	50.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalThursday, June 21, 2018 11:40:50
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	143507.3		ppb
|-	P	31	3100.2	0.84599	ppb
|>	Sc	45	95435.5		ppb
|-	As	75	210.6	0.24593	ppb
|	Se	77	586.7	10.21472	ppb
|	Se	82	12.6	0.5048	ppb
|>	Rh	103	75333		ppb
	Ho	165	553104.8		ppb
	Kr	83	50		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DalThursday, June 21, 2018 11:42:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	156716.6		ppb
|-	P	31	9508.8	22.65735	ppb
|>	Sc	45	100132.1		ppb
|-	As	75	482.4	1.17993	ppb
|	Se	77	723	16.86353	ppb
|	Se	82	22.3	0.85331	ppb
|>	Rh	103	78041		ppb
	Ho	165	582788.2		ppb
	Kr	83	47		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 3
Sample DalThursday, June 21, 2018 11:44:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	148477.6		ppb
|-	P	31	699270.8	2468.828	ppb
|>	Sc	45	98456.9		ppb
|-	As	75	70085.7	248.55395	ppb
|	Se	77	4754.5	252.12397	ppb
|	Se	82	6540.1	246.96811	ppb
|>	Rh	103	77497.3		ppb
	Ho	165	579451.4		ppb
	Kr	83	52.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DalThursday, June 21, 2018 11:46:43
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	157892.1		ppb
|-	P	31	309993.7	1033.139	ppb
|>	Sc	45	103702.1		ppb
|-	As	75	29420	100.35171	ppb
|	Se	77	2420.1	111.1521	ppb
|	Se	82	2781.7	101.38656	ppb
|>	Rh	103	80308.8		ppb
	Ho	165	610751.3		ppb
	Kr	83	53		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 5
Sample DalThursday, June 21, 2018 11:48:41
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	154290.5		ppb
|-	P	31	58772.7	195.43836	ppb
|>	Sc	45	99645.2		ppb
|-	As	75	13852.4	48.82491	ppb
|	Se	77	1578	67.20415	ppb
|	Se	82	1365.6	51.72072	ppb
|>	Rh	103	77302.7		ppb
	Ho	165	587508.8		ppb
	Kr	83	50		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 6
Sample DatThursday, June 21, 2018 11:50:38
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	167268.4		ppb
|-	P	31	1626655.9	4934.1557	ppb
|>	Sc	45	114837.5		ppb
|-	As	75	136.1	-0.0929	ppb
|	Se	77	535.7	2.70017	ppb
|	Se	82	-5.1	-0.15326	ppb
|>	Rh	103	87399.2		ppb
	Ho	165	675252.9		ppb
	Kr	83	50		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 7
Sample DatThursday, June 21, 2018 11:52:36
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	166694.4		ppb
|-	P	31	1629531.5	4946.0963	ppb
|>	Sc	45	114759.2		ppb
|-	As	75	492.7	1.00929	ppb
|	Se	77	584	4.84155	ppb
|	Se	82	27.9	0.93852	ppb
|>	Rh	103	88461.9		ppb
	Ho	165	676120		ppb
	Kr	83	52		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 8
Sample DatThursday, June 21, 2018 11:54:33
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	279600.9		ppb
|-	P	31	4149.7	-2.51245	ppb
|>	Sc	45	181439.4		ppb
|-	As	75	321.8	0.12626	ppb
|	Se	77	978.4	7.48231	ppb
|	Se	82	15.9	0.35834	ppb
|>	Rh	103	136129.3		ppb
	Ho	165	1046807		ppb
	Kr	83	51.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatThursday, June 21, 2018 11:56:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	150100		ppb
|-	P	31	9133	21.16916	ppb
|>	Sc	45	100685		ppb
|-	As	75	442.3	1.03071	ppb
|	Se	77	441.7	0.47121	ppb
|	Se	82	23	0.87365	ppb
|>	Rh	103	78380		ppb
	Ho	165	590990.5		ppb
	Kr	83	46		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalThursday, June 21, 2018 11:58:08
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	143958		ppb
|-	P	31	2822.5	0.00122	ppb
|>	Sc	45	93878.6		ppb
|-	As	75	141.3	-0.00004	ppb
|	Se	77	410.7	0.00315	ppb
|	Se	82	-0.4	-0.00023	ppb
|>	Rh	103	74251.8		ppb
	Ho	165	557874.5		ppb
	Kr	83	51.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalThursday, June 21, 2018 14:43:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	137691		ppb
|-	P	31	2350.8	-0.48624	ppb
|>	Sc	45	81986.5		ppb
|-	As	75	112.1	0.01026	ppb
|	Se	77	442.3	9.88131	ppb
|	Se	82	3.1	0.17111	ppb
|>	Rh	103	57320.3		ppb
	Ho	165	538423.9		ppb
	Kr	83	35		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DalThursday, June 21, 2018 14:44:45
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	144581.4		ppb
|-	P	31	256501.4	1017.6215	ppb
|>	Sc	45	87099.8		ppb
|-	As	75	21459.7	97.32006	ppb
|	Se	77	1786.1	108.55434	ppb
|	Se	82	2086.8	101.13835	ppb
|>	Rh	103	60406.9		ppb
	Ho	165	576075.9		ppb
	Kr	83	33.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-5 FH
Sample DalThursday, June 21, 2018 14:46:31
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	156975.3		ppb
|-	P	31	7979.6	18.46844	ppb
|>	Sc	45	96181.3		ppb
|-	As	75	410	0.88823	ppb
|	Se	77	230	-11.97123	ppb
|	Se	82	302.3	11.09113	ppb
|>	Rh	103	79862.7		ppb
	Ho	165	606444.3		ppb
	Kr	83	43.3		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 FH
Sample DalThursday, June 21, 2018 14:48:17
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	160263.1		ppb
|-	P	31	7938.3	18.68471	ppb
|>	Sc	45	94971.7		ppb
|-	As	75	160.4	0.03472	ppb
|	Se	77	21	-23.77796	ppb
|	Se	82	4.6	0.1854	ppb
|>	Rh	103	79010.3		ppb
	Ho	165	601309.2		ppb
	Kr	83	47.7		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-5 BH
Sample DalThursday, June 21, 2018 14:50:02
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	202726.5		ppb
|-	P	31	53557	161.85816	ppb
|>	Sc	45	108476.5		ppb
|-	As	75	155.9	-0.08244	ppb
|	Se	77	46	-22.83755	ppb
|	Se	82	30.3	0.92622	ppb
|>	Rh	103	97057.1		ppb
	Ho	165	683778.1		ppb
	Kr	83	52.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: 31368-6 BH
Sample DalThursday, June 21, 2018 14:51:48
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	205551.8		ppb
|-	P	31	66469.2	198.06365	ppb
|>	Sc	45	111272.8		ppb
|-	As	75	116.6	-0.19917	ppb
|	Se	77	14.7	-24.30429	ppb
|	Se	82	-6.4	-0.17579	ppb
|>	Rh	103	98680.4		ppb
	Ho	165	691653.1		ppb
	Kr	83	56		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 1
Sample DalThursday, June 21, 2018 14:53:35
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	152147		ppb
|-	P	31	2784.8	0.64645	ppb
|>	Sc	45	87248.7		ppb
|-	As	75	130.9	-0.00505	ppb
|	Se	77	230	-10.00336	ppb
|	Se	82	-5.3	-0.21052	ppb
|>	Rh	103	69367.8		ppb
	Ho	165	581706		ppb
	Kr	83	42		ppb

PerkinElmer NexIon 350X ICP-MS

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 2
Sample DatThursday, June 21, 2018 14:55:20
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	157175.9		ppb
|-	P	31	8469.8	22.84839	ppb
|>	Sc	45	88669.3		ppb
|-	As	75	323.1	0.71651	ppb
|	Se	77	256	-8.85407	ppb
|	Se	82	24.7	1.02295	ppb
|>	Rh	103	71684.6		ppb
	Ho	165	597138.4		ppb
	Kr	83	39.3		ppb

Method 6020 & 200.8 Metals Summary Report
Sample ID: QC Std 4
Sample DatThursday, June 21, 2018 14:57:06
Sample Description:
Concentration Results

	Analyte	Mass	Meas. Intens	Conc. Mear	Report Unit
	Li	6	163934.3		ppb
|-	P	31	270912.6	1013.5002	ppb
|>	Sc	45	92368.3		ppb
|-	As	75	24476	90.94526	ppb
|	Se	77	1727.7	80.9151	ppb
|	Se	82	2471.5	98.15579	ppb
|>	Rh	103	73710.2		ppb
	Ho	165	626013.3		ppb
	Kr	83	42		ppb

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2	Cor. Coeff.
Calib Blank	6/18/2018	10:18:46 AM	0.0003108			µg			0.0002852			0.0003363			
STD1 = .004ug	6/18/2018	10:20:29 AM	0.0016067			µg			0.0016231			0.0015904			
STD2 = .04ug	6/18/2018	10:22:12 AM	0.0165419			µg			0.0167294			0.0163543			
STD3 = .08ug	6/18/2018	10:24:07 AM	0.0327106			µg			0.0331139			0.0323072			
STD4 = .16ug	6/18/2018	10:26:02 AM	0.064227			µg			0.0647892			0.0636647			
STD5 = .2ug	6/18/2018	10:27:56 AM	0.0775815			µg			0.0789415			0.0762215			
Reagent Blank	6/18/2018	10:29:49 AM	-1.28E-06	-3.24E-06	-3.24E-06	µg			-2.10E-06	-5.31E-06	-5.31E-06	-4.60E-07	-1.16E-06	-1.16E-06	
0.004ug = DL	6/18/2018	10:31:31 AM	0.0016736	0.0042352	0.0042352	µg			0.0017145	0.0043389	0.0043389	0.0016326	0.0041315	0.0041315	0.99941919
0.080ug = QC STD 3	6/18/2018	10:33:14 AM	0.0289509	0.0732643	0.0732643	µg			0.0293242	0.074209	0.074209	0.0285776	0.0723197	0.0723197	0.99941919
0.080ug = QC STD 2	6/18/2018	10:35:08 AM	0.0315163	0.0797564	0.0797564	µg			0.0318639	0.0806362	0.0806362	0.0311686	0.0788767	0.0788767	0.99941919
Reagent Blank	6/18/2018	10:37:00 AM	-7.34E-05	-0.0001858	-0.0001858	µg			-6.91E-05	-0.000175	-0.000175	-7.77E-05	-0.0001967	-0.0001967	0.99941919
31368-10	6/18/2018	10:42:21 AM	0.0511265	0.1293861	12.938607	µg	0.05	5	0.0510464	0.1291833	12.918335	0.0512066	0.1295888	12.95888	0.99941919
31368-1 BH	6/18/2018	10:48:07 AM	0.0002902	0.0007377	0.09314	µg	4	505	0.0003056	0.0007766	0.0980442	0.0002749	0.0006989	0.0882359	0.99941919
31368-2 BH	6/18/2018	10:49:49 AM	0.0007849	0.0019894	0.15418	µg	4	310	0.0007879	0.0019972	0.1547798	0.0007818	0.0019817	0.1535802	0.99941919
31368-2 BH DUP	6/18/2018	10:51:31 AM	0.0004349	0.0011037	0.0855396	µg	4	310	0.0004366	0.0011082	0.0858864	0.0004331	0.0010993	0.0851929	0.99941919
31368-3 BH	6/18/2018	10:53:14 AM	0.0003628	0.0009214	0.0748638	µg	4	325	0.0003753	0.0009529	0.0774261	0.0003504	0.0008899	0.0723014	0.99941919
31368-3 BH SPK	6/18/2018	10:54:56 AM	0.0310989	0.0787035	6.39466	µg	4	325	0.0313066	0.079229	6.4373552	0.0308913	0.078178	6.3519648	0.99941919
0.004ug = DL	6/18/2018	10:56:50 AM	0.0016403	0.0041509	0.0041509	µg			0.0016514	0.0041792	0.0041792	0.0016291	0.0041226	0.0041226	0.99941919
0.080ug = QC STD 2	6/18/2018	10:58:32 AM	0.0310667	0.0786186	0.0786186	µg			0.0311703	0.078881	0.078881	0.030963	0.0783562	0.0783562	0.99941919
Reagent Blank	6/18/2018	11:00:25 AM	-6.66E-05	-0.0001686	-0.0001686	µg			-9.57E-05	-0.0002421	-0.0002421	-3.76E-05	-9.51E-05	-9.51E-05	0.99941919
31368-4 BH	6/18/2018	11:02:07 AM	0.0002971	0.0007551	0.0660692	µg	4	350	0.0003063	0.0007783	0.0681046	0.0002879	0.0007318	0.0640337	0.99941919
31368-5 BH	6/18/2018	11:03:49 AM	0.0001904	0.0004851	0.0278947	µg	4	230	0.0001866	0.0004755	0.0273432	0.0001942	0.0004947	0.0284462	0.99941919
31368-6 BH	6/18/2018	11:05:32 AM	4.93E-05	0.0001281	0.0065635	µg	4	205	0.0001185	0.000303	0.0155304	-1.98E-05	-4.69E-05	-0.0024035	0.99941919
31368-1 A	6/18/2018	11:07:15 AM	-3.91E-05	-9.58E-05	-0.0047893	µg	4	200	-4.32E-05	-0.0001061	-0.0053028	-3.51E-05	-8.55E-05	-0.0042757	0.99941919
31368-2 A	6/18/2018	11:08:59 AM	-4.26E-05	-0.0001044	-0.0052224	µg	4	200	-5.15E-05	-0.0001272	-0.0063607	-3.36E-05	-8.17E-05	-0.0040841	0.99941919
31368-2 A DUP	6/18/2018	11:10:43 AM	-6.13E-06	-1.23E-05	-0.0006132	µg	4	200	-1.52E-05	-3.52E-05	-0.0017593	2.93E-06	1.07E-05	0.0005329	0.99941919
31368-3 A	6/18/2018	11:12:28 AM	-7.19E-05	-0.0001786	-0.0089305	µg	4	200	-9.08E-05	-0.0002264	-0.0113211	-5.30E-05	-0.0001308	-0.0065398	0.99941919
31368-3 A SPK	6/18/2018	11:14:11 AM	0.03081	0.0779723	3.8986143	µg	4	200	0.0309555	0.0783405	3.9170256	0.0306645	0.0776041	3.880203	0.99941919
31368-4 A	6/18/2018	11:16:05 AM	-7.47E-05	-0.0001859	-0.0092945	µg	4	200	-5.59E-05	-0.0001383	-0.0069153	-9.35E-05	-0.0002335	-0.0116736	0.99941919
31368-5 A	6/18/2018	11:17:47 AM	-7.42E-05	-0.0001845	-0.0092263	µg	4	200	-9.75E-05	-0.0002435	-0.0121757	-5.09E-05	-0.0001255	-0.0062769	0.99941919
0.004ug = DL	6/18/2018	11:19:30 AM	0.0016301	0.0041253	0.0041253	µg			0.0016526	0.0041821	0.0041821	0.0016077	0.0040686	0.0040686	0.99941919
0.080ug = QC STD 2	6/18/2018	11:21:12 AM	0.0311272	0.0787718	0.0787718	µg			0.0313464	0.0793266	0.0793266	0.0309079	0.0782169	0.0782169	0.99941919
Reagent Blank	6/18/2018	11:23:05 AM	-0.0001088	-0.0002752	-0.0002752	µg			-0.0001264	-0.0003198	-0.0003198	-9.11E-05	-0.0002306	-0.0002306	0.99941919
31368-6 A	6/18/2018	11:24:47 AM	9.70E-05	0.0002488	0.0124387	µg	4	200	9.12E-05	0.0002341	0.0117029	0.0001028	0.0002635	0.0131744	0.99941919
0.004ug = DL	6/18/2018	11:42:45 AM	0.0015948	0.0040357	0.0040357	µg			0.0015787	0.0039952	0.0039952	0.0016108	0.0040763	0.0040763	0.99941919
0.080ug = QC STD 2	6/18/2018	11:44:27 AM	0.0308811	0.0781491	0.0781491	µg			0.0308864	0.0781624	0.0781624	0.0308759	0.0781358	0.0781358	0.99941919
Reagent Blank	6/18/2018	11:46:20 AM	-8.25E-05	-0.0002088	-0.0002088	µg			-0.0001026	-0.0002597	-0.0002597	-6.24E-05	-0.0001579	-0.0001579	0.99941919
Calib Blank	6/19/2018	10:23:29 AM	0.001215			µg			0.0012991			0.0011308			
STD1 = .004ug	6/19/2018	10:25:11 AM	0.0013815			µg			0.0013765			0.0013865			
STD2 = .04ug	6/19/2018	10:26:54 AM	0.0153157			µg			0.015336			0.0152954			
STD3 = .08ug	6/19/2018	10:28:48 AM	0.0306179			µg			0.030669			0.0305668			
STD4 = .16ug	6/19/2018	10:30:42 AM	0.0612689			µg			0.0612672			0.0612706			
STD5 = .2ug	6/19/2018	10:32:36 AM	0.0766977			µg			0.0766077			0.0767878			
Reagent Blank	6/19/2018	10:34:28 AM	-0.000183	-0.0004775	-0.0004775	µg			-0.0002268	-0.0005918	-0.0005918	-0.0001392	-0.0003632	-0.0003632	
0.004ug = DL	6/19/2018	10:36:09 AM	0.0013828	0.0036085	0.0036085	µg			0.0013822	0.003607	0.003607	0.0013834	0.00361	0.00361	0.99999622
0.080ug = QC STD 3	6/19/2018	10:37:52 AM	0.0283737	0.0740426	0.0740426	µg			0.0283633	0.0740154	0.0740154	0.0283842	0.0740699	0.0740699	0.99999622
0.080ug = QC STD 2	6/19/2018	10:39:44 AM	0.0293522	0.076596	0.076596	µg			0.0293403	0.0765649	0.0765649	0.0293641	0.0766271	0.0766271	0.99999622
Reagent Blank	6/19/2018	10:41:37 AM	-0.0001871	-0.0004883	-0.0004883	µg			-0.0002377	-0.0006203	-0.0006203	-0.0001365	-0.0003562	-0.0003562	0.99999622
31368-10	6/19/2018	10:46:57 AM	0.0510971	0.1338178	13.381779	µg	0.05	5	0.0511403	0.1339306	13.39306	0.0510538	0.133705	13.370499	0.99999622
31368-10 DUP	6/19/2018	10:48:52 AM	0.050834	0.1331314	13.313138	µg	0.05	5	0.0508362	0.1331371	13.313705	0.0508318	0.1331257	13.31257	0.99999622
31368-10 SPK	6/19/2018	10:50:47 AM	0.0781564	0.2044304	20.443043	µg	0.05	5	0.0780306	0.2041021	20.410215	0.0782822	0.2047587	20.475871	0.99999622
0.004ug = DL	6/19/2018	11:02:04 AM	0.001405	0.0036665	0.0036665	µg			0.0013919	0.0036323	0.0036323	0.0014182	0.0037008	0.0037008	0.99999622
0.080ug = QC STD 2	6/19/2018	11:03:46 AM	0.02921	0.076225	0.076225	µg			0.0291619	0.0760994	0.0760994	0.0292582	0.0763507	0.0763507	0.99999622
Reagent Blank	6/19/2018	11:05:38 AM	-8.86E-05	-0.0002311	-0.0002311	µg			4.37E-05	0.0001142	0.0001142	-0.0002209	-0.0005764	-0.0005764	0.99999622
31368-5 B	6/19/2018	11:09:14 AM	0.0001764	0.0009378	0.1172268	µg	4	500	0.0001851	0.0009605	0.120059	0.0001677	0.0009152	0.1143946	0.99999622
31368-6 B	6/19/2018	11:10:56 AM	-1.23E-05	0.0004455	0.0556863	µg	4	500	2.41E-05	0.0005404	0.0675535	-4.87E-05	0.0003506	0.0438191	0.99999622
0.004ug = DL	6/19/2018	11:25:44 AM	0.001372	0.0035804	0.0035804	µg			0.0013461	0.0035128	0.0035128	0.0013979	0.003648	0.003648	0.99999622
0.080ug = QC STD 2	6/19/2018	11:27:26 AM	0.0292908	0.0764359	0.0764359	µg			0.0293017	0.0764642	0.0764642	0.02928	0.0764076	0.0764076	0.99999622
Reagent Blank	6/19/2018	11:29:19 AM	-0.0001229	-0.0003207	-0.0003207	µg			-0.0001841	-0.0004805	-0.0004805	-6.16E-05	-0.0001609	-0.0001609	0.99999622
Calib Blank	6/20/2018	9:12:41 AM	0.0002328			µg			0.0002248			0.0002409			
STD1 = .004ug	6/20/2018	9:14:22 AM	0.0013591			µg			0.0013564			0.0013618			
STD2 = .04ug	6/20/2018	9:16:05 AM	0.0134926			µg			0.0135189			0.0134663			
STD3 = .08ug	6/20/2018	9:18:00 AM	0.0269172			µg			0.0269939			0.0268404			
STD4 = .16ug	6/20/2018	9:19:54 AM	0.0540921			µg			0.0543094			0.0538748			
STD5 = .2ug	6/20/2018	9:21:48 AM	0.0670589			µg			0.067114			0.0670037			
Reagent Blank	6/20/2018	9:23:40 AM	2.26E-05	6.73E-05	6.73E-05	µg			1.14E-05	3.38E-05	3.38E-05	3.39E-05	0.0001007	0.0001007	
0.004ug = DL	6/20/2018	9:25:21 AM	0.0013982	0.0041561	0.0041561	µg			0.0014013	0.0041655	0.0041655	0.001395	0.0041467	0.0041467	0.99997981
0.080ug = QC STD 3	6/20/2018	9:27:04 AM	0.0256662	0.0762936	0.0762936	µg			0.0256814	0.076339	0.076339	0.0256509	0.0762481	0.0762481	0.99997981
0.080ug = QC STD 2	6/20/2018	9:28:57 AM	0.0257575	0.0765652	0.0765652	µg			0.0257111	0.076427	0.076427	0.025804	0.0767033	0.0767033	0.99997981
Reagent Blank	6/20/2018	9:30:49 AM	4.36E-05	0.0001296	0.0001296	µg			4.87E-05	0.0001447	0.0001447	3.85E-05	0.0001144	0.0001144	0.99997981
31368-9	6/20/2018	9:36:09 AM	0.0544254	0.1617141	16.171413	µg	1	100	0.054444	0.1617695	16.176947	0.0544068	0.1616588	16.165878	0.99997981
31368-1 C	6/20/2018	9:41:53 AM	0.0588858	0.1749728	17.497278	µg	4	400	0.0589815	0.1752572	17.525723	0.0587901	0.1746883	17.468833	0.99997981
0.004ug = DL	6/20/2018	9:51:18 AM	0.0014801	0.0043996	0.0043996	µg			0.0014531	0.0043193	0.0043193	0.0015071	0.0044799	0.0044799	0.99997981
0.080ug = QC STD 2	6/20/2018	9:53:00 AM	0.0281076	0.0835508	0.0835508	µg			0.0282762	0.0840519	0.0840519	0.027939	0.0830496	0.0830496	0.99997981
Reagent Blank	6/20/2018	9:54:53 AM	2.41E-05	7.17E-05	7.17E-05	µg			3.13E-05	9.29E-05	9.29E-05	1.70E-05	5.05E-05	5.05E-05	0.99997981
31368-4 C	6/20/2018	9:56:34 AM	0.0342375	0.1017051	10.170507	µg	4	400	0.0342727	0.1018097	10.180966	0.0342024	0.1016005	10.160049	0.99997981
31368-5 C	6/20/2018	9:58:27 AM	0.0002556	0.0006924	0.0692411	µg	4	400	0.0002465	0.0006655	0.0665495	0.0002646	0.0007193	0.0719327	0.99997981
31368-6 C	6/20/2018	10:00:10 AM	0.0005026	0.0014266	0.142663	µg	4	400	0.0005164	0.0014679	0.1467858	0.0004887	0.0013854	0.1385401	0.99997981
31368-2 B	6/20/2018	10:03:47 AM	0.0270274	0.0802725	10.034064	µg	0.5	500	0.0270492	0.0803375	80.337513	0.0270055	0.0802075	80.207519	0.99997981
31368-2 B DUP	6/20/2018	10:05:41 AM	0.0262673	0.0780132	9.7516507	µg	0.5	500	0.0261502	0.077665	77.665045	0.0263844	0.0783614	78.361366	0.99997981
31368-4 B	6/20/2018	10:11:23 AM	0.0260035	0.0772291	9.653639	µg	4	500	0.0259916	0.0771937	9.6492179	0.0260154	0.0772645	9.65806	0.99997981
31368-LRB FH	6/20/2018	10:13:17 AM	0.0001335	0.0003295	0.0082368	µg	1	100	0.0001547	0.0003926	0.0392598	0.0001122	0.0002663	0.0266344	0.99997981
0.004ug = DL	6/20/2018	10:14:59 AM	0.001574	0.0046787	0.0046787	µg			0.0015772	0.0046884	0.0046884	0.0015707	0.004669	0.004669	0.99997981
0.080ug = QC STD 2	6/20/2018	10:16:41 AM	0.0281875	0.0837883	0.0837883	µg			0.0281519	0.0836826	0.0836826	0.028223	0.083894	0.083894	0.99997981
Reagent Blank	6/20/2018	10:18:34 AM	0.0001399	0.0004158	0.0004158	µg			0.0001381	0.0004105	0.0004105	0.0001417	0.0004212	0.0004212	0.99997981

PerkinElmer FIMS-100 CVAA Mercury Analyzer

Sample_ID	Date	Time	Mean_Sig	Mean_Rd	Mean_Rt	Units	Alq.	Vol.	Sig 1	Reading-1	Result-1	Sig 2	Reading-2	Result-2	Cor. Coeff.
31368-LRB FH SPK	6/20/2018	10:20:16 AM	0.0252578	0.0750126	4.6882869	µg	1.6	100	0.0253153	0.0751834	4.6989595	0.0252004	0.0748418	4.6776143	0.99997981
31368-1 FH	6/20/2018	10:22:09 AM	0.0006871	0.0019752	0.0493792	µg	4	100	0.0006805	0.0019554	0.0488854	0.0006937	0.0019949	0.049873	0.99997981
31368-2 FH	6/20/2018	10:23:51 AM	0.0010339	0.0030059	0.0751486	µg	4	100	0.0010163	0.0029537	0.0738426	0.0010514	0.0030582	0.0764545	0.99997981
31368-2 FH DUP	6/20/2018	10:25:34 AM	0.0010568	0.0030742	0.0768551	µg	4	100	0.0010419	0.0030297	0.0757425	0.0010718	0.0031187	0.0779678	0.99997981
31368-3 FH	6/20/2018	10:27:17 AM	0.0011456	0.0033381	0.0834526	µg	4	100	0.0011486	0.003347	0.0836739	0.0011426	0.0033293	0.0832313	0.99997981
31368-3 FH SPK	6/20/2018	10:29:00 AM	0.0318873	0.0947188	2.3679703	µg	4	100	0.0319312	0.0948493	2.3712325	0.0318434	0.0945883	2.3647081	0.99997981
31368-4 FH	6/20/2018	10:30:54 AM	0.0005225	0.0014859	0.0371475	µg	4	100	0.0005278	0.0015017	0.0375429	0.0005172	0.0014701	0.0367521	0.99997981
31368-5 FH	6/20/2018	10:32:38 AM	0.0002848	0.0007794	0.0194854	µg	4	100	0.0002839	0.0007765	0.0194126	0.0002858	0.0007823	0.0195582	0.99997981
31368-6 FH	6/20/2018	10:34:22 AM	0.0004788	0.001356	0.0338998	µg	4	100	0.0004768	0.00135	0.0337512	0.0004808	0.0013619	0.0340484	0.99997981
0.004ug = DL	6/20/2018	10:37:58 AM	0.0015919	0.0047318	0.0047318	µg			0.0016049	0.0047705	0.0047705	0.0015788	0.0046931	0.0046931	0.99997981
0.080ug = QC STD 2	6/20/2018	10:39:40 AM	0.0285349	0.084821	0.084821	µg			0.0285812	0.0849585	0.0849585	0.0284886	0.0846835	0.0846835	0.99997981
Reagent Blank	6/20/2018	10:41:32 AM	0.0001354	0.0004024	0.0004024	µg			0.0001435	0.0004264	0.0004264	0.0001273	0.0003784	0.0003784	0.99997981
Calib Blank	6/20/2018	11:05:19 AM	0.0005793			µg			0.0002706			0.000888			
STD1 = .004ug	6/20/2018	11:07:02 AM	0.0019935			µg			0.0020501			0.0019369			
STD2 = .04ug	6/20/2018	11:08:44 AM	0.0163529			µg			0.0163667			0.0163391			
STD3 = .08ug	6/20/2018	11:10:39 AM	0.0320206			µg			0.0321378			0.0319033			
STD4 = .16ug	6/20/2018	11:12:34 AM	0.063096			µg			0.0630141			0.0631778			
STD5 = .2ug	6/20/2018	11:14:27 AM	0.0782141			µg			0.0781116			0.0783165			
Reagent Blank	6/20/2018	11:16:19 AM	0.0003454	0.0008779	0.0008779	µg			0.0003158	0.0008027	0.0008027	0.000375	0.0009531	0.0009531	
0.004ug = DL	6/20/2018	11:18:01 AM	0.0018703	0.0047536	0.0047536	µg			0.0018805	0.0047796	0.0047796	0.0018601	0.0047276	0.0047276	0.99986748
0.080ug = QC STD 3	6/20/2018	11:19:43 AM	0.0300584	0.0763958	0.0763958	µg			0.0300879	0.0764707	0.0764707	0.0300289	0.0763208	0.0763208	0.99986748
0.080ug = QC STD 2	6/20/2018	11:21:36 AM	0.0299669	0.0761631	0.0761631	µg			0.0298781	0.0759374	0.0759374	0.0300557	0.0763888	0.0763888	0.99986748
Reagent Blank	6/20/2018	11:23:28 AM	0.0003718	0.000945	0.000945	µg			0.0003477	0.0008837	0.0008837	0.0003959	0.0010063	0.0010063	0.99986748
0.004ug = DL	6/20/2018	12:32:28 PM	0.0018329	0.0046584	0.0046584	µg			0.0018454	0.0046903	0.0046903	0.0018204	0.0046266	0.0046266	0.99986748
0.080ug = QC STD 2	6/20/2018	12:34:10 PM	0.0321148	0.0816222	0.0816222	µg			0.0323356	0.0821833	0.0821833	0.0318941	0.0810612	0.0810612	0.99986748
Reagent Blank	6/20/2018	12:36:02 PM	0.0001575	0.0004004	0.0004004	µg			0.0001806	0.000459	0.000459	0.0001345	0.0003418	0.0003418	0.99986748
31368-2 C	6/20/2018	12:43:27 PM	0.0391313	0.0985774	19.715484	µg	2	400	0.0392966	0.0989975	19.799505	0.0389661	0.0981573	19.631463	0.99986748
31368-2 C DUP	6/20/2018	12:45:22 PM	0.0379677	0.09562	19.124002	µg	2	400	0.0377195	0.0949892	18.997842	0.0382159	0.0962508	19.250163	0.99986748
31368-3 C	6/20/2018	12:47:18 PM	0.0400097	0.1008099	100.80989	µg	0.4	400	0.0400159	0.1008255	100.82554	0.0400036	0.1007942	100.79424	0.99986748
31368-3 C SPK	6/20/2018	12:49:13 PM	0.0720337	0.1822014	182.20138	µg	0.4	400	0.0723684	0.1830518	183.05184	0.0716991	0.1813509	181.35091	0.99986748
0.004ug = DL	6/20/2018	12:51:06 PM	0.0018594	0.0047258	0.0047258	µg			0.0018475	0.0046955	0.0046955	0.0018713	0.0047561	0.0047561	0.99986748
0.080ug = QC STD 3	6/20/2018	12:52:48 PM	0.0317486	0.0806916	0.0806916	µg			0.031729	0.0806418	0.0806418	0.0317682	0.0807414	0.0807414	0.99986748
Reagent Blank	6/20/2018	12:54:41 PM	0.0002111	0.0005364	0.0005364	µg			0.0002168	0.0005511	0.0005511	0.0002053	0.0005218	0.0005218	0.99986748
Calib Blank	6/21/2018	10:45:40 AM	0.0002303			µg			0.0002167			0.0002438			
STD1 = .004ug	6/21/2018	10:47:22 AM	0.0014462			µg			0.001486			0.0014064			
STD2 = .04ug	6/21/2018	10:49:05 AM	0.0150542			µg			0.0153235			0.0147849			
STD3 = .08ug	6/21/2018	10:50:59 AM	0.0291811			µg			0.0295606			0.0288017			
STD4 = .16ug	6/21/2018	10:52:54 AM	0.0607169			µg			0.0616011			0.0598328			
STD5 = .2ug	6/21/2018	10:54:49 AM	0.0743148			µg			0.075114			0.0735157			
Reagent Blank	6/21/2018	10:56:41 AM	-6.60E-05	-0.0001765	-0.0001765	µg			-6.89E-05	-0.0001843	-0.0001843	-6.31E-05	-0.0001688	-0.0001688	
0.004ug = DL	6/21/2018	10:58:23 AM	0.0014443	0.0038629	0.0038629	µg			0.0014635	0.0039142	0.0039142	0.0014251	0.0038116	0.0038116	0.99979153
0.080ug = QC STD 3	6/21/2018	11:00:06 AM	0.0276693	0.0740037	0.0740037	µg			0.0280462	0.0750118	0.0750118	0.0272923	0.0729956	0.0729956	0.99979153
0.080ug = QC STD 2	6/21/2018	11:05:44 AM	0.0286836	0.0767167	0.0767167	µg			0.0288845	0.0772539	0.0772539	0.0284828	0.0761796	0.0761796	0.99979153
Reagent Blank	6/21/2018	11:07:37 AM	-6.74E-05	-0.0001802	-0.0001802	µg			-6.56E-05	-0.0001754	-0.0001754	-6.92E-05	-0.0001851	-0.0001851	0.99979153
31368-1 B	6/21/2018	11:20:26 AM	0.0034082	0.0092921	23.23029	µg	0.02	500	0.003399	0.0092675	231.68806	0.0034174	0.0093167	232.91775	0.99979153
31368-3 B	6/21/2018	11:22:10 AM	0.0030445	0.0083193	20.798197	µg	0.02	500	0.0029965	0.008191	204.77598	0.0030924	0.0084475	211.18797	0.99979153
31368-3 B SPK	6/21/2018	11:23:53 AM	0.0301869	0.0809139	202.2847	µg	0.02	500	0.0298943	0.0801313	2003.2822	0.0304795	0.0816965	2042.4119	0.99979153
0.004ug = DL	6/21/2018	11:27:40 AM	0.0013639	0.0036478	0.0036478	µg			0.0013775	0.0036842	0.0036842	0.0013502	0.0036113	0.0036113	0.99979153
0.080ug = QC STD 2	6/21/2018	11:33:08 AM	0.0282898	0.0756634	0.0756634	µg			0.0284427	0.0760724	0.0760724	0.0281369	0.0752543	0.0752543	0.99979153
Reagent Blank	6/21/2018	11:35:01 AM	-7.60E-05	-0.0002033	-0.0002033	µg			-7.84E-05	-0.0002097	-0.0002097	-7.36E-05	-0.0001968	-0.0001968	0.99979153

ERA
A Waters Company

June 21, 2018

Ben Hilgendorf
Montrose Environmental Services
1371 Brummel Ave.
Elk Grove Village, IL 60007

Enclosed is your final report for ERA's Stationary Source Audit Sample (SSAS) Program. Your final report includes an evaluation of all results submitted by your laboratory to ERA.

Data Evaluation Protocols: All analytes in ERA's SSAS Program have been evaluated comparing the reported result to the acceptance limits generated using the criteria contained in the TNI SSAS Table.

For any "Not Acceptable" results, please contact your state regulator for any corrective action requirements.

Thank you for your participation in ERA's SSAS Program. If you have any questions, please contact our Proficiency Testing Department at 1-800-372-0122.

Sincerely,

Matthew Seebeck
Quality Officer

cc: Project File Number 061318S

ERA
A Waters Company

Recipient Type	Report Recipient	Contact	Project ID
Agency	IL EPA Des Plains (SSAS) 9511 Harrison Street Des Plaines, IL 60016 USA	Kevin Mattison kevin.mattison@illinois.gov Phone: 847-294-4019	
Facility	General Iron Industries 1909 N Clifton Ave Chicago, IL 60614 USA	John Pinion jpinion@rka-inc.com Phone: 630-393-9000 x 208	
Lab	Element One Inc 6319-D Carolina Beach Road Wilmington, NC 28412 USA	Paula Smith paula.smith@e1lab.com Phone: 910-793-0128	
Tester	Montrose Environmental Services 1371 Brummel Ave. Elk Grove Village, IL 60007 USA	Ben Hilgendorf bhilgendorf@montrose-env.com Phone: 630-860-4740	General Iron Industries

ACCREDITED

Project # : 061318S

ERA
A Waters Company

061318S Laboratory Exception Report

Paula Smith
Element One Inc
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128

EPA ID: Not Reported
ERA Customer Number: E533235

Evaluation Checks

There are no values reported with < where the assigned value was greater than 0.

Not Acceptable Evaluations

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description
SSAP Metals on Filter Paper (cat# 1425, lot# 061318S) Study Dates: 06/13/18 - 06/21/18							
1030	Cadmium	µg/Filter	16.0	20.6	16.5 - 24.7	Not Acceptable	EPA Method 29 2000

B-277

R 001587

A Waters Company

Final Report Results For Laboratory
Element One Inc

B-278

R 001588

GI000455

ERA
A Waters Company

SSAP Evaluation Report

Project Number: **061318S**

ERA Customer Number: **E533235**

Laboratory Name: **Element One Inc**

B-279

Inorganic Results

R 001589

GI000456

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061318S Evaluation Final Complete Report

Paula Smith
Element One Inc
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128

EPA ID: Not Reported
ERA Customer Number: E533235

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Metals in Impinger Solution (cat# 1426, lot# 061318S) Study Dates: 06/13/18 - 06/21/18									
1005	Antimony	µg/mL	0.896	1.05	0.788 - 1.31	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1010	Arsenic	µg/mL	1.13	1.20	0.900 - 1.50	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1015	Barium	µg/mL	3.28	3.19	2.39 - 3.99	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1020	Beryllium	µg/mL	1.41	1.40	1.05 - 1.75	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1030	Cadmium	µg/mL	1.07	1.06	0.848 - 1.27	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1040	Chromium	µg/mL	4.05	3.99	3.19 - 4.79	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1050	Cobalt	µg/mL	2.02	1.99	1.49 - 2.49	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1055	Copper	µg/mL	3.74	3.83	2.87 - 4.79	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1075	Lead	µg/mL	2.96	2.94	2.20 - 3.68	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1090	Manganese	µg/mL	1.86	1.96	1.47 - 2.45	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1105	Nickel	µg/mL	2.65	2.74	2.19 - 3.29	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1140	Selenium	µg/mL	1.90	1.97	1.48 - 2.46	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1150	Silver	µg/mL	4.71	4.77	3.58 - 5.96	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1165	Thallium	µg/mL	3.02	3.06	2.30 - 3.82	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1190	Zinc	µg/mL	2.86	2.84	2.13 - 3.55	Acceptable	EPA Method 29 2000	6/19/2018	DMR

B-280

R 001590

GI000457

ERA
A Waters Company

061318S Evaluation Final Complete Report

Paula Smith
Element One Inc
6319-D Carolina Beach Road
Wilmington, NC 28412
910-793-0128

EPA ID: Not Reported
ERA Customer Number: E533235

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Analyst Name
SSAP Metals on Filter Paper (cat# 1425, lot# 061318S) Study Dates: 06/13/18 - 06/21/18									
1005	Antimony	µg/Filter	40.7	42.5	31.9 - 53.1	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1010	Arsenic	µg/Filter	38.7	39.7	29.8 - 49.6	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1015	Barium	µg/Filter	39.7	41.8	31.4 - 52.2	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1020	Beryllium	µg/Filter	21.7	21.6	16.2 - 27.0	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1030	Cadmium	µg/Filter	16.0	20.6	16.5 - 24.7	Not Acceptable	EPA Method 29 2000	6/19/2018	DMR
1040	Chromium	µg/Filter	26.7	28.2	22.6 - 33.8	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1050	Cobalt	µg/Filter	23.1	22.1	16.6 - 27.6	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1055	Copper	µg/Filter	30.2	30.9	23.2 - 38.6	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1075	Lead	µg/Filter	35.9	36.9	29.5 - 44.3	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1090	Manganese	µg/Filter	41.6	42.9	34.3 - 51.5	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1105	Nickel	µg/Filter	38.6	38.3	30.6 - 46.0	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1140	Selenium	µg/Filter	38.7	40.7	30.5 - 50.9	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1150	Silver	µg/Filter	59.5	57.2	40.0 - 74.4	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1165	Thallium	µg/Filter	53.8	55.5	41.6 - 69.4	Acceptable	EPA Method 29 2000	6/19/2018	DMR
1190	Zinc	µg/Filter	45.9	45.2	33.9 - 56.5	Acceptable	EPA Method 29 2000	6/19/2018	DMR
SSAP Mercury on Filter Paper (cat# 1427, lot# 061318S) Study Dates: 06/13/18 - 06/21/18									
1095	Mercury	µg/Filter	16.2	18.3	13.7 - 22.9	Acceptable	EPA Method 29 2000	6/20/2018	MMP
SSAP Mercury in Impinger Solution (cat# 1428, lot# 061318S) Study Dates: 06/13/18 - 06/21/18									
1095	Mercury	ng/mL	13.3	15.1	11.3 - 18.9	Acceptable	EPA Method 29 2000	6/19/2018	MMP

B-281

R 001591

GI0000458

APPENDIX G
CALIBRATION DATA

Montrose Air Quality Services, LLC
Meter Box Full Test Calibration

Date: 1/30/2018 Operator: J burton

Meter Box ID M-39					Meter Box ΔH@ 1.899			Meter Box Y_d 0.9987				Barometric Pressure (in. Hg.) 29.70			
Time	**Orifice Data**				**Meter Box Data**								**Results**		
θ (min)	K'	Vacuum	T_{amb}	V_{cr}	$V_{initial}$	V_{final}	V_d	ΔH	T_i	T_o	T_{avg}	V_{mstd}	Q	Y_d	ΔH@
5.0	0.7904	18.0	69	5.103	561.60	566.77	5.17	3.60	79	72	75.5	5.103	1.021	1.0000	1.942
5.0	0.7904	18.0	69	5.103	566.77	571.93	5.16	3.60	81	73	77.0	5.079	1.021	1.0048	1.955
5.0	0.7904	18.0	69	5.103	571.93	577.11	5.18	3.60	82	73	77.5	5.094	1.021	1.0018	1.941
5.0	0.5959	20.0	69	3.847	579.00	582.89	3.89	2.00	82	74	78.0	3.807	0.769	1.0107	1.914
5.0	0.5959	20.0	69	3.847	582.89	586.78	3.89	2.00	82	75	78.5	3.803	0.769	1.0116	1.916
5.0	0.5959	20.0	69	3.847	586.78	590.67	3.89	2.00	82	75	78.5	3.803	0.769	1.0116	1.916
5.0	0.4418	22.0	69	2.852	591.60	594.56	2.96	1.10	81	76	78.5	2.888	0.570	0.9878	1.820
5.0	0.4418	22.0	69	2.852	594.66	597.53	2.97	1.10	81	77	79.0	2.895	0.570	0.9854	1.810
5.0	0.4418	22.0	69	2.852	597.53	600.48	2.95	1.10	81	77	79.0	2.875	0.570	0.9921	1.834
5.0	0.3452	24.0	69	2.229	600.90	603.20	2.30	0.70	80	77	78.5	2.242	0.446	0.9943	1.918
5.0	0.3452	24.0	69	2.229	603.20	605.51	2.31	0.70	80	77	78.5	2.251	0.446	0.9900	1.902
5.0	0.3452	24.0	69	2.229	605.51	607.81	2.30	0.70	80	77	78.5	2.242	0.446	0.9943	1.918
5.0				0.000			0.00				#DIV/0!	#DIV/0!	0.000	#DIV/0!	#DIV/0!
5.0				0.000			0.00				#DIV/0!	#DIV/0!	0.000	#DIV/0!	#DIV/0!
5.0				0.000			0.00				#DIV/0!	#DIV/0!	0.000	#DIV/0!	#DIV/0!
													Average	0.9987	1.899

Nomenclature	
K'	Critical Orifice Coefficient
T_{amb}	Ambient Temperature (°F)
V_{cr}	Volume Through Orifice (scf)
V_d	Gas Meter Volume (ft³)
ΔH	Orifice Pressure Differential (in. H_2O)
T_i	Meter Inlet Temperature (°F)
T_o	Meter Outlet Temperauture (°F)
T_{avg}	Average Meter Box Temperature (°F)
V_{mstd}	Volume Metered Standardized (scf)
Q	Flow Rate (scfm)
Y_d	Meter Correction Factor (dimensionless)
ΔH@	ΔH yielding 0.75 scfm

Vacuum Guage (in. Hg.)		**Thermometers (°F)**				**Equations**
Standard	Vacuum Gauge	Standard	Ch. No. 1	Ch. No. 2	Ch. No. 3	
5	5.0	32	32	32	32	
10	10.0	50	50	51	50	
15	15.0	100	100	101	101	
20	20.0	150	151	151	151	
25	25.0	212	213	213	214	
		250	251	252	252	
		300	301	302	302	
		350	351	352	352	
		400	401	402	402	
		500	501	502	502	
		600	601	602	602	

B-283

R 001593

GI000460

Montrose Air Quality Services, LLC
Meter Post Calibration

Average Field Sample Rate (cfm)	1.600	Date	6/18/2018
Highest Field Vacuum (inches Hg)	11	Client	Iron Ind. Inc.
Critical Orifice ID	AA-63	Project No.	023AS-383040
Orifice Flow Rate (cfm)	0.790	Meter ID	M-39

	Run 1	Run 2	Run 3
Initial Volume (ft^3)	211.40	215.35	219.30
Final Volume (ft^3)	215.35	219.30	223.25
Volume Metered (ft^3)	3.95	3.95	3.95
DGM Inlet Temperature (°F)	83	84	85
DGM Outlet Temperature (°F)	78	78	79
Average DGM Temperature (°F)	80.5	81.0	82.0
Ambient Temperature (°F)	73	73	73
Elapsed Time (min.)	5	5	5
ΔH (inches H_2O)	2.00	2.00	2.00
Barometric Pressure (inches Hg)	29.14	29.14	29.14
Pump Vacuum (inches Hg)	21	21	21
K'	0.5909	0.5909	0.5909
Vcr (ft^3)	3.729	3.729	3.729
Vmstd (ft^3)	3.776	3.772	3.765
Post Test Yc	0.9877	0.9886	0.9905
Full Test Yd	0.9987	0.9987	0.9987
% Difference	1.10	1.01	0.82
	Average % Difference		0.98

Montrose Air Quality Services, LLC
S-Type Pitot Tube Inspection Form

Date 3/9/18
Pitot ID AE5-6-7
Operator DD

	Measured	Allowed
Outside Tube Diameter - Dt (inches)	0.250	NA
Base To Opening Distance - Pa (inches)	0.356	NA
Base To Opening Distance - Pb (inches)	0.356	NA
Pa/Dt	1.42	1.05-1.50
Pb/Dt	1.42	1.05-1.50
Angle α1(°)	0.3	10
Angle α2(°)	0.7	10
Angle B1(°)	1.3	5
Angle B2(°)	0.7	5
Opening to Opening Distance Pa+Pb (inches)	0.712	NA
Angle Z (°)	0.9	NA
z (inches)	0.0112	0.125
Angle W (°)	0.1	NA
w (inches)	0.001	0.031

Note Any Damage, Nicks or Dents to the Pitot Tube

Is the Pitot Tube Part of an Assembly Yes
If Yes, Complete the Section Below

Pitot	Measured	Minimum
Distance From Nozzle (inches)	NA	0.75 in.
Pitot to Thermocouple Distance (inches)	2.25	2 in.
Pitot to Sample Probe Distance (inches)	6.25	3 in.

Does the Pitot Tube Meet the Above Requirements Yes
Is the Pitot Tube Free of Damage Yes

If Yes to Both, a Pitot Tube Coefficient of 0.84 is Assigned
If No to Either, then the Pitot Tube Must be Calibrated

MONTROSE AIR QUALITY SERVICES, LLC
Nozzle Calibration Datasheet

Client	Ferro Industries Inc	Job No.	451732
Plant	Chicago, IL		

	Nozzle 1	Nozzle 2	Nozzle 3
Date	6/13/18		
Nozzle ID	.17		
Operator	BH		
Test Location	Hammer Mill Shredder		
Run Number (s)	1,2,3,4,5		
Diameter 1	.170		
Diameter 2	.169		
Diameter 3	.171		
Average	.170		

	Nozzle 4	Nozzle 5	Nozzle 6
Date			
Nozzle ID			
Operator			
Test Location			
Run Number (s)			
Diameter 1			
Diameter 2			
Diameter 3			
Average			

Notes:
Measurements must be made to the nearest 0.001 inches.
Three different diameters should be measured.
The difference between the high and low measurement must be less than 0.004 inches.

Signed [signature] Date 6/13/18

Airtech Environmental Services Inc.
Field Balance Daily Calibration Check

Project No.	451738
Project Name	Iron Industries
Balance ID	Scale 2

Date	Actual Weight Value (grams)	Measured Weight Value (grams)	Difference (grams)
6/13/18	500	499.9	-.1
6/14/18	500	500.1	.1

Notes:
At least one weight that is 500 grams or within 50 grams of the weight of a loaded impinger must be used for the daily calibration check.
The difference between the actual and measured value of the weight must be no more than 0.5 grams.

Signed: [signature] Date: 6/13/18
6/14/18

Airgas.

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI74E15A2VT6	Reference Number:	54-124542331-1
Cylinder Number:	XC025171B	Cylinder Volume:	149.0 CF
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12016	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Mar 08, 2016

Expiration Date: Mar 08, 2024

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	5.000 %	4.885 %	G1	+/- 1.0% NIST Traceable	03/08/2016
OXYGEN	21.00 %	20.95 %	G1	+/- 0.5% NIST Traceable	03/08/2016
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	97050816	SG9167630BAL	7.029 % CARBON DIOXIDE/NITROGEN	+/- 0.5%	May 01, 2016
NTRM	12062016	CC367570	22.88 % OXYGEN/NITROGEN	+/- 0.2%	Apr 24, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Feb 16, 2016
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Feb 16, 2016

Triad Data Available Upon Request

Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
12722 S. Wentworth Ave.
Chicago, IL 60628
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: EPA Protocol

Part Number:	E03NI80E15A0138	Reference Number:	54-401086478-1
Cylinder Number:	CC167397	Cylinder Volume:	150.9 CF
Laboratory:	124 - Chicago (SAP) - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12017	Valve Outlet:	590
Gas Code:	CO2,O2,BALN	Certification Date:	Dec 26, 2017

Expiration Date: Dec 26, 2025

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
CARBON DIOXIDE	10.00 %	9.859 %	G1	+/- 0.9% NIST Traceable	12/26/2017
OXYGEN	10.00 %	9.971 %	G1	+/- 0.8% NIST Traceable	12/26/2017
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12061359	CC361050	11.002 % CARBON DIOXIDE/NITROGEN	+/- 0.6%	Jan 11, 2018
NTRM	98051005	SG9161123BAL	12.05 % OXYGEN/NITROGEN	+/- 0.7%	Dec 14, 2023

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
CO2-1 HORIBA VIA-510 V1E3H7P5	NDIR	Dec 03, 2017
O2-1 HORIBA MPA-510 3VUYL9NR	Paramagnetic	Dec 03, 2017

Triad Data Available Upon Request

Approved for Release

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If you have any questions, please contact one of the following individuals by email or phone.

Name: Mr. Matthew Libman
Title: District Manager
Region: Great Lakes Region
Email: mlibman@Montrose-env.com
Phone: (630) 860-4740

Name: Mr. Michael Hess
Title: Client Project Manager
Region: Great Lakes Region
Email: mhess@Montrose-env.com
Phone: (630) 860-4740

MONTROSE AIR QUALITY SERVICES

RK
& Associates, Inc.

Construction Permit Application for New Scrap Metal Recycling Facility

General III, LLC
11600 South Burley
Chicago, Illinois 60614

September 20, 2019

APPENDIX C

INSTITUTE IF SCRAP RECYCLING INDUSTRIES TITLE V WORKBOOK SELECT EMISSION FACTOR TABLES

Versar INC.

Title V Applicability

Workbook

Prepared for:

INSTITUTE OF SCRAP RECYCLING INDUSTRIES, INC.
1325 G Street, NW
Washington, DC 20005-3104
(202) 737-1770

Institute of Scrap Recycling Industries, Inc.
THE ORIGINAL RECYCLERS

Prepared by:

Versar, Inc.
200 West 22nd Street, Suite 250
Lombard, IL 60148

Second Printing, 1998

Table D-9. Conveyor Transfer Point Emission Factors[(1)(2)]

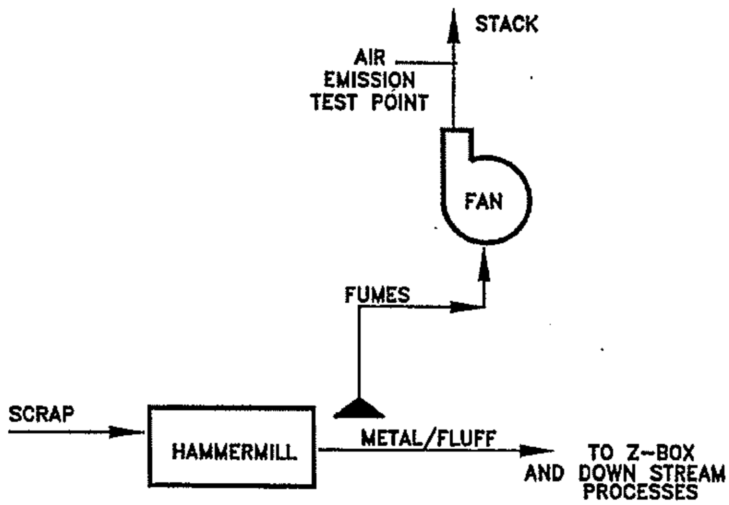
	Total PM[(3)]	Criteria Air Pollutant Factors (lb pollutant/ton transferred)						Hazardous Air Pollutant Factors (lb pollutant/ton transferred)
		PM-10 (Incl. in total PM)	NO_x	VOC	CO	SO_2	Lead (included in total PM)	HAP
Dry Operation	no data[(4)]	0.0014	0.0	0.0	0.0	0.0	no data	no data
Wet Operation	no data[(4)]	0.00048	0.0	0.0	0.0	0.0	no data	no data

(1) Emission factors applicable to conveyor transfer points for scrap in feed materials or products are not available. A conservative estimate of PM-10 emissions can 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.

(2) Note: Some states classify transfer points as fugitive sources. In the case that they are considered fugitive, transfer point emissions would not be included in determining major source classification. However, contact your state or local Agency to verify whether transfer point emissions are considered fugitive or point source.

(3) Recent EPA guidance states that only PM_{10} is to be included for Title V applicability. However, individual states may require reporting total PM.

(4) Emission factors available for PM-10 only. Guidance in AP-42, Section 11.19.2 indicates that total PM may be estimated by multiplying the PM-10 factor by 2.1.



VOC's	HAP?	Emission Rate (lb/hr)	Emission Factor (lb/ton feed)
Methylene Chloride	Yes	0.009	0.00006
Acetone (1)	No	0.002	0.0000133
1,1-Dichloroethene	No	0.002	0.0000133
2-Butanone (MEK)	Yes	0.0008	0.00000533
1,1,1-Trichloroethane	Yes	0.03	0.0002
Benzene	Yes	0.06	0.0004
Tetrachloroethene	Yes	0.0004	0.00000267
Trichloroethene	Yes	0.01	0.0000667
Toluene	Yes	0.05	0.000333
Ethylbenzene	Yes	0.01	0.0000667
Styrene	Yes	0.002	0.0000133
O-Xylene	Yes	0.01	0.0000667
M-/P-Xylene	Yes	0.02	0.000133
Total VOC		0.2042	0.00136
Total PCB's	Yes	0.0131	0.0000873
Metals			
Cadmium	Yes	0.000174	0.00000116
Chromium	Yes	0.000192	0.00000128
Lead	Yes	0.00118	0.00000789
Total Metals		0.001546	0.0014456

Total HAPs (VOC, PCB, Metals)	0.214846	0.00143

3 Run Average Total Hydrocarbon (THC) = 7.53 lb/hr

(1) = DELISTED AS A VOC PER USEPA GUIDANCE

% of THC that is VOC = 2.71%

% of THC that is HAP = 2.85%

FEED MIX - 75% AUTO BODIES, 25% MIXED SCRAP AND WHITE GOODS.
ALL AUTO BODIES HAVE BATTERIES, GAS TANKS, TIRES, RADIATORS, AND TRANSMISSIONS REMOVED. ABOUT 50% OF AUTO BODIES HAVE ENGINES REMOVED. 75% OF AUTOS FULLY DRAINED, OTHER 25% OF AUTOS AT LEAST 60% DRAINED. TEMPORARY HOOD, FAN, AND STACK CONSTRUCTED FOR TEST.
NOTE: SCRAP THROUGHPUT OF SHREDDER = 150 TONS/HR

TABLE D-11.F

ORGANICS AND METALS EMISSION TEST FOR: MILL DEFUMER W/NO CONTROLS.

CAD FILE: G:\......\30071Q.DWG

R 001605

KATHY PINION
630-393-9000
RK & ASSOCIATES, INC.
2S631 STATE ROUTE 59
WARRENVILLE IL 60555

8 LBS

1 OF 1

DWT: 18,13,3

SHIP TO:

BUREAU OF AIR
217-782-3397
ILLINOIS EPA
P.O. BOX 19276
1021 NORTH GRAND AVE., EAST
SPRINGFIELD IL 62702

IL 627 0-01

UPS NEXT DAY AIR **1**

TRACKING #: 1Z 455 4W3 01 9123 9512

BILLING: P/P

Reference #1: Mr. Ray Pilapal
Reference #2: R17421-7

XOL 19.09.23 NV45 15.0A 07/2019

031600SFX
19 09 0021

RK
& Associates, Inc.

January 27, 2020

R17421-7

RECEIVED
STATE OF ILLINOIS
JAN 28 2020
Environmental Protection Agency
BUREAU OF AIR

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

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

2 South 631 Route 59, Suite B
Warrenville, Illinois 60555

(630) 393-9000
Fax (630) 393-9111

0316000SFX
19090021

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

January 27, 2020

R17421-7

Prepared for:

General III, LLC
1909 North Clifton Avenue
Chicago, Illinois 60614
Attn: Mr. Jim Kallas

Prepared by:

John G. Pinion
Principal Engineer
RK & Associates, Inc.

RK & Associates, Inc.

2 South 631 Route 59
Suite B
Warrenville, Illinois 60555
Phone: 630-393-9000
Fax: 630-393-9111

RK & Associates, Inc.

TABLE OF CONTENTS

3.0 FACILITY EMISSIONS ESTIMATES 21

3.1 Shredder Emissions Controlled by Cyclone, Roll-Media Filter, Regenerative Thermal Oxidizer, and Packed Tower Scrubber 23

3.1.1 Shredder VOM and CO Emissions 24

3.1.2 Shredder Particulate Emissions 25

3.1.3 Shredder Hazardous Air Pollutant Emissions 26

3.1.4 Shredder RTO Natural Gas Combustion Emissions 27

3.1.5 Shredder Emissions Summary 27

3.2 Ferrous Material Processing System Emissions 27

3.2.1 Particulate Emissions 28

3.2.2 Metal HAP Emissions 30

3.3 Non-Ferrous Material Processing System Emissions 32

3.3.1 Particulate Emissions 32

3.3.2 Metal HAP Emissions 33

3.4 Stockpile Fugitive Emissions 34

3.4.1 Particulate Emissions 34

3.4.2 Metal HAP Emissions 35

3.5 Fugitive Emissions from Paved and Unpaved Roads 35

3.5.1 Particulate Emissions 35

3.5.2 Metal HAP Emissions 38

3.6 Miscellaneous Natural Gas Combustion Emissions 39

3.7 Facility-Wide Criteria Pollutant Emissions 39

3.8 Facility-Wide HAP Emissions 39

RK & Associates, Inc.

TABLES

Table 3-1A Summary of Controlled Shredder VOM and CO Emissions
Table 3-1B Summary of Controlled Shredder Filterable Particulate Emissions
Table 3-1C Summary of Controlled Shredder HAP Emissions
Table 3-1D Shredder RTO Natural Gas Combustion Emissions
Table 3-1E Summary of Controlled Shredder Emissions
Table 3-2 Ferrous Material Processing – Particulate Emissions
Table 3-3 Non-Ferrous Material Processing – Particulate Emissions
Table 3-4 Summary of Estimated Fugitive Particulate Emission from Stockpile Operation
Table 3-5A Fugitive PM Emissions – Paved Roads
Table 3-5B Fugitive PM Emissions – Unpaved Roads
Table 3-6 Miscellaneous Natural Gas Fired Environmental Heaters
Table 3-7 Summary of Facility-Wide Criteria Pollutant Emissions
Table 3-8 Summary of Facility-Wide HAP Emissions

FIGURES

Figure 3-1 Facility Roadways

APPENDICES

Appendix D Emissions Test Report Shredder RTO/Scrubber (November 2019) D-1
Appendix E Proposed Changes to Condition 11 (Emission Limits) of Draft Construction Permit 19090021 .... E-1

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.

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.

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:

$$\underbrace{100{,}000\frac{ton}{month}}_{\substack{\text{maximum}\\ \text{monthly}\\ \text{shredder}\\ \text{throughput}}} \; x \; \underbrace{0.5119\frac{lb\ VOM}{ton\ shredder\ feed}}_{\substack{\text{adjusted VOM}\\ \text{emission factor}\\ \text{(captured emissions)}\\ \text{November 2019}}} \; x \; \underbrace{\frac{1\ ton}{2{,}000\ lbs}}_{\substack{\text{convert}\\ \text{lb/ton}}} \; x \; \underbrace{(1-0.98)}_{\substack{\text{minimum}\\ \text{VOM}\\ \text{removal}\\ \text{efficiency}}} \; = \; \underbrace{0.51\frac{ton}{month}}_{\substack{\text{monthly}\\ \text{VOM}\\ \text{emissions}}}$$

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

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

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:

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

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:

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

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).

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.

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.

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.

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.

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 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:

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

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

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.

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.

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.

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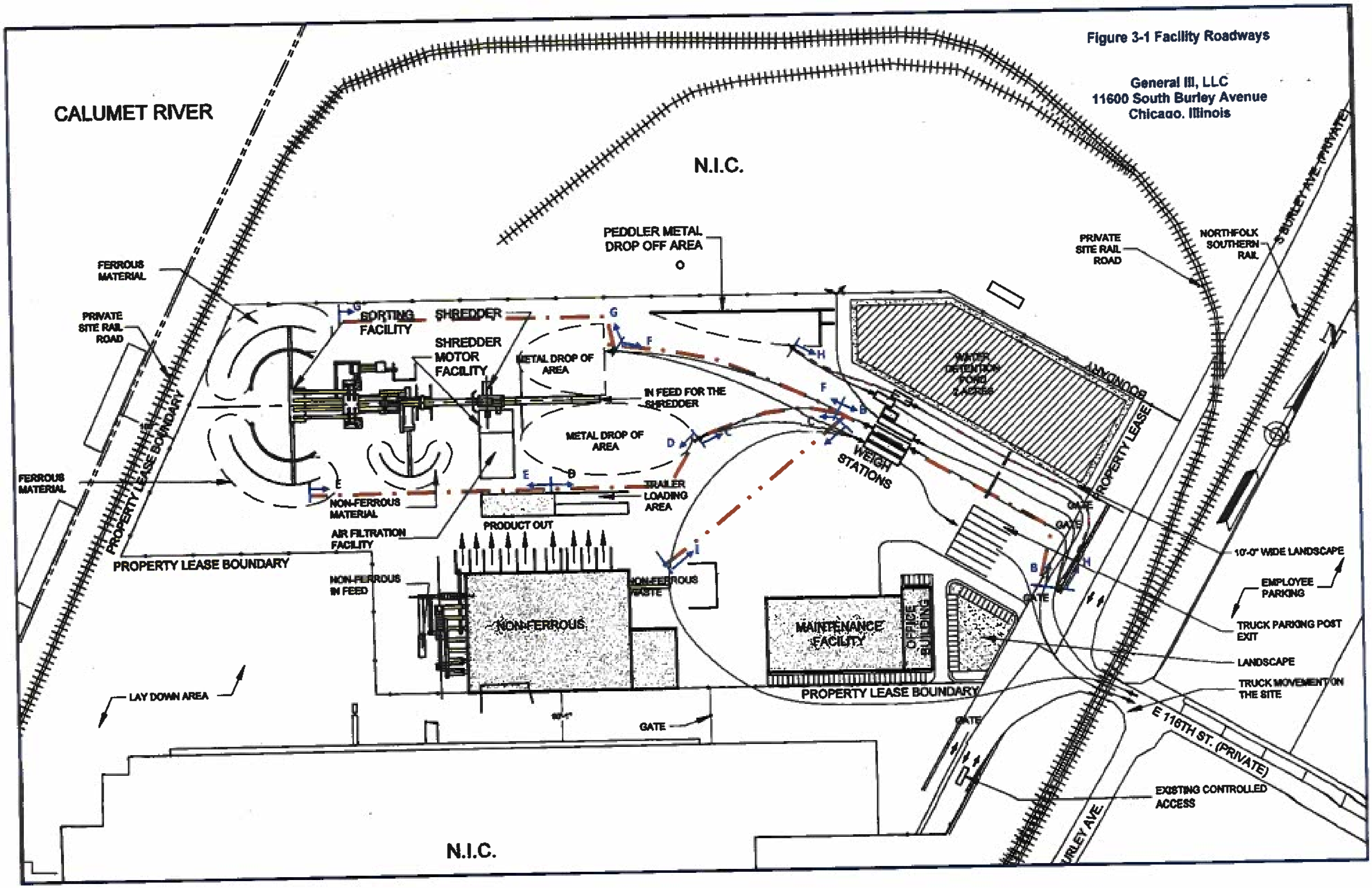
Figure 3-1 Facility Roadways
General III, LLC
11600 South Burley Avenue
Chicago, Illinois
CALUMET RIVER
N.I.C.
PEDDLER METAL DROP OFF AREA
FERROUS MATERIAL
PRIVATE SITE RAIL ROAD
SORTING FACILITY
SHREDDER
SHREDDER MOTOR FACILITY
METAL DROP OF AREA
IN FEED FOR THE SHREDDER
METAL DROP OF AREA
WATER DETENTION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

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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

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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		2.00	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	Permitted Shredder Thruput Rates 1,000,000 tpy Maximum Annual Emissions tpy
Metal HAPs[1]			
Lead [2]	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

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.

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 R	S	T	V	W	X	Z	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 [d]	0.0051	0.0514	0.000046 [d]	0.0017	0.0169	0.000013 [d]	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 [d]	0.0017	0.0169	0.000013 [d]	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 [d]	0.0070	0.0700	0.000046 [e]	0.0023	0.0230	0.000013 [d]	0.0007	0.0065
5	C-002	Shredded Material Transfer Conveyor	Shred	Y	Outside	N		NA		A	200.0	2,000	0.00014 [d]	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.000013 [d]	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	26,000	260,000	0.00014 [d]	0.0018	0.0182	0.000046 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	0.0000	0.0002	0.000013 [d]	0.0000	0.0001
24	C-025	Non-metallic not removed by magnet E-	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 [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 [e]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000

R 001639

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 Z 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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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 [e]	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	200	2,000	0.00014 [d]	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000

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		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
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 [d]	0.0000	0.0000	0.000013 [d]	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 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
53	E-7	ASR Not Removed by Magnet	Shred	Y [a3]	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
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 [d]	0.0009	0.0085	0.000013 [d]	0.0002	0.0024
55		Truck Dumping of Raw Feed	Unprepared	5.4 [a2]	Outside	N				Drop	100,000	1,000,000	0.00127 [e]	0.0633	0.6328	0.00060 [e]	0.0299	0.2993	0.00009 [e]	0.0045	0.0453
56		Raw Feed from Ground after Truck Dumping	Unprepared	5.4 [a2]	Outside	N				Drop	100,000	1,000,000	0.00127 [e]	0.0633	0.6328	0.00060 [e]	0.0299	0.2993	0.00009 [e]	0.0045	0.0453
57		Non-metallic Loadout	Non-metallic	N	Outside	N				D	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				D	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 [a5]	Outside	N		NA		D	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% [a1]	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	0.0012
61	C-037	ASR Transfer Conveyor to Stockpile	Residue	10.0% [a1]	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% [a1]	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% [a1]	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 [d]	0.0008	0.0084	0.000013 [d]	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 [d]	0.0000	0.0001	0.000013 [d]	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 [d]	0.0008	0.0084	0.000013 [d]	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 [d]	0.0000	0.0001	0.000013 [d]	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 [d]	0.0006	0.0059	0.000013 [d]	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 [d]	0.0006	0.0059	0.000013 [d]	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 [a2]	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 [a2]	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 [a2]	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-019	Ferrous Transfer Conveyor	Shred	Y [a2]	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.								

R 001641

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

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

Row #	Equipment Generating Emissions ID #	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-013	Ferrous Transfer Conveyor	Shred	Y [a2]	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-016.								
77	C-017	Ferrous Transfer Conveyor	Shred	Y [a2]	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-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	73,400	734,000	Alternate to C-017 to C-018. 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-21	Ferrous Transfer Conveyor	Shred	5.4% [a2]	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% [a2]	Outside	N		NA		Drop	73,400	734,000	Alternate to C-021 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.

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

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

A	B	C	D	E	F	G	H	I	J	K	M	N	O	P	R	S	T	V	W	X	Z	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 sstone 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	0.00014	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

R 001643

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%

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
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 Finder	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

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%

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

Row #	Equipment Generating Emissions ID #	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	tpy	PM Emissions lb/ton	lb/hr	ton/mo	tpy	PM10 Emissions lb/ton	ton/mo	tpy	PM2.5 Emissions lb/ton	ton/mo	tpy
A	B	C	D	E	F	G	H	I	J	K	L	N	O	P	Q	R	S	T	V	W	X	Z	AA
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 *	Note f	Note f	0.000013 *	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

R 001645

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%

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% 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
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	Zone	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 Zuric	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	Zone	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 Zuric	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 Zuric	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

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%

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
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

R 001647

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%

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

A	B	C	D	E	F	G	H	I	J	K	L	M	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
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 [d]	0.0098	0.0018	0.0181	0.000046 [d]	0.0006	0.0059	0.000013 [d]	0.0002	0.0017
114	C-002	Conveyor	Residue	N	Outside	Y	N	NA			A	25,026.0	250,260	0.003000 [e]	0.2037	0.0375	0.3754	0.001100 [e]	0.0138	0.1376	0.000167 [e]	0.0021	0.0208
115	C-002	Conveyor	Ferrous	N	Outside	Y	N	NA			A	774.0	7,740	0.003000 [e]	0.0063	0.0012	0.0116	0.001100 [e]	0.0004	0.0043	0.000167 [e]	0.0001	0.0006
116	C-003	Conveyor	Residue	N	Outside	Y	N	NA			A	25,026.0	250,260	0.003000 [e]	0.2037	0.0375	0.3754	0.001100 [e]	0.0138	0.1376	0.000167 [e]	0.0021	0.0208
117	C-004	Conveyor	Residue	N	Outside	Y	N	NA			A	22,446.0	224,460	0.003000 [e]	0.1827	0.0337	0.3367	0.001100 [e]	0.0123	0.1235	0.000167 [e]	0.0019	0.0187
118	C-005	Conveyor	Residue	N	Outside	Y	N	NA			A	11,223.0	112,230	0.003000 [e]	0.0914	0.0168	0.1683	0.001100 [e]	0.0062	0.0617	0.000167 [e]	0.0009	0.0093
119	C-006	Conveyor	Residue	N	Outside		N	NA			A	11,223.0	112,230	0.003000 [e]	0.0914	0.0168	0.1683	0.001100 [e]	0.0062	0.0617	0.000167 [e]	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 [e]	0.0095	0.0017	0.0174	0.001100 [e]	0.0006	0.0064	0.000167 [e]	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 [e]	0.0095	0.0017	0.0174	0.001100 [e]	0.0006	0.0064	0.000167 [e]	0.0001	0.0010
122	C-009	Conveyor	Residue	N	Outside		N	NA			A	3,368.7	33,687	0.003000 [e]	0.0274	0.0051	0.0505	0.001100 [e]	0.0019	0.0185	0.000167 [e]	0.0003	0.0028
123	C-010	Conveyor	Residue	N	Outside		N	NA			A	3,368.7	33,687	0.003000 [e]	0.0274	0.0051	0.0505	0.001100 [e]	0.0019	0.0185	0.000167 [e]	0.0003	0.0028
124	C-011	Conveyor	Residue	N	Outside	Y	N	NA			A	3,096.0	30,960	0.003000 [e]	0.0252	0.0046	0.0464	0.001100 [e]	0.0017	0.0170	0.000167 [e]	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 [e]	0.0055	0.0010	0.0101	0.001100 [e]	0.0004	0.0037	0.000167 [e]	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 [e]	0.0055	0.0010	0.0101	0.001100 [e]	0.0004	0.0037	0.000167 [e]	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 [e]	0.0050	0.0009	0.0093	0.001100 [e]	0.0003	0.0034	0.000167 [e]	0.0001	0.0005
128	C-015	Conveyor	Ferrous	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	92.1	921	0.003000 [e]	0.0002	0.0000	0.0003	0.001100 [e]	0.0000	0.0001	0.000167 [e]	0.0000	0.0000
129	C-016	Conveyor	Residue	N	Outside	Y	N	NA			A	995.1	9,951	0.003000 [e]	0.0081	0.0015	0.0149	0.001100 [e]	0.0005	0.0055	0.000167 [e]	0.0001	0.0008
130	C-017	Conveyor	Ferrous	N	Outside		N	NA			A	645.0	6,450	0.003000 [e]	0.0053	0.0010	0.0097	0.001100 [e]	0.0004	0.0035	0.000167 [e]	0.0001	0.0005
131	C-018	Conveyor	Ferrous	N	Outside	Y	N	NA			A	645.0	6,450	0.003000 [e]	0.0053	0.0010	0.0097	0.001100 [e]	0.0004	0.0035	0.000167 [e]	0.0001	0.0005
132	C-019	Conveyor	Lights	N	Outside	Y	N	NA			A	92.1	921	0.003000 [e]	0.0008	0.0001	0.0014	0.001100 [e]	0.0001	0.0005	0.000167 [e]	0.0000	0.0001
133	C-020	Conveyor	Residue	N	Outside	Y	N	NA			A	4,098.5	40,985	0.003000 [e]	0.0334	0.0061	0.0615	0.001100 [e]	0.0023	0.0225	0.000167 [e]	0.0003	0.0034
134	C-021	Conveyor	Residue	N	Outside	Y	N	NA			A	4,098.5	40,985	0.003000 [e]	0.0334	0.0061	0.0615	0.001100 [e]	0.0023	0.0225	0.000167 [e]	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 [e]	0.0024	0.0004	0.0000	0.001100 [e]	0.0002	0.0000	0.000167 [e]	0.0000	0.0000

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%

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

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
136	C-023	Conveyor to Wind Sifter	Residue	N	Outside	Y	Y	Wind Sifter	100%	100%	A	2,686.9	26,869	0.000140 [b]	0.0010	0.0002	0.0000	0.000046 [b]	0.0001	0.0000	0.000013 [b]	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 [b]	0.0010	0.0002	0.0000	0.000046 [b]	0.0001	0.0000	0.000013 [b]	0.0000	0.0000
138	C-034	Conveyor	Material Separator	N	Outside	Y	N	NA			A	202.7	2,027	0.003000 [b]	0.0017	0.0003	0.0030	0.001100 [b]	0.0001	0.0011	0.000167 [b]	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 [b]	0.0016	0.0003	0.0030	0.001100 [b]	0.0001	0.0011	0.000167 [b]	0.0000	0.0002
140	C-039	Conveyor	Mixed Non-Ferrous	N	Outside		N	NA			A	294.9	2,949	0.003000 [b]	0.0024	0.0004	0.0044	0.001100 [b]	0.0002	0.0016	0.000167 [b]	0.0000	0.0002
141	C-040	Conveyor	Residue	N	Outside		N	NA			A	1,032.0	10,320	0.003000 [b]	0.0084	0.0015	0.0155	0.001100 [b]	0.0006	0.0057	0.000167 [b]	0.0001	0.0009
142	C-040	Conveyor	Mids	N	Outside		N	NA			A	2,580.0	25,800	0.003000 [b]	0.0210	0.0039	0.0387	0.001100 [b]	0.0014	0.0142	0.000167 [b]	0.0002	0.0021
143	C-040	Conveyor	Residue	N	Outside		N	NA			A	1,548.0	15,480	0.003000 [b]	0.0126	0.0023	0.0232	0.001100 [b]	0.0009	0.0085	0.000167 [b]	0.0001	0.0013
144	C-041	Conveyor	Zorba	N	Outside		N	NA			A	184.3	1,843	0.003000 [b]	0.0015	0.0003	0.0028	0.001100 [b]	0.0001	0.0010	0.000167 [b]	0.0000	0.0002
145	C-042	Conveyor	Zorba	N	Outside		N	NA			A	552.9	5,529	0.003000 [b]	0.0045	0.0008	0.0083	0.001100 [b]	0.0003	0.0030	0.000167 [b]	0.0000	0.0005
146	C-043	Conveyor	Zorba	N	Outside		N	NA			A	1,105.7	11,057	0.003000 [b]	0.0090	0.0017	0.0166	0.001100 [b]	0.0006	0.0061	0.000167 [b]	0.0001	0.0009
147	C-044	Conveyor	Residue	N	Outside	Y	N	NA			A	9,166.4	91,664	0.003000 [b]	0.0746	0.0137	0.1375	0.001100 [b]	0.0050	0.0504	0.000167 [b]	0.0008	0.0076
148	C-044	Conveyor	Lights Zuric	N	Outside	Y	N	NA			A	110.6	1,106	0.003000 [b]	0.0009	0.0002	0.0017	0.001100 [b]	0.0001	0.0006	0.000167 [b]	0.0000	0.0001
149	C-045	Conveyor	Residue	N	Outside	Y	N	NA			A	9,166.4	91,664	0.003000 [b]	0.0746	0.0137	0.1375	0.001100 [b]	0.0050	0.0504	0.000167 [b]	0.0008	0.0076
150	C-047	Conveyor	To SSI	N	Outside		N	NA			A	202.7	2,027	0.003000 [b]	0.0017	0.0003	0.0030	0.001100 [b]	0.0001	0.0011	0.000167 [b]	0.0000	0.0002
151	C-048	Conveyor	Out of SSI	N	Outside		N	NA			A	202.7	2,027	0.003000 [b]	0.0017	0.0003	0.0030	0.001100 [b]	0.0001	0.0011	0.000167 [b]	0.0000	0.0002
152	C-050	Conveyor	Residue	N	Outside	Y	N	NA			A	9,240.1	92,401	0.003000 [b]	0.0752	0.0139	0.1386	0.001100 [b]	0.0051	0.0508	0.000167 [b]	0.0008	0.0077
153	C-052	Conveyor	Residue	N	Outside		N	NA			A	829.3	8,293	0.003000 [b]	0.0068	0.0012	0.0124	0.001100 [b]	0.0005	0.0046	0.000167 [b]	0.0001	0.0007
154	C-055	Conveyor	Wire	N	Outside	Y	N	NA			A	368.6	3,686	0.003000 [b]	0.0030	0.0006	0.0055	0.001100 [b]	0.0002	0.0020	0.000167 [b]	0.0000	0.0003
155	C-058	Conveyor	Zuric drops	N	Outside	Y	N	NA			A	110.6	1,106	0.003000 [b]	0.0009	0.0002	0.0017	0.001100 [b]	0.0001	0.0006	0.000167 [b]	0.0000	0.0001
156	C-060	Conveyor	Zone	N	Outside	Y	N	NA			A	442.3	4,423	0.003000 [b]	0.0036	0.0007	0.0066	0.001100 [b]	0.0002	0.0024	0.000167 [b]	0.0000	0.0004
157	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA			Drop	353.8	3,538	0.00761 [c]	0.0073	0.0013	0.0135	0.00360 [c]	0.0006	0.0064	0.00054 [c]	0.0001	0.0010
158	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	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 [d]	0.0038	0.0007	0.0069	0.001100 [d]	0.0003	0.0025	0.000167 [d]	0.0000	0.0004
160	C-063	Conveyor drop to stockpile	Zorba	1.5% [a]	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% [a]	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% [a]	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%

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
163	C-065	Conveyor	Residue	N	Outside	Y	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
164	C-066	Conveyor	Residue	N	Outside	Y	N	NA			A	20,046.6	200,466	0.003000 [d]	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 [d]	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% [a]	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% [a]	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 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
169	C-072	Conveyor	Lights	N	Outside	Y	Y	Cover			A	11.1	111	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
170	DC-01 Cyc	DC-01 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
171	DC-02 Cyc	DC-02 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
172	DC-03 Cyc	DC-03 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
173	DC-04 Cyc	DC-04 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.000013 [d]	0.0000	0.0000
174	E-01	Vibratory Batch Feeder	Residue	Y	Outside		N	NA			A	25,800.0	258,000	0.000140 [d]	0.0098	0.0018	0.0181	0.000046 [d]	0.0006	0.0059	0.000013 [d]	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	0.0089	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	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
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% [a]	Outside		Y	Wind Sifter	90%	100%	Drop	552.9	5,529	0.00761 [c]	0.0103	0.0021	0.0000	0.00360 [c]	0.0010	0.0000	0.00054 [c]	0.0002	0.0000

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%

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
190	E-11	Screener	Residue	N	Outside		N	NA			B	5,805.0	58,050	0.025000 d	0.3938	0.0726	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	5,480.7	54,807	0.003000	0.0089	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	0.0150	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	0.0002	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	0.0002	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

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 #	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
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 Zuric	N	Outside		N	NA			B	88.5	885	0.025000 [d]	0.0060	0.0011	0.0111	0.008700 [d]	0.0004	0.0038	0.001317 [d]	0.0001	0.0006
226	E-40	Separator	Heavies Zuric	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 Zuric	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 [c]	0.0000	0.0003	0.00054 [c]	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	0.0011	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

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%

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 ID #	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	tpy	PM Emissions lb/ton	lb/hr	ton/mo	tpy	PM10 Emissions lb/ton	ton/mo	tpy	PM2.5 Emissions 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 [d]	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	0.0220	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	0.0220	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	4.21		0.19	1.85
							Totals NonferrousPlant 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.

R 001653

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%

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

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.

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

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 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 tpm	Process Rate tpy	PM Emissions Factor lb/ton	PM Emissions tpm	PM Emissions tpy	PM10 Emissions Factor lb/ton	PM10 Emissions tpm	PM10 Emissions tpm	PM2.5 Emissions Factor lb/ton	PM2.5 Emissions tpm	PM2.5 Emissions 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	0.2406
11	Conveyor Transfer Points Controlled	57,210	572,100	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

R 001654

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/emiss-calc-rock1.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, 13.2.4-5 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)	Annual Average Controlled Emissions (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)	Annual Average Controlled Emissions (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)	Annual Average Controlled Emissions (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)	Annual Average Controlled Emissions (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)	Annual Average Controlled Emissions (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)	Annual Average Controlled Emissions (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[e]	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[g]		Facility Wide Potential[h]	Fugitive Emissions From Stockpile Operations[e]		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.

R 001660

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

Hazardous Air Pollutant	RTO[a] ton/mo	RTO[a] tpy	RTO Natural Gas[b] ton/mo	RTO Natural Gas[b] tpy	Ferrous Plant[c] ton/mo	Ferrous Plant[c] tpy	Nonferrous Plant[c] ton/mo	Nonferrous Plant[c] tpy	Stockpile Operations[c] ton/mo	Stockpile Operations[c] tpy	Paved + Unpaved Fugitive Road[c] ton/mo	Paved + Unpaved Fugitive Road[c] tpy	Misc Natural Gas[b] ton/mo	Misc Natural Gas[b] tpy	Facility Wide Total HAP Ton/mo	Facility Wide Total HAP 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)anthracen			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	2.10E-03	2.10E-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).

R 001661

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

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January 27, 2020; Note from John Pinion of RKA:

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	0.5119~~243~~	0.51~~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~~	2.69~~0.61~~

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~~24~~	9.40~~2.36~~

These limits are based upon maximum shredder material throughput, emission factors derived from stack test adjusted by a safety factor of 4.0 ~~captured 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)	~~131.43~~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% (12.86~~1.22~~ 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. ~~i.~~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~~7~~ Conveyor Transfer Points	~~1,245,450~~ 1,444,050	~~12,454,500~~ 14,440,500	0.00014	~~0.08~~ 0.10	~~0.82~~ 0.96
3 Truck~~, Railcar,~~ & Barge Loading Points	~~174,000~~ 137,600	~~1,740,000~~ 1,376,000	0.000204	~~0.02~~ 0.01	~~0.18~~ 0.14
7 Stockpile Loading Points	300,000	3,000,000	~~0.00122~~ varies	0.18	1.83
				Total:	~~2.83~~ 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 $PM/PM_{10}/PM_{2.5}$ ~~so~~ 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~~0.04~~

These limits are based upon metal HAPs being 0.49~~1.33~~% of the total PM emissions ~~measured at the discharge of existing roll media filter during June 2018 metal emission test at General II, LLC~~.

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)~~
~~74 Conveyor Transfer Points (Uncontrolled)~~	~~110,624~~	~~1,106,236~~	~~0.00300~~	~~0.17~~	~~1.66~~
~~74 Conveyor Transfer Points (Controlled)~~	~~13,436~~	~~134,361~~	~~0.00014~~	~~0.01~~	~~0.01~~

~~6 Screening Points (Uncontrolled)~~	~~2,820~~	~~28,196~~	~~0.02500~~	~~0.04~~	~~0.35~~
~~8 Screening Points (Controlled)~~	~~1,541~~	~~15,406~~	~~0.00220~~	~~0.01~~	~~0.02~~
~~17 Stockpile Loading Points~~	~~838~~	~~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 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 (PM10), and K=0.053 (PM2.5), U (mean windspeed) = 9.0 mph, and M (minimum moisture content) = 1.5% applied to light material stockpile loading.~~

ii. Filterable Particulate Matter Emissions~~PM, PM10, and PM2.5 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~~& PM10~~ (Tons/Mo)	Emission (Tons/Yr)
88~~59~~ Conveyor Transfer Points (Uncontrolled)	~~215,368~~ 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	0.09~~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)	(Tons/Yr)	Emission Factor (lb/Ton)	$PM_{2.5}$ Emission (Tons/Mo)	(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~~se~~ 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)	(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 2018 metal emission test at General II, LLC.~~

~~e. 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 8 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

EXHIBIT 8

March 20, 2020

R17421-7.2

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

Fugitive Particulate Operating Program for a
Scrap Metal Recycling Facility
General III, LLC – 11600 South Burley - Chicago, Illinois

Dear Mr. Jones:

Please find attached a revised copy of the Fugitive Particulate Operating Program for the proposed General III, LLC (GIII) Scrap Metal Recycling Facility located in Cook County at 11600 South Burley Avenue in Chicago, Illinois. This revised copy of the Program addresses your verbal comments from March 19, 2020.

An electronic copy of the above referenced document has also been forwarded to you and Mr. Barria.

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

John G. Pinion
Associate Engineer

cc: Mr. Jim Kallas – General III, LLC – Chicago, Illinois (via e-mail)
Mr. German Barria – IEPA – Springfield, Illinois (hard copy and via-e-mail)

Fugitive Particulate Operating Program
General III, LLC – 11600 S Burley Avenue - Chicago, Illinois

March 20, 2020

R17421-7.2

Prepared for:

General III, LLC
1909 North Clifton Avenue
Chicago, Illinois 60614
Attn: Mr. Jim Kallas

Prepared by:

John G. Pinion
Principal Engineer
RK & Associates, Inc.

RK & Associates, Inc.

2 South 631 Route 59
Suite B
Warrenville, Illinois 60555
Phone: 630-393-9000
Fax: 630-393-9111

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Facility Location and Contact Information 1

1.2 Illinois Environmental Protection Agency Fugitive Emission Regulatory Requirements . 2

1.2.1 General Limitation for Fugitive Particulate Matter – 35 IAC 212.301 2

1.2.2 Requirement to Prepare and Implement a Fugitive Particulate Operating Program 2

1.3 Definition of Visible Emissions 2

1.4 Site Boundaries 2

2.0 FACILITY SITE MAP 3

3.0 FACILITY OPERATIONS AND APPLICATION OF BEST MANAGEMENT PRACTICES FOR FUGITIVE PARTICULATE CONTROL 5

3.1 Raw Material Unloading/Handling 6

3.2 Shredder Enclosure 7

3.3 Material Transfer Points 8

3.4 Intermediate and Product Stockpiles 8

3.5 Non-Ferrous Processing Building 9

3.6 Material Loadout 10

3.7 Paved Areas 10

3.8 Unpaved Areas 11

3.9 Downwind Property Line and Barge Loading Area 13

4.0 ADDITIONAL DESCRIPTION OF BEST MANAGEMENT PRACTICES FOR FUGITIVE PARTICULATE CONTROL 15

4.1 Periodic Visible Emissions Observations 15

4.1.1 Employee Observations 15

4.2 Meteorological Data Station 15

4.3 Dust Boss 15

4.4 Paved and Unpaved Areas 16

4.4.1 Water Truck for Paved and Unpaved Areas 16

4.4.2 Sweeper for Paved Areas 16

4.4.3 Wheel Cleaning Station 16

4.5 Other Fugitive Particulate Control Measures 17
4.5.1 Shredder Water Injection 17
4.5.2 Shredder Emission Control System 17
4.5.3 Non-Ferrous Building Baghouse 17
4.5.4 Conveyor Covers 18
4.6 Maintenance of Fugitive Particulate Control Equipment 18

5.0 RECORDKEEPING 19

5.1 Meteorological Data 19
5.2 Visible Emissions Observation and Control Form 19
5.3 Water Truck Log 19
5.4 Sweeper Log 20
5.5 Dust Boss Log 20
5.6 Fugitive Particulate Control Equipment Maintenance 20

6.0 PROGRAM AMENDMENT 21

TABLES

Table 3-1 Summary of Facility Operations and Best Management Practices for Fugitive Dust Control 6

FIGURES

Figure 2-1 Facility Location Map
Figure 2-2 Facility Layout Map
Figure 2-3 Facility Layout Drawing
Figure 4-1 Anticipated Dust Boss Locations
Figure 4-2 Designated Areas for Routine Watering and Sweeping

1.0 INTRODUCTION

This Fugitive Particulate Operating Program (Program) has been prepared for the General III, LLC (GIII) scrap metal recycling facility as a condition of Illinois Environmental Protection Agency (IEPA) Construction Permit No. 19090021 (Condition 9.e.).

GIII is a state-of-the-art recycling facility located in the heart of an existing established industrial district well buffered from residential areas. GIII is configured to process 1,000,000 tons per year of shreddable recyclables in various forms to produce uniform grades of ferrous and non-ferrous metals. GIII will receive and shred mixed recyclable metal in various forms to produce uniform grades of ferrous and non-ferrous metals. Proposed scrap handling and processing activities include raw material receiving, sorting, shredding, metal separation, recovery of ferrous and non-ferrous metals, and shipment of finished products to customers.

The objective of this Program is to identify, monitor, and treat (as may be necessary) sources of fugitive particulate emissions. GIII is implementing this Program as part of GIII's commitment to be a good neighbor, a good steward of the environment, and to meet or exceed applicable environmental standards (identified in Section 1.2) to be protective of human health and the environment.

1.1 Facility Location and Contact Information

Business Name:	General III, LLC
Source Location:	11600 South Burley – Chicago, Illinois 60617 Hyde Park Township, Cook County Illinois
Latitude/Longitude	41.685201° N / -87.545847" W – Approximate Location of Front Gate
Office/Mailing Address:	1909 N. Clifton Avenue – Chicago, Illinois 60614
Authorized Representative Responsible for this Program:	Mr. Jim Kallas - Environmental Manager 847-508-9170 – jimkallas@general-iron.com
IEPA Site ID No.:	031600SFX
SIC Code:	5093 – Scrap and Waste Materials
NAICS Code:	423930 – Recyclable Material Merchant Wholesalers

1.2 Illinois Environmental Protection Agency – Fugitive Emission Regulatory Requirements

1.2.1 General Limitation for Fugitive Particulate Matter - 35 IAC 212.301

GIII is subject to the general limitation for fugitive particulate matter identified in 35 IAC 212.301, which requires that:

> *No person shall cause or allow the emission of fugitive particulate matter from any process, including any material handling or storage activity, that is visible by an observer looking generally toward the zenith at a point beyond the property line of the source.*

1.2.2 Requirement to Prepare and Implement a Fugitive Particulate Operating Program

Pursuant to 35 IAC 212.302, a Fugitive Particulate Operating Program is required for any facility with operations belonging to specified groups of Standard Industrial Classification (SIC) Codes **and** that are located within a specified area. GIII is located in Cook County, which is a specified area under 35 IAC 212.302; however, GIII's SIC Code (5093 Scrap and Waste Materials) is **not** among the specified SIC codes. Therefore, GIII is not subject to a requirement to have a Fugitive Particulate Operating Program.

Although not required by IEPA regulations, GIII has voluntarily agreed to prepare and implement this Fugitive Particulate Operating Program to describe the best management practices that will be used to minimize potential fugitive particulate emissions and ensure compliance with 35 IAC 212.301.

1.3 Definition of Visible Emissions

For the purposes of this Program, the presence of Visible Emissions means the existence of a visible fugitive particulate plume that threatens to cross the Industrial Campus property line.

Fugitive particulate does not include steam (water vapor), engine combustion exhaust, and particulate matter emitted from a properly permitted exhaust stacks with or without a pollution control device because each permitted exhaust point has a separate opacity limit and particulate mass emission limit included in the facility construction/operation permit.

1.4 Site Boundaries

For the purposes of this Program, the 'property line,' as referenced in 35 IAC 212.301, is the Site Boundary identified in Figure 2-2 (i.e. property line of the industrial campus).

2.0 FACILITY SITE MAP

The location of GIII is shown on Figures 2-1 and 2-2. GIII operates on approximately 25 acres of leased property within an existing industrial campus located at 11600 South Burley Avenue in Chicago, Illinois. Four other affiliated material recycling businesses are located within the industrial campus.

The GIII scrap metal recycling facility is shown on Figure 2-3. The Facility Site Map indicates the locations of the Facility boundaries, buildings, location of material handling and processing areas, shredder enclosure, shredder emission control system, stockpiles, truck scales and facility vehicle entrance.

The vast majority of the Facility is paved with concrete or asphalt pavement. The limited area that is not paved is covered with compacted asphalt grindings or similar material.

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3.0 FACILITY OPERATIONS AND APPLICATION OF BEST MANAGEMENT PRACTICES FOR FUGITIVE PARTICULATE CONTROL

GIII is a state-of-the-art recycling facility located in the heart of an existing established industrial district well buffered from residential areas. GIII is configured to process up to 1,000,000 tons per year of shreddable recyclables in various forms to produce uniform grades of ferrous and non-ferrous metals. Proposed scrap handling and processing activities include raw material receiving, sorting, shredding, metal separation, recovery of ferrous and non-ferrous metals, stockpiling and off-site shipment of finished products.

Raw materials are delivered to the facility from a variety of sources including retail, commercial/industrial accounts via trucks or contract haulers and peddlers via peddler vehicles. Peddlers and semi-trucks entering the facility first pass through a truck scale.

Semi- trucks are then directed to a material staging area near the raw material stockpiles. Designated Facility personnel inspect all loads for unauthorized materials in accordance with Facility procedures. After unloading, the semi-trucks and peddler vehicles exit the Facility after passing over the appropriate truck scale.

The shredding process produces ferrous metal and Automobile Shredder Residue (ASR) which contains non-metallic material, non-ferrous metal and a limited amount of ferrous metal. Ferrous metal is processed to remove non-metallic material through a series of material handling steps in the Ferrous Metal Processing system to produce clean ferrous metal.

The ASR is directed to a stockpile for temporary storage prior to processing. ASR is transferred a short distance from the ASR stockpile to the Non-Ferrous Metal Processing system using a rubber-tired loader. ASR is processed by a variety of advanced material handling and separation equipment in the Non-Ferrous Metal Processing system to recover various sizes and grades of non-ferrous metals. Non-metallic material removed by the Non-Ferrous Metal Processing system is directed to a stockpile prior to being loaded into semi-trucks for off-site disposal at an appropriately licensed landfill.

Table 1 summarizes facility operations with the potential to generate fugitive particulate and the Best Management Practices (BMPs) that will be utilized to achieve compliance with 35 IAC 212.301. For the purposes of this Program, compliance with 35 IAC 212.301 is determined at the Site Boundary (i.e. the property line of the industrial campus as shown on Figure 2-2). Detailed descriptions of the BMPs are presented in Section 4.0.

Table 1 – Summary of Facility Operations and Best Management Practices for Fugitive Particulate Control

Operation	Best Management Practices				
	Periodic Inspections/ Observations	Water Atomizing Dust Bosses	Sweeping/ Watering of Paved Areas	Watering of Unpaved Areas	Potential Additional BMPs That May Be Used
Raw Material Unloading/Handling	X	X	X		
Shredder Enclosure	X				Water injection/shredder emissions capture and control system
Material Transfer Points	X	X			Conveyor covers on selected conveyors
Material Stockpiles	X	X	X		Partial enclosures (side walls) on selected stockpiles
Non-Ferrous Processing Building					Enclosed in a building with building exhaust treated by dust collectors
Material Loadout	X	X	X		Dedicated water spray if needed
Traffic Areas – Paved Areas	X	X	X		Water truck as needed
Traffic Areas – Unpaved Areas	X	X		X	Water truck as needed
Property Lines	X				Identify the source(s) of visible emissions and take corrective actions as described above.

3.1 Raw Material Unloading/Handling

Raw scrap in bulk trucks (semi-trailers) is dumped on the ground near the shredder infeed conveyor where cranes equipped with magnets or grapples sort through the material and place it on a raw material stockpile or onto the shredder infeed conveyor of the shredder. These or other cranes equipped with magnets or grapples then transfer the material from the stockpiles to the shredder infeed conveyor.

The space available for stockpiling raw material is limited, and therefore, the material is typically processed within several days of its receipt. The raw material stockpiles will not be used for long term storage.

The following BMPs will be used to identify and control (as needed) Visible Emissions from raw material unloading and handling.

A. **Inspections/Observations**:

i. Trained personnel will conduct visual observations of the raw material unloading and handling areas for the presence of Visible Emissions three times per day and record the results on a Visible Emissions Observation and Control (VEOC) form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.

B. **Fugitive Particulate Control Measures**:

i. Dust Boss water atomizers will be positioned to mist the raw material handling area and will be utilized as needed. The water applied by the Dust Boss will increase the moisture content of the material being transferred to minimize the potential for Visible Emissions.

ii. Areas adjacent to raw material handling operations will be included in the watering and sweeping of paved areas described in Section 3.7.

3.2 Shedder Enclosure

The shredder is located in a partial enclosure with solid wall panels, open metal grating on the roof and an open area at ground level. Shredder emissions are captured by a hood located over the top of the shredder. Captured emissions are routed to the emission control system. Captured emissions are not fugitive emissions.

Potential sources of fugitive emissions inside the shredder enclosure are limited to three conveyor transfer points and potential uncaptured emissions from the shredder operation.

A. **Inspections/Observations**:

i. Trained personnel will conduct visual observations of the shredder enclosure for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.

B. **Fugitive Particulate Control Measures**:

i. If Visible Emissions are observed exiting the shredder enclosure, operators will perform a system inspection to identify the potential source and cause of the Visible Emissions and take appropriate corrective actions, which may include a change in the shredder water injection rate or shredder emissions capture and control system operating parameters.

3.3 Material Transfer Points

Material is primarily transported through the Ferrous and Non-Ferrous processes on a series of belt conveyors. A material transfer point is the point at which material from an upstream conveyor is transferred to a downstream conveyor, the point at which an upstream conveyor feeds a piece of processing equipment, or the point at which a piece of processing equipment discharges material onto a takeaway conveyor. Visible Emissions from a transfer point may occur when the material being transferred has a high concentration of fine material and low moisture content.

Select conveyors that transfer streams containing significant amounts of light material that could easily become windblown will be equipped with covers.

A. <u>Inspections/Observations</u>:

i. Trained personnel will conduct visual observations of specific areas that include material transfer points for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.

B. <u>Fugitive Particulate Control Measures</u>:

i. Dust Boss water atomizers will be positioned to mist the facility areas with the highest potential for fugitive particulate. The water applied by the Dust Boss will increase the moisture content of the material being transferred to minimize the potential for Visible Emissions.

ii.

3.4 Intermediate and Product Stockpiles

The space available for stockpiling intermediates and products is limited and, therefore, these materials are typically processed or shipped off site regularly. These stockpiles will not be used for long term storage of materials.

A. <u>Inspections/Observations</u>:

i. Trained personnel will conduct visual observations of material stockpiles for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.

B. Fugitive Particulate Control Measures:

i. Dust Boss water atomizers will be positioned to mist stockpiles if Visible Emissions are observed. The water applied by the Dust Boss will increase the moisture content of the material being transferred to minimize the potential for Visible Emissions.

ii. With the exception of the Raw Material stockpiles, the two Ferrous Metal Stockpiles, and the ASR stockpile, all stockpiles identified in facility emission estimates will have solid partitions on three sides.

iii. Areas adjacent to stockpiles will be included in the watering and sweeping of paved areas described in Sections 3.7.

3.5 Non-Ferrous Processing Building

Non-Ferrous material processing is performed in the Non-Ferrous Processing Building. The building is equipped with four identical baghouses that collect dust from specific points in the process using a network of duct work and hoods. Dust captured in the collection system is routed to a baghouse filter. Treated air from three of the four baghouses is exhausted back into the building. The treated air from the fourth baghouse is discharged to the atmosphere. Particulate emissions in the baghouse exhaust stream that is discharged to the atmosphere are not fugitive emissions.

A. Inspections/Observations:

i. Trained personnel will conduct visual observations of conveyor wall openings, personnel doors, and other openings in the Non-Ferrous Processing Building for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.

B. Fugitive Particulate Control Measures:

i. If Visible Emissions are observed from the building openings, the building will be inspected to ensure that personnel and service doors are closed when not in use and that the baghouses are functioning properly. Material removed by the baghouses is collected on a covered conveyor and transferred to the waste material stockpile.

3.6 Material Loadout

Material loadout occurs when stockpiled material is transferred to trucks using a rubber-tired loader, or material handler.

A. Inspections/Observations:

i. Trained personnel will conduct visual observations of material loadout areas for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.

B. Fugitive Particulate Control Measures:

i. Dust Boss water atomizers will be positioned to mist stockpiles and adjacent loadout areas if Visible Emissions are observed. The water applied by the Dust Boss will increase the moisture content of the material to minimize the potential for Visible Emissions.

ii. Areas adjacent to material loadout activity will be included in the watering and sweeping of paved areas described in Sections 3.7.

3.7 Paved Areas

The majority of the facility is paved with concrete or asphalt. The areas with the highest potential for fugitive particulate are the primary traffic routes used by vehicles delivering raw material or transporting materials from the site.

Application of water will be limited on days when precipitation exceeds ¼" or when temperatures are near freezing and water application may create unsafe conditions.

A. Inspections/Observations:

i. Trained personnel will conduct visual observations of paved vehicle traffic routes for the presence of Visible Emissions and record the results on a VEOC form. Heavily traveled routes will be observed three times per day and less traveled routes and non-traffic paved areas will be observed once per day.

B. Fugitive Particulate Control Measures:

i. Water will be applied to heavily used paved areas at least once per day , subject to the weather conditions identified above. Additional applications may be made in response to Employee Observations.

Operation of the water truck will documented in a water truck log that will identify the area(s) where water is applied, the approximate amount of water applied, the time of application, the name of the person operating the water truck, and the reason for application (i.e., routine daily application or in response to an Employee Observation).

ii. Sweeping of designated heavy traffic areas will occur at least once every other day, based on daily observations and subject to the weather conditions identified above.

    Operation of the sweeper will be documented in a sweeper log that will identify the area(s) swept, the date/time sweeping was performed, the name of the person operating the sweeper, and the reason for sweeping (i.e., routine daily sweeping or in response to an Employee Observation).

iii. Rumble strips will be installed at the entrance to the outgoing scale to remove loose material from exterior of vehicle trailers and vehicle tires.

3.8 Unpaved Areas

Limited areas within the Facility that are not paved with concrete or asphalt are covered with compacted asphalt grindings or similar material. Fugitive particulate emissions from unpaved areas are associated with vehicle use.

Application of water will be limited on days when precipitation exceeds ¼" or when temperatures are near freezing and water application may create unsafe conditions.

A. Inspections/Observations:

i. Trained personnel will conduct visual observations of unpaved areas for the presence of Visible Emissions and record the results on a VEOC form. Heavily used areas will be observed three times per day and lightly used areas will be observed once per day.

B. Fugitive Particulate Control Measures:

i. Water will be applied to heavily used unpaved areas at least once per day subject to the weather conditions identified above. Additional applications may be made in response to Employee Observations.

    Operation of the water truck will documented in a water truck log that will identify the area(s) where water is applied, the approximate amount of water applied, the time of application, the name of the person operating the water truck, and the reason for application (i.e., routine daily application or in response to an Employee Observation).

ii. If Visible Emissions are observed from unpaved areas during weather conditions that prohibit water application, alternative control measures will be evaluated. Evaluation and potential application of alternative control measures will be based on operating experience and routine observations. Alternative control measures may include, but are not limited to minimizing activity in unpaved areas, application of surfactant or oil-based coatings prior to winter conditions, or placement of additional asphalt grindings or similar material.

3.9 Downwind Property Line and Barge Loading Area

For the purposes of this Program, the 'property line,' as referenced in 35 IAC 212.301, is the Site Boundary identified in Figure 2-2 (i.e. property line of the industrial campus).

Property line observations will be limited to the portion(s) of the industrial campus property lines that are, at the time of the observation, downwind from GIII operations and the barge loading area (when a barge is actively being loaded at the time of the observation).

A. <u>Inspections/Observations</u>:

i. Trained personnel will conduct visual observations at least once per day of the barge loading area (when barge loading is occurring at the time of the observation) and the downwind property line(s) of the industrial campus for the presence of Visible Emissions and record the results on a VEOC form.

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4.0 ADDITIONAL DESCRIPTION OF BEST MANAGEMENT PRACTICES FOR FUGITIVE PARTICULATE CONTROL

The following provides an additional description of the BMPs that will be implemented under this Program.

4.1 Periodic Visible Emissions Observations

As described in Section 3, designated trained personnel will make periodic observations three times per day for the presence of Visible Emissions and have the authority to implement fugitive particulate control measures as may be required. Observations will be made three times per day

Records of observations and dust control measures implemented (if any), are recorded on a VEOC form (see Section 5.2).

4.1.1 Employee Observations

In addition to the designated observations described above, other employees will be trained to identify Visible Emissions when performing their assigned duties. If Visible Emissions are identified, the employee will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures. Employee Observations will not be recorded on a VEOC form.

4.2 Meteorological Data Station

An onsite meteorological data station (met station) will be installed and operated to record hourly temperature, wind speed, wind direction, barometric pressure, relative humidity, and precipitation amounts. The met station will be centrally located at a minimum height pursuant to applicable USEPA protocols and guidance. Met data will be periodically downloaded and stored electronically at the Facility.

4.3 Dust Boss

Dust Bosses are water atomizing cannons like those pictured to the right. The barrel of the cannon is equipped with a fan to force air through the barrel of the cannon at an elevated velocity. Water is injected into the air stream at the discharge of the barrel through specially designed atomizing nozzles. The velocity of the air stream directs the water droplets toward the source of the fugitive particulate matter. Water droplets impact suspended particulate, increasing the density of the particulate matter causing it to settle to the ground via gravity. Dust Bosses are used to control fugitive particulate emissions from conveyors, stockpiles and roadways.

The cloud of atomized water above a particulate emission source may be mistaken for particulate matter by uninformed observers. The cloud of water droplets should not be read as particulate matter if crossing the property line. Dust Bosses can be located at ground level, building rooftops or on supported columns in order to distribute the atomized water over the desired area(s). Figure 4-1 identifies the anticipated location of Dust Bosses. The deployment of Dust Bosses will be modified as may be required based on Facility operating experience.

4.4 Paved and Unpaved Areas

Paved and unpaved areas (including traffic routes) are routinely treated using water application and sweeping unless observed pavement conditions indicate it is unnecessary, such as following a precipitation event.

Application of water will be limited by near freezing temperatures in order to maintain safe operating conditions.

4.4.1 Water Truck for Paved and Unpaved Areas

A water truck owned and operated by GIII will be used to periodically apply water to accessible paved and unpaved areas. The water truck will make routine rounds in the areas identified in Figure 4-2. Application of water to paved and unpaved areas will be documented on a log.

4.4.2 Sweeper for Paved Areas

A motorized sweeper owned and operated by GIII will be used to periodically sweep paved areas. The sweeper will make routine rounds approximately every other day in accessible areas.

Routine sweeping of paved areas will be supplemented by additional sweeping as indicated by Visible Emissions observations described in Section 4.1.

Sweeping of paved areas will be documented in a log.

4.4.3 Wheel Cleaning Station

Rumble strips will be installed on the approach to the outbound truck scale requiring large vehicles to pass over the control device before entering the scale. The purpose of the rumble strips is to reduce the amount of loose dirt and debris on truck and trailer tires to reduce potential for vehicle track out.

The wheel cleaning station will be routinely inspected, and accumulated material removed on a regular basis to ensure effective operation of the cleaning station.

4.5 Other Fugitive Particulate Control Measures

The following identifies other fugitive particulate control measures that will be implemented at this Facility.

4.5.1 Shredder Water Injection

The shredder will be equipped with water injection as a mitigation measure for deflagrations in the shredder. Water injected into the shredder flashes steam and fills the voids in the shredder body displacing oxygen in ambient air. Removal of oxygen from the shredder will reduce the potential for deflagrations. Although it is not used as a control measure, wetting the material in the shredder has a secondary effect of minimizing the potential for fugitive particulate emissions from the shredder material discharge conveyor and other downstream conveyors.

The shredder operator will adjust the water injection rate as indicated by the rate, type and characteristics of the material being processed. Adjustments to the shredder water injection rate are part of routine shredder operation and will not be recorded under this Program.

4.5.2 Shredder Emission Control System

The shredder emission control system consists of an emissions collection hood, cyclone for removal of large pieces of solid matter, a roll media filter for particulate control, and a regenerative thermal oxidizer and packed tower scrubber. Potential particulate emissions from the shredder emission control system are not fugitive emissions, because the shredder emission control system is assigned a permitted emission rate, and is subject to specific opacity and mass emission limits identified in the Facility construction/operation permit.

4.5.3 Non-Ferrous Processing Building Baghouse

Potential particulate emissions from the equipment located in the Non-Ferrous Processing Building are collected and controlled by four identical cartridge style baghouses. Three of the baghouses collect particulate emissions from various dust pickup points in the process, remove entrained particulate, and exhaust treated air back into the building. There are no emissions to the atmosphere from the three baghouses that exhaust back into the building. The fourth baghouse collects particulate emissions from various dust pickup points in the process, removes entrained particulate and exhausts treated air to the outside atmosphere.

Particulate emissions from the baghouse that exhausts to the outside atmosphere are not considered fugitive emissions because the dust collector is assigned a permitted emission rate and is subject to specific opacity and mass emission limits identified in the facility construction/operation permits.

Fine particulate matter removed by the baghouses is collected in sealed hoppers and periodically conveyed to the Non-Ferrous waste material stockpile via covered conveyor.

4.5.4 Conveyor Covers

Select conveyors are be equipped with covers to minimize the potential for windblown material.

4.6 Maintenance of Fugitive Particulate Control Equipment

Maintenance of equipment used for fugitive particulate control, including Dust Bosses, water truck and sweeper, is performed by on-site personnel in accordance with manufacturers recommendations.

5.0 RECORDKEEPING

It should be noted that the description of the information to be captured in the forms described herein are considered preliminary. This Program will be updated to reflect as-built conditions.

The following records will be maintained pursuant to this Program in accordance with permit recordkeeping requirements.

5.1 Meteorological Data

Meteorological data will be recorded and maintained electronically on site. Data will include hourly temperature, wind speed, wind direction, barometric pressure, relative humidity, and precipitation amounts.

5.2 Visible Emissions Observation and Control Form

A Visible Emissions Observation and Control (VEOC) Form will be used to record the results of routine Visible Emissions observations and corresponding control measures applied. Employee Observations will not be recorded.

The VEOC form will include the following information:

- Date/Time
- Name of Observer
- Area(s) Observed
    - Time of Observation
    - Visible Emissions Observed – Yes/No
        - Approximate migration distance from source (ft)
    - Controls Required (Yes/No)
        - If Yes, identify Control(s) Implemented

The VEOC form is not attached to this document and will be included in an amended program that will reflect as-built site conditions.

5.3 Water Truck Log

A log of water truck use will be maintained by the operator to record water applications to paved and unpaved areas. This log will include:

- Date/Time
- Name of Water Truck Operator
- Reason for Water Application
    - Scheduled or
    - Corrective Action in response to an Employee Observation

- Area(s) of Water Application
  - Time of Application
  - Approximate Amount of Water Applied (gallons)

5.4 Sweeper Log

A log of sweeper operation will be maintained by the operator to record sweeping events. This log will include:

- Date/Time
- Name of Sweeper Operator
- Reason for Sweeping
  - Scheduled or
  - Corrective Action in response to an Employee Observation
- Area(s) Swept
  - Time of Sweeping

5.5 Dust Bosses

A log of Dust Boss operation will be maintained. This log will include:

- Date/Time(s) of Dust Boss Operation
- Reason for Operation
  - Proactive or
  - Corrective Action in response to an Employee Observation

5.6 Fugitive Particulate Control Equipment Maintenance

Records of maintenance performed on fugitive particulate control equipment will be maintained by the Facility in accordance with permit recordkeeping requirements.

6.0 PROGRAM AMENDMENT

This Fugitive Particulate Operating Program shall be amended from time to time so that the operating program is current. Program amendments will be submitted to the Illinois EPA within thirty (30) days of such amendment. Any future revision to this Program made by GIII is automatically incorporated by reference as an enforceable condition of the Facility construction/operation permit, unless it is expressly disapproved, in writing, by the Illinois EPA. In the event that the Illinois EPA notifies GIII of a deficiency with any revision to the Program, GIII will revise and re-submit the Fugitive Particulate Operating Program within thirty (30) days of receipt of notification to address the deficiency.

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Fugitive Particulate Operating Program

General III, LLC
11600 South Burley
Chicago, Illinois 60614

FIGURES

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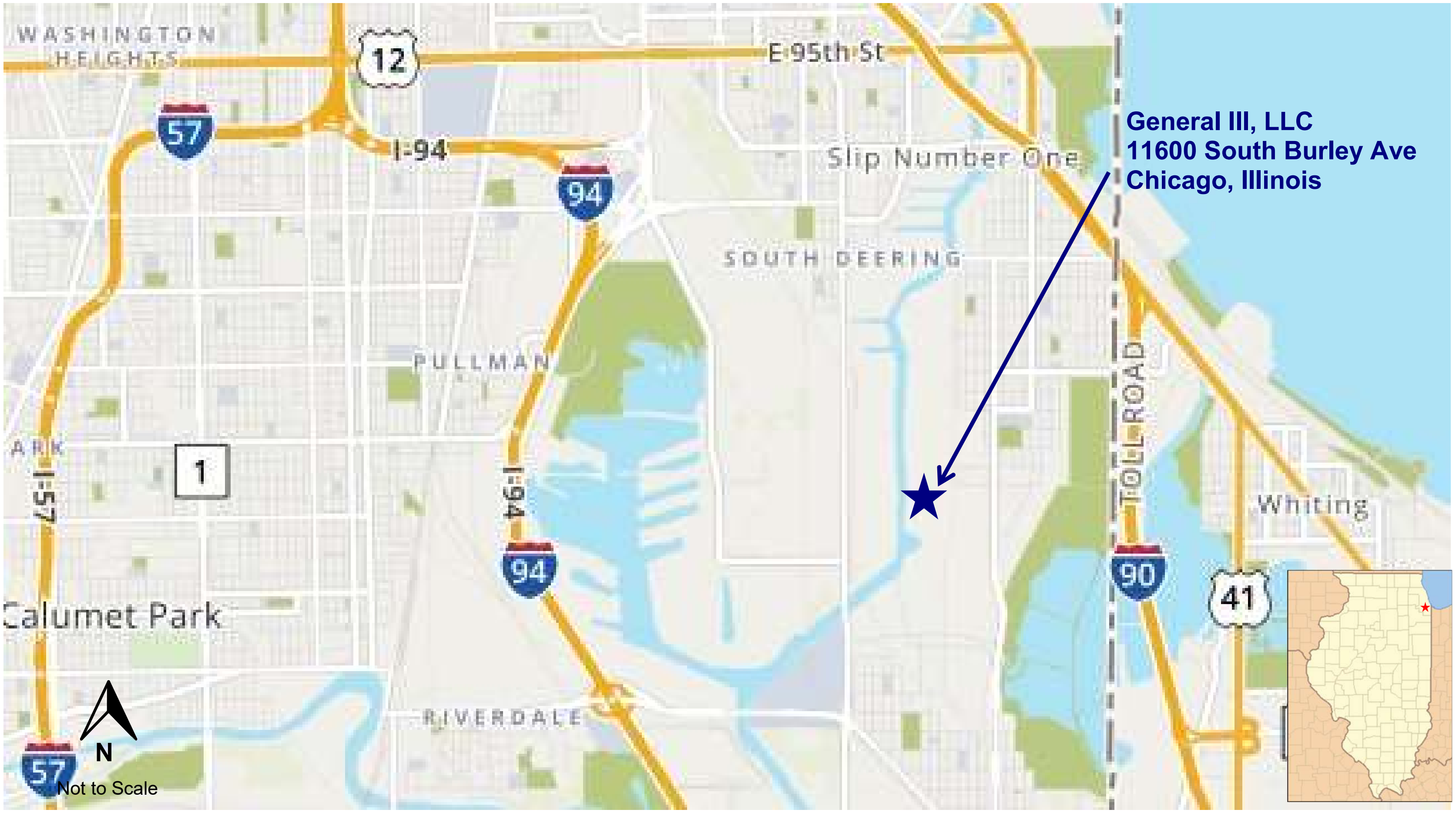

2S631 ROUTE 59, SUITE B
WARRENVILLE, IL 60555
630-393-9000/630-393-9111

COMMENTS:				FIGURE
Fugitive Particulate Operating Program		Facility Location Map General III, LLC 11600 South Burley, Chicago, Illinois		2-1
DRAWN BY::	APPROVED BY:: JGP	PROJECT NUMBER R19439-7.10	DATE DRAWN: 11-01-2019	REVISED DATE

RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: Fugitive Particulate Operating Program		Facility Layout Map General III, LLC 11600 South Burley, Chicago, IL			FIGURE 2-2
	DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER: R19439-7.10	DATE DRAWN: 11-01-2019	REVISED DATE	

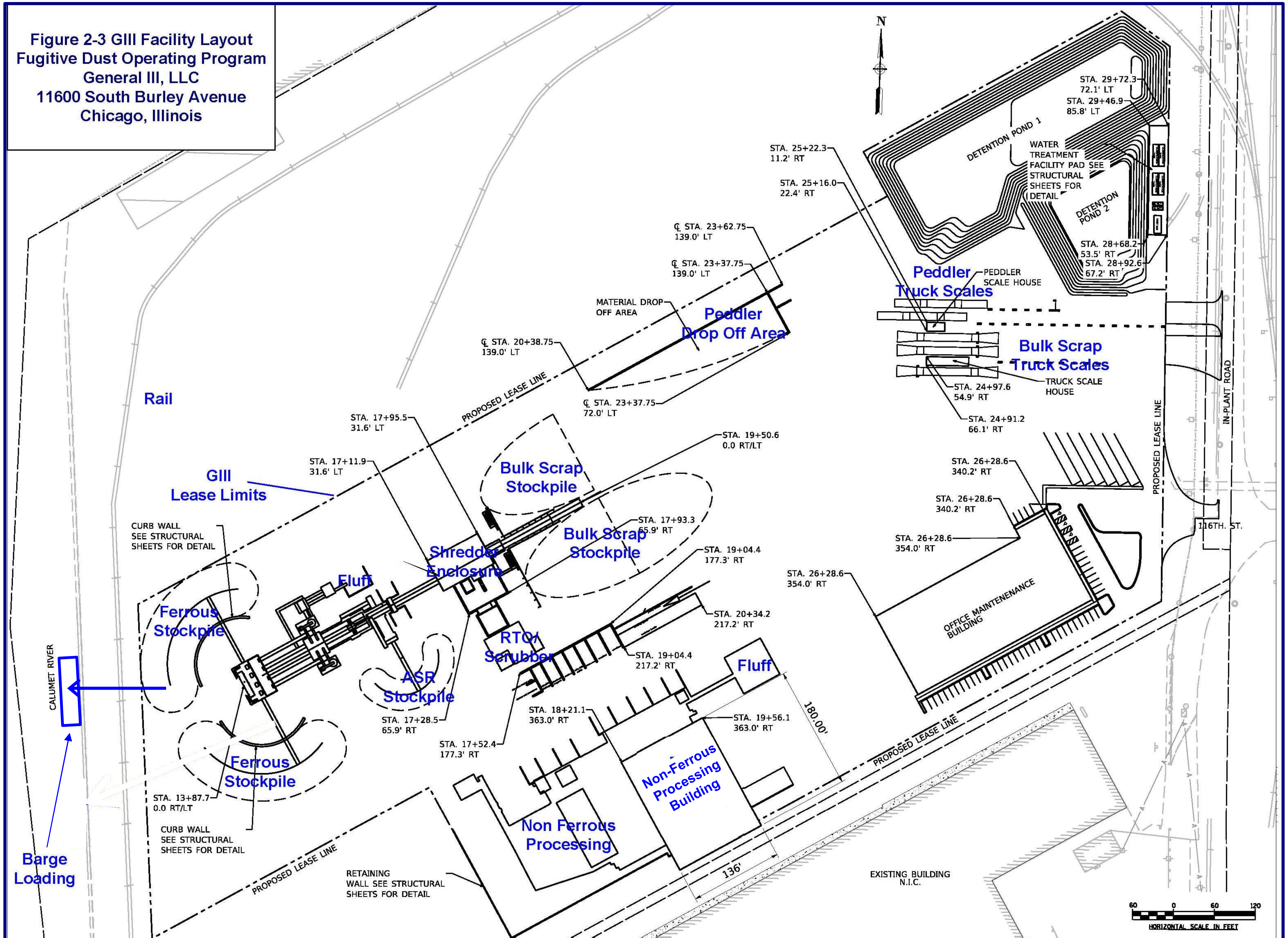

Figure 2-3 GIII Facility Layout
Fugitive Dust Operating Program
General III, LLC
11600 South Burley Avenue
Chicago, Illinois

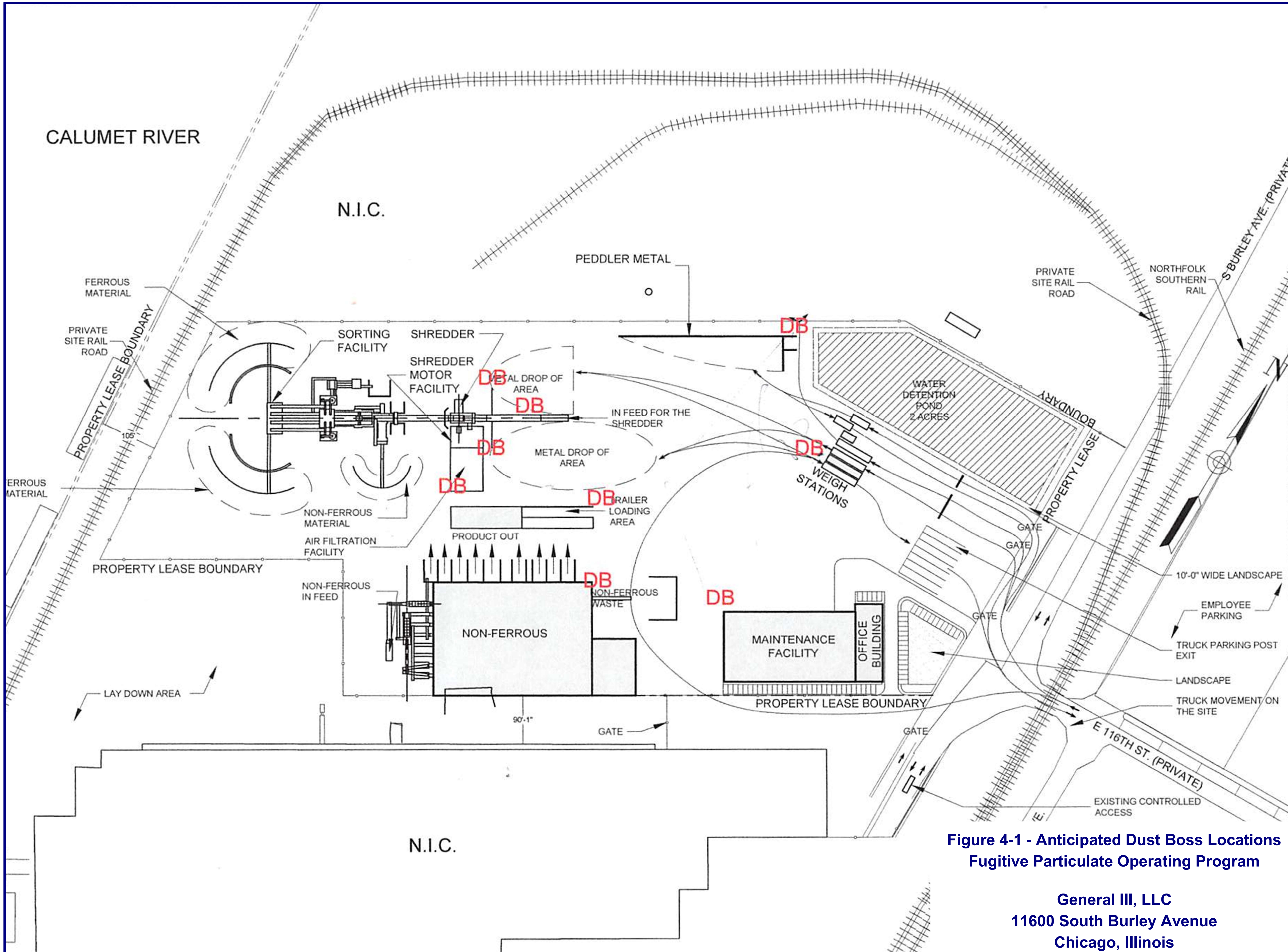

Figure 4-1 - Anticipated Dust Boss Locations
Fugitive Particulate Operating Program

General III, LLC
11600 South Burley Avenue
Chicago, Illinois

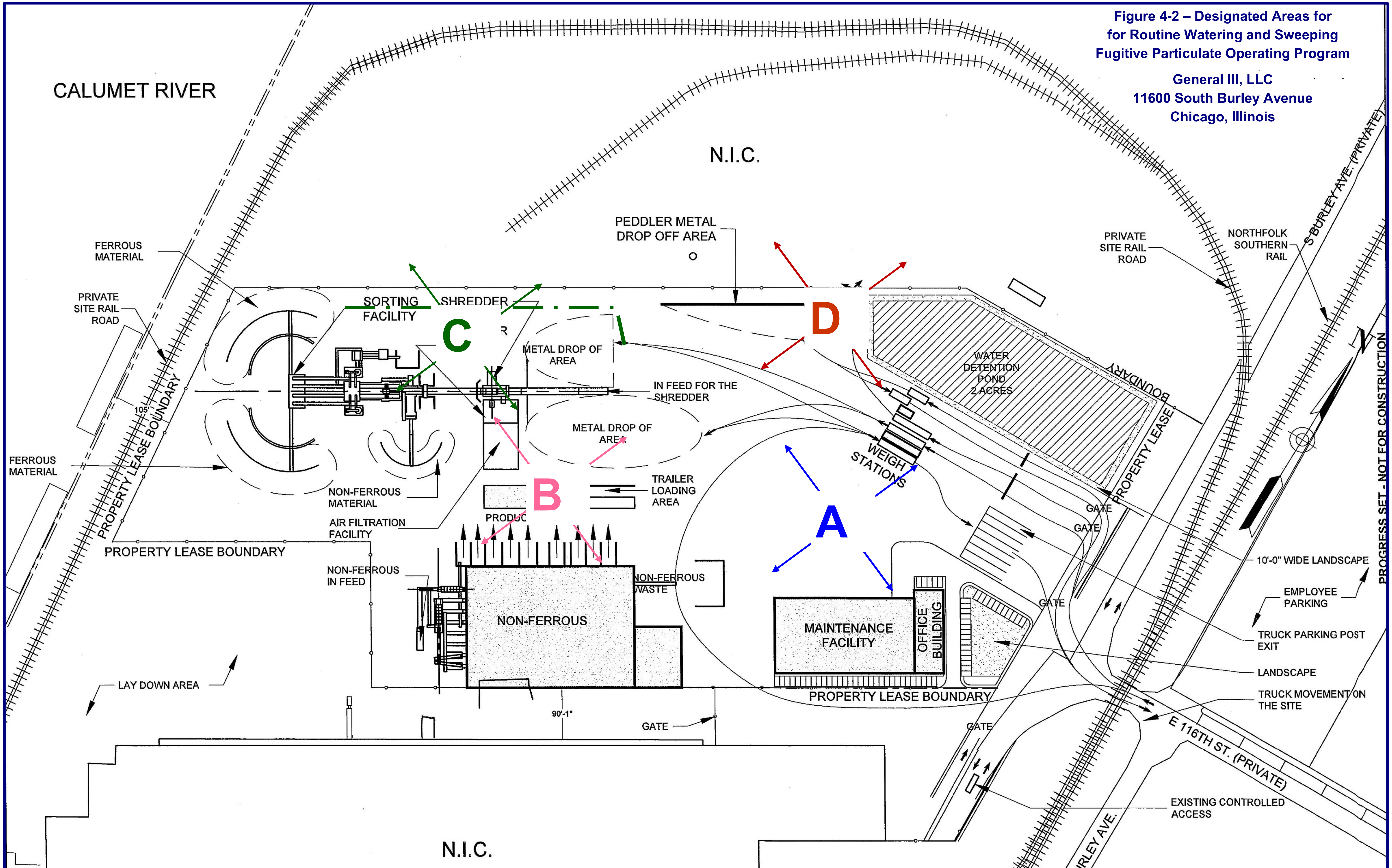

Figure 4-2 – Designated Areas for
for Routine Watering and Sweeping
Fugitive Particulate Operating Program
General III, LLC
11600 South Burley Avenue
Chicago, Illinois
CALUMET RIVER
N.I.C.
PEDDLER METAL DROP OFF AREA
FERROUS MATERIAL
PRIVATE SITE RAIL ROAD
SORTING FACILITY
SHREDDER
C
D
METAL DROP OF AREA
IN FEED FOR THE SHREDDER
WATER DETENTION POND 2 ACRES
BOUNDARY
PROPERTY LEASE
WEIGH STATIONS
METAL DROP OF AREA
TRAILER LOADING AREA
B
A
PROPERTY LEASE BOUNDARY
NON-FERROUS MATERIAL
AIR FILTRATION FACILITY
PRODUC
NON-FERROUS IN FEED
NON-FERROUS WASTE
NON-FERROUS
MAINTENANCE FACILITY
OFFICE BUILDING
GATE
PRIVATE SITE RAIL ROAD
NORTHFOLK SOUTHERN RAIL
S BURLEY AVE. (PRIVATE)
10'-0" WIDE LANDSCAPE
EMPLOYEE PARKING
TRUCK PARKING POST EXIT
LANDSCAPE
TRUCK MOVEMENT ON THE SITE
E 116TH ST. (PRIVATE)
EXISTING CONTROLLED ACCESS
PROGRESS SET - NOT FOR CONSTRUCTION
LAY DOWN AREA
90'-1"
105'
BURLEY AVE.
N.I.C.

EXHIBIT 9

R 001705

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 · (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

Inspection Report

GENERAL INFORMATION			
Report Date:	3/20/2020	Report Author	Eric E. Jones

SOURCE INFORMATION	
LOCATION	
Facility ID #:	031600SFX
Company Name:	General Iron III
Street Address:	11600 South Burley
City, County:	Chicago, Cook County
State, Zip Code:	Illinois, 60617
Contact/Title:	Jim Kallas
Contact Phone/Fax:	847/508-9170
Contact Email:	

SCOPE OF INSPECTION

Review of Fugitive Dust Plan dated March 20, 2020.

EVALUATION # 1

Fugitive Particulate Matter Operating Program

INSPECTION FOCUS

- Name and address of the source, owner and operator.
- Map of source showing locations of storage piles, conveyor loading operations and traffic patterns.
- Location of unloading and transporting operations.
- Description of best management practices (BMP).
- Description of air pollution control equipment.
- Frequency of application of dust suppressants.

REVIEW FINDINGS

The source is not required to submit a Operating Program under 35 Ill. Adm Code 212.302. Therefore I am reviewing this under the risk of violation of 35 Ill. Adm. Code 212.301.

Raw material unloading/handling:

Monitoring: Trained personnel will conduct visual observations of the raw material unloading and handling areas for the presence of Visible Emissions three times per day and record the results on a Visible Emissions Observation and

Control (VEOC) form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.
Control measures: Dust Boss water atomizers will be positioned to mist the raw material handling area and will be utilized as needed. The water applied by the Dust Boss will increase the moisture content of the material being transferred to minimize the potential for Visible Emissions.

Shredder enclosure:
Monitoring: Trained personnel will conduct visual observations of the shredder enclosure for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.
Control measures: If Visible Emissions are observed exiting the shredder enclosure, operators will perform a system inspection to identify the potential source and cause of the Visible Emissions and take appropriate corrective actions, which may include a change in the shredder water injection rate or shredder emissions capture and control system operating parameters.

Material Transfer Points:
Monitoring: Trained personnel will conduct visual observations of specific areas that include material transfer points for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.
Control Measures: Dust Boss water atomizers will be positioned to mist the facility areas with the highest potential for fugitive particulate. The water applied by the Dust Boss will increase the moisture content of the material being transferred to minimize the potential for Visible Emissions.

Intermediate and Product Storage Piles:
Monitoring: Trained personnel will conduct visual observations of specific areas that include material transfer points for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.
Control Measures: Dust Boss water atomizers will be positioned to mist stockpiles if Visible Emissions are observed. The water applied by the Dust Boss will increase the moisture content of the material being transferred to minimize the potential for Visible Emissions. With the exception of the Raw Material stockpiles, the two Ferrous Metal Stockpiles, and the ASR stockpile, all stockpiles identified in facility emission estimates will have solid partitions on three sides.

Non-Ferrous Processing Building:
Monitoring: Trained personnel will conduct visual observations of conveyor wall openings, personnel doors, and other openings in the Non-Ferrous Processing Building for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.
Control Measures: If Visible Emissions are observed from the building openings, the building will be inspected to ensure that personnel and service doors are closed when not in use and that the baghouses are functioning properly. Material removed by the baghouses is collected on a covered conveyor and transferred to the waste material stockpile.

Material Loadout:

Monitoring: Trained personnel will conduct visual observations of material loadout areas for the presence of Visible Emissions three times per day and record the results on a VEOC form. If Visible Emissions are identified, observers will notify the Facility Manager who will be responsible for deployment of fugitive particulate control measures.

Control Measures: Dust Boss water atomizers will be positioned to mist stockpiles and adjacent loadout areas if Visible Emissions are observed. The water applied by the Dust Boss will increase the moisture content of the material to minimize the potential for Visible Emissions.

Paved Areas:

Monitoring: rained personnel will conduct visual observations of paved vehicle traffic routes for the presence of Visible Emissions and record the results on a VEOC form. Heavily traveled routes will be observed three times per day and less traveled routes and non-traffic paved areas will be observed once per day.

Control Measures Water will be applied to heavily used paved areas at least once per day, subject to the weather conditions identified above. Additional applications may be made in response to Employee Observations. Operation of the water truck will documented in a water truck log that will identify the area(s) where water is applied, the approximate amount of water applied, the time of application, the name of the person operating the water truck, and the reason for application (i.e., routine daily application or in response to an Employee Observation). Sweeping of designated heavy traffic areas will occur at least once every other day, based on daily observations and subject to the weather conditions identified above. Operation of the sweeper will be documented in a sweeper log that will identify the area(s) swept, the date/time sweeping was performed, the name of the person operating the sweeper, and the reason for sweeping (i.e., routine daily sweeping or in response to an Employee Observation). Rumble strips will be installed at the entrance to the outgoing scale to remove loose material from exterior of vehicle trailers and vehicle tires.

Unpaved Areas:

Monitoring: Trained personnel will conduct visual observations of unpaved areas for the presence of Visible Emissions and record the results on a VEOC form. Heavily used areas will be observed three times per day and lightly used areas will be observed once per day.

Control Measures: Water will be applied to heavily used unpaved areas at least once per day subject to the weather conditions identified above. Additional applications may be made in response to Employee Observations. Operation of the water truck will documented in a water truck log that will identify the area(s) where water is applied, the approximate amount of water applied, the time of application, the name of the person operating the water truck, and the reason for application (i.e., routine daily application or in response to an Employee Observation).

Downwind Property Line/Barge Loading:

Monitoring: Trained personnel will conduct visual observations at least once per day of the barge loading area (when barge loading is occurring at the time of the observation) and the downwind property line(s) of the industrial campus for the presence of Visible Emissions and record the results on a VEOC form.

It is the determination of this reviewer that the revised FPOP as submitted on July 17, 2019, meets the criteria of a FPOP and is acceptable. No issues are anticipated to arise from the implementation of this revised FPOP as written.

General Checklist	YES	NO	N/A
What is the purpose of this review? **FPOP review for Permits**			
Is this review being done on site or in the office (desk top)? **Office Review**			
1. Is the facility in an area of Granite City as defined by 35 Ill. Adm. Code 212.324(a)(1)(C) and engaged in one of these operations? • Mining operations (SIC major groups 10 through 14) • Manufacturing operations (SIC major groups 20 through 39 including grain-handling and grain-drying operations, portable grain-handling equipment and one-turn storage space) • Transportation, communications, electric, gas, and sanitary services (SIC major groups 40 through 49) • Wholesale trade-farm supplies (SIC Industry No. 5191) If yes, answer 4-9 then go to the Granite City check list.		x	
2. Is the facility in the area of McCook defined by 35 Ill. Adm. Code 212.324(a)(1)(A) or the area of Lake Calumet defined by 35 Ill. Adm. Code 212.324(a)(1)(B) and engaged in one of these operations? • Mining operations (SIC major groups 10 through 14) • Manufacturing operations (SIC major groups 20 through 39 including grain-handling and grain-drying operations, portable grain-handling equipment and one-turn storage space) • Transportation, communications, electric, gas, and sanitary services (SIC major groups 40 through 49) If yes, answer 4-9 then go to the McCook/Lake Calumet check list.	x		
3. Is the facility in one of the other geographical areas of application defined by 35 Ill. Adm. Code 212.302(a) and engaged in one of these operations? • Mining operations (SIC major groups 10 through 14) • Manufacturing operations (SIC major groups 20 through 39 except for grain-handling and grain-drying operations, portable grain-handling equipment and one-turn storage space) • Electric generating operations (SIC group 491) If yes, answer 4-9 then go to the Other Geographical Areas check list.		x	
If the answers to 1, 2, and 3 are no, the facility is not required to have an operating program pursuant to Part 212, Subpart K. They may have an operating program pursuant to permit conditions, compliance commitment agreements (“CCA’s”), or facility may choose to submit on their own accord. If this is the case please answer 4-9 and conduct a review as outlined in the General Guidance document (as applicable) and document the review in a Tier 1 report. NOTE: The review should include compliance determinations in reference to any permit condition or CCA’s as applicable.			
4. Do they have an Operating Program?		X	
If yes, when was it originally prepared? See GIR Report			
5. Was the Operating Program submitted to the Agency?	X		
If yes, when was it submitted? See GIR Report If yes, when was it reviewed? See GIR Report			
6. Has the program been incorporated into a permit?		X	
If yes, what is the permit and when was it issued? Has not been incorporated as of this review but will be included when Joint Construction and Lifetime Operating Permit is issued.			
7. Does it have the name and address of the source?	X		
8. Does it have the name and address of the owner or operator in charge of the source and the program?	X		
9. Has it been updated recently?	X		

If yes, when? See GIR Report

Other Geographic Areas Check List

	YES	NO	N/A
Property Line			
1. Are there emissions of fugitive particulate matter, as defined by 35IAC2112490, that are visible by an observer looking generally toward the zenith at a point beyond the property line of the source?			x
If yes, provide more information:			
2. Does the source conduct observations for visible emissions and are records kept of such?	x		
Storage Piles			
3. Does the facility have a potential to emit in excess of 100 T/yr of particulate emissions from all sources? If so, how was this determination made? Is the potential to emit limited by a permit(s)? If no, go to 8		x	
a) If yes, does the storage pile have uncontrolled fugitive particulate matter emissions in excess of 50 T/yr? Explain basis for answer. If no storage piles apply, go to 8			x
b) If yes, are all storage piles protected by a cover or sprayed with a surfactant solution or water on a regular basis, as needed, or treated by an equivalent method, in accordance with the operating program?			x
c) If any are not, then can it be proved that the storage pile does not have fugitive particulate matter emissions that cross the property line by either direct wind action or re-entrainment (i.e., cleaning of spills, moving of equipment, etc.)?			
Identify the storage pile and provide more information if visible emissions are observed or indicated:			
4. Are all conveyor loading operations to the storage pile utilizing spray systems, telescopic chutes, stone ladders or other equivalent methods in accordance with the operating program?	x		
Identify the operation and provide more information if visible emissions are observed or indicated:			
5. Are all normal traffic pattern access areas surrounding the storage pile either paved and cleaned regularly or treated with water, oils or chemical dust suppressants and have the treatment applied on a regular basis, as needed, in accordance with the operating program?	x		
Identify the area and provide more information if visible emissions are observed or indicated:			
6. Are the above control methods detailed in the Fugitive Dust Plan?	x		
7. Are the storage piles, conveyor loading operations, and normal traffic pattern access areas surrounding the storage pile shown on a map of the facility?	x		
Provide more information on methods, frequencies, and any deviations:			
Traffic Areas			
8. Is the facility a mining or manufacturing facility?		x	
a) If yes, are all normal traffic pattern roads and parking facilities either paved and cleaned regularly or treated with water, oils or chemical dust suppressants and have the treatment applied on a regular basis, as needed, in accordance with the operating program?			x
Identify the area and provide more information if visible emissions are observed or indicated:			
9. Are these control methods detailed in the Fugitive Dust Plan?	x		
10. Are the normal traffic pattern roads and parking facilities shown on a map of the facility?	x		
Provide more information on methods, frequencies, and any deviations:			
Pollution Control Equipment			
11. If pollution control equipment is used for controlling particulate matter emissions according to an Fugitive Dust Plan, are emissions from that equipment below or equal to 68 mg/dscf (0.03 gr/dscf) as demonstrated by a stack test?			x
If no for any equipment, identify equipment and provide more information:			

12. Are all unloading and transporting operations of materials collected by pollution control equipment enclosed or utilize spraying, pelletizing, screw conveying or other equivalent methods?			x
If no for any operation, identify operation and provide more information:			
13. Are these pollution control equipment and control methods detailed in the Operating Program?			x
14. Are the locations of all the unloading and transporting operations of materials collected by pollution control equipment shown on a map of the facility?			x
Provide more information on methods, frequencies, and any deviations: Materials are returned to silos and not off site.			
Crushing, Grinding, Conveying, Bagging, and Loading Operations			
15. Are all crushers, grinding mills, screening operations, bucket elevators, conveyor transfer points, conveyors, bagging operations, storage bins and fine product truck and railcar loading operations being sprayed with water or a surfactant solution, utilizing choke-feeding or being treated by an equivalent method in accordance with the operating program?	x		
Identify the operation and provide more information if visible emissions are observed or indicated: Only Transfer points.			
16. Are these control methods detailed in the Fugitive Dust Plan?	x		
Provide more information on methods, frequencies, and any deviations:. Water injection at the shredder and daily observations of other processes for visible emissions and additional watering.			
1. Are there any additional Federal standards or permit conditions?		x	
If yes, list them:			

SIGNATURE

REPORT CERTIFICATION:	X Eric E. Jones Reviewer

cc: DAPC – Division File
DAPC/FOS –

EXHIBIT 10

Air Dispersion Modeling Protocol to Assess Metal Emission Impacts

General III, LLC – Chicago, Illinois

November 18, 2019

R17421-7.1

Prepared for:

General III, LLC
1909 North Clifton Avenue
Chicago, Illinois 60614
Attn: Mr. Jim Kallas

This Document Contains Redacted TRADE SECRET Information

Figures A-1, A-2, B-1, and B-3 Contain Trade Secret Information and Have Been Redacted from this Document.

Prepared by:

John G. Pinion
Principal Engineer
RK & Associates, Inc.

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& Associates, Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION 1

1.1 Facility Location and Contact Information 2

2.0 EMISSION SOURCES 5

2.1 Shredder Emissions 5

2.2 Ferrous Material Processing 6

2.3 Non-Ferrous Material Processing 6

2.4 Vehicle Traffic 7

3.0 DISPERSION MODELING 9

3.1 Meteorological Data 9

3.2 Terrain Data 9

3.3 Receptor Network 9

3.4 Building Downwash 9

3.5 Lead Modeling 9

3.6 Manganese Modeling 11

3.7 Modeling Other Metals 13

3.8 Adjustments to Background Data 14

TABLES

Table 3-1 Offsite Lead Sources 10

Table 3-2 Lead Background Concentrations 10

Table 3-3 Offsite Manganese Sources 12

Table 3-4 Manganese Background Concentrations 13

Table 3-5 NR 445 Standards For Other Metals 13

Table A-1a Ferrous Material Processing– Metal Emissions in Active Hours .... Appendix A

Table A-1b Ferrous Material Processing – Metal Emissions in Inactive Hours .... Appendix A

Table A-2 Ferrous Material Processing – Particulate Emissions .... Appendix A

Table A-3 Ferrous Plant Stockpile – Particulate Emissions .... Appendix A

Table A-4 Ferrous Material Processing – PM Emission Summary .... Appendix A

Table B-1 Non-Ferrous Material Processing – Particulate Emissions .... Appendix B

Table B-2 Non-Ferrous Plant Stockpile – Particulate Emissions .... Appendix B

Table B-3 Non-Ferrous Material Processing – PM Emission Summary .... Appendix B

Table B-4a Non-Ferrous Material Processing – Metal Emissions in Active Hours .... Appendix B

Table B-4b Non-Ferrous Material Processing – Metal Emissions in Inactive Hours .... Appendix B

FIGURES

Figure 1-2 Site Location Map 3
Figure 1-2 Facility Map 4
Figure A-1 Ferrous Processing System Flow Diagram **TRADE SECRET Redacted** .... Appendix A
Figure A-2 Ferrous Processing System Layout **TRADE SECRET Redacted** .... Appendix A
Figure B-1 Non-Ferrous Processing System Flow Diagram **TRADE SECRET Redacted** Appendix B
Figure B-2 Non-Ferrous Processing System Layout **TRADE SECRET Redacted** .... Appendix B
Figure C-1 Anticipated Traffic Routes .... Appendix C

APPENDIXES

Appendix A Ferrous Material Processing Figures and Tables

Appendix B Non-Ferrous Material Processing Figures and Tables

Appendix C Vehicle Traffic

RK
& ASSOCIATES, INC.

1.0 INTRODUCTION

General III, LLC (GIII), is proposing to construct and operate a new scrap metal recycling facility (Facility) in Cook County at 11600 South Burley Avenue in Chicago, Illinois. A Site Location Map and Facility Layout Map are presented in Figures 1-1 and 1-2.

GIII's proposed facility will be a state-of-the-art metal recycling facility located in the heart of an industrial district well buffered from residential properties. The proposed new metal shredder and material processing operations will utilize the latest technology to create a clean, efficient, and environmentally sensitive plant.

GIII will receive and shred mixed recyclables in various forms to produce uniform grades of ferrous and non-ferrous metals. Proposed scrap handling and processing activities include receiving, sorting, shredding, metal separation, and recovery of ferrous and non-ferrous metals.

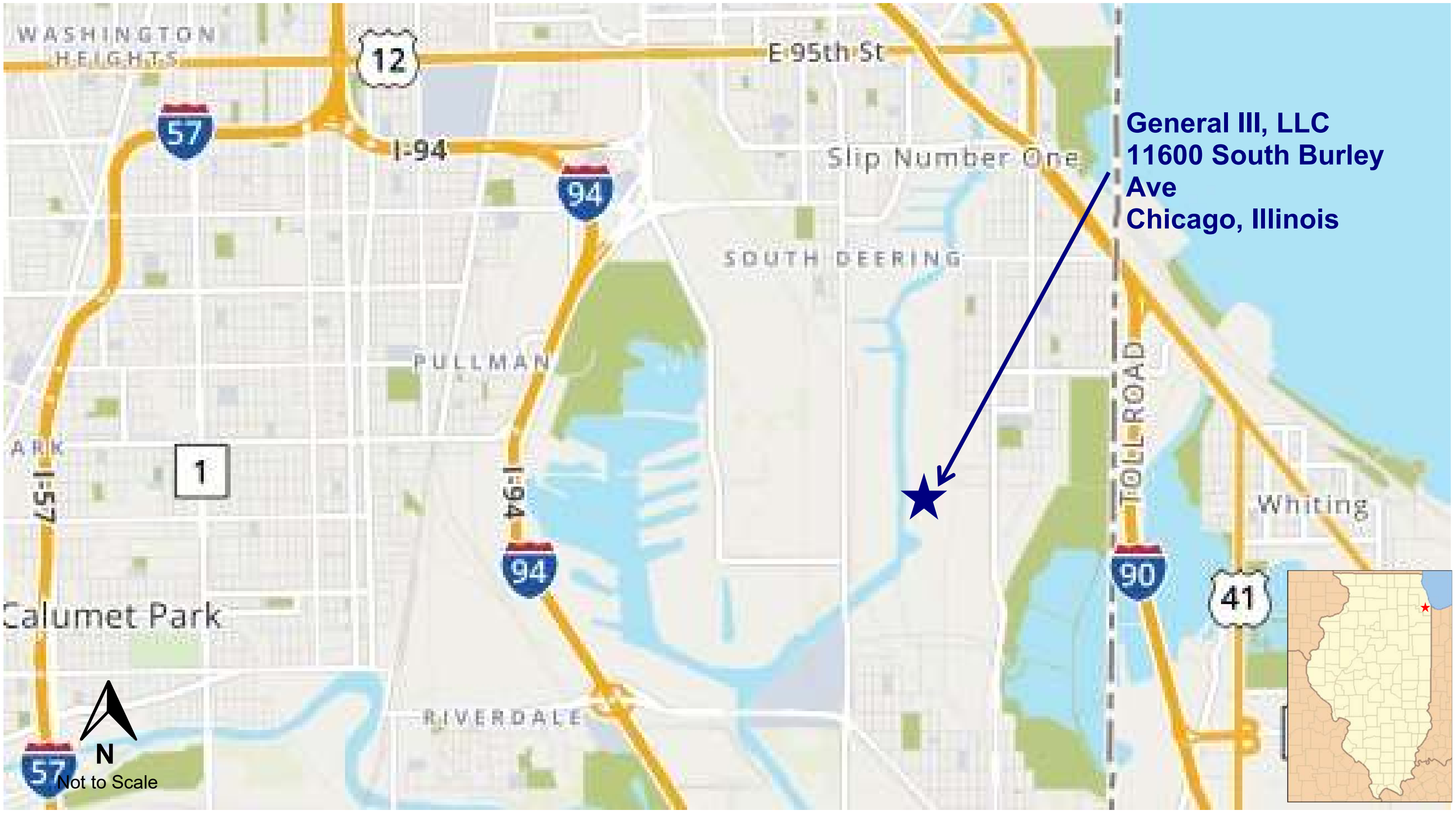
The proposed GIII facility will be a minor source with respect to federal and state nonattainment area new source review (NA NSR), prevention of significant deterioration (PSD) requirements and Title V permitting requirements. The proposed facility will also be an area source with respect to hazardous air pollutants (HAPs).

As part of the air permitting process, Illinois Environmental Protection Agency (IEPA) has requested that GIII perform air dispersion modeling of metal emissions from the proposed facility. Emission testing was conducted at the existing GII facility (formally General Iron Industries, Inc.) located at 1909 North Clifton Avenue in Chicago, on June 13 and 14, 2018, that measured metal emissions from the discharge of the roll media filter used to control particulate emissions from the existing shredder operation, in accordance with USEPA Methods 1-4 and Method 29. Test results were submitted to IEPA in June 2018. Pursuant to USEPA Method 29, the emissions of seventeen metals were reported. IEPA requested that GIII evaluate the offsite impacts from those seventeen metals.

There are no IEPA or USEPA regulations limiting emissions of specific metals or requiring an ambient impact analysis. There is a National Ambient Air Quality Standard (NAAQS) for lead (Pb). In an effort to identify a standard for metals, RKA reviewed the Wisconsin Department of Natural Resources (WDNR's) rule regulating the emissions of air toxic pollutants (including metals) that is applicable to facilities that are not subject to other state or federal rules for metals emissions. WDNR's Air Toxics Rule (NR 445) sets health-based emission standards for about 550 air toxics, including metals. The standards in NR 445 are based on threshold limit values established by American Conference of Governmental Industrial Hygienists (ACGIH) and USEPA or California Air Resources Board risk factors. Wisconsin's NR 445 will be used to assess the potential impacts for the estimated emissions of the 17 identified metals as described in Section 3 of this document.

1.1 Facility Location and Contact Information

Business Name:	General III, LLC.
Source Location:	11600 South Burley – Chicago, Illinois 60617 Hyde Park Township, Cook County Illinois
Latitude/Longitude	41.685201° N / -87.545847" W – Approximate Location of Front Gate
Office/Mailing Address:	1909 N. Clifton Avenue – Chicago, Illinois 60614
General III, LLC	Mr. Jim Kallas - Environmental Manager 847-508-9170 – jim@general-iron.com
IEPA Site ID No.:	Not yet assigned
SIC Code:	5093 – Scrap and Waste Materials
NAICS Code:	423930 – Recyclable Material Merchant Wholesalers
RKA Contact for Application Preparation	John Pinion - Principal Engineer 2S631 Route 59, Suite B - Warrenville, Illinois 60555 630-393-9000 - jpinion@rka-inc.com



RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: Air Dispersion Modeling Protocol to Assess Metal Emission Impacts		Site Location Map General III, LLC 11600 South Burley, Chicago, Illinois		FIGURE 1-1
	DRAWN BY::	APPROVED BY:: JGP	PROJECT NUMBER R19439-7.10	DATE DRAWN: 11-11-2019	REVISED DATE

RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: Air Dispersion Modeling Protocol to Assess Metal Emission Impacts		Facility Map General III, LLC 11600 South Burley, Chicago, IL		FIGURE 1-2
	DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER: R19439-7.10	DATE DRAWN: 11-11-2019	REVISED DATE

2.0 EMISSION SOURCES

Emission sources, emission factors, and emission rates are described in detail in the Construction Permit Application submitted to IEPA dated September 24, 2019. The new proposed GIII facility will consist of the following operations:

- Raw material receiving and handling;
- Hammermill shredder;
- Ferrous separation and material processing; and,
- Non-ferrous separation and material processing.

The following emission sources are identified:

- Shredder controlled by roll-media filter, RTO, and quench packed tower scrubber;
- Ferrous Material Processing System –conveyors, magnetic separators, stockpiles, and material loadout;
- Non-Ferrous Material Processing System - feed hopper, conveyors transfer points, magnetic separators, screens, vibratory feed tables, stockpiles and material loadout, and a baghouse for control of emission sources located in the fines processing building;
- Stockpiles (fugitive emissions); and,
- Paved and Unpaved Roads (fugitive emissions)

2.1 Shredder Emissions

Emissions from the shredder will be collected and controlled by a hood located over the top of the shredder and ducted through a control system consisting of a roll media filter, RTO, and a quench/ packed tower scrubber. Emissions from the shredder (scrubber exhaust stack) will be modelled as a point source. Point source parameters are as follows:

Stack Height:	41 ft
Stack Diameter:	6 ft
Exhaust Flow Rate:	73,500 acfm
Exhaust Temperature:	100˚F

Emission testing conducted at the existing GII facility in Chicago on June 13 and 14, 2018 measured metals from the exhaust of the existing roll media filter pursuant to USEPA Methods 1-4 and Method 29. Due to the similarities in shredder material feed streams, the metals partitioning in filterable particulate measured at the discharge of the roll media filter at GII are assumed to be the representative of the metals partitioning in the estimated filterable particulate in shredder emissions discharged from the scrubber exhaust stack.

Metal emissions from the proposed shredder are presented in Appendix A, Table A-1a and A-1b.

2.2 Ferrous Material Processing

The Ferrous Material Processing System consists of multiple emissions sources as described in the construction permit application. Emission sources include conveyors, magnetic separators, stockpiles and material loadout.

For the purpose of modeling, emission sources that are spatially close together are combined into separate volume sources. The Ferrous Material Processing System emission sources have been grouped into thirteen (13) volume sources, V-1 through V-13, as shown in Figure A-1 in Appendix A. A layout drawing of the Ferrous Material Processing System is presented in Figure A-2 in Appendix A. Figures A-1 and A-2 contain TRADE SECRET information and have been redacted from this document.

Individual metal emission rates are calculated by multiplying the estimated particulate emission rate for each modeled source by the metal partitioning factor for each metal, expressed as a percentage of the total filterable particulate measured during the June 2018 GII shredder emission testing.

The type of emission source, the emission source identification number, and corresponding PM emissions are shown in Table A-2 in Appendix A.

Stockpile sources and their appropriate volume source group are shown in Table A-3. Emissions from stockpiles are different during the time piles are active and when piles are inactive. Table A-4 identifies the individual metal emission rates from material handling sources and stockpile sources. For the purpose of this modeling assessment, the stockpiles in the Ferrous Material Handling System are assumed to be active for 12 hours per day Monday through Saturday.

2.3 Non-Ferrous Material Processing

The Non-Ferrous Material Processing System consists of multiple emissions sources as described in the construction permit application. Emission sources include feed hopper, conveyors transfer points, magnetic separators, screens, vibratory feed tables, stockpiles and material loadout. Emission sources have been grouped into six (6) volume sources, VN-1 through VN-6, as shown in Figure B-1 in Appendix B. A layout drawing of the Non-Ferrous Material Processing System is presented in Figure B-2 in Appendix B. Figures B-1 and B-2 contain TRADE SECRET information and have been redacted from this document.

Individual metal emission rates are calculated by multiplying the estimated particulate emission rate for each modeled source by the metal partitioning factor for each metal, expressed as a percentage of the total filterable particulate measured during the June 2018 GII shredder emission testing.

The type of emission source, the emission source identification number, and corresponding PM emissions are shown in Table B-1 in Appendix B.

Stockpile sources and their appropriate volume source group are shown in Table B-2. Emissions from stockpiles are different during the time piles are active and when piles are inactive. Table B-3 contains combined emissions from material handling sources and stockpile sources. For the purpose of this modeling assessment, the stockpiles in the Non-Ferrous Material Handling System are assumed to be active for 24 hours per day Monday through Saturday.

Individual metal emission rates are shown in Table B-4a for active facility hours and in Table B-4b for inactive hours.

The Non-Ferrous Material Processing System includes a Fines Processing System that is located in a building. Emissions from the fines processing equipment are ducted to one of four identical dust collectors. Three of the dust collectors exhaust treated air back into the building and the fourth dust collector exhausts treated air to the outside atmosphere. Emissions from the single dust collector that exhausts to the atmosphere will be modeled as a point source with the following parameters:

Stack Height:	47 ft
Stack Diameter:	2 ft
Exhaust Flow Rate:	12,000 acfm
Exhaust Temperature:	Ambient

Metal emissions from the dust collector are shown in Table B-4 in Appendix B.

2.4 Vehicle Traffic

The vast majority of material received at the proposed facility will be delivered by semi-trailers and the remaining portion will enter the facility in pickup truck sized vehicles driven by peddlers. Vehicles will enter the facility through a controlled gate and travel over a weigh scale before being routed to a designated unloading area.

Proposed vehicle routes are presented in Figure C-1 in Appendix C. Vehicle emissions will be modeled as a line of adjacent volume sources, representing each of the vehicle routes in the facility. Estimated roadway fugitive emissions will be distributed to reflect the frequency of the vehicle traffic on each road.

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3.0 DISPERSION MODELING

Dispersion modeling will be performed to predict the maximum impact from General III sources. AERMOD dispersion model Version 19191, AIRMET Version 19191, AERMINUTE Version 15272, AERMAP Version 18081, and AIRSURFACE Version 13016 will be used in this modeling analysis.

3.1 Meteorological Data

Surface meteorological data used in the modeling is obtained from the National Weather Service at the Midway Airport Station for the years 2014 through 2018. Wind data was downloaded as 1-minute average ASOS data and processed in AERMINUTE. Upper air data for the same period is obtained from nearest upper air Lincoln-Logan County station. Surface and upper air data is preprocessed with AERMET using surface parameters from AIRSURFACE.

3.2 Terrain Data

Receptor elevations, source elevations, and building elevations were obtain by running AERMAP, using National Elevation Dataset (NED) files downloaded from USGS website.

3.3 Receptor Network

A Cartesian receptor grid is placed around the property lines up to 5 km from the property line as follows:

- 50 m apart along the property line
- 100 m extending from the fence line to 2 km
- 500 m apart from 2 km to 5 km

3.4 Building Downwash

Downwash parameters will be developed based on detailed building information provided by GIII for proposed buildings, and information derived from aerial photos from Google Earth for nearby buildings.

3.5 Lead Modeling

Lead modeling will be performed to identify off site impacts for comparison to the National Ambient Air Quality Standard (NAAQS) for lead, which is 0.15 $\mu g/m^3$ on a rolling three-month average.

GIII lead emission sources described in Section 2 of this protocol will be modeled along with other, non-GIII offsite lead sources. IEPA has provided a list of offsite lead sources to be included in this modeling assessment. The list of offsite sources is included in Table 3-1.

TABLE 3-1. OFFSITE LEAD SOURCES

ID Number	Stack Number	Stack Id	Stack Description	Lead Emissions (lb/hr)	Stack Diameter (ft)	Stack Height (ft)	Flow Rate (acfm)	Temperature (F)	UTM Zone	UTM Northing	UTM Easting
031600AAR	109	250881	4 Big foot air houses (19.4 million BTU/hr each)	0.00000335	1.76	37	3000	442	16	4612420	453419
031600FGT	3	195877	Cement silo loading	0.000069	2.80	36	10266	80	16	4617532	451809
031600FGT	6	195880	Mixer and/or truck loading	0.0002292	2.90	32	10220	80	16	4617532	451809
031600FHQ	1	121260	Portland cement terminal: Cement silo loading	0.000368	5.30	50	3000	70	16	4612185	452489
031600FHQ	2	121261	Portland cement terminal: Truck loading/unloading	0.002208	7.92	20	3000	70	16	4612185	452489
031600GKE	9	222736	Backup generator EDG A	0.000277144	3.00	12	16200	895	16	4618584	454708
031600GKE	10	222737	Backup generator EDG B	0.000277144	3.00	12	16200	895	16	4618571	454708
031600GKE	11	222738	Backup generator EDG C	0.000277144	3.00	12	16200	895	16	4618559	454708
031600AFV	5	118896	Kiln #2	0.144	15.85	16	4115	356	16	4615216	453823
031600AFV	27	184788	Crude zinc oxide bin loadout (bag collector 5)	0.009	29.87	30	123228	300	16	4615216	453823
031600AFV	30	184791	Feed handling system	0.0018	22.86	23	4101	301	16	4615216	453823
031600GWV	7	234365	Boiler	0.00019	22.56	23	19740	487	16	4613685	454218

AERMOD will be run for five years of meteorological data to predict the first-high monthly average concentration. AERMOD post files will be created and processed with LEADPOST, which outputs the rolling three-month averages. LEADPOST identifies the receptor of maximum impact based on a three-month rolling average.

Background lead ambient concentration will be added to the predicted maximum 3-month average concentration. The nearest statewide air monitoring site for lead is located at Washington High School, AQS ID 17-031-0022. The three-month rolling means for the past three years are shown in Table 3-2. The maximum three-month rolling mean from the latest three-year period will used as a background concentration.

Predicted modeled concentrations plus background concentration will be compared to the NAAQS.

TABLE 3-2. LEAD BACKGROUND CONCENTRATIONS

Year	Three-Month Rolling Mean ($\mu g/m^3$)	Design Value* (μg/m3)
2018	0.01	0.02
2017	0.02	
2016	0.02	

* The design value is the maximum three-month rolling mean over the latest three-year period.

3.6 Manganese Modeling

There is no NAAQS for manganese. Modeling will be performed to identify predicted offsite impacts for comparison to Wisconsin's NR 445 standard of 4.8 µg/m^3 on a 24-hour average basis and USEPA's chronic inhalation Minimal Risk Level (MRL) of 0.3 µg/m^3 on an annual average basis.

GIII manganese sources described in Section 2 of this protocol will be modeled along with other, non-GIII offsite manganese sources. IEPA provided a list of offsite manganese sources to be included in this modeling assessment. The list of offsite manganese emission sources is included in Table 3-3.

AERMOD will be run for five years of meteorological data to predict the first-high 24-hour average concentration (for comparison to the NR 445 standard) and the annual concentration (for comparison the USEPA MRL).

Background manganese ambient concentration will be added to the predicted first-high 24-hour average concentration. The nearest statewide air monitoring site for manganese is located at Washington High School, AQS ID 17-031-0022. The maximum 24-hour and annual manganese concentrations measured during the past three years are shown in Table 3-4. The maximum 24-hour concentration among the last three years is 0.370 µg/m^3, which will be used as a the 24-hour background concentration. The maximum annual average among the three years is 0.070 µg/m^3 , which will be used as the annual background concentration.

TABLE 3-3. OFFSITE MANGANESE SOURCES

ID Number	Stack Number	Stack Id	Stack Description	Mn Emissions (lb/hr)	Stack Diameter (ft)	Stack Height (ft)	Flow Rate (acfm)	Temperature (F)	UTM Zone	UTM Northing	UTM Easting
031036AAA	0003	115247	Boiler #3	0.00000152	2.00	25	2752	300	16	4610011	454809
031036AAA	0004	115248	Boiler #2	0.000000589	2.00	25	2752	300	16	4610011	454809
031036AAA	0002	115246	Boiler stack #1	0.000000589	3.50	95	2600	220	16	4610011	454809
031600AAR	0046	118716	60 million BTU/hr boiler	0	3.30	117	19319	300	16	4612420	453419
031600AAR	0055	118725	Air supply	0	2.30	55	8000	225	16	4612420	453419
031600AAR	0056	118726	Air supply	0	1.00	45	2000	245	16	4612420	453419
031600AAR	0088	156582	2 Natural gas fired hot water heaters	0.000001026	3.70	85	17345	361	16	4612420	453419
031600AAR	0109	250881	4 Big foot air houses (19.4 million BTU/hr each)	0.000002546	1.76	37	3000	442	16	4612420	453419
031600AAR	0110	250882	2 Hot water stations	0.000001026	1.84	37	3300	430	16	4612420	453419
031600AAR	0111	250883	Paint line water heater	0.000000266	1.84	37	3300	430	16	4612420	453419
031600AAR	0112	250884	Other natural gas combustion (curing ovens, oxidize	0.000039976	1.92	39	4860	258	16	4612420	453419
031600AAR	0114	250886	Emergency generator	7.4565E-06	2.02	36	12960	692	16	4612420	453419
031600AFV	0005	118896	Kiln #2	0.033000178	6.40	52	4115	181	16	4615216	453823
031600AFV	0005	118896	Kiln #2	0.032776655	6.40	52	4115	181	16	4615216	453823
031600AFV	0035	184796	Engine	0	4.80	56	73901	503	16	4615216	453823
031600ALC	0002	118971	Boiler	0.000009272	2.50	112	9520	470	16	4613531	454085
031600AOL	0015	209976	Natural gas combustion	0.000002964	3.40	30	25373	324	16	4617392	450256
031600BIY	0001	119521	Boiler #1	0.000001748	5.00	90	7970	565	16	4613129	451612
031600BIY	0024	241900	Boiler #3	0.00000209	2.00	28	4936	395	16	4613129	451612
031600BRA	0001	119770	Gas heater	0.00000171	2.50	35	700	350	16	4618594	454528
031600DPK	0001	120674	Silo loading	0.000505	2.20	32	12424	113	16	4619060	454722
031600DQO	0021	173045	Centrifuge Boilers #1 and #2	1.38624E-06	1.83	46	2050	450	16	4613049	450146
031600FDK	0002	121107	2 Steam generators	0.000001482	2.60	34	1	400	16	4617978	453577
031600FGT	0003	195877	Cement silo loading	0.0189375	2.80	36	10266	80	16	4617532	451809
031600FGT	0006	195880	Mixer and/or truck loading	0.03672	2.90	32	10220	80	16	4617532	451809
031600FGT	0007	195881	Natural gas combustion	0.00000342	2.70	50	8859	341	16	4617532	451809
031600FHQ	0001	121260	Portland cement terminal: Cement silo loading	0.000101	5.30	50	3000	70	16	4612185	452489
031600FHQ	0002	121261	Portland cement terminal: Truck loading/unloading	0.000606	7.92	20	3000	70	16	4612185	452489
031600FHQ	0003	190764	Portland cement terminal: Barge unloader	0	2.80	36	10266	80	16	4612185	452489
031600FHQ	0004	215253	Slag dryer	0	5.33	157	74700	183	16	4612141	452468
031600FHQ	0004	215253	Slag dryer	0.000011704	5.33	157	74700	183	16	4612141	452468
031600FLD	0017	188346	Product collector from shaft dryers (T51-HG1), Cyclo	6.65E-09	2.20	90	20000	205	16	4617602	454330
031600FLD	0016	188345	Polymers (Y-Chutes, top of T61-RP2 bin and T61-RP2	1.672E-09	2.20	90	3336	205	16	4617602	454330
031600FWM	0023	233161	Natural gas combustion	0.000005852	3.40	58	15060	436	16	4613979	453740
031600GFX	0003	193349	Natural gas combustion	0.000006194	2.47	49	9240	331	16	4617336	450418
031600GHA	0001	219682	Turbine CT-01	0.106666	20.00	90	1658000	997	16	4614792	453654
031600GHA	0001	219682	Turbine CT-01	0	20.00	90	1658000	997	16	4614792	453654
031600GHA	0003	222391	Turbine CT-02	0.10025	20.00	90	1658000	997	16	4614792	453697
031600GHA	0003	222391	Turbine CT-02	0	20.00	90	1658000	997	16	4614792	453697
031600GHV	0005	189629	2 Boilers	0.000005434	1.50	35	4700	330	16	4612395	452774
031600GHV	0005	189629	2 Boilers	0.000004712	1.50	35	4700	330	16	4612395	452774
031600GKE	0001	219577	Turbine CTG-5	0.0429471	12.14	84	611000	1050	16	4618643	454621
031600GKE	0009	222736	Backup generator EDG A	0.01563884	3.00	12	16200	895	16	4618584	454708
031600GKE	0010	222737	Backup generator EDG B	0.01563884	3.00	12	16200	895	16	4618571	454708
031600GKE	0011	222738	Backup generator EDG C	0.01563884	3.00	12	16200	895	16	4618559	454708
031600GKE	0002	219591	Turbine CTG-6	0.04244986	12.14	84	611000	1050	16	4618616	454621
031600GKE	0003	219592	Turbine CTG-7	0.04277066	12.14	84	611000	1050	16	4618590	454621
031600GKE	0004	219593	Turbine CTG-8	0.04341226	12.14	84	611000	1050	16	4618564	454621
031600GKE	0005	219594	Turbine CTG-9	0.04197668	12.14	84	611000	1050	16	4618643	454672
031600GKE	0006	219595	Turbine CTG-10	0.0420248	12.14	84	611000	1050	16	4618617	454672
031600GKE	0007	219596	Turbine CTG-11	0.04220926	12.14	84	611000	1050	16	4618590	454672
031600GKE	0008	219597	Turbine CTG-12	0.04207292	12.14	84	611000	1050	16	4618564	454672
031600GKU	0001	209195	Combined boilers stack	0.00000494	3.00	30	5150	350	16	4617728	451623
031600GWV	0007	234365	Boliler	0.000127848	3.78	74	19740	416	16	4613685	454218

TABLE 3-4. MANGANESE BACKGROUND CONCENTRATIONS

Year	1st High 24-Hour Concentration ($\mu g/m^3$)	Annual Mean ($\mu g/m^3$)	Maximum 24-Hour Concentration ($\mu g/m^3$)
2018	0.197	0.048	0.370
2017	0.235	0.070	
2016	0.370	0.068	

3.7 Modeling Other Metals

There are no NAAQS for other metals. Wisconsin's Air Toxics Rule (NR 445) sets health-based emission standards. The metal impacts predicted by this modeling analysis will be compared to the NR 445 standards.

Table 3-5 includes a list of the other metals and their corresponding NR 445 limits.

TABLE 3-5. NR 445 STANDARDS FOR OTHER METALS

Metals	Ambient Air Standard		Unit Risk Factor	Source
	24 Hour (ug/m^3)	Annual (ug/m^3)	(ug/m^3)$^{-1}$	
Antimony	12.00	NA		
Arsenic	NA	Carcinogen	0.00430	IRIS
Barium	12.00	NA		
Beryllium	NA	Carcinogen	0.00240	IRIS
		0.02		
Cadmium	NA	Carcinogen	0.00180	IRIS
Chromium (1)	12.00	NA		
Cobalt	0.48	NA		
Copper	24.00	NA		
Nickel	NA	Carcinogen	0.00026	CAL
Phosphorus	2.43	NA		
Selenium	4.80	NA		
Thallium	2.40	NA		
Silver(2)	NA	NA		
Zinc(2)	NA	NA		
Mercury	2.40	0.30		

(1) Chromium (metal) and compounds other than Chromium VI.
(2) Silver, and zinc compounds are not in NR445 and no inhalation RfC is reported on the EPA Integrated Risk Information System (IRIS).

For other metals, AERMOD will be run only with GIII sources described in Section 2. Five years of meteorological data will be used.

For non-carcinogenic metals, the predicted first-high 24-hour average will be compared to the NR 445 24-hour limit. For beryllium and mercury, the predicted maximum annual concentration will be compared to the NR 445 annual limit. There is no NR 445 limit for silver and zinc and there is no inhalation exposure dose reported on the Integrated Risk Information System. The predicted 24-hour average and predicted annual concentration for these two metals will be reported but not compared to any limits.

According to NR 445.08(2)(c), emissions of carcinogenic air contaminants having a unit risk factor established by either the EPA or the California Air Resources Board, shall not result in an ambient air concentration off the source property corresponding to an inhalation impact (or risk) greater than 1 in 1,000,000 (1×10^{-6}).

The inhalation impact is determined by the following equation:

Inhalation impact = (Inhalation impact concentration annual average) x (Unit risk factor)

where:

the inhalation impact concentration is the annual average concentration of a contaminant in ($\mu g/m^3$); and,

the unit risk factor for the contaminant is the unit risk factor value established by either EPA or the California Air Resources Board and is expressed in $(\mu g/m^3)^{-1}$.

The predicted maximum annual concentrations will be multiplied by the compounds corresponding unit risk factor, and then compared to a value of 1 in 1,000,000.

The IEPA monitoring station located at Washington High School [AQS ID 17-031-0022] also reported ambient concentrations arsenic, beryllium, cadmium, chromium, and nickel. Published design values for these metals, if available, will be incorporated into the modeling results as background concentrations.

3.8 Adjustments to Background Data

The prevailing wind direction at the proposed GIII site is from the southwest to the northeast. A portion of the identified offsite lead and manganese emission sources are located upwind of the Washington High School Monitoring Station that is used to identify background concentrations. To the extent this spatial relationship exists, the lead and manganese impacts from these offsite sources would be double counted by first adding their modeled impacts to the predicted GIII impacts in the modeling analysis and then adding the offsite impacts a second time by including their contribution to the background concentrations.

If the modeling analysis shows that these offsite sources significantly contribute to the measured background concentrations at the Washington High School monitoring station, the following procedure will be used to adjust the background concentrations that will be added to the modeled impacts.

Measured concentrations at the monitoring station will be sorted into 36 groups by wind direction. Wind directions are divided into 36 sectors. Wind directions from 0° to 9° are included in Sector 1; wind directions from 10° to 19° are included in Sector 2, etc. The monitoring station data will be adjusted to subtract data measured on days when the wind direction indicates that the monitoring station is located downwind from significant offsite sources.

If modeling results show that adjustment of the lead and manganese background concentrations is warranted, RKA will work with IEPA to develop an acceptable procedure for this purpose.

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Air Dispersion Modeling Protocol to Assess Metal Emission Impacts

General III, LLC – Chicago, Illinois

November 18, 2019

Appendix A

Ferrous Material Processing

Figures A-1 and A-2 contain TRADE SECRET information and have been redacted from this document.

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TRADE SECRET

Figure A-1 Redacted

Figure A-1 - Ferrous Processing System Flow Diagram
Air Dispersion Modeling Protocol

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

TRADE SECRET

Figure A-2 Redacted

Figure A-2 - Ferrous Processing System Layout
Air Dispersion Modeling Protocol

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

Table A-1a - Ferrous Material Processing - Metal Emissions in Active Hours (7 AM - 7 PM, Mon-Sat)
General III, LLC - Chicago, Illinois

Volume Source	Metal as % of Total PM[a]	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13	RTO
PM (Active)		1.1610000	0.1400000	0.1400000	0.0462000	0.1881000	0.2087000	0.1458000	0.0244000	0.0391000	0.2412000	0.1996000	0.1996000	0.5673000	2.4704690
Lead[b]	0.0665%	0.0007722	0.0000931	0.0000931	0.0000307	0.0001251	0.0001388	0.0000970	0.0000162	0.0000260	0.0001604	0.0001328	0.0001328	0.0003773	0.0016432
Manganese	0.0535%	0.0006217	0.0000750	0.0000750	0.0000247	0.0001007	0.0001118	0.0000781	0.0000131	0.0000209	0.0001292	0.0001069	0.0001069	0.0003038	0.0013229
Mercury	1.2866%	0.0149373	0.0018012	0.0018012	0.0005944	0.0024201	0.0026851	0.0018758	0.0003139	0.0005031	0.0031033	0.0025680	0.0025680	0.0072988	0.0317848
Nickel	0.0207%	0.0002405	0.0000290	0.0000290	0.0000096	0.0000390	0.0000432	0.0000302	0.0000051	0.0000081	0.0000500	0.0000413	0.0000413	0.0001175	0.0005118
Antimony	0.0040%	0.0000462	0.0000056	0.0000056	0.0000018	0.0000075	0.0000083	0.0000058	0.0000010	0.0000016	0.0000096	0.0000079	0.0000079	0.0000226	0.0000983
Arsenic	0.0015%	0.0000179	0.0000022	0.0000022	0.0000007	0.0000029	0.0000032	0.0000022	0.0000004	0.0000006	0.0000037	0.0000031	0.0000031	0.0000087	0.0000380
Beryllium	0.0003%	0.0000036	0.0000004	0.0000004	0.0000001	0.0000006	0.0000006	0.0000005	0.0000001	0.0000001	0.0000007	0.0000006	0.0000006	0.0000018	0.0000076
Cadmium	0.0147%	0.0001704	0.0000205	0.0000205	0.0000068	0.0000276	0.0000306	0.0000214	0.0000036	0.0000057	0.0000354	0.0000293	0.0000293	0.0000833	0.0003625
Chromium[c]	0.0163%	0.0001888	0.0000228	0.0000228	0.0000075	0.0000306	0.0000339	0.0000237	0.0000040	0.0000064	0.0000392	0.0000325	0.0000325	0.0000923	0.0004018
Cobalt	0.0014%	0.0000160	0.0000019	0.0000019	0.0000006	0.0000026	0.0000029	0.0000020	0.0000003	0.0000005	0.0000033	0.0000027	0.0000027	0.0000078	0.0000340
Phosphorus	0.2000%	0.0023217	0.0002800	0.0002800	0.0000924	0.0003761	0.0004173	0.0002916	0.0000488	0.0000782	0.0004823	0.0003991	0.0003991	0.0011344	0.0049402
Selenium	0.0074%	0.0000858	0.0000103	0.0000103	0.0000034	0.0000139	0.0000154	0.0000108	0.0000018	0.0000029	0.0000178	0.0000148	0.0000148	0.0000419	0.0001826
Zinc	3.7272%	0.0432723	0.0052180	0.0052180	0.0017219	0.0070108	0.0077786	0.0054342	0.0009094	0.0014573	0.0089899	0.0074394	0.0074394	0.0211442	0.0920783
Barium	0.0360%	0.0004182	0.0000504	0.0000504	0.0000166	0.0000677	0.0000752	0.0000525	0.0000088	0.0000141	0.0000869	0.0000719	0.0000719	0.0002043	0.0008898
Copper	0.0266%	0.0003083	0.0000372	0.0000372	0.0000123	0.0000499	0.0000554	0.0000387	0.0000065	0.0000104	0.0000640	0.0000530	0.0000530	0.0001506	0.0006560
Silver	0.0064%	0.0000746	0.0000090	0.0000090	0.0000030	0.0000121	0.0000134	0.0000094	0.0000016	0.0000025	0.0000155	0.0000128	0.0000128	0.0000364	0.0001587
Thallium	0.0012%	0.0000143	0.0000017	0.0000017	0.0000006	0.0000023	0.0000026	0.0000018	0.0000003	0.0000005	0.0000030	0.0000025	0.0000025	0.0000070	0.0000305

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

Table A-1b - Ferrous Material Processing - Metal Emissions in Inactive Hours (7 PM - 7 AM, Mon-Sat, All Day, Sun)
General III, LLC - Chicago, Illinois

Volume Source	Metal as % of Total PM[a]	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13	RTO
PM (Inactive)		0.0794000	-	-	0.0004000	-	0.0371000	-	-	0.0002000	-	0.0529000	0.0529000	-	
Lead [b]	0.0665%	0.0000528			0.0000003		0.0000247			0.0000001		0.0000352	0.0000352		
Manganese	0.0535%	0.0000425			0.0000002		0.0000199			0.0000001		0.0000283	0.0000283		
Mercury	1.2866%	0.0010216			0.0000051		0.0004773			0.0000026		0.0006806	0.0006806		
Nickel	0.0207%	0.0000164			0.0000001		0.0000077			0.0000000		0.0000110	0.0000110		
Antimony	0.0040%	0.0000032			0.0000000		0.0000015			0.0000000		0.0000021	0.0000021		
Arsenic	0.0015%	0.0000012			0.0000000		0.0000006			0.0000000		0.0000008	0.0000008		
Beryllium	0.0003%	0.0000002			0.0000000		0.0000001			0.0000000		0.0000002	0.0000002		
Cadmium	0.0147%	0.0000117			0.0000001		0.0000054			0.0000000		0.0000078	0.0000078		
Chromium [c]	0.0163%	0.0000129			0.0000001		0.0000060			0.0000000		0.0000086	0.0000086		
Cobalt	0.0014%	0.0000011			0.0000000		0.0000005			0.0000000		0.0000007	0.0000007		
Phosphorus	0.2000%	0.0001588			0.0000008		0.0000742			0.0000004		0.0001058	0.0001058		
Selenium	0.0074%	0.0000059			0.0000000		0.0000027			0.0000000		0.0000039	0.0000039		
Zinc	3.7272%	0.0029594			0.0000149		0.0013828			0.0000075		0.0019717	0.0019717		
Barium	0.0360%	0.0000286			0.0000001		0.0000134			0.0000001		0.0000191	0.0000191		
Copper	0.0266%	0.0000211			0.0000001		0.0000099			0.0000001		0.0000140	0.0000140		
Silver	0.0064%	0.0000051			0.0000000		0.0000024			0.0000000		0.0000034	0.0000034		
Thallium	0.0012%	0.0000010			0.0000000		0.0000005			0.0000000		0.0000007	0.0000007		

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

Table A-2 - Ferrous Material Processing - Particulate Emissions

General III, LLC - Chicago, Illinois

1	2		3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
V-1	55		Truck Dumping of Raw Feed	Unprepared	5.4 [a2]	Outside	N	-	0%	0%	Drop	300	0.00127 [c]	0.3797
V-1	56		Raw Feed from Ground after Truck Dumping	Unprepared	5.4 [a2]	Outside	N	-	0%	0%	Drop	300	0.00127 [c]	0.3797
V-1	59	Magnet/ Clam	Drop Raw Scrap to Infeed Conveyor	Unprepared	N [a4]	Outside	N	-	NA	0%	D	500	0.00020 [f]	0.1022
												Total Filterable PM Emissions		0.8616
V-2	37	E-01	Drop Raw Scrap onto Shredder Feed Chute	Unprepared	Y [a4]	Outside	N	-	NA	0%	A	500	0.00014 [d]	0.0700
V-2	40	E-05	Shredder Under Mill Vibratory Conveyor	Shred	Y [0]	Inside	N	-	NA	0%	A	500	0.00014 [d]	0.0700
V-2	79	E-02	Shredder Bottom Discharge	Shred	Y [0]	shredder emissions	0	-	0%	0%	A	500	Emissions captured and controlled by shredder emission	
V-2	81	E-02	Shredder Chute	Unprepared	Y [0]	shredder emissions	0	-	0%	0%	A	500	Emissions captured and controlled by shredder emission	
												Total Filterable PM Emissions		0.1400
V-3	4	C-001	Shredded Material Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	500	0.00014 [d]	0.0700
V-3	5	C-002	Shredded Material Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-3	6	C-002	Mat'l Not Removed by Poker Picker	Shred	Y [0]	Outside	N	-	NA	0%	A	499	0.00014 [d]	0.0699
												Total Filterable PM Emissions		0.1400
V-4	58	-	Poker Loadout	Pokers	N [0]	Outside	N	-	0%	0%	D	183	0.00020 [f]	0.0374
V-4	62	E-06	Poker Picker Chute to Stockpile	Shred	1.5% [a1]	Outside	N	-	0%	0%	Drop	1	0.00761 [c]	0.0076
												Total Filterable PM Emissions		0.0450

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

1		2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
V-5	7	C-003	Ferrous Transfer Conveyor	Residue	Y [0]	Outside	N	-	NA	0%	A	130	0.00014 [d]	0.0182
V-5	8	C-003	Ferrous Transfer Conveyor	Ferrous	Y [0]	Outside	N	-	NA	0%	A	369	0.00014 [d]	0.0517
V-5	31	C-032	ASR Transfer Conveyor	Residue	Y [0]	Outside	N	-	NA	0%	A	4	0.00014 [d]	0.0006
V-5	32	C-033	Magnetic Material	Shred	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	33	C-033	ASR Not Removed by Magnet E-12	Residue	Y [0]	Outside	N	-	NA	0%	A	129	0.00014 [d]	0.0181
V-5	34	C-034	Ferrous Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	35	C-035	Ferrous Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	36	C-036	ASR Transfer Conveyor	Residue	Y [0]	Outside	N	-	NA	0%	A	129	0.00014 [d]	0.0181
V-5	41	E-07	Magnet Discharge to Chute	Shred	Y [0]	Outside	N	-	NA	0%	A	187	0.00014 [d]	0.0262
V-5	42	E-07	Magnet Discharge to Chute	Shred	Y [0]	Outside	N	-	NA	0%	A	187	0.00014 [d]	0.0262
V-5	49	E-12	Ferrous Removed by Magnet	Ferrous	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	53	E-7	ASR Not Removed by Magnet	Shred	Y [a3]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-5	54	E-7	Ferrous Removed by Magnet E-7	Residue	Y [0]	Outside	N	-	NA	0%	A	185	0.00014 [d]	0.0259
											Total Filterable PM Emissions			**0.1881**
V-6	61	C-037	ASR Transfer Conveyor to Stockpile	Residue	10 [a3]	Outside	N	-	0%	0%	Drop	129	0.00053 [c]	0.0689

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

1	2	3	6	7	8	9	10	11	12	13	18	19	22	#	24
Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
V-7	9	C-006	Ferrous Transfer Conveyor	Shred	Y	0	Outside	Y	Z-Box Air Loop	100%	100%	A	183	0.00014 d	0.0000
V-7	10	C-007	Ferrous Transfer Conveyor	Shred	Y	0	Outside	Y	Z-Box Air Loop	100%	100%	A	183	0.00014 d	0.0000
V-7	21	C-022	Ferrous Transfer Conveyor	Shred	Y	a2	Outside	N	-	NA	0%	A	55	0.00014 d	0.0077
V-7	22	C-023	Ferrous Transfer Conveyor	Shred	Y	a2	Outside	N	-	NA	0%	A	55	0.00014 d	0.0077
V-7	23	C-024	Non-metallic transfer conveyor	Ferrous	Y	0	Outside	N	-	NA	0%	A	4	0.00014 d	0.0006
V-7	30	C-031	ASR Transfer Conveyor	Residue	Y	0	Outside	N	-	NA	0%	A	4	0.00014 d	0.0006
V-7	38	E-015	Z-Box Separator Cyclone	Ferrous	Y	0	Outside	N	-	NA	0%	A	2	0.00014 d	0.0003
V-7	39	E-016	Z-Box Separator Cyclone	Ferrous	Y	0	Outside	N	-	NA	0%	A	2	0.00014 d	0.0003
V-7	43	E-08	ASR Not Removed by Magnet	Shred	Y	0	Outside	N	-	NA	0%	A	2	0.00014 d	0.0003
V-7	44	E-08	Ferrous Removed by Magnet E-7	Residue	Y	0	Outside	N	-	NA	0%	A	185	0.00014 d	0.0259
V-7	45	E-10	Ferrous Removed by Magnet	Shred	Y	a2	Outside	N	-	NA	0%	A	128	0.00014 d	0.0179
V-7	46	E-11	Ferrous Removed by Magnet	Shred	Y	a2	Outside	N	-	NA	0%	A	128	0.00014 d	0.0179
V-7	47	E-11	Ferrous Removed by Magnet	Shred	Y	a2	Outside	N	-	NA	0%	A	55	0.00014 d	0.0077
V-7	48	E-11	Ferrous Removed by Magnet	Shred	Y	a2	Outside	N	-	NA	0%	A	55	0.00014 d	0.0077
V-7	64	SC-001	Supplemental Conveyor	Shred	Y	0	Outside	N	-	NA	0%	A	183	0.00014 d	0.0256
V-7	66	SC-002	Supplemental Conveyor	Shred	Y	0	Outside	N	-	NA	0%	A	183	0.00014 d	0.0256
V-7	70	C-004	Ferrous Transfer Conveyor	Shred	Y	0	Outside	N	-	NA	0%	A	185	Emissions captured by inward air flow at inlet to Z-Box separator	
V-7	72	C-005	Ferrous Transfer Conveyor	Shred	Y	0	Outside	N	-	NA	0%	A	185	Emissions captured by inward air flow at inlet to Z-Box separator	
												Total Filterable PM Emissions			**0.1458**

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

	1	2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	Equipment Generating Emissions		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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
		ID #	Description											
V-8	24	C-025	Non-metallic not removed by magnet E-13	Ferrous	Y [0]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-8	25	C-025	material removed by first magnet to second magnet	Ferrous	Y [a2]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	26	C-026	Ferrous Transfer Conveyor	Ferrous	Y [a2]	0	0	-	0%	0%	A	1	0.00014 [d]	0.0001
V-8	27	C-027	Ferrous Transfer Conveyor	Ferrous	Y [a2]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	28	C-028	Non-metallic Transfer Conveyor	Ferrous	Y [0]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	29	C-029	Non-metallic Transfer Conveyor	Ferrous	Y [0]	0	0	-	0%	0%	A	1	0.00014 [d]	0.0001
V-8	50	E-13	Ferrous Removed by E-13	Ferrous	Y [a2]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	51	E-13	Ferrous Removed by E-13	Ferrous	Y [0]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	52	E-14	Mat'l Not removed by Separator	Ferrous	Y [0]	Outside	N	-	NA	0%	A	0.25	0.00014 [d]	0.0000
V-8	60	C-030	Mat'l not Removed by Separator	Ferrous	1.5 [a1]	Outside	Y	Cover	0%	0%	Drop	2.25	0.00761 [c]	0.0171
V-8	63	E-14	Final Discharge from Mat'l Separator	Ferrous	1.5 [a1]	Outside	N	-	0%	0%	Drop	0.75	0.00761 [c]	0.0057
V-8	65	SC-009	Supplemental Conveyor	Ferrous	Y [0]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-8	67	SC-010	Supplemental Conveyor	Ferrous	Y [0]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
											Total Filterable PM Emissions			**0.0244**
V-9	57	-	Non-metallic Loadout	Non-metallic	N [0]	Outside	N	-	0%	0%	D	187	0.00020 [f]	**0.0382**

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

	1	2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	Equipment Generating Emissions		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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
		ID #	Description											
V-10	11	C-008	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	56	0.00014 [d]	0.0078
V-10	12	C-009	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	13	C-010	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	14	C-011	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-10	15	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	56	0.00014 [d]	0.0078
V-10	16	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	17	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	18	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-10	19	C-016	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-10	20	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-10	68	SC-005	Supplemental Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	69	SC-008	Supplemental Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	71	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-014 to C-016. Emissions from 100% of material	
V-10	73	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-012 to C-016. Emissions from 100% of material	
V-10	74	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-015 to C-016. Emissions from 100% of material	
V-10	75	C-019	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-016 top C-017. Emissions from 100% of material	
V-10	76	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-013 to C-016. Emissions from 100% of material	
V-10	77	C-017	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-020/C-021 or C-017/C-018.	
V-10	78	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-017 to C-018. Emissions from 100% of material	
													Total Filterable PM Emissions	**0.2412**

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

1	2		3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	Equipment Generating Emissions		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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
		ID #	Description											
V-11	82	C-018	Ferrous Transfer Conveyor to stockpile	Shred	5.4% [a2]	Outside	N	-	NA	0%	Drop	367	Alternate to C-021 to S Ferrous Stockpile or Barge 2 to Barge.	
V-12	80	C-21	Ferrous Transfer Conveyor to stockpile	Shred	5.4% [a2]	Outside	N	-	NA	0%	Drop	367	Alternate to C-018 to N Ferrous Stockpile or Barge 2 to Barge.	
V-13	1	Barge 1	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-13	2	Barge 2	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-13	3	Barge 3	Ferrous Transfer Conveyor to barge (stockpile)	Shred	5.4% [a2]	Outside	N	-	0%	0%	Drop	367	0.00127 [c]	0.4645
											Total Filterable PM Emissions			**0.5673**

a1 Controlled particulate matter emission factors from AP-42, Table 11.19.2-2 for conveying used based on conservative assumption that moisture content i

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% moisture.

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 calculations conservatively assume dust collector emission are vented to the atmosphere.

h Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

Table A-3 Ferrous Plant Stockpile - Particulate Emissions
General III, LLC - Chicago, Illinois

Volume Source Grouping	Stock Pile	Stock Pile Area Acres	Control Factor[b]	Inactive Emissions[a,d] PM lb/hr	Active Emissions[a,d] PM lb/hr
V-1	Raw Material Truck Dumping (Drop 1)	0.3630	1.0	0.0529	0.1996
V-1	Raw Material Movement from Truck Dumping Area to Stockpile (Drop 2)	0.1815	1.0	0.0265	0.0998
			Total	0.0794	0.2994
V-4	Poker North	0.0115	0.1	0.0002	0.0006
V-4	Poker South	0.0115	0.1	0.0002	0.0006
			Total	0.0004	0.0012
V-6	ASR	0.2541	1.0	0.0371	0.1398
V-9	Fluff (Bin)	0.0161	0.1	0.0002	0.0009
V-11	Ferrous North	0.3630	1.0	0.0529	0.1996
V-12	Ferrous South	0.3630	1.0	0.0529	0.1996

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

b. Control Factor of 0.1 (90% control) for partial enclosure consisting of walls on three sides of bin. Control Factor of 1.0 for no control.

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.

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

Active Day PM Emission Factor = 13.20 lb-PM/acre-day

Table A-4 - Ferrous Material Processing - PM Emission Summary
General III, LLC - Chicago, Illinois

Volume Source	Filterable PM Emissions					
	Matl Handling		Stockpile		Total	
	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr
V-1	0.8616		0.2994	0.0794	1.1610	0.0794
V-2	0.1400				0.1400	
V-3	0.1400				0.1400	
V-4	0.0450		0.0012	0.0004	0.0462	0.0004
V-5	0.1881				0.1881	
V-6	0.0689		0.1398	0.0371	0.2087	0.0371
V-7	0.1458				0.1458	
V-8	0.0244				0.0244	
V-9	0.0382		0.0009	0.0002	0.0391	0.0002
V-10	0.2412				0.2412	
V-11	0.0000		0.1996	0.0529	0.1996	0.0529
V-12	0.0000		0.1996	0.0529	0.1996	0.0529
V-13	0.5673				0.5673	
Totals	**2.46050**		**0.84050**	**0.22290**	**3.30100**	**0.22290**

RK & Associates, Inc.

Air Dispersion Modeling Protocol to Assess Metal Emission Impacts

General III, LLC – Chicago, Illinois

November 18, 2019

Appendix B

Non-Ferrous Material Processing Figures and Tables

Figures B-1 and B-2 contain TRADE SECRET information and have been redacted from this document.

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TRADE SECRET

Figure B-1 Redacted

Figure B-1 - Non-Ferrous Processing System Flow Diagram
Air Dispersion Modeling Protocol

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

TRADE SECRET

Figure B-2 Redacted

Figure B-2 - Non-Ferrous Processing System Layout
Air Dispersion Modeling Protocol

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-1	113	C-001	Conveyor	Residue	Y [0]	Outside	Y	N	NA		0%	70	0.000140 [d]	0.0098
VN-1	114	C-002	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	68	0.003000 [0]	0.2037
VN-1	115	C-002	Conveyor	Ferrous	N [0]	Outside	Y	N	NA		0%	2	0.003000 [0]	0.0063
VN-1	116	C-003	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	67.90	0.003000 [0]	0.2037
VN-1	117	C-004	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	60.90	0.003000 [0]	0.1827
VN-1	118	C-005	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	30.45	0.003000 [0]	0.0914
VN-1	119	C-006	Conveyor	Residue	N [0]	Outside		N	NA		0%	30.45	0.003000 [0]	0.0914
VN-1	122	C-009	Conveyor	Residue	N [0]	Outside		N	NA		0%	9.14	0.003000 [0]	0.0274
VN-1	123	C-010	Conveyor	Residue	N [0]	Outside		N	NA		0%	9.14	0.003000 [0]	0.0274
VN-1	124	C-011	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	8.40	0.003000 [0]	0.0252
VN-1	129	C-016	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	2.7	0.003000 [0]	0.0081
VN-1	174	E-01	Vibratory Batch Feeder	Residue	Y [0]	Outside		N	NA		0%	70	0.000140 [d]	0.0098
VN-1	175	E-03	Screener	Residue	Y [0]	Outside		N	NA		0%	60.90	0.002200 [e]	0.1340
VN-1	176	E-03	Screener	Residue	Y [0]	Outside		N	NA		0%	6.80	0.002200 [e]	0.0150
VN-1	177	E-03	Screener	Residue	Y [0]	Outside		N	NA		0%	2.70	0.002200 [e]	0.0059
VN-1	178	E-04	Screener	Residue	Y [0]	Outside		N	NA		0%	15.75	0.002200 [e]	0.0347
VN-1	179	E-04	Screener	Residue	Y [0]	Outside		N	NA		0%	9.14	0.002200 [e]	0.0201
VN-1	180	E-04	Screener	Residue	Y [0]	Outside		N	NA		0%	4.20	0.002200 [e]	0.0092
VN-1	190	E-11	Screener	Residue	N [0]	Outside		N	NA		0%	15.75	0.025000 [d]	0.3938
VN-1	191	E-11	Screener	Residue	N [0]	Outside		N	NA		0%	9.14	0.025000 [d]	0.2285
VN-1	192	E-11	Screener	Residue	N [0]	Outside		N	NA		0%	4.20	0.025000 [d]	0.1050
VN-1	244	End Loader	Drop ASR into feed hopper	Residue into Hopper	N [0]	Outside		Y	Cover		0%	70.00	0.000204 [d]	0.0143
VN-1	246	SC-001	Supplemental Conveyor	Residue	0 [0]	0		0	0		0%	15.75	0.003000	0.0473
VN-1	247	SC-002	Supplemental Conveyor	Residue	0 [0]	0		0	0		0%	16	0.003000	0.0473
												Total Filterable PM Emissions		1.9420

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	120	C-007	Conveyor	Residue	N [0]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	15.75	0.003000 [0]	0.0095
VN-2	121	C-008	Conveyor	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	15.75	0.003000 [0]	0.0095
VN-2	125	C-012	Conveyor	Residue	N [0]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	9.14	0.003000 [0]	0.0055
VN-2	126	C-013	Conveyor	Residue	N [0]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	9.14	0.003000 [0]	0.0055
VN-2	127	C-014	Conveyor	Residue	N [0]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	8.40	0.003000 [0]	0.0050
VN-2	128	C-015	Conveyor	Ferrous	N [0]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	.25	0.003000 [0]	0.0002
VN-2	130	C-017	Conveyor	Ferrous	N [0]	Outside		N	NA		0%	1.75	0.003000 [0]	0.0053
VN-2	131	C-018	Conveyor	Ferrous	N [0]	Outside	Y	N	NA		0%	1.75	0.003000 [0]	0.0053
VN-2	132	C-019	Conveyor	Lights	N [0]	Outside	Y	N	NA		0%	0.25	0.003000 [0]	0.0008
VN-2	133	C-020	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	11.12	0.003000 [0]	0.0334
VN-2	134	C-021	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	11.12	0.003000 [0]	0.0334
VN-2	135	C-022	Conveyor to Wind Sifter	Mixed Non-Ferrous	N [0]	Outside	Y	Y	Wind Sifter	100%	100%	0.80	0.003000 [0]	0.0024
VN-2	136	C-023	Conveyor to Wind Sifter	Residue	N [0]	Outside	Y	Y	Wind Sifter	100%	100%	7.29	0.000140 [0]	0.0010
VN-2	137	C-024	Conveyor to Wind Sifter	Residue	N [0]	Outside	Y	Y	Wind Sifter	100%	100%	7.29	0.000140 [0]	0.0010
VN-2	139	C-035	Conveyor	Residue	N [0]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	2.7	0.003000 [0]	0.0016
VN-2	147	C-044	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	24.87	0.003000 [0]	0.0746
VN-2	181	E-05	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	14.87	0.003000	0.0089
VN-2	182	E-05	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.87	0.003000	0.0059
VN-2	183	E-05	Magnetic Separation	Ferrous	N [0]	Inside		N	NA		0%	0.88	0.003000	0.0026
VN-2	184	E-05	Magnetic Separation	Ferrous	N [0]	Inside		N	NA		0%	5.00	0.003000	0.0150
VN-2	185	E-06	Eddy Current Separator	Residue	N [0]	Outside		N	NA		0%	6.12	0.003000 [d]	0.0184
VN-2	186	E-06	Eddy Current Separator	Mids	N [0]	Outside		N	NA		0%	3.50	0.003000 [d]	0.0105
VN-2	187	E-06	Eddy Current Separator	Zorba	N [0]	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-2	188	E-07	Wind Sifter	Lights	N [0]	Outside		Y	Cover		0%	0.25	0.002200 [d]	0.0006
VN-2	189	E-07	Wind Sifter	Heavies	1.5 [a]	Outside		Y	Wind Sifter	90%	100%	1.50	0.007606 [c]	0.0103

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	193	E-12	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	14.87	0.003000	0.0089
VN-2	194	E-12	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.87	0.003000	0.0059
VN-2	195	E-12	Magnetic Separation	Ferrous	N [0]	Inside		N	NA		0%	0.88	0.003000	0.0026
VN-2	196	E-12	Magnetic Separation	Ferrous	N [0]	Inside		N	NA		0%	5.00	0.003000	0.0150
VN-2	197	E-12	Magnetic Separation	Zorba	N [0]	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-2	198	E-13	Eddy Current Separator	Residue	N [0]	Outside		N	NA		0%	6.12	0.003000 [d]	0.0184
VN-2	199	E-13	Eddy Current Separator	Mids	N [0]	Outside		N	NA		0%	3.50	0.003000 [d]	0.0105
VN-2	200	E-14	Wind Sifter	Lights	N [0]	Outside		Y	Cover		0%	0.20	0.002200 [d]	0.0004
VN-2	201	E-14	Wind Sifter	Heavies	1.5 [a]	Outside		Y	Wind Sifter	100%	100%	0.60	0.007606 [c]	0.0046
VN-2	202	E-15	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.09	0.003000	0.0055
VN-2	203	E-15	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.29	0.003000	0.0050
VN-2	204	E-15	Magnetic Separation	Ferrous	N [0]	Outside		N	NA		0%	0.05	0.003000 [d]	0.0002
VN-2	205	E-15	Magnetic Separation	Mixed Non-Ferrous	N [0]	Outside		N	NA		0%	0.40	0.003000 [d]	0.0012
VN-2	206	E-16	Eddy Current Separator	Residue	N [0]	Outside		N	NA		0%	7.29	0.003000 [d]	0.0219
VN-2	207	E-16	Eddy Current Separator	Zorba	N [0]	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-2	208	E-17	Wind Sifter	Lights	N [0]	Outside		Y	Cover		0%	1.09	0.002200 [d]	0.0024
VN-2	209	E-17	Wind Sifter	Residue	N [0]	Outside		Y	Wind Sifter	100%	100%	6.20	0.002200 [d]	0.0136
VN-2	210	E-21	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.29	0.003000	0.0050
VN-2	211	E-21	Magnetic Separation	Ferrous	N [0]	Outside		N	NA		0%	0.05	0.003000 [d]	0.0002
VN-2	212	E-21	Magnetic Separation	Mixed Non-Ferrous	N [0]	Outside		N	NA		0%	0	0.003000 [d]	0.0012
VN-2	213	E-22	Eddy Current Separator	Zorba	N [0]	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-2	214	E-22	Eddy Current Separator	Residue	N [0]	Outside		N	NA		0%	7.29	0.003000 [d]	0.0219
VN-2	215	E-23	Wind Sifter	Lights	N [0]	Outside		Y	Cover		0%	1	0.002200 [d]	0.0024
VN-2	216	E-23	Wind Sifter	Residue	N [0]	Outside		Y	Wind Sifter	100%	100%	6.20	0.002200 [d]	0.0136
VN-2	217	E-27	Magnetic Separation	Residue	N [0]	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.15	0.003000	0.0049

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N		Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	219	E-28	Eddy Current Separator	Residue	N	0	Outside		N	NA		0%	7.15	0.003000 [d]	0.0215
VN-2	221	E-34	Magnetic Separation	Residue	N	0	Inside		N	ECS Enclosure	100%	Bldg Eff.	6.55	0.003000	0.0039
VN-2	222	E-34	Magnetic Separation	Residue	N	0	Inside		N	ECS Enclosure	100%	Bldg Eff.	6.55	0.003000	0.0039
VN-2	224	E-35	Eddy Current Separator	Residue	N	0	Outside		N	NA		0%	5.05	0.003000 [d]	0.0152
VN-2	231	E-43	Vibratory Feeder	Residue	N	0	Inside		N	ECS Enclosure	100%	Bldg Eff.	2.70	0.003000	0.0016
VN-2	232	E-44	Eddy Current Separator drop to stockpile	Zorba	1.5	a	Inside		N	NA		0%	0.50	0.007600	0.0038
VN-2	240	E-49	Transfer Conveyor	Residue onto ECS	N	0	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.15	0.003000	0.0049
VN-2	242	ECS	Eddy Current Separator drop to container	Zorba	1.5	a	Inside		N	NA		0%	0.04	0.007600	0.0003
VN-2	243	ECS	Eddy Current Separator drop to container	Zorba	1.5	a	Inside		N	NA		0%	0.18	0.007600	0.0014
VN-2	248	SC-003	Supplemental Conveyor	Residue	0	0	0		0	0		0%	7.34	0.003000	0.0220
VN-2	249	SC-004	Supplemental Conveyor	Residue	0	0	0		0	0		0%	7.34	0.003000	0.0220
													Total Filterable PM Emissions		**0.5395**

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-3	138	C-034	Conveyor	Material Separator	N [0]	Outside	Y	N	NA		0%	0.55	0.003000 [0]	0.0017
VN-3	140	C-039	Conveyor	Mixed Non-Ferrous	N [0]	Outside		N	NA		0%	0.80	0.003000 [0]	0.0024
VN-3	141	C-040	Conveyor	Residue	N [0]	Outside		N	NA		0%	2.80	0.003000 [0]	0.0084
VN-3	142	C-040	Conveyor	Mids	N [0]	Outside		N	NA		0%	7	0.003000 [0]	0.0210
VN-3	143	C-040	Conveyor	Residue	N [0]	Outside		N	NA		0%	4.20	0.003000 [0]	0.0126
VN-3	144	C-041	Conveyor	Zorba	N [0]	Outside		N	NA		0%	0.50	0.003000 [0]	0.0015
VN-3	145	C-042	Conveyor	Zorba	N [0]	Outside		N	NA		0%	1.50	0.003000 [0]	0.0045
VN-3	146	C-043	Conveyor	Zorba	N [0]	Outside		N	NA		0%	3	0.003000 [0]	0.0090
VN-3	148	C-044	Conveyor	Lights Zuric	N [0]	Outside	Y	N	NA		0%	0.30	0.003000 [0]	0.0009
VN-3	149	C-045	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	24.87	0.003000 [0]	0.0746
VN-3	150	C-047	Conveyor	To SSI	N [0]	Outside		N	NA		0%	0.55	0.003000 [0]	0.0017
VN-3	151	C-048	Conveyor	Out of SSI	N [0]	Outside		N	NA		0%	0.55	0.003000 [0]	0.0017
VN-3	152	C-050	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	25.07	0.003000 [0]	0.0752
VN-3	153	C-052	Conveyor	Residue	N [0]	Outside		N	NA		0%	2	0.003000 [0]	0.0068
VN-3	154	C-055	Conveyor	Wire	N [0]	Outside	Y	N	NA		0%	1.00	0.003000 [0]	0.0030
VN-3	155	C-058	Conveyor	Zuric drops	N [0]	Outside	Y	N	NA		0%	0.30	0.003000 [0]	0.0009
VN-3	156	C-060	Conveyor	Zone	N [0]	Outside	Y	N	NA		0%	1.20	0.003000 [0]	0.0036
VN-3	162	C-064	Conveyor drop to container	Zorba	1.5 [a]	Outside		N	NA		0%	0.70	0.007606 [c]	0.0053
VN-3	163	C-065	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	2.2	0.003000 [d]	0.0066
VN-3	164	C-066	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	54.39	0.003000 [d]	0.1632
VN-3	165	C-067	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	54.39	0.003000 [d]	0.1632
VN-3	168	C-071	Conveyor	Lights	N [0]	Outside	Y	Y	Cover		0%	0.03	0.000140 [d]	0.0000
VN-3	169	C-072	Conveyor	Lights	N [0]	Outside	Y	Y	Cover		0%	0	0.000140 [d]	0.0000
VN-3	170	DC-01 Cyc	DC-01 fines discharge to covered coneyor	Lights	N [0]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000
VN-3	171	DC-02 Cyc	DC-02 fines discharge to covered coneyor	Lights	N [0]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-3	172	DC-03 Cyc	DC-03 fines discharge to covered coneyor	Lights	N [0]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000
VN-3	173	DC-04 Cyc	DC-04 fines discharge to covered coneyor	Lights	N [0]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000
VN-3	218	E-27	Magnetic Separation	Ferrous	N [0]	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-3	220	E-28	Eddy Current Separator	Zorba	N [0]	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-3	223	E-35	Eddy Current Separator	Zorba	N [0]	Outside		N	NA		0%	1.50	0.003000 [d]	0.0045
VN-3	225	E-40	Separator	Lights Zuric	N [0]	Outside		N	NA		0%	0.24	0.025000 [d]	0.0060
VN-3	226	E-40	Separator	Heavies Zuric	N [0]	Outside		N	NA		0%	0.96	0.025000 [d]	0.0240
VN-3	227	E-40	Separator	Lights Zuric	N [0]	Outside		N	NA		0%	0.35	0.025000 [d]	0.0088
VN-3	228	E-41	Separator	Lights	N [0]	Outside		N	NA		0%	0.95	0.025000 [d]	0.0238
VN-3	229	E-41	Separator drop to container	Heavies	1.5 [a]	Outside		N	NA		0%	0.05	0.007606 [c]	0.0004
VN-3	230	E-42	Low speed shredder for size reduction	Out of SSI	N [0]	Outside		N	NA		0%	0.55	0.003000 [d]	0.0017
VN-3	234	E-46	Separator	Heavier Zorba	N [0]	Outside		N	NA		0%	1.25	0.02500 [d]	0.0313
VN-3	235	E-46	Separator	Lights Zorba	N [0]	Outside		N	NA		0%	0.25	0.02500 [d]	0.0063
VN-3	236	E-47	Separator	Zorba	N [0]	Outside		N	NA		0%	2.70	0.02500 [d]	0.0675
VN-3	237	E-47	Separator	Heavies Zorba	N [0]	Outside		N	NA		0%	0.85	0.02500 [d]	0.0213
VN-3	238	E-47	Separator	Lights Zorba	N [0]	Outside		N	NA		0%	0.15	0.02500 [d]	0.0038
VN-3	239	E-47	Separator	Light Zorba	N [0]	Outside		N	NA		0%	0.30	0.02500 [d]	0.0075
VN-3	241	E-50	Air Vibe	To Infeed SSI	N [0]	Outside		Y	Cover		0%	0.55	0.00014 [d]	0.0001
VN-3	250	SC-005	Supplemental Conveyor	Residue	0.0% [0]	0		0	0		0%	54.39	0.00300	0.1632
VN-3	251	SC-006	Supplemental Conveyor	Residue	0.0% [0]	0		0	0		0%	54.39	0.00300	0.1632
												Total Filterable PM Emissions		**1.1050**

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-4	159	C-062	Conveyor	Heavier Zorba	N [0]	Outside		N	NA		0%	1.25	0.003000 [d]	0.0038
VN-4	160	C-063	Conveyor drop to stockpile	Zorba	1.5 [a]	Outside		N	NA		0%	2.70	0.007606 [c]	0.0205
VN-4	161	C-063	Conveyor drop to stockpile	Heavies Zorba	1.5% [a]	Outside		N	NA		0%	0.85	0.00761 [c]	0.0065
VN-4	233	E-44	Eddy Current Separator	Residue	N [0]	Outside		N	NA		0%	2.2	0.00300 [d]	0.0066
												Total Filterable PM Emissions		**0.0374**
VN-5	157	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA		0%	0.96	0.00761 [c]	0.0073
VN-5	158	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA		0%	0.30	0.00761 [c]	0.0023
VN-5	167	C-070	Conveyor drop to stockpile	Waste to Stockpile	1.5% [a]	Outside		N	NA		0%	0.55	0.00761 [c]	0.0042
												Total		**0.0138**
VN-6	166	C-068	Conveyor drop to stockpile	Residue	1.5 [a]	Outside	Y	N	NA		0%	54.39	0.007606 [c]	0.4137
VN-6	245	End Loader	load waste to truck	Waste	N [0]	Outside		N	NA		0%	0.00	0.00020 [0]	0.0000
												Total		**0.4137**

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

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 the atmosphere through Dust Collection DC-01. Emissions are estimated by 12,000

g Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

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Table B-2 - Non-Ferrous Plant Stockpile - Particulate Emissions
General III, LLC - Chicago, Illinois

Volume Source Grouping	Stock Pile	Stock Pile Area Acres	Control Factor[b]		Inactive Emissions[a,d] PM lb/hr	Active Emissions[a,d] PM lb/hr
VN-1	FE from E-02	0.0047	0.1		0.0001	0.0003
VN-4	5" + Zorba	0.0189	0.1		0.0003	0.0010
VN-4	2-1/2" - 5" Zorba	0.0189	0.1		0.0003	0.0010
VN-4	5/8" - 2-1/2" Zorba	0.0189	0.1		0.0003	0.0010
			Total		0.0009	0.0030
VN-5	Tailings	0.0195	0.1		0.0003	0.0011
VN-5	Open	0.0195	0.1		0.0003	0.0011
VN-5	Wire	0.0195	0.1		0.0003	0.0011
VN-5	Wire Rich Solids	0.0195	0.1		0.0003	0.0011
VN-5	Zurick	0.0195	0.1		0.0003	0.0011
			Total		0.0015	0.0055
VN-6	Waste	0.0868	0.1		0.0013	0.0048

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

b. Control Factor of 0.1 (90% control) for partial enclosure consisting of walls on three sides of bin. Control Factor of 1.0 for no control.

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.

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

Active Day PM Emission Factor = 13.20 lb-PM/acre-day

Table B-3 - Non-Ferrous Material Processing - PM Emission Summary
General III, LLC - Chicago, Illinois

Srouces	PM Emission					
	Matl Handling		Stockpile		Tot	
	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr
VN-1	1.9420	1.9420	0.0003	0.0001	1.9423	1.9421
VN-2	0.5395	0.5395			0.5395	0.5395
VN-3	1.1050	1.1050			1.1050	1.1050
VN-4	0.0374	0.0374	0.003	0.0009	0.0404	0.0383
VN-5	0.0138	0.0138	0.0055	0.0015	0.0193	0.0153
VN-6	0.4137	0.4137	0.0048	0.0013	0.4185	0.4150

Table B-4a - Non-Ferrous Material Processing - Metal Emissions in Active Hours
(7 AM - 7 PM, Mon-Sat)
General III, LLC - Chicago, Illinois

Volume Source	Metal as % of Total PM[a]	VN-1	VN-2	VN-3	VN-4	VN-5	VN-6	DC-1
PM		1.9423000	0.5395280	1.1050000	0.0404000	0.0193000	0.4185000	0.5143000
Lead [b]	0.0665%	0.001291882	0.000358856	0.000734968	0.000026871	0.000012837	0.000278357	0.000342076
Manganese	0.0535%	0.001040081	0.000288912	0.000591716	0.000021634	0.000010335	0.000224102	0.000275402
Mercury	1.2866%	0.024989429	0.006941511	0.014216815	0.000519782	0.000248312	0.005384377	0.006616930
Nickel	0.0207%	0.000402342	0.000111762	0.000228898	0.000008369	0.000003998	0.000086691	0.000106536
Antimony	0.0040%	0.000077309	0.000021475	0.000043982	0.000001608	0.000000768	0.000016657	0.000020470
Arsenic	0.0015%	0.000029897	0.000008305	0.000017009	0.000000622	0.000000297	0.000006442	0.000007916
Beryllium	0.0003%	0.000006004	0.000001668	0.000003416	0.000000125	0.000000060	0.000001294	0.000001590
Cadmium	0.0147%	0.000285034	0.000079176	0.000162160	0.000005929	0.000002832	0.000061415	0.000075474
Chromium [c]	0.0163%	0.000315879	0.000087744	0.000179708	0.000006570	0.000003139	0.000068061	0.000083641
Cobalt	0.0014%	0.000026711	0.000007420	0.000015196	0.000000556	0.000000265	0.000005755	0.000007073
Phosphorus	0.2000%	0.003884029	0.001078897	0.002209675	0.000080788	0.000038594	0.000836877	0.001028449
Selenium	0.0074%	0.000143533	0.000039870	0.000081658	0.000002985	0.000001426	0.000030926	0.000038006
Zinc	3.7272%	0.072392600	0.020109064	0.041185102	0.001505772	0.000719342	0.015598159	0.019168776
Barium	0.0360%	0.000699570	0.000194325	0.000397995	0.000014551	0.000006951	0.000150734	0.000185239
Copper	0.0266%	0.000515713	0.000143254	0.000293396	0.000010727	0.000005124	0.000111119	0.000136555
Silver	0.0064%	0.000124735	0.000034649	0.000070963	0.000002594	0.000001239	0.000026876	0.000033028
Thallium	0.0012%	0.000024006	0.000006668	0.000013657	0.000000499	0.000000239	0.000005172	0.000006356

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

Table B-4b - Non-Ferrous Material Processing - Metal Emissions in Inactive Hours
(7 PM - 7 AM, Mon-Sat, All Day, Sun)
General III, LLC - Chicago, Illinois

Volume Source	Metal as % of Total PM[a]	VN-1	VN-2	VN-3	VN-4	VN-5	VN-6	DC-1
PM		1.9421000	0.5395280	1.1050000	0.0383000	0.0153000	0.4150000	0.5143000
Lead [b]	0.0665%	0.001291749	0.000358856	0.000734968	0.000025474	0.000010176	0.000276029	0.000342076
Manganese	0.0535%	0.001039974	0.000288912	0.000591716	0.000020509	0.000008193	0.000222228	0.000275402
Mercury	1.2866%	0.024986856	0.006941511	0.014216815	0.000492764	0.000196848	0.005339347	0.006616930
Nickel	0.0207%	0.000402300	0.000111762	0.000228898	0.000007934	0.000003169	0.000085966	0.000106536
Antimony	0.0040%	0.000077301	0.000021475	0.000043982	0.000001524	0.000000609	0.000016518	0.000020470
Arsenic	0.0015%	0.000029894	0.000008305	0.000017009	0.000000590	0.000000236	0.000006388	0.000007916
Beryllium	0.0003%	0.000006004	0.000001668	0.000003416	0.000000118	0.000000047	0.000001283	0.000001590
Cadmium	0.0147%	0.000285005	0.000079176	0.000162160	0.000005621	0.000002245	0.000060902	0.000075474
Chromium [c]	0.0163%	0.000315847	0.000087744	0.000179708	0.000006229	0.000002488	0.000067492	0.000083641
Cobalt	0.0014%	0.000026709	0.000007420	0.000015196	0.000000527	0.000000210	0.000005707	0.000007073
Phosphorus	0.2000%	0.003883629	0.001078897	0.002209675	0.000076589	0.000030595	0.000829878	0.001028449
Selenium	0.0074%	0.000143518	0.000039870	0.000081658	0.000002830	0.000001131	0.000030668	0.000038006
Zinc	3.7272%	0.072385146	0.020109064	0.041185102	0.001427502	0.000570255	0.015467708	0.019168776
Barium	0.0360%	0.000699498	0.000194325	0.000397995	0.000013795	0.000005511	0.000149473	0.000185239
Copper	0.0266%	0.000515660	0.000143254	0.000293396	0.000010169	0.000004062	0.000110189	0.000136555
Silver	0.0064%	0.000124722	0.000034649	0.000070963	0.000002460	0.000000983	0.000026651	0.000033028
Thallium	0.0012%	0.000024003	0.000006668	0.000013657	0.000000473	0.000000189	0.000005129	0.000006356

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

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Air Dispersion Modeling Protocol to Assess Metal Emission Impacts

General III, LLC – Chicago, Illinois

November 18, 2019

Appendix C

Vehicle Traffic

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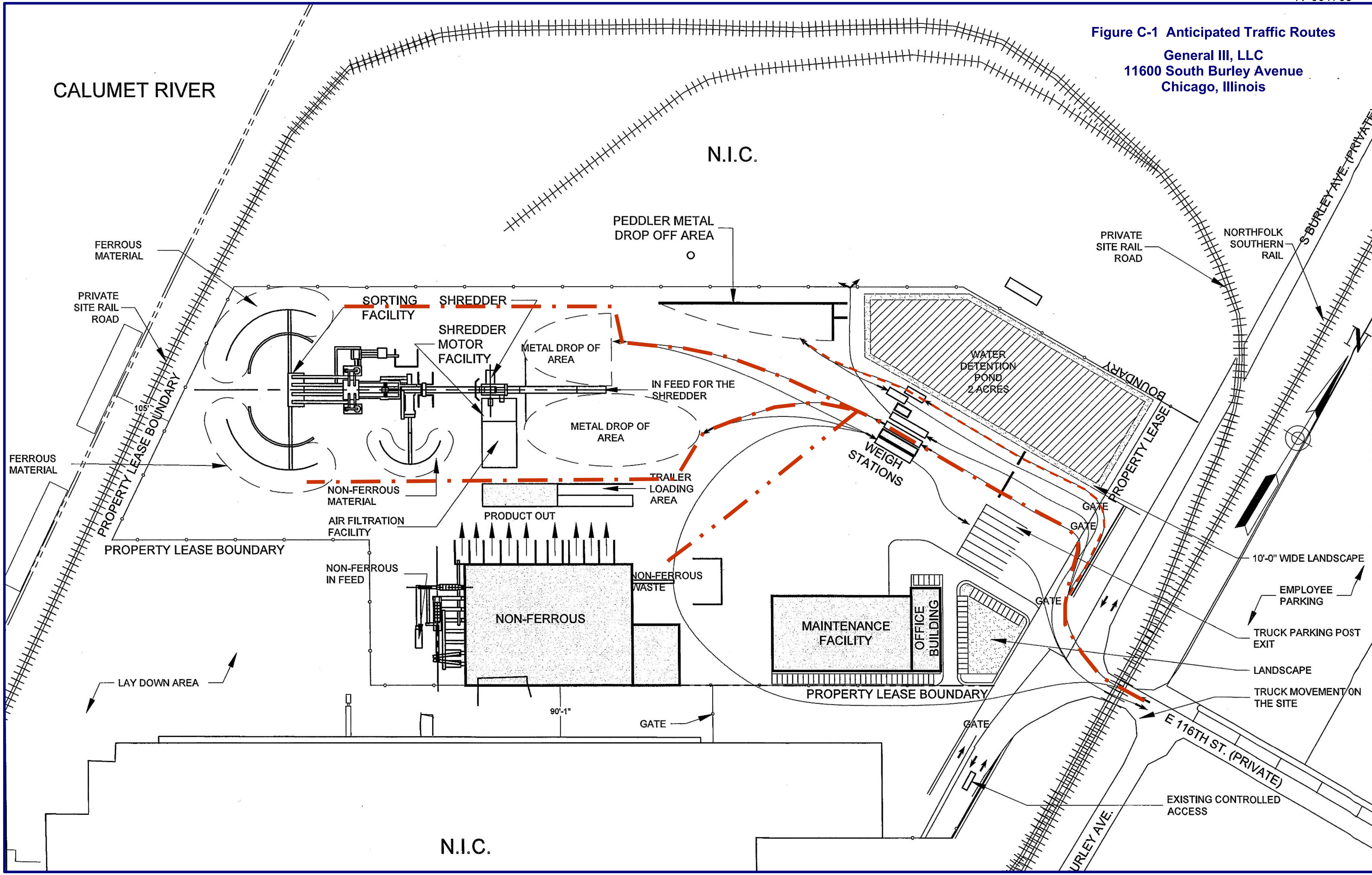

Figure C-1 Anticipated Traffic Routes
General III, LLC
11600 South Burley Avenue
Chicago, Illinois
CALUMET RIVER
N.I.C.
PEDDLER METAL DROP OFF AREA
FERROUS MATERIAL
PRIVATE SITE RAIL ROAD
SORTING FACILITY
SHREDDER
SHREDDER MOTOR FACILITY
METAL DROP OF AREA
IN FEED FOR THE SHREDDER
METAL DROP OF AREA
WATER DETENTION POND 2 ACRES
PROPERTY LEASE BOUNDARY
PRIVATE SITE RAIL ROAD
NORTHFOLK SOUTHERN RAIL
S BURLEY AVE. (PRIVATE)
PROGRESS SET - NOT FOR CONSTRUCTION
WEIGH STATIONS
TRAILER LOADING AREA
FERROUS MATERIAL
105'
PROPERTY LEASE BOUNDARY
NON-FERROUS MATERIAL
AIR FILTRATION FACILITY
PRODUCT OUT
PROPERTY LEASE BOUNDARY
GATE
GATE
10'-0" WIDE LANDSCAPE
EMPLOYEE PARKING
NON-FERROUS IN FEED
NON-FERROUS WASTE
NON-FERROUS
MAINTENANCE FACILITY
OFFICE BUILDING
GATE
TRUCK PARKING POST EXIT
LANDSCAPE
LAY DOWN AREA
PROPERTY LEASE BOUNDARY
TRUCK MOVEMENT ON THE SITE
90'-1"
GATE
GATE
E 116TH ST. (PRIVATE)
EXISTING CONTROLLED ACCESS
URLEY AVE.
N.I.C.

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R 001765

EXHIBIT 11

031600SFX
19090021

RK
& Associates, Inc.

RECEIVED
STATE OF ILLINOIS
JAN 27 2020
Environmental Protection Agency
BUREAU OF AIR

January 24, 2020

R17421-7.1

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

Air Dispersion Modeling Report for Assessment of Metal Emission Impacts
Proposed Scrap Metal Recycling Facility
General III, LLC – 11600 South Burley - Chicago, Illinois
Construction Permit Application 19090021; Site ID No.: 031600SFX

Dear Mr. Sprague:

Please find attached a copy of the air dispersion modeling report for assessment of metal emission impacts for the proposed General III, LLC (GIII) Scrap Metal Recycling Facility located in Cook County at 11600 South Burley Avenue in Chicago, Illinois.

A copy of all AERMOD input and output files are included on a CD ROM included in Appendix E of the attached report.

Two copies of the report are attached, one containing information claimed as Trade Secret and one with the claimed Trade Secret information redacted.

A separate letter providing GIII's justification for the Claim of Trade Secret information is included with this submittal.

If you have any questions or need any additional information, please don't hesitate to contact me at 630-393-9000 or by e-mail at jpinion@hotmail.com.

Yours very truly,
RK & Associates

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE
MAR 13 2020
REVIEWER: JMR

cc: Mr. Bob Bernoteit – IEPA Bureau of Air – Springfield, Illinois – (Hard Copies)
Mr. Jim Kallas – General III, LLC – Chicago, Illinois (via e-mail)

2 South 631 Route 59, Suite B
Warrenville, Illinois 60555

(630) 393-9000
Fax (630) 393-9111

General Iron
1909 N. Clifton Avenue | Chicago, IL 60614-4803 | 773-327-9600

January 24, 2020

VIA OVERNIGHT DELIVERY

Mr. Jeff Sprague
Illinois Environmental Protect Agency
Division of Air Pollution Control
PO Box 19506 - 1021 North Grand Avenue East
Springfield, IL 62794-9506

Justification for Claim of TRADE SECRET Information
Air Dispersion Modeling Report for Assessment of Metal Emission Impacts
General III, LLC – 11600 South Burley Avenue – Chicago, Illinois
Construction Permit Application 19090021; Site ID No.: 031600SFX

Mr. Sprague:

Please find attached two copies of the Air Dispersion Modeling Report for Assessment of Metal Emission Impacts (Report) from the proposed General III, LLC (GIII) scrap metal recycling facility at 11600 South Burley Avenue in Chicago, Illinois. The Report includes detailed equipment layout drawings for the proposed scrap metal recycling facility described in the above-referenced construction permit application.

GIII is claiming the detailed equipment layout drawings for the Ferrous Material Processing System (Figures A-1 and A-2 included in Appendix A of the attached Report) and the Non-Ferrous Material Processing System (Figures B-1 and B-2 included in Appendix B of the attached Report) as Trade Secret information as defined in 35 IAC 101.202 and Section 3.490 of the Illinois Environmental Protection Act [415 ILCS 5/3.490].

The above referenced drawings included in the attached Report are claimed as Trade Secret information in accordance with 35 IAC 130 and are clearly marked with the words "Trade Secret" in red letters on each page of the drawings (total of four pages). Two copies of the Report are attached to this claim, one including the clearly marked drawings claimed as Trade Secret and one copy with the drawings redacted noting that they have been claimed as Trade Secret information.

Pursuant to 35 IAC 130.203, GIII is providing the following information as its statement of justification for the claim of Trade Secret information. Each specific element, identified in 35 IAC 130.203(a) through (e), required for a statement of justification for a claim of Trade Secret claim is identified below.

§130.203(a) *A detailed description of the procedures used by the owner to safeguard the article from becoming available to persons other than those selected by the owner to have access thereto for limited purposes;*

The equipment layout drawings, prepared under a strict confidentiality agreement between GIII and a prospective equipment manufacturer, have only been provided to select GIII management personnel and outside consultants as required for preparation of facility permit applications and other information required for local governmental approval. This information is maintained on a password protected server at GIII with limited access. All equipment drawings produced to date have been labeled as confidential to protect this information and prevent its public dissemination.

§130.203(b) *A detailed statement identifying the persons or class of persons to whom the article has been disclosed;*

This information has only been disclosed to the top management of GIII and select outside consultants.

§130.203(c) *A certification that the owner has no knowledge that the article has ever been published or disseminated or has otherwise become a matter of general public knowledge;*

GIII hereby certifies that it has no knowledge that these identified articles claimed as trade secret information have been published or disseminated or have otherwise become a matter of general public information.

§130.203(d) *A detailed discussion of why the owner believes the article to be of competitive value; and*

The equipment drawings claimed as trade secret information were produced at great expense to GIII and represent months of intense effort by GIII and a prospective equipment manufacturer. The final design is a product of GIII's over 60 years of experience recycling scrap metal in the Chicago market and the considerable technological expertise of the prospective equipment manufacturer and represents a state-of-the-art recycling process that will maximize recovery and production of high value ferrous and non-ferrous metals in a sustainable and economic manner. GIII believes that the specific design and equipment layout will provide GIII with a significant competitive advantage over its competitors by providing increased metal recovery at reduced operating expense.

§130.203(e) *Any other information that will support the claim.*

The equipment layout drawings represent a process design that is unique to GIII and is not available in any market.

We believe that the above information is sufficient to justify a claim of trade secret for the equipment layout drawings described herein. If you believe that additional information is required to approve this designation, please contact Mr. Adam Labkon of GIII at 773-868-3491 (adamlabkon@general-iron.com).

Yours very truly,
General III, LLC

Adam Labkon /SK

Mr. Adam Labkon

cc: Ms. Ann Zwick – Freeborn & Peters – Chicago, Illinois

Illinois EPA FOIA Exemption Reference Sheet

Agency ID: 170002390446 Media File Type: AIR
Bureau ID: 031600SFX
Site Name: General III LLC
Site Address1: 11600 S Burley Ave
Site Address2:
Site City: Chicago State: IL Zip: 60617-

This record has been determined to be partially or wholly exempt from public disclosure

Exemption Type:

Portion Removed

Exempt Doc #: 3 **Document Date:** 1 /27/2020 **Staff:** JMR

Document Description: AIR DISPERSION MODELING REPORT FOR ASSESSMENT OF METAL EMISSION IMPACTS (TRADE SECRET COPY)

Category ID: 03M **Category Description:** AIR PERMIT - CONSTRUCTION/JOINT **Exempt Type:** Portion Removed
Permit ID: 19090021 **Date of Determination:** 3 /13/2020

TRADE SECRET INFORMATION - REDACTED

Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – Chicago, Illinois

January 24 2020

R17421-7.1

Prepared for:

General III, LLC
1909 North Clifton Avenue
Chicago, Illinois 60614
Attn: Mr. Jim Kallas

This Document Contains Redacted TRADE SECRET Information

Figures A-1, A-2, B-1, and B-3 Contain Trade Secret Information and have been Redacted from this Document.

Prepared by:

John G. Pinion
Principal Engineer
RK & Associates, Inc.

RK & Associates, Inc.
2 South 631 Route 59
Suite B
Warrenville, Illinois 60555
Phone: 630-393-9000
Fax: 630-393-9111

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RK & Associates, Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 Facility Location and Contact Information 2

2.0 EMISSION SOURCES 5
2.1 Shredder Emissions 5
2.2 Ferrous Material Processing 6
2.3 Non-Ferrous Material Processing 6
2.4 Vehicle Traffic 7
2.5 Metal Emission Rates for Emission Units Other Than the Metal Shredder 8

3.0 DISPERSION MODELING 11
3.1 Meteorological Data 11
3.2 Terrain Data 11
3.3 Ambient Air Boundaries 11
3.4 Receptor Network 11
3.5 Building Downwash 12
3.6 Lead Modeling 12
3.7 Manganese Modeling 13
3.8 Modeling Other Metals 16

4.0 MODELING RESULTS 19
4.1 Predicted Lead Impacts 19
4.2 Predicted Manganese Impacts 19
4.3 Predicted Impacts for Other Metals 20

TABLES

Table 2-1	Summary of Metal Concentrations in Material Deposition at GII	8
Table 3-1	Offsite Lead Sources Identified by IEPA	12
Table 3-2	Lead Background Concentrations	13
Table 3-3	Offsite Manganese Sources Identified by IEPA	14
Table 3-4	Manganese Background Concentrations	15
Table 3-5	NR 445 Standards for Other Metals	16
Table 4-1	Summary of Predicted Impacts for Lead	19
Table 4-2	Summary of Predicted Impacts for Manganese	20
Table 4-3	Comparison of Predicted Maximum Metal Impacts to Identified Standards	21
Table A-1a	Ferrous Material Processing– Metal Emissions in Active Hours	Appendix A
Table A-1b	Ferrous Material Processing – Metal Emissions in Inactive Hours	Appendix A
Table A-2	Ferrous Material Processing – Particulate Emissions	Appendix A
Table A-3	Ferrous Plant Stockpile – Particulate Emissions	Appendix A
Table A-4	Ferrous Material Processing – PM Emission Summary	Appendix A
Table B-1	Non-Ferrous Material Processing – Particulate Emissions	Appendix B
Table B-2	Non-Ferrous Plant Stockpile – Particulate Emissions	Appendix B
Table B-3	Non-Ferrous Material Processing – PM Emission Summary	Appendix B
Table B-4a	Non-Ferrous Material Processing – Metal Emissions in Active Hours	Appendix B
Table B-4b	Non-Ferrous Material Processing – Metal Emissions in Inactive Hours	Appendix B

FIGURES

Figure 1-1	Site Location Map	3
Figure 1-2	Facility Map	4
Figure A-1	Ferrous Processing System Flow Diagram **TRADE SECRET Redacted**	Appendix A
Figure A-2	Ferrous Processing System Layout **TRADE SECRET Redacted**	Appendix A
Figure B-1	Non-Ferrous Processing System Flow Diagram **TRADE SECRET Redacted**	Appendix B
Figure B-2	Non-Ferrous Processing System Layout **TRADE SECRET Redacted**	Appendix B
Figure C-1	Anticipated Traffic Routes	Appendix C

APPENDICES

Appendix A	Ferrous Material Processing Figures and Tables
Appendix B	Non-Ferrous Material Processing Figures and Tables
Appendix C	Vehicle Traffic Routes
Appendix D	Laboratory Analytical Report for GII Material Deposition Samples
Appendix E	Modeling Input and Output Files (CD ROM)

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1.0 INTRODUCTION

General III, LLC (GIII), is proposing to construct and operate a new scrap metal recycling facility (Facility) in Cook County at 11600 South Burley Avenue in Chicago, Illinois. A Site Location Map and Facility Layout Map are presented in Figures 1-1 and 1-2.

GIII's proposed facility will be a state-of-the-art metal recycling facility located in the heart of an industrial district well buffered from residential properties. The proposed new metal shredder and material processing operations will utilize the latest technology to create a clean, efficient, and environmentally sensitive plant.

GIII will receive and shred mixed recyclables in various forms to produce uniform grades of ferrous and non-ferrous metals. Proposed scrap handling and processing activities include receiving, sorting, shredding, metal separation, and recovery of ferrous and non-ferrous metals.

The proposed GIII facility will be a minor source with respect to federal and state nonattainment area new source review (NA NSR), prevention of significant deterioration (PSD) requirements and Title V permitting requirements. The proposed facility will also be an area source with respect to hazardous air pollutants (HAPs).

As part of the air permitting process, Illinois Environmental Protection Agency (IEPA) has requested that GIII perform an air dispersion modeling analysis for metal emissions from the proposed facility. Emission rates for the proposed GIII facility have been estimated based on data obtained from the existing GII, LLC (GII) metal recycling facility (formerly General Iron Industries, Inc.) located at 1909 N. Clifton Avenue in Chicago, Illinois.

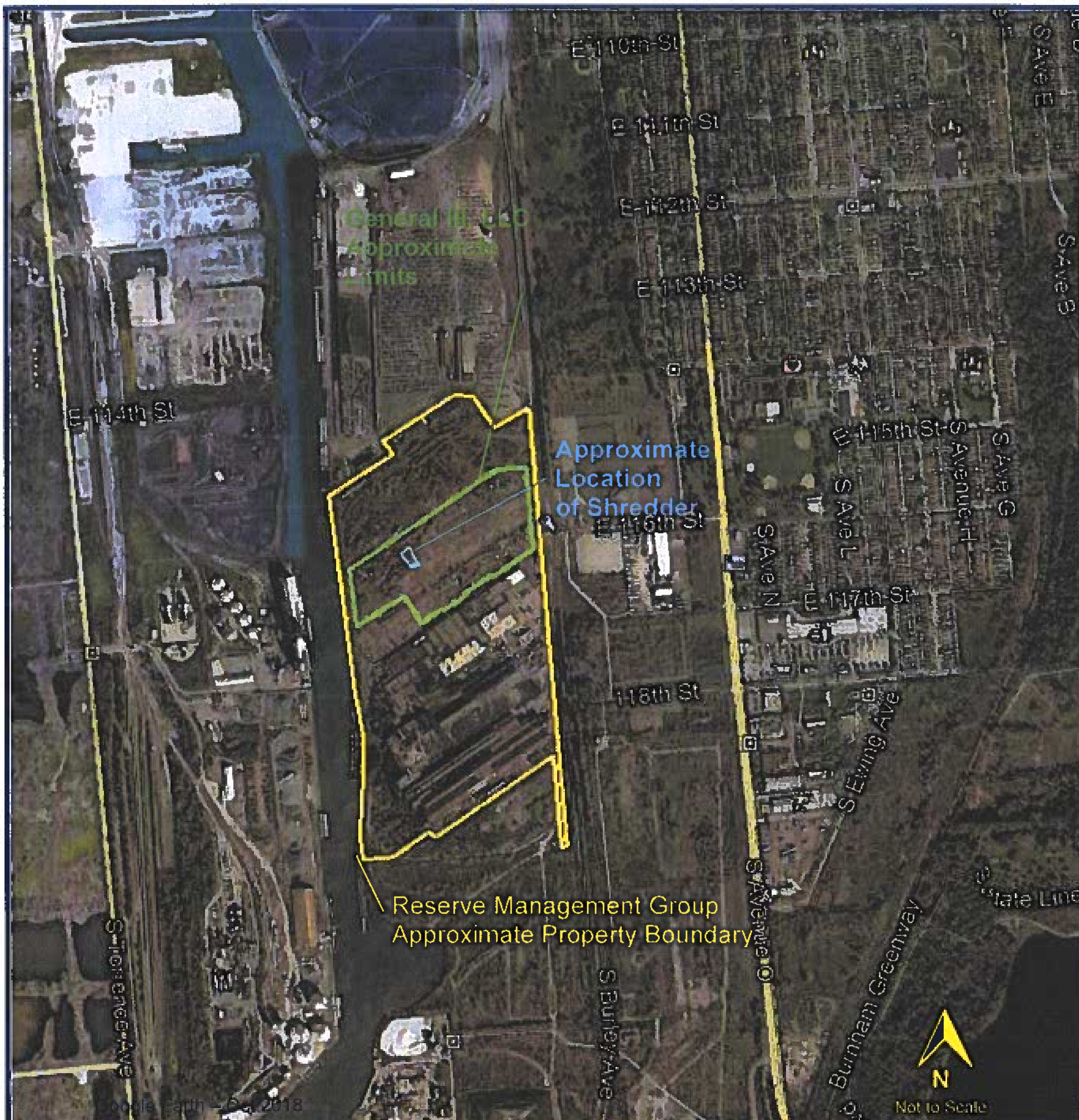
With the exception of Lead (Pb), for which there is a National Ambient Air Quality Standard (NAAQS), there are no IEPA or USEPA regulations limiting emissions of other metals. In an effort to identify standards for metals, RKA reviewed the Wisconsin Department of Natural Resources (WDNR's) rule regulating the emissions of air toxic pollutants (including metals). WDNR's Air Toxics Rule (NR 445) sets health-based emission standards for about 550 air toxics, including metals. The standards in NR 445 are based on threshold limit values established by American Conference of Governmental Industrial Hygienists (ACGIH) and USEPA or California Air Resources Board risk factors. Wisconsin's NR 445 will be used to assess the potential off-site impacts from the estimated emissions of 17 metals as described in Section 3 of this report.

1.1 Facility Location and Contact Information

Business Name:	General III, LLC
Source Location:	11600 South Burley – Chicago, Illinois 60617 Hyde Park Township, Cook County Illinois
Latitude/Longitude	41.685201° N / -87.545847" W – Approximate Location of Front Gate
Office/Mailing Address:	1909 N. Clifton Avenue – Chicago, Illinois 60614
General III, LLC	Mr. Jim Kallas - Environmental Manager 847-508-9170 – jimkallas@general-iron.com
IEPA Site ID No.:	031600SFX
IEPA Draft Construction Permit:	19090021
SIC Code:	5093 – Scrap and Waste Materials
NAICS Code:	423930 – Recyclable Material Merchant Wholesalers
RKA Contact for Modeling Analysis	John Pinion - Principal Engineer 2S631 Route 59, Suite B - Warrenville, Illinois 60555 630-393-9000 - jpinion@rka-inc.com

RK & Associates, Inc. 2S631 Route 59, Suite B Warrenville, IL 60555 630-393-9000/630-393-9111	Comments: Air Dispersion Modeling Report for the Assessment of Metal Emission Impacts		Site Location Map General III, LLC 11600 South Burley, Chicago, Illinois		Figure 1-1
	Drawn by:	Approved by: JGP	Project Number R19439-7.10	Date Drawn: 01-2020	Revised Date

R 001776



RK & Associates, Inc. 2S631 ROUTE 59, SUITE B WARRENVILLE, IL 60555 630-393-9000/630-393-9111	COMMENTS: Air Dispersion Modeling Report for the Assessment of Metal Emission Impacts		Facility Map General III, LLC 11600 South Burley, Chicago, IL			FIGURE 1-2
	DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER: R19439-7.10	DATE DRAWN: 01-2020	REVISED DATE	

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& Associates, Inc.

2.0 EMISSION SOURCES

Emission sources, emission factors, and emission rates are described in detail in the Construction Permit Application 19010021 submitted to IEPA dated September 24, 2019 and as amended by updated emission estimates. The proposed GIII facility will consist of the following operations:

- Raw material receiving and handling;
- Hammermill shredder;
- Ferrous separation and material processing; and,
- Non-ferrous separation and material processing.

GIII emission sources will include:

- Metal shredder controlled by roll-media particulate filter, Regenerative Thermal Oxidizer (RTO), quench, and packed tower scrubber;
- Ferrous Material Processing System –conveyor transfer points, magnetic separators, stockpiles, and material loadout;
- Non-Ferrous Material Processing System - feed hopper, conveyor transfer points, magnetic separators, screens, vibratory feed tables, stockpiles and material loadout, and a baghouse for control of emission sources located in the fines processing building;
- Stockpiles (fugitive emissions); and,
- Vehicular emissions from Paved and Unpaved Areas (fugitive emissions)

2.1 Shredder Emissions

The existing metal shredder at GII is equipped with a roll-media particulate filter installed in 2014. A Regenerative Thermal Oxidizer (RTO), quench, and packed tower scrubber were added downstream of the roll-media particulate filter in 2019. The GII shredder emission control system (including an emission capture hood, cyclone, roll-media particulate filter, RTO, quench, and packed tower scrubber) will be moved from GII to the proposed GIII facility and will be used to control emissions from the new GIII metal shredder.

GIII shredder emissions will be discharged through the scrubber discharge stack and are modeled as a point source having the following parameters:

Stack Height:	41 ft
Stack Diameter:	6 ft
Exhaust Flow Rate:	73,500 acfm
Exhaust Temperature:	100°F

Metal emission rates from the proposed GIII shredder are estimated based upon the results of November 14, 2019, metal emission testing performed at the existing GII metal shredder controlled by the roll-media particulate filter, RTO, quench and packed tower scrubber. Metal testing was performed pursuant to EPA Methods 1 through 4 and Method 29. Metal emission factors (in units of pounds of metal emitted per ton of shredder feed) were applied to the proposed shredder feed rate for the new GIII shredder. Metal emission rates for the proposed GIII shredder are presented in Appendix A, Table A-1a and A-1b.

2.2 Ferrous Material Processing

The Ferrous Material Processing System consists of multiple emission sources as described in the construction permit application. Emission sources include conveyors, magnetic separators, stockpiles and material loadout.

For the purpose of modeling, emission sources that are spatially close together are combined into separate volume sources. The Ferrous Material Processing System emission sources have been grouped into thirteen (13) volume sources, V-1 through V-13, as shown in Figure A-1 in Appendix A. A layout drawing of the Ferrous Material Processing System is presented in Figure A-2 in Appendix A. Figures A-1 and A-2 contain TRADE SECRET information.

Individual metal emission rates were estimated using the procedures described in Section 2.5 below. Table A-2, in Appendix A, identifies each emission unit, the emission unit identification number, and corresponding PM emissions.

Stockpile sources and their appropriate volume source group are shown in Table A-3. Emissions from stockpiles are different during the time piles are active and when piles are inactive. Table A-4 identifies the individual metal emission rates from material handling sources and stockpile sources. For the purpose of this modeling assessment, the stockpiles in the Ferrous Material Handling System are assumed to be active for 12 hours per day Monday through Saturday.

2.3 Non-Ferrous Material Processing

The Non-Ferrous Material Processing System consists of multiple emission sources as described in the construction permit application. Emission sources include feed hopper, conveyor transfer points, magnetic separators, screens, vibratory feed tables, stockpiles and material loadout. Emission sources have been grouped into six (6) volume sources, VN-1 through VN-6, as shown in Figure B-1 in Appendix B. A layout drawing of the Non-Ferrous Material Processing System is presented in Figure B-2 in Appendix B. Figures B-1 and B-2 contain TRADE SECRET information.

Individual metal emission rates were estimated using the procedures described in Section 2.5 below. Table B-1, in Appendix B, identifies each emission unit, the emission unit identification number, and corresponding PM emissions.

Stockpile sources and their appropriate volume source group are shown in Table B-2. Emissions from stockpiles are different during the time piles are active and when piles are inactive. Table B-3 contains combined emissions from material handling sources and stockpile sources. For the purpose of this modeling assessment, the stockpiles in the Non-Ferrous Material Handling System are assumed to be active for 24 hours per day Monday through Saturday.

Individual metal emission rates are shown in Table B-4a for active facility hours and in Table B-4b for inactive hours.

The Non-Ferrous Material Processing System includes a Fines Processing System that is located in a building. Emissions from the fines processing equipment are ducted to one of four identical dust collectors. Three of the dust collectors exhaust treated air back into the building and the fourth dust collector exhausts treated air to the outside atmosphere. Emissions from the single dust collector that exhausts to the atmosphere will be modeled as a point source with the following parameters:

Stack Height:	47 ft
Stack Diameter:	2 ft
Exhaust Flow Rate:	12,000 acfm
Exhaust Temperature:	Ambient

Metal emissions from the dust collector are shown in Table B-4 in Appendix B.

2.4 Vehicle Traffic

The vast majority of material received at the proposed facility will be delivered by semi-trailers and the remaining portion will enter the facility in pickup truck sized vehicles driven by peddlers. Vehicles will enter the facility through a controlled gate and travel over a weigh scale before being routed to a designated unloading area. Proposed vehicle routes are presented in Figure C-1 in Appendix C.

Roadways at the facility were divided into segments. Estimated PM emissions for each segment were calculated based on the number and type of vehicles on each segment each day. The estimated PM emission for segment were then combined with representative metals concentrations as described in Section 2.5 below. The resulting segment-specific metals emissions rates were then modeled as a line of adjacent volume sources distributed over each segment pursuant to applicable modeling guidelines.

2.5 Metal Emission Rates for Emission Units Other Than the Metal Shredder

There is no published data describing metal concentrations in various particulate emission streams associated with scrap recycling facilities. In order to develop representative metal emission factors for facility emission units and activities, samples of material deposition from five areas at the existing GII facility were collected, screened, and the resulting particulate matter analyzed for metals. The identified metal concentrations from the samples collected at GII were assigned to particulate matter emissions from corresponding areas and emission units proposed for GIII. A copy of the laboratory analytical report for these samples is presented in Appendix D.

A summary of the metal analyses described above is presented in Table 2-1 below.

Table 2-1 Summary of Metal Concentrations in Material Deposition[1] at GII

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

The following describes locations of the samples collected at GII and the areas and activities at GIII that each sample represents.

Sample Name	Sample Description
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.
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.

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3.0 DISPERSION MODELING

Dispersion modeling was performed to predict the maximum impact from General III sources. AERMOD dispersion model Version 19191, AIRMET Version 19191, AERMINUTE Version 15272, AERMAP Version 18081, and AIRSURFACE Version 13016 was used in this modeling analysis.

3.1 Meteorological Data

Surface meteorological data used in the modeling was obtained from the National Weather Service at the Midway Airport Station for the years 2012 through 2016. Wind data was downloaded as 1-minute average ASOS data and processed using AERMINUTE. Upper air data for the same period was obtained from the coincident upper air sounding station at Davenport, Iowa. Surface and upper air data were preprocessed with AERMET using surface parameters from AIRSURFACE.

3.2 Terrain Data

Receptor elevations, source elevations, and building elevations were obtained by running AERMAP, using National Elevation Dataset (NED) files downloaded from USGS website.

3.3 Ambient Air Boundaries

There is security fencing on the north boundary and the northern part of the east boundary of the RMG industrial campus property that leads to a guard shack with gates (open when occupied or closed when unoccupied). The southern boundary of the RMG industrial campus property is a combination of fencing and berm, while the west boundary is the Calumet River. No Trespassing signs are posted around the boundary and no part of the boundary is adjacent to any public right away, which limits casual access to the site by the general public.

Based on the above, ambient air boundaries have been set at the RMG industrial campus property boundaries shown in Figure 1-2.

3.4 Receptor Network

A Cartesian receptor grid is placed around the property lines up to 5 km from the property line as follows:

- 50 m apart along the property line
- 100 m extending from the fence line to 2 km
- 500 m apart from 2 km to 5 km

3.5 Building Downwash

Downwash parameters were developed based on information provided by Reserve Management Group (RMG) for existing buildings and GIII for proposed buildings. Structure coordinates were obtained for existing buildings from Google Earth and for proposed buildings from GIII site plans. Building heights for existing buildings were obtained from direct measurements taken by RMG representatives and for the proposed building from facility site plans.

3.6 Lead Modeling

Lead modeling was performed to identify off site impacts for comparison to the National Ambient Air Quality Standard (NAAQS) for lead (Pb), which is 0.15 μg/m^3 on a rolling three-month average.

GIII Pb emission sources described in Section 2 of this report were modeled along with other, non-GIII offsite Pb emission sources identified by IEPA for inclusion in the assessment. A list of the offsite Pb emission sources and emission point characteristics identified by IEPA is presented in Table 3-1 below.

Table 3-1. Offsite Lead Emission Sources Identified by IEPA

Row #	ID Number	Stack Number	Stack ID	Stack Description	Lead Emissions (lb/hr)	Stack Diameter (ft)	Stack Height (ft)	Flow Rate (acfm)	Stack Temp (F)	UTM Zone	UTM Easting	UTM Northing
1	031600AAR	109	250881	4 Big foot air houses (19.4 million BTU/hr each)	0.00000335	1.76	37	3,000	442	16	453419	4612420
2	031600FGT	3	195877	Cement silo loading	0.000069	2.80	36	10,266	80	16	451809	4617532
3	031600FGT	6	195880	Mixer and/or truck loading	0.0002292	2.90	32	10,220	80	16	451809	4617532
4	031600FHQ	1	121260	Portland cement terminal: Cement silo loading	0.00037	2.25	203	3,000	70	16	452489	4612185
5	031600FHQ	2	121261	Portland cement terminal: Truck loading/unloading	0.00222	4.50	120	3,000	70	16	452489	4612185
6	031600GKE	9	222736	Backup generator EDG A	0.000277144	3.00	12	16,200	895	16	454708	4618584
7	031600GKE	10	222737	Backup generator EDG B	0.000277144	3.00	12	16,200	895	16	454708	4618571
8	031600GKE	11	222738	Backup generator EDG C	0.000277144	3.00	12	16,200	895	16	454708	4618559
9	031600AFV	5	118896	Kiln #1 & Kiln #2[a]	0.0465	8.67	102	4,114	181	16	453823	4615216
10	031600AFV	27	184788	Crude zinc oxide bin loadout[a] (bag collector 5)	0.000000	8.99	98	123,228	81	16	453823	4615216
11	031600AFV	30	184791	Feed handling system[a]	0.0018	1.51	75	4,101	82	16	453823	4615216
12	031600GWV	7	234365	Boiler	0.00019	3.77	74	19,740	416	16	454218	4613685

a. Above data for Site ID 031600AFV and Site ID 031600FHQ included updated emissions and stack characteristics provided by IEPA.

AERMOD was run with five years of meteorological data (See Section 3.1) to predict the first-high monthly average lead concentration. AERMOD post files were created and processed with LEADPOST, which converts the monthly average values to rolling three-month averages for direct comparison with the Lead NAAQS. LEADPOST identifies the receptor of maximum impact based on a three-month rolling average.

The background ambient Pb concentration was added to the predicted maximum rolling 3-month average concentration. The nearest statewide air monitoring site for Pb is located at Washington High School, AQS ID 17-031-0022. The three-month rolling mean for Pb measured at Washington High School during the past three years are shown in Table 3-2. The maximum three-month rolling mean from the latest three-year period was used as a background concentration.

Table 3-2 - Lead background concentrations

Year	Three-Month Rolling Mean Pb Concentration (ug/m³)	Pb Design Value* (ug/m³)
2018	0.01	0.02
2017	0.02	
2016	0.02	

* The design value is the maximum three-month rolling mean over the latest three-year period.

The maximum predicted rolling three-month average Pb concentration, plus a background concentration of 0.02 *ug*/m³ was compared to the Pb NAAQS.

3.7 Manganese Modeling

There is no NAAQS for manganese. Modeling was performed to identify predicted offsite impacts for comparison to Wisconsin's NR 445 standard of 4.8 µg/m³ on a 24-hour average basis and USEPA's chronic inhalation Minimal Risk Level (MRL) of 0.3 µg/m³ on an annual average basis.

GIII manganese sources described in Section 2 of this protocol were modeled along with non- GIII offsite manganese sources identified by IEPA for inclusion in this assessment. The list of offsite manganese emission sources is presented in Table 3-3.

AERMOD was run for five years of meteorological data (see Section 3.1) to predict the first-high 24-hour average concentration (for comparison to the NR 445 standard) and the maximum annual concentration (for comparison the USEPA MRL).

Table 3-3 - Offsite Manganese Sources Identified by IEPA

ID Number	Stack Number	Stack Id	Stack Description	Mn Emissions (lb/hr)	Stack Diameter (ft)	Stack Height (ft)	Flow Rate (acfm)	Stack Temp (F)	UTM Zone	UTM Northing	UTM Easting
031036AAA	0003	115247	Boiler #3	0.00000152	2.00	25	2,752	300	16	4610011	454809
031036AAA	0004	115248	Boiler #2	0.000000589	2.00	25	2,752	300	16	4610011	454809
031036AAA	0002	115246	Boiler stack #1	0.000000589	3.50	95	2,600	220	16	4610011	454809
031600AAR	0046	118716	60 million BTU/hr boiler	0	3.30	117	19,319	300	16	4612420	453419
031600AAR	0055	118725	Air supply	0	2.30	55	8,000	225	16	4612420	453419
031600AAR	0056	118726	Air supply	0	1.00	45	2,000	245	16	4612420	453419
031600AAR	0088	156582	2 Natural gas fired hot water heaters	0.000001026	3.70	85	17,345	361	16	4612420	453419
031600AAR	0109	250881	4 Big foot air houses (19.4 million BTU/hr each)	0.000002546	1.76	37	3,000	442	16	4612420	453419
031600AAR	0110	250882	2 Hot water stations	0.000001026	1.84	37	3,300	430	16	4612420	453419
031600AAR	0111	250883	Paint line water heater	0.000000266	1.84	37	3,300	430	16	4612420	453419
031600AAR	0112	250884	Other natural gas combustion (curing ovens, oxidizers, space heaters)	0.000039976	1.92	39	4,860	258	16	4612420	453419
031600AAR	0114	250886	Emergency generator	7.4565E-06	2.02	36	12,960	692	16	4612420	453419
031600AFV	0005	118896	Kiln #2	0.033000178	6.40	52	4,115	181	16	4615216	453823
031600AFV	0005	118896	Kiln #2	0.032776655	6.40	52	4,115	181	16	4615216	453823
031600AFV	0035	184796	Engine	0	4.80	56	73,901	503	16	4615216	453823
031600ALC	0002	118971	Boiler	0.000009272	2.50	112	9,520	470	16	4613531	454085
031600AOL	0015	209976	Natural gas combustion	0.000002964	3.40	30	25,373	324	16	4617392	450256
031600BIY	0001	119521	Boiler #1	0.000001748	5.00	90	7,970	565	16	4613129	451612
031600BIY	0024	241900	Boiler #3	0.00000209	2.00	28	4,936	395	16	4613129	451612
031600BRA	0001	119770	Gas heater	0.00000171	2.50	35	700	350	16	4618594	454528
031600DPK	0001	120674	Silo loading	0.000505	2.20	32	12,424	113	16	4619060	454722
031600DQO	0021	173045	Centrifuge Boilers #1 and #2	1.38624E-06	1.83	46	2,050	450	16	4613049	450146
031600FDK	0002	121107	2 Steam generators	0.000001482	2.60	34	1	400	16	4617978	453577
031600FGT	0003	195877	Cement silo loading	0.0189375	2.80	36	10,266	80	16	4617532	451809
031600FGT	0006	195880	Mixer and/or truck loading	0.03672	2.90	32	10,220	80	16	4617532	451809
031600FGT	0007	195881	Natural gas combustion	0.00000342	2.70	50	8,859	341	16	4617532	451809
031600FHQ	0001	121260	Portland cement terminal: Cement silo loading	0.000101	5.30	50	3,000	70	16	4612185	452489
031600FHQ	0002	121261	Portland cement terminal: Truck loading/unloading	0.000606	7.92	20	3,000	70	16	4612185	452489
031600FHQ	0003	190764	Portland cement terminal: Barge unloader	0	2.80	36	10,266	80	16	4612185	452489
031600FHQ	0004	215253	Slag dryer	0	5.33	157	74,700	183	16	4612141	452468
031600FHQ	0004	215253	Slag dryer	0.000011704	5.33	157	74,700	183	16	4612141	452468
031600FLD	0017	188346	Product collector from shaft dryers (T51-HG1), Cyclone (T51-CN1), and Separator (T61-SR1)	6.65E-09	2.20	90	20,000	205	16	4617602	454330
031600FLD	0016	188345	Polymers (Y-Chutes, top of T61-RP2 bin and T61-RP2), and Aux. dryers (T71-HG2 and T71-HG7)	1.672E-09	2.20	90	3,336	205	16	4617602	454330
031600FWM	0023	233161	Natural gas combustion	0.000005852	3.40	58	15,060	436	16	4613979	453740
031600GFX	0003	193349	Natural gas combustion	0.000006194	2.47	49	9,240	331	16	4617336	450418
031600GHA	0001	219682	Turbine CT-01	0.106666	20.00	90	1,658,000	997	16	4614792	453654
031600GHA	0001	219682	Turbine CT-01	0	20.00	90	1,658,000	997	16	4614792	453654
031600GHA	0003	222391	Turbine CT-02	0.10025	20.00	90	1,658,000	997	16	4614792	453697
031600GHA	0003	222391	Turbine CT-02	0	20.00	90	1,658,000	997	16	4614792	453697
031600GHV	0005	189629	2 Boilers	0.000005434	1.50	35	4,700	330	16	4612395	452774
031600GHV	0005	189629	2 Boilers	0.000004712	1.50	35	4,700	330	16	4612395	452774
031600GKE	0001	219577	Turbine CTG-5	0.0429471	12.14	84	611,000	1050	16	4618643	454621
031600GKE	0009	222736	Backup generator EDG A	0.01563884	3.00	12	16,200	895	16	4618584	454708
031600GKE	0010	222737	Backup generator EDG B	0.01563884	3.00	12	16,200	895	16	4618571	454708
031600GKE	0011	222738	Backup generator EDG C	0.01563884	3.00	12	16,200	895	16	4618559	454708
031600GKE	0002	219591	Turbine CTG-6	0.04244986	12.14	84	611,000	1050	16	4618616	454621
031600GKE	0003	219592	Turbine CTG-7	0.04277066	12.14	84	611,000	1050	16	4618590	454621
031600GKE	0004	219593	Turbine CTG-8	0.04341226	12.14	84	611,000	1050	16	4618564	454621
031600GKE	0005	219594	Turbine CTG-9	0.04197668	12.14	84	611,000	1050	16	4618643	454672
031600GKE	0006	219595	Turbine CTG-10	0.0420248	12.14	84	611,000	1050	16	4618617	454672
031600GKE	0007	219596	Turbine CTG-11	0.04220926	12.14	84	611,000	1050	16	4618590	454672
031600GKE	0008	219597	Turbine CTG-12	0.04207292	12.14	84	611,000	1050	16	4618564	454672
031600GKU	0001	209195	Combined boilers stack	0.00000494	3.00	30	5,150	350	16	4617728	451623
031600GWV	0007	234365	Boiler	0.000127848	3.78	74	19,740	416	16	4613685	454218

The background ambient manganese concentrations were added to the modeled results for comparison with identified 24-hour and annual standards. The nearest statewide air monitoring site for manganese is located at Washington High School, AQS ID 17-031-0022. The maximum 24-hour and annual manganese concentrations measured at Washington High School during the past three years are shown in Table 3-4. The maximum 24-hour concentration among the last three years is 0.370 µg/m^3, which was used as a the 24-hour background concentration. The maximum annual average among the three years is 0.070 µg/m^3 , which was used as the annual background concentration.

Table 3-4. Manganese Background Concentrations

Year	Measured 1st High 24-Hour Mn Concentration (µg/m^3)	Maximum 24-Hour Mn Concentration used as Background (µg/m^3)	Measured Annual Mean Mn Concentrations (µg/m^3)	Maximum Annual Mean Mn Concentration Used as Background (µg/m^3)
2018	0.197	0.370	0.048	0.07
2017	0.235		0.070	
2016	0.370		0.068	

3.8 Modeling Other Metals

There are no NAAQS for other metals. Wisconsin's Air Toxics Rule (NR 445) sets health-based emission standards. The metal impacts predicted by this modeling analysis are compared to the NR 445 standards.

Table 3-5 includes a list of the other metals and their corresponding NR 445 limits.

Table 3-5. NR 445 Standards for Other metals

Metal	NR445 Standard		ATSDR Minimal Risk Level[3] Annual (ug/m³)	NAAQS 3-Month Rolling Average Value (ug/m³)	USEPA's IRIS Database Unit Risk Factor	
	24-hr (ug/m³)	Annual (ug/m³)			(ug/m³)	Source
Antimony	12.00	NA	0.30			
Arsenic	NA	Carcinogen			0.00430	USEPA IRIS
Barium	12.00	NA				
Beryllium		Carcinogen			0.00240	USEPA IRIS
		0.02				
Cadmium	NA	Carcinogen	0.01		0.00180	USEPA IRIS
Chromium[1]	12.00	NA				
Cobalt	0.48	NA	0.10			
Copper	24.00	NA				
Lead	NA	NA		0.15		
Manganese	4.80	NA	0.30			
Nickel	NA	Carcinogen	0.09		0.00026	CARB
Phosphorus	2.43	NA				
Selenium	4.80	NA				
Silver[2]	NA	Na				
Thallium	2.40	NA				
Zinc[2]	NA	NA				
Mercury	0.60	0.30	0.20			

1. Chromium (metal) and compounds other than Chromium VI.
2. NR 445does not identify standards for Silver and zinc compounds and no inhalation RfC is reported in the EPA Integrated Risk Information System (IRIS).
3. Chronic-duration inhalation exposure $\geq$ 1 year.

For other metals, AERMOD was run only with GIII sources described in Section 2 using five years of meteorological data (see Section 3.1).

For non-carcinogenic metals, the predicted first-high 24-hour average is compared to the NR 445 24-hour limit. For beryllium and mercury, the predicted maximum annual concentration is compared to the NR 445 annual limit. There is no NR 445 limit for silver and zinc and there is no inhalation exposure dose reported on the Integrated Risk Information System (IRIS). The predicted 24-hour average and predicted annual concentration for these two metals are reported but not compared to any limits.

Pursuant to NR 445.08(2)(c), emissions of carcinogenic air contaminants having a unit risk factor established by either the EPA or the California Air Resources Board, shall not result in an ambient air concentration off the source property corresponding to an inhalation impact (or risk) greater than 1 in 1,000,000 (1×10^{-6}).

The inhalation impact is determined by the following equation:

Inhalation impact = (Inhalation impact concentration annual average) x (Unit risk factor)

where:

the inhalation impact concentration is the annual average concentration of a contaminant in ($\mu g/m^3$); and,

the unit risk factor for the contaminant is the unit risk factor value established by either EPA or the California Air Resources Board and is expressed in $(\mu g/m^3)^{-1}$.

The predicted maximum annual concentrations are multiplied by the compounding unit risk factor. The result is then compared to a standard of 1 in 1,000,000.

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4.0 MODELING RESULTS

The results of this modeling assessment demonstrate that the predicted worst case off-site ambient impacts are below the identified standards.

4.1 Predicted Lead Impacts

Modeling was performed using the proposed Pb emission rates for GIII, as well as Pb emissions from other sources identified in IEPA's Pb emissions inventory data (see Section 3.7; Table 3-1).

IEPA provided updated allowable Pb emission rates, stack characteristics, and site-specific building downwash parameters for two of the background sources identified in the Agency's inventory (Site ID No. 031600GKE and 013600FHQ). The Agency identified the updated information from recent facility compliance activities (i.e., permitting and emission testing) and physical site data from the recent statewide modeling of sulfur dioxide.

Table 4-1 – Summary of Predicted Impacts for Lead

Pollutant	Maximum 3-Month Rolling Average Period	Predicted Monthly Average (µg/m³)	Predicted Maximum 3-Month Rolling Average (µg/m³)	Design Value (Background) (µg/m³)	Total Predicted 3-Month Rolling Average (w/Background) (µg/m³)	East (X) (m)	North (Y) (m)
Lead	Feb-16	0.0591	0.0678	0.0200	0.0878	452500	4612200
	Mar-16	0.0679				452500	4612200
	Apr-16	0.0764				452500	4612200

Comparison of Modeling Results to NAAQS Standard for Lead

Parameter	Units	3 Month Rolling Average
Pb NAAQS Standard (3-Month Rolling Avg)	ug/m³	0.15
Maximum Predicted Pb Impact	ug/m³	0.0878
Predicted Impact Meets Standard	Yes/No	Yes

4.2 Predicted Manganese Impacts

Modeling was performed using estimated Mn emission for GIII as well as Mn emissions from other emission sources identified by IEPA (see Section 3.7; Table 3-3).

The maximum predicted 24 hour and annual impacts (ug/m^3) for manganese are presented in Table 4-2 below. These data show that the maximum predicted impact is well below the identified 24 hour and annual standard for manganese.

Table 4-2 – Summary of Predicted Impacts for Manganese

Pollutant	Averaging Period	Year	AERMOD Predicted Conc. ($\mu g/m^3$)	Background Conc. ($\mu g/m^3$)	Total Predicted Conc. ($\mu g/m^3$)	East (X) (m)	North (Y) (m)	Time yy/mm/dd/hh
Mn	24-HR	2012	0.618	0.370	0.988	452500	4612200	12081524
		2013	0.786		1.156	452500	4612200	13090724
		2014	0.618		0.988	452500	4612200	14092024
		2015	0.724		1.094	452500	4612200	15090724
		2016	0.694		1.064	452500	4612200	16082724
	ANNUAL	2012	0.102	0.070	0.172	452500	4612200	1 YEARS
		2013	0.102		0.172	452500	4612200	1 YEARS
		2014	0.104		0.174	452500	4612200	1 YEARS
		2015	0.113		0.183	452500	4612200	1 YEARS
		2016	0.102		0.172	452500	4612200	1 YEARS

Comparison of Modeled Results to Identified Standards

Parameter	Units	24-hr Value	Annual Value
NR445 Standard	$\mu g/m^3$	4.80	0.30
ATSDR Minimal Risk Level	$\mu g/m^3$	NA	0.30
Total Predicted Impact	$\mu g/m^3$	1.156	0.183
Impact Meets Standard	Yes/No	Yes	Yes

4.3 Predicted Impacts for Other Metals

Modeling for other metals was performed using the proposed metal emissions for the identified GIII metal emission sources.

The maximum predicted 24-hour and annual impacts (ug/m^3) for other metals is presented in Table 4-3 below. Comparison of the maximum predicted 24 hour and annual impacts are compared to corresponding standards in Table 4-4. These data show that the maximum predicted impacts for each of the other metals modeled are well below the identified standards.

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc. (µg/m^3)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Antimony	24-HR	2012	0.00088		454209	4615133	178.19	12101624
		2013	0.00109	12.00 ug/m3 NR445	454089	4614966	176.92	13011024
		2014	0.00097		454209	4615133	178.19	14111024
		2015	0.00100	Pass	454126	4615088	178.19	15111724
		2016	0.00090		454089	4614966	176.92	16081524
	ANNUAL	2012	0.00007		454340	4615247	178.19	1 YEARS
		2013	0.00007	0.30 ug/m3 ATSDR MRL	454596	4615041	178.19	1 YEARS
		2014	0.00007		454596	4615041	178.19	1 YEARS
		2015	0.00006	Pass	454377	4615267	178.19	1 YEARS
		2016	0.00006		454596	4615041	178.19	1 YEARS
Arsenic	24-HR	2012	0.00056		454596	4615041	178.19	12020224
		2013	0.00065	No Standard Identified	454596	4615041	178.19	13011524
		2014	0.00065		454600	4615000	178.19	14010824
		2015	0.00044		454596	4615041	178.19	15123024
		2016	0.00048		454596	4615041	178.19	16012024
	ANNUAL	2012	0.00008	Unit Risk Factor 0.0043	454596	4615041	178.19	1 YEARS
		2013	0.00009		454596	4615041	178.19	1 YEARS
		2014	0.00009	Inhalation Impact* 3.87E-07	454596	4615041	178.19	1 YEARS
		2015	0.00008		454596	4615041	178.19	1 YEARS
		2016	0.00009	Pass	454596	4615041	178.19	1 YEARS
Barium	24-HR	2012	0.05583		454099	4614767	178.14	12012624
		2013	0.06609	12.00 ug/m3 NR445	454099	4614767	178.14	13122124
		2014	0.06250		454099	4614767	178.14	14020424
		2015	0.06909	Pass	454099	4614767	178.14	15122524
		2016	0.04944		454000	4614800	175.37	16022324
	ANNUAL	2012	0.00857		454099	4614767	178.14	1 YEARS
		2013	0.00769	No Standard Identified	454596	4615041	178.19	1 YEARS
		2014	0.00781		454596	4615041	178.19	1 YEARS
		2015	0.00830		454099	4614767	178.14	1 YEARS
		2016	0.00834		454099	4614767	178.14	1 YEARS

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc. (µg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Beryllium	24-HR	2012	0.00105	No Standard Identified	454600	4615000	178.19	12010724
		2013	0.00122		454596	4615041	178.19	13011524
		2014	0.00131		454600	4615000	178.19	14010824
		2015	0.00080		454596	4615041	178.19	15012224
		2016	0.00092		454600	4615000	178.19	16021324
	ANNUAL	2012	0.00013	0.02 ug/m3 NR445 Pass	454596	4615041	178.19	1 YEARS
		2013	0.00014		454596	4615041	178.19	1 YEARS
		2014	0.00015	Unit Risk Factor 0.0024 Inhalation Impact[a] 3.60E-07 Pass	454596	4615041	178.19	1 YEARS
		2015	0.00013		454596	4615041	178.19	1 YEARS
		2016	0.00014		454596	4615041	178.19	1 YEARS
Cadmium	24-HR	2012	0.00259	No Standard Identified	454099	4614767	178.14	12012624
		2013	0.00313		454099	4614767	178.14	13122124
		2014	0.00282		454099	4614767	178.14	14020424
		2015	0.00321		454099	4614767	178.14	15122524
		2016	0.00236		454000	4614800	175.37	16022324
	ANNUAL	2012	0.00040	0.01 ug/m3 ATSDR MRL Pass	454099	4614767	178.14	1 YEARS
		2013	0.00036		454099	4614767	178.14	1 YEARS
		2014	0.00036	Unit Risk Factor 0.0018 Inhalation Impact[a] 7.20E-07 Pass	454099	4614767	178.14	1 YEARS
		2015	0.00039		454099	4614767	178.14	1 YEARS
		2016	0.00039		454099	4614767	178.14	1 YEARS
Chromium	24-HR	2012	0.05583	12.00 ug/m3 NR445 Standard	454099	4614767	178.14	12012624
		2013	0.06609		454099	4614767	178.14	13122124
		2014	0.06250		454099	4614767	178.14	14020424
		2015	0.06909	Pass	454099	4614767	178.14	15122524
		2016	0.04944		454000	4614800	175.37	16022324
	ANNUAL	2012	0.00857	No Standard Identified	454099	4614767	178.14	1 YEARS
		2013	0.00769		454596	4615041	178.19	1 YEARS
		2014	0.00781		454596	4615041	178.19	1 YEARS
		2015	0.00830		454099	4614767	178.14	1 YEARS
		2016	0.00834		454099	4614767	178.14	1 YEARS

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc. (µg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Cobalt	24-HR	2012	0.00313	0.48 ug/m3 NR445 Standard	454092	4614916	177.28	12110724
		2013	0.00441		454092	4614916	177.28	13011024
		2014	0.00373		454596	4614644	178.19	14010824
		2015	0.00390	Pass	454092	4614916	177.28	15022124
		2016	0.00302		454102	4614718	178.19	16031224
	ANNUAL	2012	0.00053	0.10 ug/m3 NR445 Standard	454099	4614767	178.14	1 YEARS
		2013	0.00048		454099	4614767	178.14	1 YEARS
		2014	0.00048		454099	4614767	178.14	1 YEARS
		2015	0.00052	Pass	454099	4614767	178.14	1 YEARS
		2016	0.00053		454099	4614767	178.14	1 YEARS
Copper	24-HR	2012	0.17066	24.00 ug/m3 NR445 Standard	454596	4615041	178.19	12020224
		2013	0.20476		454596	4615041	178.19	13011524
		2014	0.20416		454600	4615000	178.19	14010824
		2015	0.14940	Pass	454099	4614767	178.14	15122524
		2016	0.15274		454596	4615041	178.19	16012024
	ANNUAL	2012	0.02321	No Standard Identified	454596	4615041	178.19	1 YEARS
		2013	0.02527		454596	4615041	178.19	1 YEARS
		2014	0.02575		454596	4615041	178.19	1 YEARS
		2015	0.02346		454596	4615041	178.19	1 YEARS
		2016	0.02484		454596	4615041	178.19	1 YEARS
Mercury	24-HR	2012	0.03414	2.40 ug/m3 NR445 Standard	454209	4615133	178.19	12101624
		2013	0.04017		454089	4614966	176.92	13011024
		2014	0.03769		454209	4615133	178.19	14111024
		2015	0.03917	Pass	454126	4615088	178.19	15111724
		2016	0.03444		454089	4614966	176.92	16081524
	ANNUAL	2012	0.00262	0.20 ug/m3 NR445 Standard	454340	4615247	178.19	1 YEARS
		2013	0.00217		454340	4615247	178.19	1 YEARS
		2014	0.00209		454251	4615156	178.19	1 YEARS
		2015	0.00232	Pass	454377	4615267	178.19	1 YEARS
		2016	0.00222		454303	4615228	178.19	1 YEARS

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc. (µg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Nickel	24-HR	2012	0.02387	No Standard Identified	454596	4615041	178.19	12020224
		2013	0.02857		454092	4614916	177.28	13011024
		2014	0.02597		454600	4615000	178.19	14010824
		2015	0.02490		454092	4614916	177.28	15022124
		2016	0.02076		454596	4615041	178.19	16012024
	ANNUAL	2012	0.00345	0.09 ug/m3 NR445 Pass	454099	4614767	178.14	1 YEARS
		2013	0.00355		454596	4615041	178.19	1 YEARS
		2014	0.00360	Unit Risk Factor 0.0003 Inhalation Impact[a] 9.36E-07 Pass	454596	4615041	178.19	1 YEARS
		2015	0.00336		454099	4614767	178.14	1 YEARS
		2016	0.00348		454596	4615041	178.19	1 YEARS
Phosphorus	24-HR	2012	0.11755	2.43 ug/m3 NR445 Standard Pass	454089	4614966	176.92	12050124
		2013	0.16445		454089	4614966	176.92	13011024
		2014	0.11429		454209	4615133	178.19	14111024
		2015	0.11922		454126	4615088	178.19	15111724
		2016	0.12083		454126	4615088	178.19	16121624
	ANNUAL	2012	0.01193	No Standard Identified	454099	4614767	178.14	1 YEARS
		2013	0.01269		454596	4615041	178.19	1 YEARS
		2014	0.01268		454596	4615041	178.19	1 YEARS
		2015	0.01202		454596	4615041	178.19	1 YEARS
		2016	0.01224		454596	4615041	178.19	1 YEARS
Selenium	24-HR	2012	0.00463	4.80 ug/m3 NR445 Standard Pass	454209	4615133	178.19	12101624
		2013	0.00545		454089	4614966	176.92	13011024
		2014	0.00511		454209	4615133	178.19	14111024
		2015	0.00531		454126	4615088	178.19	15111724
		2016	0.00467		454089	4614966	176.92	16081524
	ANNUAL	2012	0.00036	No Standard Identified	454340	4615247	178.19	1 YEARS
		2013	0.00030		454340	4615247	178.19	1 YEARS
		2014	0.00028		454251	4615156	178.19	1 YEARS
		2015	0.00032		454377	4615267	178.19	1 YEARS
		2016	0.00030		454303	4615228	178.19	1 YEARS

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc. (µg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Silver	24-HR	2012	0.00223	2.40 ug/m3 NR445 Standard	454600	4615000	178.19	12010724
		2013	0.00271		454596	4615041	178.19	13011524
		2014	**0.00280**		454600	4615000	178.19	14010824
		2015	0.00180	Pass	454596	4615041	178.19	15123024
		2016	0.00196		454596	4615041	178.19	16012024
	ANNUAL	2012	0.00032	No Standard Identified	454596	4615041	178.19	1 YEARS
		2013	0.00035		454596	4615041	178.19	1 YEARS
		2014	**0.00036**		454596	4615041	178.19	1 YEARS
		2015	0.00032		454596	4615041	178.19	1 YEARS
		2016	0.00034		454596	4615041	178.19	1 YEARS
Thallium	24-HR	2012	0.00022	No Standard Identified	454596	4615041	178.19	12020224
		2013	0.00027		454596	4615041	178.19	13011524
		2014	**0.00028**		454600	4615000	178.19	14010824
		2015	0.00018		454596	4615041	178.19	15123024
		2016	0.00020		454596	4615041	178.19	16012024
	ANNUAL	2012	0.00003	No Standard Identified	454596	4615041	178.19	1 YEARS
		2013	**0.00004**		454596	4615041	178.19	1 YEARS
		2014	**0.00004**		454596	4615041	178.19	1 YEARS
		2015	0.00003		454596	4615041	178.19	1 YEARS
		2016	0.00003		454596	4615041	178.19	1 YEARS
Zinc	24-HR	2012	2.05738	No Standard Identified	454099	4614767	178.14	12012024
		2013	**2.62604**		454092	4614916	177.28	13011024
		2014	2.30367		454092	4614916	177.28	14010924
		2015	2.50381		454099	4614767	178.14	15122524
		2016	1.91458		454000	4614800	175.37	16022324
	ANNUAL	2012	**0.32888**	No Standard Identified	454099	4614767	178.14	1 YEARS
		2013	0.29975		454099	4614767	178.14	1 YEARS
		2014	0.29897		454099	4614767	178.14	1 YEARS
		2015	0.32042		454099	4614767	178.14	1 YEARS
		2016	0.32752		454099	4614767	178.14	1 YEARS

a. There are currently no state or federal ambient air quality standards for these metals. Predicted impacts are compared to a unit risk of $1x10^{-6}$. Unit risk is calculated by multiplying predicted impact by the published unit risk factor from USEPA's IRIS database.

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RK & Associates, Inc.

Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – Chicago, Illinois

January 24, 2020

Appendix A

Ferrous Material Processing

Figures A-1 and A-2 contain TRADE SECRET information and have been REDACTED from this document.

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TRADE SECRET

Figure A-1 Redacted

Figure A-1 - Ferrous Processing System Flow Diagram
Air Dispersion Modeling Report

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

TRADE SECRET

Figure A-2 Redacted

Figure A-2 - Ferrous Processing System Layout
Air Dispersion Modeling Report

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

Table A-1a - Ferrous Material Processing - Metal Emissions in Active Hours (7 AM - 7 PM, Mon-Sat)
General III, LLC - Chicago, Illinois

Volume Source	Units	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13	RTO
PM (Active)	lb/hr	1.161000	0.140000	0.140000	0.012000	0.188100	0.208700	0.145800	0.024400	0.041100	0.241200	0.199600	0.199600	0.567300	0.000000
Source of Metals Conc. Data	Sample No.	3	3	4	4	4	5	4	4	5	4	4	4	4	Nov 2019 Emission Test Data
	Sample	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	
Lead	lb/hr	0.000610	0.000074	0.000592	0.000051	0.000796	0.000985	0.000617	0.000103	0.000194	0.001020	0.000844	0.000844	0.002400	0.002766
Manganese	lb/hr	0.000846	0.000102	0.000309	0.000027	0.000416	0.000367	0.000322	0.000054	0.000072	0.000533	0.000441	0.000441	0.001254	0.003981
Mercury	lb/hr	0.000003	0.000000	0.000003	0.000000	0.000004	0.000002	0.000003	0.000000	0.000000	0.000005	0.000004	0.000004	0.000011	0.089273
Nickel	lb/hr	0.000123	0.000015	0.000043	0.000004	0.000057	0.000065	0.000044	0.000007	0.000013	0.000073	0.000061	0.000061	0.000172	0.006592
Antimony	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	0.002247
Arsenic	lb/hr	0.000003	0.000000	0.000000	0.000000	0.000001	0.000001	0.000000	0.000000	0.000000	0.000001	0.000001	0.000001	0.000002	0.000794
Beryllium	lb/hr	0.000006	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	0.000178
Cadmium	lb/hr	0.000006	0.000001	0.000007	0.000001	0.000009	0.000007	0.000007	0.000001	0.000001	0.000011	0.000010	0.000010	0.000027	0.000851
Chromium [c]	lb/hr	0.000201	0.000024	0.000056	0.000005	0.000076	0.000089	0.000059	0.000010	0.000017	0.000097	0.000080	0.000080	0.000228	0.006903
Cobalt	lb/hr	0.000012	0.000001	0.000007	0.000001	0.000010	0.000012	0.000008	0.000001	0.000002	0.000013	0.000010	0.000010	0.000029	0.000213
Phosphorus	lb/hr	0.000313	0.000038	0.000117	0.000010	0.000157	0.000195	0.000121	0.000020	0.000038	0.000201	0.000166	0.000166	0.000473	0.242907
Selenium	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	0.012093
Zinc	lb/hr	0.003576	0.000431	0.005222	0.000448	0.007016	0.007096	0.005438	0.000910	0.001397	0.008997	0.007445	0.007445	0.021160	0.053460
Barium	lb/hr	0.000269	0.000032	0.000138	0.000012	0.000185	0.000143	0.000143	0.000024	0.000028	0.000237	0.000196	0.000196	0.000558	0.007682
Copper	lb/hr	0.000976	0.000118	0.000294	0.000025	0.000395	0.000344	0.000306	0.000051	0.000068	0.000507	0.000419	0.000419	0.001191	0.007785
Silver	lb/hr	0.000013	0.000002	0.000002	0.000000	0.000002	0.000003	0.000002	0.000000	0.000000	0.000003	0.000002	0.000002	0.000007	0.002003
Thallium	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	0.000239

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

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Table A-1b - Ferrous Material Processing - Metal Emissions in Inactive Hours (7 PM - 7 AM, Mon-Sat, All Day, Sun)
General III, LLC - Chicago, Illinois

Volume Source	Units	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13	RTO
PM (Inactive)	lb/hr	0.079400	-	-	0.001200	-	0.037100	-	-	0.000800	-	0.052900	0.052900	-	-
Source of Metals Conc. Data	Sample No.	3	3	4	4	4	5	4	4	5	4	4	4	4	
	Sample Name	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	Nov 2019 Emission Test Data
Lead	lb/hr	0.000042			0.000005		0.000175			0.000004		0.000224	0.000224		
Manganese	lb/hr	0.000058			0.000003		0.000065			0.000001		0.000117	0.000117		
Mercury	lb/hr	-			-		-			-		0.000001	0.000001		
Nickel	lb/hr	0.000008			-		0.000012			-		0.000016	0.000016		
Antimony	lb/hr	-			-		-			-		-	-		
Arsenic	lb/hr	-			-		-			-		-	-		
Beryllium	lb/hr	-			-		-			-		-	-		
Cadmium	lb/hr	-			-		0.000001			-		0.000003	0.000003		
Chromium [c]	lb/hr	0.000014			-		0.000016			-		0.000021	0.000021		
Cobalt	lb/hr	0.000001			-		0.000002			-		0.000003	0.000003		
Phosphorus	lb/hr	0.000021			0.000001		0.000035			0.000001		0.000044	0.000044		
Selenium	lb/hr	-			-		-			-		-	-		
Zinc	lb/hr	0.000245			0.000045		0.001261			0.000027		0.001973	0.001973		
Barium	lb/hr	0.000018			0.000001		0.000025			0.000001		0.000052	0.000052		
Copper	lb/hr	0.000067			0.000003		0.000061			0.000001		0.000111	0.000111		
Silver	lb/hr	0.000001			-		-			-		0.000001	0.000001		
Thallium	lb/hr	-			-		-			-		-	-		

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

R 001805

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

1		2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
V-1	55		Truck Dumping of Raw Feed	Unprepare d	5.4 [a2]	Outside	N	-	0%	0%	Drop	300	0.00127 [c]	0.3797
V-1	56		Raw Feed from Ground after Truck Dumping	Unprepare d	5.4 [a2]	Outside	N	-	0%	0%	Drop	300	0.00127 [c]	0.3797
V-1	59	Magnet/ Clam	Drop Raw Scrap to Infeed Conveyor	Unprepare d	N [a4]	Outside	N	-	NA	0%	D	500	0.00020 [f]	0.1022
											Total Filterable PM Emissions			0.8616
V-2	37	E-01	Drop Raw Scrap onto Shredder Feed Chute	Unprepare d	Y [a4]	Outside	N	-	NA	0%	A	500	0.00014 [d]	0.0700
V-2	40	E-05	Shredder Under Mill Vibratory Conveyor	Shred	Y [0]	Inside	N	-	NA	0%	A	500	0.00014 [d]	0.0700
V-2	79	E-02	Shredder Bottom Discharge	Shred	Y [0]	shredder emissions	0	-	0%	0%	A	500	Emissions captured and controlled by shredder emission	
V-2	81	E-02	Shredder Chute	Unprepare d	Y [0]	shredder emissions	0	-	0%	0%	A	500	Emissions captured and controlled by shredder emission	
											Total Filterable PM Emissions			0.1400
V-3	4	C-001	Shredded Material Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	500	0.00014 [d]	0.0700
V-3	5	C-002	Shredded Material Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-3	6	C-002	Mat'l Not Removed by Poker Picker	Shred	Y [0]	Outside	N	-	NA	0%	A	499	0.00014 [d]	0.0699
											Total Filterable PM Emissions			0.1400
V-4	58	-	Poker Loadout	Pokers	N [0]	Outside	N	-	0%	0%	D	1	0.00020 [f]	0.0002
V-4	62	E-06	Poker Picker Chute to Stockpile	Shred	1.5% [a1]	Outside	N	-	0%	0%	Drop	1	0.00761 [c]	0.0076
											Total Filterable PM Emissions			0.0078

R 001806

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

Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
	1	2	3	6	7 8	9	10	11	12	13	18	19	22	# 24
V-5	7	C-003	Ferrous Transfer Conveyor	Residue	Y [0]	Outside	N	-	NA	0%	A	130	0.00014 [d]	0.0182
V-5	8	C-003	Ferrous Transfer Conveyor	Ferrous	Y [0]	Outside	N	-	NA	0%	A	369	0.00014 [d]	0.0517
V-5	31	C-032	ASR Transfer Conveyor	Residue	Y [0]	Outside	N	-	NA	0%	A	4	0.00014 [d]	0.0006
V-5	32	C-033	Magnetic Material	Shred	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	33	C-033	ASR Not Removed by Magnet E-12	Residue	Y [0]	Outside	N	-	NA	0%	A	129	0.00014 [d]	0.0181
V-5	34	C-034	Ferrous Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	35	C-035	Ferrous Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	36	C-036	ASR Transfer Conveyor	Residue	Y [0]	Outside	N	-	NA	0%	A	129	0.00014 [d]	0.0181
V-5	41	E-07	Magnet Discharge to Chute	Shred	Y [0]	Outside	N	-	NA	0%	A	187	0.00014 [d]	0.0262
V-5	42	E-07	Magnet Discharge to Chute	Shred	Y [0]	Outside	N	-	NA	0%	A	187	0.00014 [d]	0.0262
V-5	49	E-12	Ferrous Removed by Magnet	Ferrous	Y [0]	Outside	N	-	NA	0%	A	5	0.00014 [d]	0.0007
V-5	53	E-7	ASR Not Removed by Magnet	Shred	Y [a3]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-5	54	E-7	Ferrous Removed by Magnet E-7	Residue	Y [0]	Outside	N	-	NA	0%	A	185	0.00014 [d]	0.0259
									Total Filterable PM Emissions					0.1881
V-6	61	C-037	ASR Transfer Conveyor to Stockpile	Residue	10 [a3]	Outside	N	-	0%	0%	Drop	129	0.00053 [c]	0.0689

R 001807

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

1		2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
V-7	9	C-006	Ferrous Transfer Conveyor	Shred	Y [o]	Outside	Y	Z-Box Air Loop	100%	100%	A	183	0.00014 [d]	0.0000
V-7	10	C-007	Ferrous Transfer Conveyor	Shred	Y [o]	Outside	Y	Z-Box Air Loop	100%	100%	A	183	0.00014 [d]	0.0000
V-7	21	C-022	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-7	22	C-023	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-7	23	C-024	Non-metallic transfer conveyor	Ferrous	Y [o]	Outside	N	-	NA	0%	A	4	0.00014 [d]	0.0006
V-7	30	C-031	ASR Transfer Conveyor	Residue	Y [o]	Outside	N	-	NA	0%	A	4	0.00014 [d]	0.0006
V-7	38	E-015	Z-Box Separator Cyclone	Ferrous	Y [o]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-7	39	E-016	Z-Box Separator Cyclone	Ferrous	Y [o]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-7	43	E-08	ASR Not Removed by Magnet	Shred	Y [o]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-7	44	E-08	Ferrous Removed by Magnet E-7	Residue	Y [o]	Outside	N	-	NA	0%	A	185	0.00014 [d]	0.0259
V-7	45	E-10	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-7	46	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-7	47	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-7	48	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-7	64	SC-001	Supplemental Conveyor	Shred	Y [o]	Outside	N	-	NA	0%	A	183	0.00014 [d]	0.0256
V-7	66	SC-002	Supplemental Conveyor	Shred	Y [o]	Outside	N	-	NA	0%	A	183	0.00014 [d]	0.0256
V-7	70	C-004	Ferrous Transfer Conveyor	Shred	Y [o]	Outside	N	-	NA	0%	A	185	Emissions captured by inward air flow at inlet to Z-Box separator.	
V-7	72	C-005	Ferrous Transfer Conveyor	Shred	Y [o]	Outside	N	-	NA	0%	A	185	Emissions captured by inward air flow at inlet to Z-Box separator.	
											Total Filterable PM Emissions			0.1458

R 001808

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

Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
	1	2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
V-8	24	C-025	Non-metallic not removed by magnet E-13	Ferrous	Y [b]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-8	25	C-025	material removed by first magnet to second magnet	Ferrous	Y [a2]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	26	C-026	Ferrous Transfer Conveyor	Ferrous	Y [a2]	0	0	-	0%	0%	A	1	0.00014 [d]	0.0001
V-8	27	C-027	Ferrous Transfer Conveyor	Ferrous	Y [a2]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	28	C-028	Non-metallic Transfer Conveyor	Ferrous	Y [b]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	29	C-029	Non-metallic Transfer Conveyor	Ferrous	Y [b]	0	0	-	0%	0%	A	1	0.00014 [d]	0.0001
V-8	50	E-13	Ferrous Removed by E-13	Ferrous	Y [a2]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	51	E-13	Ferrous Removed by E-13	Ferrous	Y [b]	Outside	N	-	NA	0%	A	1	0.00014 [d]	0.0001
V-8	52	E-14	Mat'l Not removed by Separator	Ferrous	Y [b]	Outside	N	-	NA	0%	A	0.25	0.00014 [d]	0.0000
V-8	60	C-030	Mat'l not Removed by Separator	Ferrous	1.5 [a1]	Outside	Y	Cover	0%	0%	Drop	2.25	0.00761 [c]	0.0171
V-8	63	E-14	Final Discharge from Mat'l Separator	Ferrous	1.5 [a1]	Outside	N	-	0%	0%	Drop	0.75	0.00761 [c]	0.0057
V-8	65	SC-009	Supplemental Conveyor	Ferrous	Y [b]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
V-8	67	SC-010	Supplemental Conveyor	Ferrous	Y [b]	Outside	N	-	NA	0%	A	2	0.00014 [d]	0.0003
											Total Filterable PM Emissions			0.0244
V-9	57	-	Non-metallic Loadout	Non-metallic	N [b]	Outside	N	-	0%	0%	D	187	0.00020 [f]	0.0382

R 001809

Table A-2 - Ferrous Material Processing - Particulate Emissions

General III, LLC - Chicago, Illinois

Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
	1	2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
V-10	11	C-008	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	56	0.00014 [d]	0.0078
V-10	12	C-009	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	13	C-010	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	14	C-011	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-10	15	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	56	0.00014 [d]	0.0078
V-10	16	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	17	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	18	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	55	0.00014 [d]	0.0077
V-10	19	C-016	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-10	20	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-10	68	SC-005	Supplemental Conveyor	Shred	Y [o]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	69	SC-008	Supplemental Conveyor	Shred	Y [o]	Outside	N	-	NA	0%	A	128	0.00014 [d]	0.0179
V-10	71	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-014 to C-016. Emissions from 100% of material	
V-10	73	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-012 to C-016. Emissions from 100% of material	
V-10	74	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-015 to C-016. Emissions from 100% of material	
V-10	75	C-019	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-016 top C-017. Emissions from 100% of material	
V-10	76	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-013 to C-016. Emissions from 100% of material	
V-10	77	C-017	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-020/C-021 or C-017/C-018.	
V-10	78	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	Alternate to C-017 to C-018. Emissions from 100% of material	
												Total Filterable PM Emissions		0.2412

R 001810

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

	1	2	3	6	7 8	9	10	11	12	13	18	19	22 #	24
Volume Source Grouping	Row No.	Equipment Generating Emissions		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	Material Throughput Rates tph	PM Emissions lb/ton	Filterable PM Emissions lb/hr
		ID #	Description											
V-11	82	C-018	Ferrous Transfer Conveyor to stockpile	Shred	5.4% [a2]	Outside	N	-	NA	0%	Drop	367	Alternate to C-021 to S Ferrous Stockpile or Barge 2 to Barge.	
V-12	80	C-21	Ferrous Transfer Conveyor to stockpile	Shred	5.4% [a2]	Outside	N	-	NA	0%	Drop	367	Alternate to C-018 to N Ferrous Stockpile or Barge 2 to Barge.	
V-13	1	Barge 1	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-13	2	Barge 2	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N	-	NA	0%	A	367	0.00014 [d]	0.0514
V-13	3	Barge 3	Ferrous Transfer Conveyor to barge (stockpile)	Shred	5.4% [a2]	Outside	N	-	0%	0%	Drop	367	0.00127 [c]	0.4645
											Total Filterable PM Emissions			0.5673

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% moisture.

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 calculations conservatively assume dust collector emission are vented to the atmosphere.

h Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

R 001811

Table A-3 Ferrous Plant Stockpile - Particulate Emissions
General III, LLC - Chicago, Illinois

Volume Source Grouping	Stock Pile	Stock Pile Area Acres	Control Factor[b]	Inactive Emissions[a,d] PM lb/hr	Active Emissions[a,d] PM lb/hr
V-1	Raw Material Truck Dumping (Drop 1)	0.3630	1.00	0.0529	0.1996
V-1	Raw Material Movement from Truck Dumping Area to Stockpile (Drop 2)	0.1815	1.00	0.0265	0.0998
			Total	0.0794	0.2994
V-4	Poker North	0.0115	0.33	0.0006	0.0021
V-4	Poker South	0.0115	0.33	0.0006	0.0021
			Total	0.0012	0.0042
V-6	ASR	0.2541	1.00	0.0371	0.1398
V-9	Fluff (Bin)	0.0161	0.33	0.0008	0.0029
V-11	Ferrous North	0.3630	1.00	0.0529	0.1996
V-12	Ferrous South	0.3630	1.00	0.0529	0.1996

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

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.

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.

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

Active Day PM Emission Factor = 13.20 lb-PM/acre-day

R 001812

Table A-4 - Ferrous Material Processing - PM Emission Summary
General III, LLC - Chicago, Illinois

	Filterable PM Emissions					
	Matl Handling		Stockpile		Total	
Volume Source	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr
V-1	0.8616		0.2994	0.0794	1.1610	0.0794
V-2	0.1400				0.1400	
V-3	0.1400				0.1400	
V-4	0.0078		0.0042	0.0012	0.0120	0.0012
V-5	0.1881				0.1881	
V-6	0.0689		0.1398	0.0371	0.2087	0.0371
V-7	0.1458				0.1458	
V-8	0.0244				0.0244	
V-9	0.0382		0.0029	0.0008	0.0411	0.0008
V-10	0.2412				0.2412	
V-11	0.0000		0.1996	0.0529	0.1996	0.0529
V-12	0.0000		0.1996	0.0529	0.1996	0.0529
V-13	0.5673				0.5673	
Totals	2.4233		0.8455	0.2243	3.2688	0.2243

R 001813

RK & Associates, Inc.

Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – Chicago, Illinois

January 24, 2020

Appendix B

Non-Ferrous Material Processing Figures and Tables

Figures B-1 and B-2 contain TRADE SECRET information and have been REDACTED from this document.

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R 001816

TRADE SECRET

Figure B-1 Redacted

Figure B-1 - Non-Ferrous Processing System Flow Diagram
Air Dispersion Modeling Report

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

R_001817

TRADE SECRET

Figure B-2 Redacted

Figure B-2 - Non-Ferrous Processing System Layout
Air Dispersion Modeling Report

General III, LLC
11600 South Burley Avenue - Chicago, Illinois

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

	A	B	C	F	G	H	I	J	K	L	M	O	Q	R
Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-1	113	C-001	Conveyor	Residue	Y [0]	Outside	Y	N	NA		0%	70	0.000140 [d]	0.0098
VN-1	114	C-002	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	68	0.003000 [0]	0.2037
VN-1	115	C-002	Conveyor	Ferrous	N [0]	Outside	Y	N	NA		0%	2	0.003000 [0]	0.0063
VN-1	116	C-003	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	67.90	0.003000 [0]	0.2037
VN-1	117	C-004	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	60.90	0.003000 [0]	0.1827
VN-1	118	C-005	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	30.45	0.003000 [0]	0.0914
VN-1	119	C-006	Conveyor	Residue	N [0]	Outside		N	NA		0%	30.45	0.003000 [0]	0.0914
VN-1	122	C-009	Conveyor	Residue	N [0]	Outside		N	NA		0%	9.14	0.003000 [0]	0.0274
VN-1	123	C-010	Conveyor	Residue	N [0]	Outside		N	NA		0%	9.14	0.003000 [0]	0.0274
VN-1	124	C-011	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	8.40	0.003000 [0]	0.0252
VN-1	129	C-016	Conveyor	Residue	N [0]	Outside	Y	N	NA		0%	2.7	0.003000 [0]	0.0081
VN-1	174	E-01	Vibratory Batch Feeder	Residue	Y [0]	Outside		N	NA		0%	70	0.000140 [d]	0.0098
VN-1	175	E-03	Screener	Residue	Y [0]	Outside		N	NA		0%	60.90	0.002200 [e]	0.1340
VN-1	176	E-03	Screener	Residue	Y [0]	Outside		N	NA		0%	6.80	0.002200 [e]	0.0150
VN-1	177	E-03	Screener	Residue	Y [0]	Outside		N	NA		0%	2.70	0.002200 [e]	0.0059
VN-1	178	E-04	Screener	Residue	Y [0]	Outside		N	NA		0%	15.75	0.002200 [e]	0.0347
VN-1	179	E-04	Screener	Residue	Y [0]	Outside		N	NA		0%	9.14	0.002200 [e]	0.0201
VN-1	180	E-04	Screener	Residue	Y [0]	Outside		N	NA		0%	4.20	0.002200 [e]	0.0092
VN-1	190	E-11	Screener	Residue	N [0]	Outside		N	NA		0%	15.75	0.025000 [d]	0.3938
VN-1	191	E-11	Screener	Residue	N [0]	Outside		N	NA		0%	9.14	0.025000 [d]	0.2285
VN-1	192	E-11	Screener	Residue	N [0]	Outside		N	NA		0%	4.20	0.025000 [d]	0.1050
VN-1	244	End Loader	Drop ASR into feed hopper	Residue into Hopper	N [0]	Outside		Y	Cover		0%	70.00	0.000204 [d]	0.0143
VN-1	246	SC-001	Supplemental Conveyor	Residue	0 [0]	0		0	0		0%	15.75	0.003000	0.0473
VN-1	247	SC-002	Supplemental Conveyor	Residue	0 [0]	0		0	0		0%	16	0.003000	0.0473
												Total Filterable PM Emissions		1.9420

R 001818

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions

General III, LLC - Chicago, Illinois

	A	B	C	F	G	H	I	J	K	L	M	O	Q	R
Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	120	C-007	Conveyor	Residue	N [o]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	15.75	0.003000 [o]	0.0095
VN-2	121	C-008	Conveyor	Residue	N [o]	Inside		N	ECS Enclosure	100%	Bldg Eff.	15.75	0.003000 [o]	0.0095
VN-2	125	C-012	Conveyor	Residue	N [o]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	9.14	0.003000 [o]	0.0055
VN-2	126	C-013	Conveyor	Residue	N [o]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	9.14	0.003000 [o]	0.0055
VN-2	127	C-014	Conveyor	Residue	N [o]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	8.40	0.003000 [o]	0.0050
VN-2	128	C-015	Conveyor	Ferrous	N [o]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	.25	0.003000 [o]	0.0002
VN-2	130	C-017	Conveyor	Ferrous	N [o]	Outside		N	NA		0%	1.75	0.003000 [o]	0.0053
VN-2	131	C-018	Conveyor	Ferrous	N [o]	Outside	Y	N	NA		0%	1.75	0.003000 [o]	0.0053
VN-2	132	C-019	Conveyor	Lights	N [o]	Outside	Y	N	NA		0%	0.25	0.003000 [o]	0.0008
VN-2	133	C-020	Conveyor	Residue	N [o]	Outside	Y	N	NA		0%	11.12	0.003000 [o]	0.0334
VN-2	134	C-021	Conveyor	Residue	N [o]	Outside	Y	N	NA		0%	11.12	0.003000 [o]	0.0334
VN-2	135	C-022	Conveyor to Wind Sifter	Mixed Non-Ferrous	N [o]	Outside	Y	Y	Wind Sifter	100%	100%	0.80	0.003000 [o]	0.0024
VN-2	136	C-023	Conveyor to Wind Sifter	Residue	N [o]	Outside	Y	Y	Wind Sifter	100%	100%	7.29	0.000140 [o]	0.0010
VN-2	137	C-024	Conveyor to Wind Sifter	Residue	N [o]	Outside	Y	Y	Wind Sifter	100%	100%	7.29	0.000140 [o]	0.0010
VN-2	139	C-035	Conveyor	Residue	N [o]	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	2.7	0.003000 [o]	0.0016
VN-2	147	C-044	Conveyor	Residue	N [o]	Outside	Y	N	NA		0%	24.87	0.003000 [o]	0.0746
VN-2	181	E-05	Magnetic Separation	Residue	N [o]	Inside		N	ECS Enclosure	100%	Bldg Eff.	14.87	0.003000	0.0089
VN-2	182	E-05	Magnetic Separation	Residue	N [o]	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.87	0.003000	0.0059
VN-2	183	E-05	Magnetic Separation	Ferrous	N [o]	Inside		N	NA		0%	0.88	0.003000	0.0026
VN-2	184	E-05	Magnetic Separation	Ferrous	N [o]	Inside		N	NA		0%	5.00	0.003000	0.0150
VN-2	185	E-06	Eddy Current Separator	Residue	N [o]	Outside		N	NA		0%	6.12	0.003000 [d]	0.0184
VN-2	186	E-06	Eddy Current Separator	Mids	N [o]	Outside		N	NA		0%	3.50	0.003000 [d]	0.0105
VN-2	187	E-06	Eddy Current Separator	Zorba	N [o]	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-2	188	E-07	Wind Sifter	Lights	N [o]	Outside		Y	Cover		0%	0.25	0.002200 [d]	0.0006
VN-2	189	E-07	Wind Sifter	Heavies	1.5 [a]	Outside		Y	Wind Sifter	90%	100%	1.50	0.007606 [c]	0.0103

R 001819

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions

General III, LLC - Chicago, Illinois

	A	B	C	F	G	H	I	J	K	L	M	O	Q	R
Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	193	E-12	Magnetic Separation	Residue	N [b]	Inside		N	ECS Enclosure	100%	Bldg Eff.	14.87	0.003000	0.0089
VN-2	194	E-12	Magnetic Separation	Residue	N [b]	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.87	0.003000	0.0059
VN-2	195	E-12	Magnetic Separation	Ferrous	N [b]	Inside		N	NA		0%	0.88	0.003000	0.0026
VN-2	196	E-12	Magnetic Separation	Ferrous	N [b]	Inside		N	NA		0%	5.00	0.003000	0.0150
VN-2	197	E-12	Magnetic Separation	Zorba	N [b]	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-2	198	E-13	Eddy Current Separator	Residue	N [b]	Outside		N	NA		0%	6.12	0.003000 [d]	0.0184
VN-2	199	E-13	Eddy Current Separator	Mids	N [b]	Outside		N	NA		0%	3.50	0.003000 [d]	0.0105
VN-2	200	E-14	Wind Sifter	Lights	N [b]	Outside		Y	Cover		0%	0.20	0.002200 [d]	0.0004
VN-2	201	E-14	Wind Sifter	Heavies	1.5 [a]	Outside		Y	Wind Sifter	100%	100%	0.60	0.007606 [c]	0.0046
VN-2	202	E-15	Magnetic Separation	Residue	N [b]	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.09	0.003000	0.0055
VN-2	203	E-15	Magnetic Separation	Residue	N [b]	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.29	0.003000	0.0050
VN-2	204	E-15	Magnetic Separation	Ferrous	N [b]	Outside		N	NA		0%	0.05	0.003000 [d]	0.0002
VN-2	205	E-15	Magnetic Separation	Mixed Non-Ferrous	N [b]	Outside		N	NA		0%	0.40	0.003000 [d]	0.0012
VN-2	206	E-16	Eddy Current Separator	Residue	N [b]	Outside		N	NA		0%	7.29	0.003000 [d]	0.0219
VN-2	207	E-16	Eddy Current Separator	Zorba	N [b]	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-2	208	E-17	Wind Sifter	Lights	N [b]	Outside		Y	Cover		0%	1.09	0.002200 [d]	0.0024
VN-2	209	E-17	Wind Sifter	Residue	N [b]	Outside		Y	Wind Sifter	100%	100%	6.20	0.002200 [d]	0.0136
VN-2	210	E-21	Magnetic Separation	Residue	N [b]	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.29	0.003000	0.0050
VN-2	211	E-21	Magnetic Separation	Ferrous	N [b]	Outside		N	NA		0%	0.05	0.003000 [d]	0.0002
VN-2	212	E-21	Magnetic Separation	Mixed Non-Ferrous	N [b]	Outside		N	NA		0%	0	0.003000 [d]	0.0012
VN-2	213	E-22	Eddy Current Separator	Zorba	N [b]	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-2	214	E-22	Eddy Current Separator	Residue	N [b]	Outside		N	NA		0%	7.29	0.003000 [d]	0.0219
VN-2	215	E-23	Wind Sifter	Lights	N [b]	Outside		Y	Cover		0%	1	0.002200 [d]	0.0024
VN-2	216	E-23	Wind Sifter	Residue	N [b]	Outside		Y	Wind Sifter	100%	100%	6.20	0.002200 [d]	0.0136
VN-2	217	E-27	Magnetic Separation	Residue	N [b]	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.15	0.003000	0.0049

R 001820

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

A	B	C	F	G	H	I	J	K	L	M	O	Q	R
Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	219	E-28	Eddy Current Separator	Residue	N	Outside		N	NA		0%	7.15	0.003000 [d]	0.0215
VN-2	221	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	6.55	0.003000	0.0039
VN-2	222	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	6.55	0.003000	0.0039
VN-2	224	E-35	Eddy Current Separator	Residue	N	Outside		N	NA		0%	5.05	0.003000 [d]	0.0152
VN-2	231	E-43	Vibratory Feeder	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	2.70	0.003000	0.0016
VN-2	232	E-44	Eddy Current Separator drop to stockpile	Zorba	1.5	Inside		N	NA		0%	0.50	0.007600	0.0038
VN-2	240	E-49	Transfer Conveyor	Residue onto ECS	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.15	0.003000	0.0049
VN-2	242	ECS	Eddy Current Separator drop to container	Zorba	1.5	Inside		N	NA		0%	0.04	0.007600	0.0003
VN-2	243	ECS	Eddy Current Separator drop to container	Zorba	1.5	Inside		N	NA		0%	0.18	0.007600	0.0014
VN-2	248	SC-003	Supplemental Conveyor	Residue	0	0		0	0		0%	7.34	0.003000	0.0220
VN-2	249	SC-004	Supplemental Conveyor	Residue	0	0		0	0		0%	7.34	0.003000	0.0220
												Total Filterable PM Emissions	0.5395

R 001821

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

	A	B	C	F	G	H	I	J	K	L	M	O	Q	R
Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-3	138	C-034	Conveyor	Material Separator	N [b]	Outside	Y	N	NA		0%	0.55	0.003000 [b]	0.0017
VN-3	140	C-039	Conveyor	Mixed Non-Ferrous	N [b]	Outside		N	NA		0%	0.80	0.003000 [b]	0.0024
VN-3	141	C-040	Conveyor	Residue	N [b]	Outside		N	NA		0%	2.80	0.003000 [b]	0.0084
VN-3	142	C-040	Conveyor	Mids	N [b]	Outside		N	NA		0%	7	0.003000 [b]	0.0210
VN-3	143	C-040	Conveyor	Residue	N [b]	Outside		N	NA		0%	4.20	0.003000 [b]	0.0126
VN-3	144	C-041	Conveyor	Zorba	N [b]	Outside		N	NA		0%	0.50	0.003000 [b]	0.0015
VN-3	145	C-042	Conveyor	Zorba	N [b]	Outside		N	NA		0%	1.50	0.003000 [b]	0.0045
VN-3	146	C-043	Conveyor	Zorba	N [b]	Outside		N	NA		0%	3	0.003000 [b]	0.0090
VN-3	148	C-044	Conveyor	Lights Zuric	N [b]	Outside	Y	N	NA		0%	0.30	0.003000 [b]	0.0009
VN-3	149	C-045	Conveyor	Residue	N [b]	Outside	Y	N	NA		0%	24.87	0.003000 [b]	0.0746
VN-3	150	C-047	Conveyor	To SSI	N [b]	Outside		N	NA		0%	0.55	0.003000 [b]	0.0017
VN-3	151	C-048	Conveyor	Out of SSI	N [b]	Outside		N	NA		0%	0.55	0.003000 [b]	0.0017
VN-3	152	C-050	Conveyor	Residue	N [b]	Outside	Y	N	NA		0%	25.07	0.003000 [b]	0.0752
VN-3	153	C-052	Conveyor	Residue	N [b]	Outside		N	NA		0%	2	0.003000 [b]	0.0068
VN-3	154	C-055	Conveyor	Wire	N [b]	Outside	Y	N	NA		0%	1.00	0.003000 [b]	0.0030
VN-3	155	C-058	Conveyor	Zuric drops	N [b]	Outside	Y	N	NA		0%	0.30	0.003000 [b]	0.0009
VN-3	156	C-060	Conveyor	Zone	N [b]	Outside	Y	N	NA		0%	1.20	0.003000 [b]	0.0036
VN-3	162	C-064	Conveyor drop to container	Zorba	1.5 [a]	Outside		N	NA		0%	0.70	0.007606 [c]	0.0053
VN-3	163	C-065	Conveyor	Residue	N [b]	Outside	Y	N	NA		0%	2.2	0.003000 [d]	0.0066
VN-3	164	C-066	Conveyor	Residue	N [b]	Outside	Y	N	NA		0%	54.39	0.003000 [d]	0.1632
VN-3	165	C-067	Conveyor	Residue	N [b]	Outside	Y	N	NA		0%	54.39	0.003000 [d]	0.1632
VN-3	168	C-071	Conveyor	Lights	N [b]	Outside	Y	Y	Cover		0%	0.03	0.000140 [d]	0.0000
VN-3	169	C-072	Conveyor	Lights	N [b]	Outside	Y	Y	Cover		0%	0	0.000140 [d]	0.0000
VN-3	170	DC-01 Cyc	DC-01 fines discharge to covered coneyor	Lights	N [b]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000
VN-3	171	DC-02 Cyc	DC-02 fines discharge to covered coneyor	Lights	N [b]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000

R 001822

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

	A	B	C	F	G	H	I	J	K	L	M	O	Q	R
Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-3	172	DC-03 Cyc	DC-03 fines discharge to covered conevor	Lights	N [0]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000
VN-3	173	DC-04 Cyc	DC-04 fines discharge to covered conevor	Lights	N [0]	Outside		Y	Cover		0%	0.01	0.000140 [d]	0.0000
VN-3	218	E-27	Magnetic Separation	Ferrous	N [0]	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-3	220	E-28	Eddy Current Separator	Zorba	N [0]	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-3	223	E-35	Eddy Current Separator	Zorba	N [0]	Outside		N	NA		0%	1.50	0.003000 [d]	0.0045
VN-3	225	E-40	Separator	Lights Zuric	N [0]	Outside		N	NA		0%	0.24	0.025000 [d]	0.0060
VN-3	226	E-40	Separator	Heavies Zuric	N [0]	Outside		N	NA		0%	0.96	0.025000 [d]	0.0240
VN-3	227	E-40	Separator	Lights Zuric	N [0]	Outside		N	NA		0%	0.35	0.025000 [d]	0.0088
VN-3	228	E-41	Separator	Lights	N [0]	Outside		N	NA		0%	0.95	0.025000 [d]	0.0238
VN-3	229	E-41	Separator drop to container	Heavies	1.5 [a]	Outside		N	NA		0%	0.05	0.007606 [c]	0.0004
VN-3	230	E-42	Low speed shredder for size reduction	Out of SSI	N [0]	Outside		N	NA		0%	0.55	0.003000 [d]	0.0017
VN-3	234	E-46	Separator	Heavier Zorba	N [0]	Outside		N	NA		0%	1.25	0.02500 [d]	0.0313
VN-3	235	E-46	Separator	Lights Zorba	N [0]	Outside		N	NA		0%	0.25	0.02500 [d]	0.0063
VN-3	236	E-47	Separator	Zorba	N [0]	Outside		N	NA		0%	2.70	0.02500 [d]	0.0675
VN-3	237	E-47	Separator	Heavies Zorba	N [0]	Outside		N	NA		0%	0.85	0.02500 [d]	0.0213
VN-3	238	E-47	Separator	Lights Zorba	N [0]	Outside		N	NA		0%	0.15	0.02500 [d]	0.0038
VN-3	239	E-47	Separator	Light Zorba	N [0]	Outside		N	NA		0%	0.30	0.02500 [d]	0.0075
VN-3	241	E-50	Air Vibe	To Infeed SSI	N [0]	Outside		Y	Cover		0%	0.55	0.00014 [d]	0.0001
VN-3	250	SC-005	Supplemental Conveyor	Residue	0.0% [0]	0		0	0		0%	54.39	0.00300	0.1632
VN-3	251	SC-006	Supplemental Conveyor	Residue	0.0% [0]	0		0	0		0%	54.39	0.00300	0.1632
												Total Filterable PM Emissions		1.1050

R 001823

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

	A	B	C	F	G	H	I	J	K	L	M	O	Q	R
Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-4	159	C-062	Conveyor	Heavier Zorba	N [0]	Outside		N	NA		0%	1.25	0.003000 [d]	0.0038
VN-4	160	C-063	Conveyor drop to stockpile	Zorba	1.5 [a]	Outside		N	NA		0%	2.70	0.007606 [c]	0.0205
VN-4	161	C-063	Conveyor drop to stockpile	Heavies Zorba	1.5% [a]	Outside		N	NA		0%	0.85	0.00761 [c]	0.0065
VN-4	233	E-44	Eddy Current Separator	Residue	N [0]	Outside		N	NA		0%	2.2	0.00300 [d]	0.0066
												Total Filterable PM Emissions		0.0374
VN-5	157	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA		0%	0.96	0.00761 [c]	0.0073
VN-5	158	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA		0%	0.30	0.00761 [c]	0.0023
VN-5	167	C-070	Conveyor drop to stockpile	Waste to Stockpile	1.5% [a]	Outside		N	NA		0%	0.55	0.00761 [c]	0.0042
												Total		0.0138
VN-6	166	C-068	Conveyor drop to stockpile	Residue	1.5 [a]	Outside	Y	N	NA		0%	54.39	0.007606 [c]	0.4137
VN-6	245	End Loader	load waste to truck	Waste	N [0]	Outside		N	NA		0%	54.39	0.00020 [0]	0.0111
												Total		0.4248

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

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 the atmosphere through Dust Collection DC-01. Emissions are estimated by 12,000

g Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

R 001824

Table B-2 - Non-Ferrous Plant Stockpile - Particulate Emissions
General III, LLC - Chicago, Illinois

Volume Source Grouping	Stock Pile	Stock Pile Area Acres	Control Factor[b]	Inactive Emissions[a,d] PM lb/hr	Active Emissions[a,d] PM lb/hr
VN-1	FE from E-02	0.0047	0.33	0.0002	0.0009
VN-4	5" + Zorba	0.0189	0.33	0.0009	0.0034
VN-4	2-1/2" - 5" Zorba	0.0189	0.33	0.0009	0.0034
VN-4	5/8" - 2-1/2" Zorba	0.0189	0.33	0.0009	0.0034
			Total	0.0027	0.0102
VN-5	Tailings	0.0195	0.33	0.0009	0.0035
VN-5	Open	0.0195	0.33	0.0009	0.0035
VN-5	Wire	0.0195	0.33	0.0009	0.0035
VN-5	Wire Rich Solids	0.0195	0.33	0.0009	0.0035
VN-5	Zurick	0.0195	0.33	0.0009	0.0035
			Total	0.0045	0.0175
VN-6	Waste	0.0868	0.33	0.0042	0.0158

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

b. Control Factor of 0.1 (90% control) for partial enclosure consisting of walls on three sides of bin. Control Factor of 1.0 for no control.

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.

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

Active Day PM Emission Factor = 13.20 lb-PM/acre-day

R 001825

Table B-3 - Non-Ferrous Material Processing - PM Emission Summary
General III, LLC - Chicago, Illinois

Srouces	PM Emission					
	Matl Handling		Stockpile		Tot	
	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr	Active lb/hr	Inactive lb/hr
VN-1	1.9420	1.9420	0.0009	0.0002	1.9429	1.9422
VN-2	0.5395	0.5395			0.5395	0.5395
VN-3	1.1050	1.1050			1.1050	1.1050
VN-4	0.0374	0.0374	0.0102	0.0027	0.0476	0.0401
VN-5	0.0138	0.0138	0.0175	0.0045	0.0313	0.0183
VN-6	0.4248	0.4248	0.0158	0.0042	0.4406	0.4290

Table B-4a - Non-Ferrous Material Processing - Metal Emissions in Active Hours
(7 AM - 7 PM, Mon-Sat)
General III, LLC - Chicago, Illinois

Volume Source	Units	VN-1	VN-2	VN-3	VN-4	VN-5	VN-6	DC-1
PM (Active)	lb/hr	1.942900	0.539528	1.105000	0.047600	0.031300	0.440600	0.514300
Source of Metals Conc. Data	Sample No.	5	5	5	5	5	5	5
	Sample Name	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	lb/hr	0.009170	0.002547	0.005216	0.000225	0.000148	0.002080	0.002427
Manganese	lb/hr	0.003420	0.000950	0.001945	0.000084	0.000055	0.000775	0.000905
Mercury	lb/hr	0.000018	0.000005	0.000010	0.000000	0.000000	0.000004	0.000005
Nickel	lb/hr	0.000604	0.000168	0.000344	0.000015	0.000010	0.000137	0.000160
Antimony	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001
Arsenic	lb/hr	0.000009	0.000002	0.000005	0.000000	0.000000	0.000002	0.000002
Beryllium	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001
Cadmium	lb/hr	0.000067	0.000019	0.000038	0.000002	0.000001	0.000015	0.000018
Chromium[c]	lb/hr	0.000826	0.000229	0.000470	0.000020	0.000013	0.000187	0.000219
Cobalt	lb/hr	0.000108	0.000030	0.000062	0.000003	0.000002	0.000025	0.000029
Phosphorus	lb/hr	0.001815	0.000504	0.001032	0.000044	0.000029	0.000412	0.000480
Selenium	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001
Zinc	lb/hr	0.066059	0.018344	0.037570	0.001618	0.001064	0.014980	0.017486
Barium	lb/hr	0.001329	0.000369	0.000756	0.000033	0.000021	0.000301	0.000352
Copper	lb/hr	0.003206	0.000890	0.001823	0.000079	0.000052	0.000727	0.000849
Silver	lb/hr	0.000024	0.000007	0.000013	0.000001	0.000000	0.000005	0.000006
Thallium	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

R 001827

Table B-4b - Non-Ferrous Material Processing - Metal Emissions in Inactive Hours (7 PM - 7 AM, Mon-Sat, All Day, Sun)

General III, LLC - Chicago, Illinois

Volume Source	Units	VN-1	VN-2	VN-3	VN-4	VN-5	VN-6	OC-1
PM (Inactive)	lb/hr	1.942200	0.539528	1.105000	0.040100	0.018300	0.429000	0.514300
Source of Metals Conc. Data	Sample No.	5	5	5	5	5	5	5
	Sample Name	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	lb/hr	0.009167	0.002547	0.005216	0.000189	0.000086	0.002025	0.002427
Manganese	lb/hr	0.003418	0.000950	0.001945	0.000071	0.000032	0.000755	0.000905
Mercury	lb/hr	0.000018	0.000005	0.000010	-	-	0.000004	0.000005
Nickel	lb/hr	0.000604	0.000168	0.000344	0.000012	0.000006	0.000133	0.000160
Antimony	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001
Arsenic	lb/hr	0.000009	0.000002	0.000005	-	-	0.000002	0.000002
Beryllium	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001
Cadmium	lb/hr	0.000067	0.000019	0.000038	0.000001	0.000001	0.000015	0.000018
Chromium[c]	lb/hr	0.000825	0.000229	0.000470	0.000017	0.000008	0.000182	0.000219
Cobalt	lb/hr	0.000108	0.000030	0.000062	0.000002	0.000001	0.000024	0.000029
Phosphorus	lb/hr	0.001814	0.000504	0.001032	0.000037	0.000017	0.000401	0.000480
Selenium	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001
Zinc	lb/hr	0.066035	0.018344	0.037570	0.001363	0.000622	0.014586	0.017486
Barium	lb/hr	0.001328	0.000369	0.000756	0.000027	0.000013	0.000293	0.000352
Copper	lb/hr	0.003205	0.000890	0.001823	0.000066	0.000030	0.000708	0.000849
Silver	lb/hr	0.000024	0.000007	0.000013	-	-	0.000005	0.000006
Thallium	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001

a. Percentage of metal as % of total PM caculated based on measured metal emission rates from hammermill shredder controlled by cyclone and a roll media filter from June 2018.

b. Uncontrolled organic compound emission rates, as presented in ISRI Title V Applicability Workbook, Table D-11F, adjusted for RTO with 98% destruction efficiency.

c. Chromium (metal) and compounds other than Chromium VI

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Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – Chicago, Illinois

January 24, 2020

Appendix C

Vehicle Traffic Routes

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R 001832

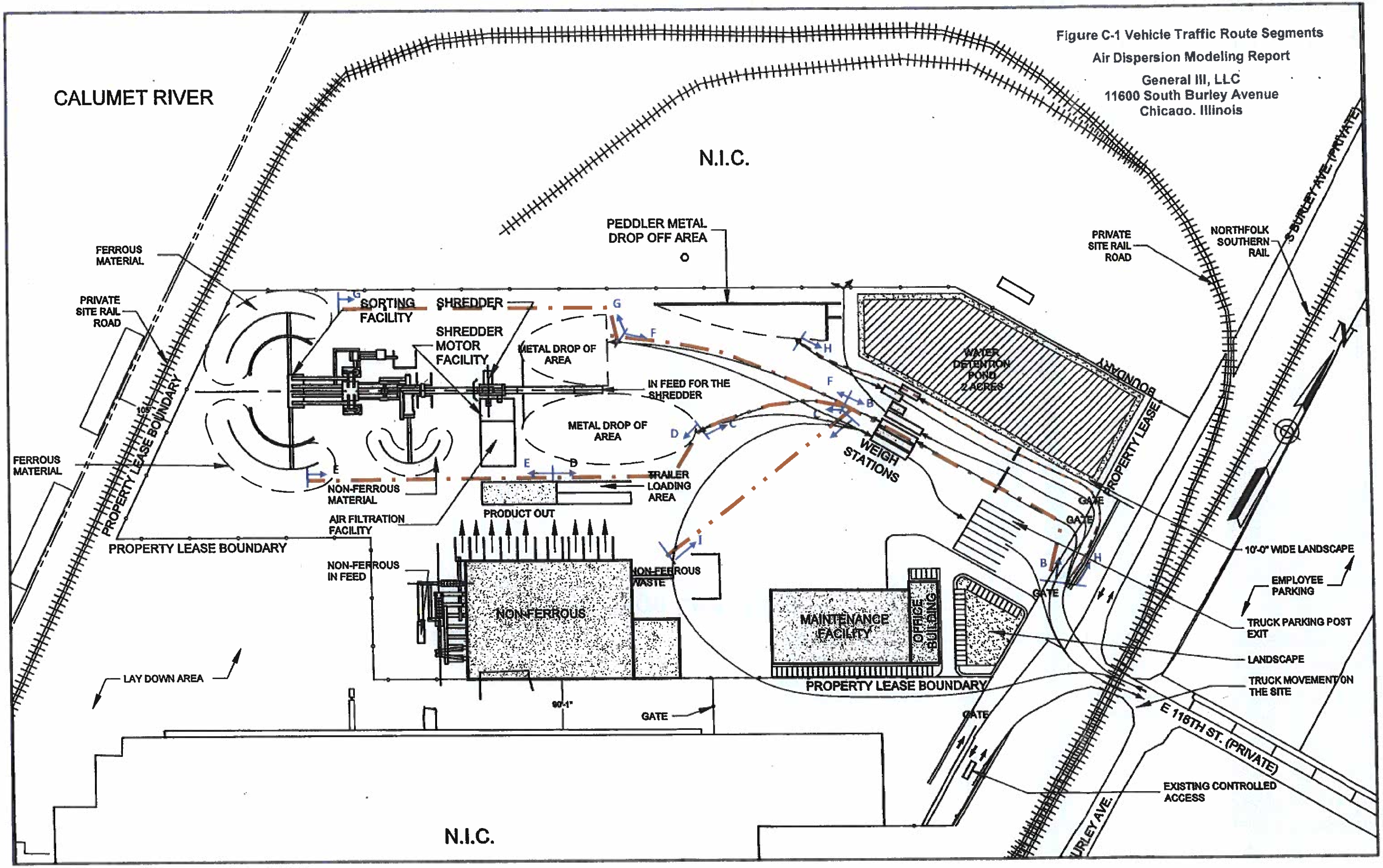
Figure C-1 Vehicle Traffic Route Segments
Air Dispersion Modeling Report
General III, LLC
11600 South Burley Avenue
Chicago, Illinois
CALUMET RIVER
N.I.C.
PEDDLER METAL DROP OFF AREA
PRIVATE SITE RAIL ROAD
NORTHFOLK SOUTHERN RAIL
S BURLEY AVE. (PRIVATE)
FERROUS MATERIAL
PRIVATE SITE RAIL ROAD
SORTING FACILITY
SHREDDER
SHREDDER MOTOR FACILITY
METAL DROP OF AREA
IN FEED FOR THE SHREDDER
WATER DETENTION POND 2 ACRES
PROPERTY LEASE BOUNDARY
METAL DROP OF AREA
WEIGH STATIONS
FERROUS MATERIAL
NON-FERROUS MATERIAL
TRAILER LOADING AREA
AIR FILTRATION FACILITY
PRODUCT OUT
PROPERTY LEASE BOUNDARY
GATE
10'-0" WIDE LANDSCAPE
NON-FERROUS IN FEED
NON-FERROUS WASTE
EMPLOYEE PARKING
NON-FERROUS
MAINTENANCE FACILITY
OFFICE BUILDING
TRUCK PARKING POST EXIT
LANDSCAPE
LAY DOWN AREA
PROPERTY LEASE BOUNDARY
TRUCK MOVEMENT ON THE SITE
GATE
E 118TH ST. (PRIVATE)
EXISTING CONTROLLED ACCESS
N.I.C.
BURLEY AVE.

RK
& Associates, Inc.

Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – Chicago, Illinois

January 24, 2020

Appendix D

Laboratory Report for Metals Analyses of GII Material Deposition Samples

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Environmental Monitoring and Technologies, Inc.

509 N. 3rd Avenue Des Plaines, Illinois 60016 P 847.967.6666 800.246.0663 F 847.967.6735 www.emt.com

Analytical Report

Mark Weintraub
Reserve Management Group
4550 Darrow Road
Stow, OH 44224

December 13, 2019

Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

RE: Residential Soil Analysis

Dear Mark Weintraub:

Enclosed are the analytical reports for the EMT Work Order listed. Also included with this analytical report is a copy of the chain of custody associated with these samples. If you have any questions, please contact me.

Sincerely,

Mark Steuer
Project Manager
847.967.6666
MSteuer@emt.com
Approved for release: 12/13/2019 4:08:41PM

Approved by,

Nathan Fey
Laboratory Operations Manager

Table of Contents

Cover Letter	*1*
Sample Summary	*3*
Case Narrative	*4*
Client Sample Results	*6*
Dates Report	*11*
Quality Control	*14*
Certified Analyses	*19*
List of Certifications	*19*
Qualifiers and Definitions	*20*
Chain of Custody	*21*

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Sample Summary

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
FERDWY	19L0295-01	Soil	12/05/19 00:00	12/05/19 15:20
ASRRDWY	19L0296-01	Soil	12/05/19 00:00	12/05/19 15:20
FETP	19L0297-01	Soil	12/05/19 00:00	12/05/19 15:20
RDWY	19L0298-01	Soil	12/05/19 00:00	12/05/19 15:20
NFETP	19L0299-01	Soil	12/05/19 00:00	12/05/19 15:20

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Case Narrative

Client: Reserve Management Group **Date:** 12/13/2019
Project: Residential Soil Analysis

Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

Sample results only relate to the sample(s) received at the laboratory and analytes of interest tested.

Work Order: 19L0295
The samples were received on 12/05/19 15:20. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	20.0

COC missing sample time.

R1) This is a revised report to include 6010_Tl

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

Work Order: 19L0296
The samples were received on 12/05/19 15:20. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	20.0

COC missing sample time.

R1) This is a revised report to include 6010_Tl

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

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Monitoring and
Technologies, Inc.

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Work Order: 19L0297
The samples were received on 12/05/19 15:20. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	20.0

COC missing sample time.

R1) This is a revised report to include 6010_Tl

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

Work Order: 19L0298
The samples were received on 12/05/19 15:20. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	20.0

COC missing sample time.

R1) This is a revised report to include 6010_Tl

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

Work Order: 19L0299
The samples were received on 12/05/19 15:20. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	20.0

COC missing sample time.

R1) This is a revised report to include 6010_Tl

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

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Client Sample Results

Client:	Reserve Management Group	**Client Sample ID:**	FERDWY
Project:	Residential Soil Analysis	**Report Date:**	12/13/2019
		Collection Date:	12/05/2019 00:00
Work Order:	19L0295, 19L0296, 19L0297, 19L0298, 19L0299	**Matrix:**	Soil
		Lab ID:	19L0295-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.23	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Arsenic	**2.28**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Barium	**388**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Beryllium	< 5.90	5.90		mg/Kg	12/12/19 13:13	B9L0408	KJ1
Cadmium	**9.63**	0.123		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Chromium	**220**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Cobalt	**15.7**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Copper	**1110**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Lead	**763**	12.3	Q, S3	mg/Kg	12/12/19 13:13	B9L0408	KJ1
Manganese	**960**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Nickel	**125**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Phosphorus	**598**	6.16	Q, S3	mg/Kg	12/12/19 14:03	B9L0408	KJ1
Selenium	< 1.23	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Silver	< 12.3	12.3		mg/Kg	12/12/19 13:13	B9L0408	KJ1
Thallium	< 1.23	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Titanium	**137**	1.23		mg/Kg	12/12/19 14:03	B9L0408	KJ1
Zinc	**5470**	12.3		mg/Kg	12/12/19 13:13	B9L0408	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	**1.77**	0.098		mg/Kg	12/11/19 13:53	B9L0421	GSB

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Client Sample Results
(Continued)

Client: Reserve Management Group
Project: Residential Soil Analysis
Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

Client Sample ID: ASRRDWY
Report Date: 12/13/2019
Collection Date: 12/05/2019 00:00
Matrix: Soil
Lab ID: 19L0296-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.22	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Arsenic	**1.76**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Barium	**673**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Beryllium	< 1.30	1.30		mg/Kg	12/12/19 13:17	B9L0408	KJ1
Cadmium	**18.4**	0.122		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Chromium	**991**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Cobalt	**38.5**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Copper	**1080**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Lead	**1610**	12.2	Q, S3	mg/Kg	12/12/19 13:17	B9L0408	KJ1
Manganese	**1030**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Nickel	**463**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Phosphorus	**561**	6.12	Q, S3	mg/Kg	12/12/19 14:08	B9L0408	KJ1
Selenium	< 1.22	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Silver	< 12.2	12.2		mg/Kg	12/12/19 13:17	B9L0408	KJ1
Thallium	< 1.22	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Titanium	**162**	1.22		mg/Kg	12/12/19 14:08	B9L0408	KJ1
Zinc	**13300**	122		mg/Kg	12/12/19 12:53	B9L0408	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	**6.95**	0.972		mg/Kg	12/11/19 14:24	B9L0421	GSB

Environmental Monitoring and Technologies, Inc.

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Client Sample Results
(Continued)

Client:	Reserve Management Group	**Client Sample ID:**	FETP
Project:	Residential Soil Analysis	**Report Date:**	12/13/2019
		Collection Date:	12/05/2019 00:00
Work Order:	19L0295, 19L0296, 19L0297, 19L0298, 19L0299	**Matrix:**	Soil
		Lab ID:	19L0297-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.17	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Arsenic	**2.75**	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Barium	**984**	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Beryllium	< 1.17	1.17		mg/Kg	12/12/19 13:21	B9L0408	KJ1
Cadmium	**47.6**	0.117		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Chromium	**402**	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Cobalt	**52.0**	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Copper	**2100**	11.7		mg/Kg	12/12/19 13:21	B9L0408	KJ1
Lead	**4230**	117	Q, S3	mg/Kg	12/12/19 12:57	B9L0408	KJ1
Manganese	**2210**	11.7		mg/Kg	12/12/19 13:21	B9L0408	KJ1
Nickel	**304**	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Phosphorus	**833**	5.87	Q, S3	mg/Kg	12/12/19 14:13	B9L0408	KJ1
Selenium	< 1.17	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Silver	< 11.7	11.7		mg/Kg	12/12/19 13:21	B9L0408	KJ1
Thallium	< 1.17	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Titanium	**199**	1.17		mg/Kg	12/12/19 14:13	B9L0408	KJ1
Zinc	**37300**	117		mg/Kg	12/12/19 12:57	B9L0408	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	**18.8**	9.89		mg/Kg	12/11/19 14:18	B9L0421	GSB

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Client Sample Results
(Continued)

Client:	Reserve Management Group	**Client Sample ID:**	RDWY
Project:	Residential Soil Analysis	**Report Date:**	12/13/2019
		Collection Date:	12/05/2019 00:00
Work Order:	19L0295, 19L0296, 19L0297, 19L0298, 19L0299	**Matrix:**	Soil
		Lab ID:	19L0298-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.16	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Arsenic	2.70	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Barium	232	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Beryllium	< 5.50	5.50		mg/Kg	12/12/19 13:26	B9L0408	KJ1
Cadmium	5.42	0.116		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Chromium	173	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Cobalt	10.7	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Copper	841	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Lead	526	11.6	Q, S3	mg/Kg	12/12/19 13:26	B9L0408	KJ1
Manganese	729	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Nickel	106	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Phosphorus	270	5.78	Q, S3	mg/Kg	12/12/19 14:18	B9L0408	KJ1
Selenium	< 1.16	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Silver	< 11.6	11.6		mg/Kg	12/12/19 13:26	B9L0408	KJ1
Thallium	< 1.16	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Titanium	112	1.16		mg/Kg	12/12/19 14:18	B9L0408	KJ1
Zinc	3080	11.6		mg/Kg	12/12/19 13:26	B9L0408	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	2.22	0.965		mg/Kg	12/11/19 14:20	B9L0421	GSB

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Client Sample Results
(Continued)

Client:	Reserve Management Group	**Client Sample ID:**	NFETP
Project:	Residential Soil Analysis	**Report Date:**	12/13/2019
		Collection Date:	12/05/2019 00:00
Work Order:	19L0295, 19L0296, 19L0297, 19L0298, 19L0299	**Matrix:**	Soil
		Lab ID:	19L0299-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.21	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Arsenic	**4.51**	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Barium	**684**	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Beryllium	< 1.21	1.21		mg/Kg	12/12/19 13:39	B9L0408	KJ1
Cadmium	**34.6**	0.121		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Chromium	**425**	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Cobalt	**55.8**	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Copper	**1660**	12.1		mg/Kg	12/12/19 13:39	B9L0408	KJ1
Lead	**4720**	121	Q, S3	mg/Kg	12/12/19 13:05	B9L0408	KJ1
Manganese	**1760**	12.1		mg/Kg	12/12/19 13:39	B9L0408	KJ1
Nickel	**311**	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Phosphorus	**934**	6.03	Q, S3	mg/Kg	12/12/19 14:31	B9L0408	KJ1
Selenium	< 1.21	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Silver	< 12.1	12.1		mg/Kg	12/12/19 13:39	B9L0408	KJ1
Thallium	< 1.21	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Titanium	**221**	1.21		mg/Kg	12/12/19 14:31	B9L0408	KJ1
Zinc	**34000**	121		mg/Kg	12/12/19 13:05	B9L0408	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	**9.34**	9.00		mg/Kg	12/11/19 14:22	B9L0421	GSB

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Dates Report

Client: Reserve Management Group
Project: Residential Soil Analysis
Report Date: 12/13/2019

Work Order: 19L0295,19L0296,19L0297,19L0298,19L0299

Sample ID	Client Sample ID	Collection	Matrix	Test Name	Leached Prep Date	Prep Date	Analysis Date	Batch ID	Sequence
19L0295-01	FERDWY	12/05/19	Soil	Antimony, Total ICP-AES		12/11/19 09:53	12/12/19 14:03	B9L0408	S9L0269
				Silver, Total ICP-AES		12/11/19 09:53	12/12/19 13:13		
				Zinc, Total ICP-AES		12/11/19 09:53	12/12/19 13:13		
				Thallium, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Selenium, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Lead, Total ICP-AES		12/11/19 09:53	12/12/19 13:13		
				Phosphorus, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Nickel, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Barium, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Titanium, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Arsenic, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Manganese, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Beryllium, Total ICP-AES		12/11/19 09:53	12/12/19 13:13		
				Cadmium, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Cobalt, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Chromium, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Copper, Total ICP-AES		12/11/19 09:53	12/12/19 14:03		
				Mercury, Total CVAA		12/11/19 10:35	12/11/19 13:53	B9L0421	S9L0229
19L0296-01	ASRRDWY			Nickel, Total ICP-AES		12/11/19 09:53	12/12/19 14:08	B9L0408	S9L0269
				Beryllium, Total ICP-AES		12/11/19 09:53	12/12/19 13:17		
				Zinc, Total ICP-AES		12/11/19 09:53	12/12/19 12:53		
				Thallium, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Titanium, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Selenium, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Antimony, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Lead, Total ICP-AES		12/11/19 09:53	12/12/19 13:17		
				Phosphorus, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Copper, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Chromium, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Silver, Total ICP-AES		12/11/19 09:53	12/12/19 13:17		
				Cadmium, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Barium, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Arsenic, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Manganese, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Cobalt, Total ICP-AES		12/11/19 09:53	12/12/19 14:08		
				Mercury, Total CVAA		12/11/19 10:35	12/11/19 14:24	B9L0421	S9L0229
19L0297-01	FETP			Chromium, Total ICP-AES		12/11/19 09:53	12/12/19 14:13	B9L0408	S9L0269
				Cobalt, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Cadmium, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Beryllium, Total ICP-AES		12/11/19 09:53	12/12/19 13:21		
				Barium, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Silver, Total ICP-AES		12/11/19 09:53	12/12/19 13:21		

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Dates Report
(Continued)

Client: Reserve Management Group
Project: Residential Soil Analysis
Report Date: 12/13/2019

Work Order: 19L0295,19L0296,19L0297,19L0298,19L0299

Sample ID	Client Sample ID	Collection	Matrix	Test Name	Leached Prep Date	Prep Date	Analysis Date	Batch ID	Sequence
19L0297-01	FETP	12/05/19	Soil	Nickel, Total ICP-AES		12/11/19 09:53	12/12/19 14:13	B9L0408	S9L0269
				Manganese, Total ICP-AES		12/11/19 09:53	12/12/19 13:21		
				Arsenic, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Zinc, Total ICP-AES		12/11/19 09:53	12/12/19 12:57		
				Phosphorus, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Lead, Total ICP-AES		12/11/19 09:53	12/12/19 12:57		
				Antimony, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Selenium, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Titanium, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Thallium, Total ICP-AES		12/11/19 09:53	12/12/19 14:13		
				Copper, Total ICP-AES		12/11/19 09:53	12/12/19 13:21		
				Mercury, Total CVAA		12/11/19 10:35	12/11/19 14:18	B9L0421	S9L0229
19L0298-01	RDWY			Manganese, Total ICP-AES		12/11/19 09:53	12/12/19 14:18	B9L0408	S9L0269
				Thallium, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Antimony, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Selenium, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Lead, Total ICP-AES		12/11/19 09:53	12/12/19 13:26		
				Phosphorus, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Nickel, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Zinc, Total ICP-AES		12/11/19 09:53	12/12/19 13:26		
				Silver, Total ICP-AES		12/11/19 09:53	12/12/19 13:26		
				Chromium, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Cobalt, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Cadmium, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Titanium, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Beryllium, Total ICP-AES		12/11/19 09:53	12/12/19 13:26		
				Barium, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Arsenic, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Copper, Total ICP-AES		12/11/19 09:53	12/12/19 14:18		
				Mercury, Total CVAA		12/11/19 10:35	12/11/19 14:20	B9L0421	S9L0229
19L0299-01	NFETP			Nickel, Total ICP-AES		12/11/19 09:53	12/12/19 14:31	B9L0408	S9L0269
				Titanium, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Selenium, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Beryllium, Total ICP-AES		12/11/19 09:53	12/12/19 13:39		
				Antimony, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Zinc, Total ICP-AES		12/11/19 09:53	12/12/19 13:05		
				Lead, Total ICP-AES		12/11/19 09:53	12/12/19 13:05		
				Phosphorus, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Thallium, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Manganese, Total ICP-AES		12/11/19 09:53	12/12/19 13:39		
				Copper, Total ICP-AES		12/11/19 09:53	12/12/19 13:39		
				Chromium, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		

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Dates Report
(Continued)

Client: Reserve Management Group
Project: Residential Soil Analysis
Report Date: 12/13/2019

Work Order: 19L0295,19L0296,19L0297,19L0298,19L0299

Sample ID	Client Sample ID	Collection	Matrix	Test Name	Leached Prep Date	Prep Date	Analysis Date	Batch ID	Sequence
19L0299-01	NFETP	12/05/19	Soil	Cadmium, Total ICP-AES		12/11/19 09:53	12/12/19 14:31	B9L0408	S9L0269
				Barium, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Arsenic, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Silver, Total ICP-AES		12/11/19 09:53	12/12/19 13:39		
				Cobalt, Total ICP-AES		12/11/19 09:53	12/12/19 14:31		
				Mercury, Total CVAA		12/11/19 10:35	12/11/19 14:22	B9L0421	S9L0229

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Quality Control

Client: Reserve Management Group
Project: Residential Soil Analysis
Report Date: 12/13/2019
Matrix: Solid

Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

Metals by ICP-AES

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch: B9L0408 - SW3050										
Blank (B9L0408-BLK1)				*Prepared: 12/11/2019 09:53 Analyzed: 12/12/2019 12:25*						
Antimony	< 2.50	2.50	mg/Kg							
Arsenic	< 2.50	2.50	mg/Kg							
Barium	< 2.50	2.50	mg/Kg							
Beryllium	< 0.250	0.250	mg/Kg							
Cadmium	< 0.250	0.250	mg/Kg							
Chromium	< 2.50	2.50	mg/Kg							
Cobalt	< 2.50	2.50	mg/Kg							
Copper	< 2.50	2.50	mg/Kg							
Lead	< 2.50	2.50	mg/Kg							
Manganese	< 2.50	2.50	mg/Kg							
Nickel	< 2.50	2.50	mg/Kg							
Phosphorus	< 12.5	12.5	mg/Kg							
Selenium	< 2.50	2.50	mg/Kg							
Silver	< 2.50	2.50	mg/Kg							
Thallium	< 2.50	2.50	mg/Kg							
Titanium	< 2.50	2.50	mg/Kg							
Zinc	< 2.50	2.50	mg/Kg							
LCS (B9L0408-BS1)				*Prepared: 12/11/2019 09:53 Analyzed: 12/12/2019 12:29*						
Antimony	51.5	2.50	mg/Kg	50.00		103	80-105			
Arsenic	47.6	2.50	mg/Kg	50.00		95.1	80-107			
Barium	50.4	2.50	mg/Kg	50.00		101	80-109			
Beryllium	4.90	0.250	mg/Kg	5.000		98.1	81.9-112			
Cadmium	5.10	0.250	mg/Kg	5.000		102	80-110			
Chromium	49.8	2.50	mg/Kg	50.00		99.5	80-111			
Cobalt	51.2	2.50	mg/Kg	50.00		102	85-110			
Copper	52.0	2.50	mg/Kg	50.00		104	84.8-108			
Lead	47.3	2.50	mg/Kg	50.00		94.6	80-111			
Manganese	50.0	2.50	mg/Kg	50.00		100	82.3-108			
Nickel	48.3	2.50	mg/Kg	50.00		96.6	83.5-107			
Phosphorus	249	12.5	mg/Kg	250.0		99.6	80-120			
Selenium	47.6	2.50	mg/Kg	50.00		95.2	80-106			
Silver	4.90	2.50	mg/Kg	5.000		98.0	80-116			
Thallium	49.9	2.50	mg/Kg	50.00		99.8	80-112			
Titanium	48.1	2.50	mg/Kg	50.00		96.2	80-120			
Zinc	49.5	2.50	mg/Kg	50.00		98.9	80-110			
Serial Dilution (B9L0408-DUP1)		**Source: 19L0334-04RE1**		*Prepared: 12/11/2019 09:53 Analyzed: 12/12/2019 13:59*						
Beryllium	3.23	5.76	mg/Kg		3.53			8.87	10	
Copper	19.8	57.6	mg/Kg		18.4			7.48	10	
Manganese	428	57.6	mg/Kg		423			1.25	10	
Silver	< 6.91	57.6	mg/Kg		ND				10	

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Quality Control

(Continued)

Client: Reserve Management Group
Project: Residential Soil Analysis

Report Date: 12/13/2019
Matrix: Solid

Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

Metals by ICP-AES

(Continued)

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch: B9L0408 - SW3050 *(Continued)*										
Serial Dilution (B9L0408-DUP1) (Continued)	**Source: 19L0334-04RE1**			*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 13:59*				
Zinc	44.4	57.6	mg/Kg		44.0			0.730	10	
Serial Dilution (B9L0408-DUP2)	**Source: 19L0334-04RE2**			*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 14:54*				
Antimony	< 2.30	5.76	mg/Kg		ND				10	
Arsenic	3.50	5.76	mg/Kg		3.19			9.22	10	
Barium	48.1	5.76	mg/Kg		45.1			6.44	10	
Cadmium	< 0.161	0.576	mg/Kg		ND				10	
Chromium	31.1	5.76	mg/Kg		27.2			13.3	10	P
Cobalt	10.0	5.76	mg/Kg		8.80			13.1	10	P
Lead	14.1	5.76	mg/Kg		13.4			4.96	10	
Nickel	23.7	5.76	mg/Kg		20.7			13.6	10	P
Phosphorus	231	28.8	mg/Kg		213			7.96	10	
Selenium	< 2.26	5.76	mg/Kg		ND				10	
Thallium	< 1.96	5.76	mg/Kg		ND				10	
Titanium	46.5	5.76	mg/Kg		42.2			9.79	10	
MRL Check (B9L0408-MRL1)				*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 12:33*				
Antimony	2.52	2.50	mg/Kg	2.500		101	70-130			
Arsenic	2.52	2.50	mg/Kg	2.500		101	70-130			
Barium	2.63	2.50	mg/Kg	2.500		105	70-130			
Beryllium	0.245	0.250	mg/Kg	0.2500		98.0	70-130			
Cadmium	0.260	0.250	mg/Kg	0.2500		104	70-130			
Chromium	2.66	2.50	mg/Kg	2.500		107	70-130			
Cobalt	2.10	2.50	mg/Kg	2.000		105	70-130			
Copper	2.68	2.50	mg/Kg	2.500		107	70-130			
Lead	2.46	2.50	mg/Kg	2.500		98.6	70-130			
Manganese	2.62	2.50	mg/Kg	2.500		105	70-130			
Nickel	2.44	2.50	mg/Kg	2.500		97.8	70-130			
Phosphorus	14.0	12.5	mg/Kg	12.50		112	70-130			
Selenium	2.89	2.50	mg/Kg	2.500		116	70-130			
Silver	0.270	2.50	mg/Kg	0.2500		108	70-130			
Thallium	2.60	2.50	mg/Kg	2.500		104	70-130			
Titanium	2.50	2.50	mg/Kg	2.500		100	70-130			
Zinc	3.10	2.50	mg/Kg	2.500		124	70-130			
Matrix Spike (B9L0408-MS1)	**Source: 19L0334-04RE1**			*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 13:47*				
Beryllium	5.83	1.20	mg/Kg	2.408	3.53	95.6	75-125			
Copper	41.9	12.0	mg/Kg	24.08	18.4	97.7	75-125			
Manganese	332	12.0	mg/Kg	24.08	423	NR	75-125			S
Silver	< 1.44	12.0	mg/Kg	2.408	ND		75-125			S
Zinc	63.7	12.0	mg/Kg	24.08	44.0	81.7	75-125			

Environmental Monitoring and Technologies, Inc.

509 N. 3rd Avenue Des Plaines, Illinois 60016 P 847.967.6666 800.246.0663 F 847.967.6735 www.emt.com

Quality Control
(Continued)

Client: Reserve Management Group
Project: Residential Soil Analysis
Report Date: 12/13/2019
Matrix: Solid

Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

Metals by ICP-AES
(Continued)

Batch: B9L0408 - SW3050 *(Continued)*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Matrix Spike (B9L0408-MS2)	**Source: 19L0334-04RE2**		*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 14:40*					
Antimony	0.508	1.20	mg/Kg	24.08	ND	2.11	75-125			S
Arsenic	22.0	1.20	mg/Kg	24.08	3.19	78.2	75-125			
Barium	63.5	1.20	mg/Kg	24.08	45.1	76.7	75-125			
Cadmium	1.69	0.120	mg/Kg	2.408	ND	70.3	75-125			S
Chromium	46.6	1.20	mg/Kg	24.08	27.2	80.7	75-125			
Cobalt	24.2	1.20	mg/Kg	24.08	8.80	64.1	75-125			S
Lead	28.9	1.20	mg/Kg	24.08	13.4	64.4	75-125			S
Nickel	34.2	1.20	mg/Kg	24.08	20.7	56.4	75-125			S
Phosphorus	306	6.02	mg/Kg	120.4	213	77.4	75-125			
Selenium	14.9	1.20	mg/Kg	24.08	ND	61.9	75-125			S
Thallium	15.4	1.20	mg/Kg	24.08	ND	64.1	75-125			S
Titanium	46.2	1.20	mg/Kg	24.08	42.2	16.5	75-125			S
Matrix Spike Dup (B9L0408-MSD1)	**Source: 19L0334-04RE1**		*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 13:51*					
Beryllium	5.43	1.22	mg/Kg	2.436	3.53	78.3	75-125	7.02	20	
Copper	39.2	12.2	mg/Kg	24.36	18.4	85.3	75-125	6.79	20	
Manganese	436	12.2	mg/Kg	24.36	423	55.1	75-125	27.2	20	P, S
Silver	< 1.46	12.2	mg/Kg	2.436	ND		75-125		20	S
Zinc	62.8	12.2	mg/Kg	24.36	44.0	76.9	75-125	1.48	20	
Matrix Spike Dup (B9L0408-MSD2)	**Source: 19L0334-04RE2**		*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 14:45*					
Antimony	1.12	1.22	mg/Kg	24.36	ND	4.60	75-125	75.2	20	P, S
Arsenic	21.5	1.22	mg/Kg	24.36	3.19	74.9	75-125	2.70	20	S
Barium	65.1	1.22	mg/Kg	24.36	45.1	82.3	75-125	2.44	20	
Cadmium	1.73	0.122	mg/Kg	2.436	ND	71.2	75-125	2.43	20	S
Chromium	45.2	1.22	mg/Kg	24.36	27.2	73.8	75-125	3.17	20	S
Cobalt	25.7	1.22	mg/Kg	24.36	8.80	69.5	75-125	6.01	20	S
Lead	28.2	1.22	mg/Kg	24.36	13.4	60.7	75-125	2.57	20	S
Nickel	36.4	1.22	mg/Kg	24.36	20.7	64.8	75-125	6.23	20	S
Phosphorus	295	6.09	mg/Kg	121.8	213	67.0	75-125	3.84	20	S
Selenium	15.6	1.22	mg/Kg	24.36	ND	64.2	75-125	4.80	20	S
Thallium	16.1	1.22	mg/Kg	24.36	ND	66.1	75-125	4.15	20	S
Titanium	67.9	1.22	mg/Kg	24.36	42.2	105	75-125	38.0	20	P, S
Post Spike (B9L0408-PS1)	**Source: 19L0334-04RE1**		*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 13:55*					
Beryllium	120	1.15	mg/Kg	115.2	3.53	101	80-120			
Copper	143	11.5	mg/Kg	115.2	18.4	108	80-120			
Manganese	531	11.5	mg/Kg	115.2	423	94.0	80-120			
Silver	3.73	11.5	mg/Kg	115.2	ND	3.24	80-120			S
Zinc	161	11.5	mg/Kg	115.2	44.0	101	80-120			

Environmental Monitoring and Technologies, Inc.

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Quality Control
(Continued)

Client: Reserve Management Group
Project: Residential Soil Analysis
Report Date: 12/13/2019
Matrix: Solid

Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

Metals by ICP-AES
(Continued)

Batch: B9L0408 - SW3050 *(Continued)*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Post Spike (B9L0408-PS2)		**Source: 19L0334-04RE2**		*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 14:49*				
Antimony	8.53	1.28	mg/Kg	12.80	ND	66.6	80-120			S
Arsenic	15.2	1.28	mg/Kg	12.80	3.19	94.1	80-120			
Barium	59.6	1.28	mg/Kg	12.80	45.1	114	80-120			
Cadmium	10.8	0.128	mg/Kg	12.80	ND	84.2	80-120			
Chromium	39.7	1.28	mg/Kg	12.80	27.2	97.4	80-120			
Cobalt	20.2	1.28	mg/Kg	12.80	8.80	88.7	80-120			
Lead	23.6	1.28	mg/Kg	12.80	13.4	80.0	80-120			
Nickel	31.9	1.28	mg/Kg	12.80	20.7	87.8	80-120			
Phosphorus	229	6.40	mg/Kg	12.80	213	125	80-120			S
Selenium	8.96	1.28	mg/Kg	12.80	ND	70.0	80-120			S
Thallium	9.34	1.28	mg/Kg	12.80	ND	72.9	80-120			S
Titanium	55.4	1.28	mg/Kg	12.80	42.2	103	80-120			
Reference (B9L0408-SRM1)				*Prepared: 12/11/2019 09:53*		*Analyzed: 12/12/2019 12:37*				
Antimony	16.8	25.0	mg/Kg	12.70		133	50-150			
Arsenic	92.0	25.0	mg/Kg	111.3		82.7	50-150			
Barium	357	25.0	mg/Kg	304.9		117	50-150			
Beryllium	109	2.50	mg/Kg	101.6		107	50-150			
Cadmium	78.6	2.50	mg/Kg	88.94		88.4	50-150			
Chromium	177	25.0	mg/Kg	152.5		116	50-150			
Cobalt	41.3	25.0	mg/Kg	46.70		88.4	50-150			
Copper	90.1	25.0	mg/Kg	76.23		118	50-150			
Lead	142	25.0	mg/Kg	127.0		112	50-150			
Manganese	237	25.0	mg/Kg	228.7		104	50-150			
Nickel	139	25.0	mg/Kg	161.6		86.3	50-150			
Selenium	59.2	25.0	mg/Kg	50.82		116	50-150			
Silver	22.1	25.0	mg/Kg	15.25		145	50-150			
Thallium	40.4	25.0	mg/Kg	50.11		80.7	50-150			
Titanium	215	25.0	mg/Kg	287.1		74.8	50-150			
Zinc	144	25.0	mg/Kg	158.1		91.0	50-150			

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Quality Control
(Continued)

Client: Reserve Management Group
Project: Residential Soil Analysis
Report Date: 12/13/2019
Matrix: Solid

Work Order: 19L0295, 19L0296, 19L0297, 19L0298, 19L0299

Mercury by CVAA

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch: B9L0421										
Blank (B9L0421-BLK1)				*Prepared: 12/11/2019 10:35 Analyzed: 12/11/2019 13:48*						
Mercury	< 0.100	0.100	mg/Kg							
LCS (B9L0421-BS1)				*Prepared: 12/11/2019 10:35 Analyzed: 12/11/2019 13:50*						
Mercury	0.504	0.100	mg/Kg	0.5000		101	89.7-115			
MRL Check (B9L0421-MRL1)				*Prepared: 12/11/2019 10:35 Analyzed: 12/11/2019 13:42*						
Mercury	0.218	0.100	mg/Kg	0.2000		109	70-130			
Matrix Spike (B9L0421-MS1)		**Source: 19K0764-02**		*Prepared: 12/11/2019 10:35 Analyzed: 12/11/2019 14:12*						
Mercury	0.447	0.097	mg/Kg	0.4853	ND	92.2	75-125			
Matrix Spike Dup (B9L0421-MSD1)		**Source: 19K0764-02**		*Prepared: 12/11/2019 10:35 Analyzed: 12/11/2019 14:14*						
Mercury	0.452	0.097	mg/Kg	0.4837	ND	93.5	75-125	1.06	20	
Reference (B9L0421-SRM1)				*Prepared: 12/11/2019 10:35 Analyzed: 12/11/2019 13:51*						
Mercury	0.147	0.100	mg/Kg	0.1832		80.3	50-150			

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Certified Analyses included in this Report

Analyte	CAS #	Certifications
SW6010C in Solid		
Antimony	7440-36-0	DoD,ISO,WDNR,ILEPA
Arsenic	7440-38-2	DoD,ISO,AKDEC,WDNR,ILEPA
Barium	7440-39-3	DoD,ISO,AKDEC,WDNR,ILEPA
Beryllium	7440-41-7	DoD,ISO,WDNR,ILEPA
Cadmium	7440-43-9	DoD,ISO,AKDEC,WDNR,ILEPA
Chromium	7440-47-3	DoD,ISO,AKDEC,WDNR,ILEPA
Cobalt	7440-48-4	DoD,ISO,WDNR,ILEPA
Copper	7440-50-8	DoD,ISO,WDNR,ILEPA
Lead	7439-92-1	DoD,ISO,AKDEC,WDNR,ILEPA
Manganese	7439-96-5	DoD,ISO,WDNR,ILEPA
Nickel	7440-02-0	DoD,ISO,AKDEC,WDNR,ILEPA
Phosphorus	7723-14-0	DoD
Selenium	7782-49-2	DoD,ISO,WDNR,ILEPA
Silver	7440-22-4	DoD,ISO,WDNR,ILEPA
Thallium	7440-28-0	DoD,WDNR,ILEPA
Titanium	7440-32-6	DoD,WDNR,ILEPA
Zinc	7440-66-6	DoD,ISO,WDNR,ILEPA
SW7471B in Solid		
Mercury	7439-97-6	ISO,DoD,WDNR,ILEPA

List of Certifications

Code	Description	Number	Expires
AKDEC	State of Alaska, Dept. Environmental Conservation	17-011	04/30/2020
CPSC	US Consumer Product Safety Commission, Accredited by PJLA Lab No. 1050	L18-184-R1	04/30/2020
DoD	Department of Defense, Accredited by PJLA	L18-183-R3	04/30/2020
ILEPA	State of Illinois, NELAP Accredited Lab No. 100256	004524	01/31/2020
ISO	ISO/IEC 17025, Accredited by PJLA	L18-184-R1	04/30/2020
WDNR	State of Wisconsin Dept of Natural Resources	999888890	08/31/2020

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Qualifiers and Definitions

Item	Description
P	The quality control sample %RPD is above the laboratory control limit.
Q	One or more quality control results were outside of the acceptance limits (e.g. LCS recovery, surrogate spike recovery, or CCV recovery).
S	The quality control sample recovery is outside of the laboratory control limits.
S3	The percent recovery was outside the limits, but the analyte is reported within the calibration range. Data is acceptable.
%Rec	Percent Recovery

ENVIRONMEI MONITORING TECHNOLOGIES

8100 North Austin Avenue
Morton Grove, Illinois 60053-320:

19L0295
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

n of Custody Record

5666
-967-6735
nt.com

TURNAROUND TIME:
☐ RUSH
_____ day turnaround
☐ ROUTINE

Due Date: 12-10-19 COC #: 229008

Company: GENERAL IRON (Reserve Management Group)
Address:
Phone #: (440) 287-7209 Fax #: ( ) -
P.O. #: Proj. #: -
Client Contact: MARK WEINTRAUB
Project ID / Location:

Sample Type: 1. Waste Water 2. Drinking Water 3. Soil 4. Sludge 5. Oil 6. Groundwater 7. Groundwater (filtered) 8. Other

Container Type: P - Plastic G - Glass V - VOC Vial B - Tedlar Bag O - Other

Preservative: 1. None 2. H_2SO_4 3. HNO_3 4. NaOH 5. HCl 6. MeOH 7. Zn Ace 8. Other

Analyses: 17 TOTAL METALS (SEE LIST)

EMT USE ONLY — EMT WORKORDER #19L0295

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	pH	Temp.	Preservation Field	Preservation Lab	17 TOTAL METALS (SEE LIST)	EMT Workorder
FERDWY				1	JK	12/5						X	01A

Relinquished By:	Date / Time	Received By:	Date / Time
[signature]	Date: 12-5-19 Time: :		Date: - - Time: :
	Date: - - Time: :		Date: - - Time: :
	Date: - - Time: :	Received For Lab By: [signature]	Date: 12-5-19 Time: 15:20

EMT USE ONLY
Client Code:
EMT Project I.D. Residential Soil Analysis
Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE 20.0

EMT SAMPLE RETURN POLICY ON BACK

SPECIAL INSTRUCTIONS:
Add to log in notes "must run sample thru size 200 sieve prior to analysis"

Sample Receipt Checklist

Work Order: 19L0295

Printed: 12/5/2019 4:52:12PM

Client: ***Reserve Management Group***
Project: **Residential Soil Analysis**

Date Due: **12/10/19 17:00 (3 day TAT)**

Received By:	**Agnieszka B. Zabawa**	**Date Received:**	**12/05/19 15:20**
Logged In By:	**Agnieszka B. Zabawa**	**Date Logged In:**	**12/05/19 16:48**

Samples Received at:	**20°C**
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Cont/Cooler Intact	Yes
COC Present/Complete	No
COC/Labels Agree	Yes
Proper Cont/Preservation checked	Yes
Sufficient Sample Volume	Yes
Samples Within Holdtime	Yes
Cooler Temp Within Limits	No
VOA Water Vials Received	No
VOA Water Vials/Zero Headspace	NA
PM or Client Contacted	No

COMMENTS

COC missing sample time.

ABZ
12/5/19

ENVIRONMENTAL MONITORING AND TECHNOLOGIES, INC.

8100 North Austin Avenue
Morton Grove, Illinois 60053-3203

19L0296
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

Chain of Custody Record

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...57-6735
www.emt.com

TURNAROUND TIME:
☐ RUSH
____ day turnaround
☐ ROUTINE

Due Date: 12-10-19 COC #: 229005

Company: GENERAL IRON (Reserve Management Group)
Address:

Phone #: 440-287-7209 Fax #: ( ) -
P.O. #: Proj. #: -
Client Contact: MARK WEINTRAUB
Project ID / Location:

Sample Type: 1. Waste Water 2. Drinking Water 3. Soil 4. Sludge 5. Oil 6. Groundwater 7. Groundwater (filtered) (8) Other

Container Type: P - Plastic G - Glass V - VOC Vial B - Tedlar Bag (O) - Other

Preservative: (1) None 2. H_2SO_4 3. HNO_3 4. NaOH 5. HCl 6. MeOH 7. Zn Ace 8. Other

Analyses: 17 TOTAL METALS (SEE LIST)

EMT USE ONLY

EMT WORKORDER #19L0296

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	Sampling pH	Sampling Temp.	Preservation Field	Preservation Lab	17 TOTAL METALS (SEE LIST)	EMT Use Only
ASRRDWY				1	JK	12/5						X	01A

Relinquished By:	Date: 12-5-19 Time: :	Received By:	Date: - - Time: :
Relinquished By:	Date: - - Time: :	Received By:	Date: - - Time: :
Relinquished By:	Date: - - Time: :	Received For Lab By:	Date: 12 5 19 Time: 15:20

EMT USE ONLY
Client Code:
EMT Project I.D. Residential Soil Analysis
Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE 20.0

EMT SAMPLE RETURN POLICY ON BACK

SPECIAL INSTRUCTIONS:
Add to Log in Notes -> "Must run sample thru size 200 seive prior to analysis"

Sample Receipt Checklist

Work Order: 19L0296

Printed: 12/5/2019 5:01:50PM

Client:	**Reserve Management Group**	**Date Due:**	**12/10/19 17:00 (3 day TAT)**
Project:	**Residential Soil Analysis**		

Received By:	**Agnieszka B. Zabawa**	**Date Received:**	**12/05/19 15:20**
Logged In By:	**Agnieszka B. Zabawa**	**Date Logged In:**	**12/05/19 16:52**

Samples Received at:	20°C
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Cont/Cooler Intact	Yes
COC Present/Complete	No
COC/Labels Agree	Yes
Proper Cont/Preservation checked	Yes
Sufficient Sample Volume	Yes
Samples Within Holdtime	Yes
Cooler Temp Within Limits	No
VOA Water Vials Received	No
VOA Water Vials/Zero Headspace	NA
PM or Client Contacted	No

COMMENTS

COC missing sample time.

ABZ
12/5/19

ENVIRONME
MONITORING
TECHNOLOGIE!

8100 North Austin Avenue
Morton Grove, Illinois 60053-32(

19L0297
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

in of Custody Record

-6666
7-967-6735
www.emt.com

TURNAROUND TIME:
☐ RUSH
_____ day turnaround
☐ ROUTINE

Due Date: 12 - 10 - 19 COC #: 151417

Company: GENERAL IRON (Reserve Management Group)
Address:
Phone #: (440) 287 - 7209 Fax #: ( ) -
P.O. #: Proj. #: -
Client Contact: MARK WEINTRAUB
Project ID / Location:

Sample Type: 1. Waste Water 2. Drinking Water 3. Soil 4. Sludge 5. Oil 6. Groundwater 7. Groundwater (filtered) 8. Other

Container Type: P - Plastic G - Glass V - VOC Vial B - Tedlar Bag O - Other

Preservative: 1. None 2. H_2SO_4 3. HNO_3 4. NaOH 5. HCl 6. MeOH 7. Zn Ace 8. Other

Analyses: 17 TOTAL METALS (SEE LIST)

EMT USE ONLY
EMT WORKORDER # 19L0297

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	pH	Temp.	Preservation Field	Preservation Lab	17 TOTAL METALS (SEE LIST)	EMT USE ONLY
FETP				1	JR	12/5						X	01A

Relinquished By:	Date / Time	Received By:	Date / Time
[signature]	Date: 12-5-19 Time: :		Date: - - Time: :
	Date: - - Time: :		Date: - - Time: :
	Date: - - Time: :	Received For Lab By: [signature]	Date: 12-5-19 Time: 15:20

EMT USE ONLY
Client Code:
EMT Project I.D. Residential Soil Analysis
Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE (Must be recorded if sampling was greater than 6 hrs. prior to sample receipt) 20.0

EMT SAMPLE RETURN POLICY ON BACK

SPECIAL INSTRUCTIONS: Add to Login Notes "Must run Sample thru size 200 seive prior to analysis"

EMT-FORM-GEN-028

Sample Receipt Checklist

Work Order: 19L0297

Printed: 12/5/2019 4:55:05PM

Client:	**Reserve Management Group**	**Date Due:**	**12/10/19 17:00 (3 day TAT)**
Project:	**Residential Soil Analysis**		

Received By:	**Agnieszka B. Zabawa**	**Date Received:**	**12/05/19 15:20**
Logged In By:	**Agnieszka B. Zabawa**	**Date Logged In:**	**12/05/19 16:54**

Samples Received at:	20°C
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Cont/Cooler Intact	Yes
COC Present/Complete	No
COC/Labels Agree	Yes
Proper Cont/Preservation checked	Yes
Sufficient Sample Volume	Yes
Samples Within Holdtime	Yes
Cooler Temp Within Limits	No
VOA Water Vials Received	No
VOA Water Vials/Zero Headspace	NA
PM or Client Contacted	No

COMMENTS

COC missing sample time.

ABZ
12/5/19

ENVIRONMENT
MONITORING A
TECHNOLOGIES, I

19L0298
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

of Custody Record

8100 North Austin Avenue
Morton Grove, Illinois 60053-3203
-6735

TURNAROUND TIME:
☐ RUSH
_____ day turnaround
☐ ROUTINE

Due Date: 12-10-19 COC #: 229004

Company: GENERAL IRON (Reserve Management Group)
Address:
Phone #: (440) 287-7209 Fax #: ( ) -
P.O. #: Proj. #: -
Client Contact: MARK WEINTRAUB
Project ID / Location:

Sample Type: 1. Waste Water 2. Drinking Water 3. Soil 4. Sludge 5. Oil 6. Groundwater 7. Groundwater (filtered) 8. Other

Container Type: P - Plastic G - Glass V - VOC Vial B - Tedlar Bag O - Other

Preservative: 1. None 2. H_2SO_4 3. HNO_3 4. NaOH 5. HCl 6. MeOH 7. Zn Ace 8. Other

Analyses: 17 TOTAL METALS (SEE LIST)

EMT USE ONLY
EMT WORKORDER #19L0298

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	Sampling pH	Sampling Temp.	Preservation Field	Preservation Lab	17 TOTAL METALS (SEE LIST)	EMT USE ONLY
RDW/Y				1	JK	12/5							01A

Relinquished By:	Date: 12-5-19 Time: :	Received By:	Date: - - Time: :	EMT USE ONLY Client Code:
Relinquished By:	Date: - - Time: :	Received By:	Date: - - Time: :	EMT Project I.D. Residential Soil Analysis
Relinquished By:	Date: - - Time: :	Received For Lab By:	Date: 12-5-19 Time: 15:20	Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE 20.0

EMT SAMPLE RETURN POLICY ON BACK

SPECIAL INSTRUCTIONS:
Add Notes to Log in → "Must Run Sample thru 200 seive prior to Analysis"

Sample Receipt Checklist

Work Order: 19L0298

Printed: 12/5/2019 4:56:57PM

Client:	**Reserve Management Group**	**Date Due:**	**12/10/19 17:00 (3 day TAT)**
Project:	**Residential Soil Analysis**		

Received By:	**Agnieszka B. Zabawa**	**Date Received:**	**12/05/19 15:20**
Logged In By:	**Agnieszka B. Zabawa**	**Date Logged In:**	**12/05/19 16:55**

Samples Received at:	**20°C**
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Cont/Cooler Intact	Yes
COC Present/Complete	No
COC/Labels Agree	Yes
Proper Cont/Preservation checked	Yes
Sufficient Sample Volume	Yes
Samples Within Holdtime	Yes
Cooler Temp Within Limits	No
VOA Water Vials Received	No
VOA Water Vials/Zero Headspace	NA
PM or Client Contacted	No

COMMENTS

COC missing sample time.

ABZ
12/5/19

ENVIRONME
MONITORING
TECHNOLOGIE

8100 North Austin Avenue
Morton Grove, Illinois 60053-32

19L0299
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

...ain of Custody Record

...7-6666
...47-967-6735
www.emt.com

TURNAROUND TIME:
☒ RUSH
____ day turnaround
☐ ROUTINE

Due Date: 12-10-19 COC #: 210038

Company: GENERAL IRON (Reserve Management Group)
Address:
Phone #: ( ) - Fax #: ( ) -
P.O. #: Proj.#: -
Client Contact: MARK WEINTRAUB
Project ID / Location:

Sample Type: 1. Waste Water 2. Drinking Water 3. Soil 4. Sludge 5. Oil 6. Groundwater 7. Groundwater (filtered) 8. Other

Container Type: P - Plastic G - Glass V - VOC Vial B - Tedlar Bag O - Other

Preservative: 1. None 2. H_2SO_4 3. HNO_3 4. NaOH 5. HCl 6. MeOH 7. Zn Ace 8. Other

Analyses: 17 TOTAL METALS (SEE LIST)

EMT USE ONLY — EMT WORKORDER #19L0299

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	pH	Temp.	Preservation Field	Preservation Lab	17 TOTAL METALS (SEE LIST)	EMT USE ONLY
NFETP				3	JK	12/5						X	01A-C

Relinquished By:	Date/Time	Received By:	Date/Time
[signature]	Date: 12-5-19 Time: :		Date: - - Time: :
	Date: - - Time: :		Date: - - Time: :
	Date: - - Time: :	Received For Lab By: [signature]	Date: 12-5-19 Time: 15:20

EMT USE ONLY
Client Code:
EMT Project I.D. Residential Soil Analysis
Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE 20.0

EMT SAMPLE RETURN POLICY ON BACK

SPECIAL INSTRUCTIONS: # Add to Log in Notes → "Must Run Sample thru size 200 sieve Prior to Analysis

R 001863
Table of Contents

Sample Receipt Checklist

Work Order: 19L0299

Printed: 12/5/2019 4:58:36PM

Client:	**Reserve Management Group**	**Date Due:**	**12/10/19 17:00 (3 day TAT)**
Project:	**Residential Soil Analysis**		

Received By:	**Agnieszka B. Zabawa**	**Date Received:**	**12/05/19 15:20**
Logged In By:	**Agnieszka B. Zabawa**	**Date Logged In:**	**12/05/19 16:57**

Samples Received at:	20°C
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Cont/Cooler Intact	Yes
COC Present/Complete	No
COC/Labels Agree	Yes
Proper Cont/Preservation checked	Yes
Sufficient Sample Volume	Yes
Samples Within Holdtime	Yes
Cooler Temp Within Limits	No
VOA Water Vials Received	No
VOA Water Vials/Zero Headspace	NA
PM or Client Contacted	No

COMMENTS

COC missing sample time.

ABZ
12/5/19

RK & Associates, Inc.

Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – Chicago, Illinois

January 24, 2020

Appendix E

Modeling Input and Output Files (CD-ROM)

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RK
& Associates, Inc.

Air Dispersion Modeling Report for Assessment of Metal Emission Impacts General III, LLC – Chicago, Illinois

January 24, 2020

Appendix E

Modeling Input and Output Files (CD-ROM)

Modeling was performed for each of the 17 metals identified in USEPA Method 29 emission testing. A separate modeling run was performed for each of the 17 metals. Accordingly, the CD ROM attached to this page contains AERMOD input and output files for each of the 17 modeling runs.

This is a copy of the original modeling report. The CD ROM with AERMOD input and output files was included in the original reports sent to the attention of Jeff Sprague of IEPA.

If you require these files, please contact John Pinion of RKA at jpinion@rka-inc.com.

RK & Associates, Inc.

EXHIBIT 12

February 12, 2020

R17421-7.1

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

Supplement No. 1 to the January 24, 2020
Air Dispersion Modeling Report for Assessment of Metal Emission Impacts
General III, LLC – 11600 South Burley - Chicago, Illinois
Construction Permit Application 19090021; Site ID No.: 031600SFX

Dear Mr. Sprague:

Pre our recent discussions, the following supplemental information is being provided to replace information in the above referenced modeling report.

2.6 Modeling Facility Operating Schedule

Section 2.6 is a new section and is being added to identify the operating schedule used in the revised modeling. The modeled operating schedule is as follows:

Site Operation	Modeled Facility Operating Schedule			
	Mon - Fri		Sat	
Ferrous System Operation (includes Shredder)	7 AM to 7 PM	12 hr/day	7 AM to 5 PM	12 hr/day
Barge Loading	7 AM to 3 PM	8 hr/day	7 AM to 3 PM	8 hr/day
Non Ferrous System Operation	5 AM to 11 PM	18 hr/day	5 AM to 11 PM	18 hr/day
Roadway Fugitive Emissions (Facility Vehicular Traffic)	5 AM to 7 PM	14 hr/day	5 AM to 5 PM	12 hr/day

Breaking out the barge loading operating time from the general ferrous material processing system operating time resulted in minor changes to hourly metal emission rates from following Volume Sources in the Ferrous Material Processing System and shredder RTO/Scrubber.

- <u>**Volume Source 10**</u> – includes conveyors downstream from the Z-Box Separators that direct recovered ferrous metal to material stockpiles through the manual picking station to the north or south ferrous material stockpiles (V-11 and V-12 respectively) or to the barge loading conveyors and barge (V-13). During Barge Loading hours, emission estimates assume that 100% of the ferrous metal produced is directed to the Barge. During non-barge loading operating hours, it is

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RK & Associates, Inc.

assumed that 50% of the recovered ferrous metal is directed to the north ferrous stockpile and 50% is directed to the south ferrous stockpile.

- **Volume Source 11** – consists of a stacking conveyor and the north ferrous metal stockpile and includes process emissions from stockpile loading, truck loading (out of the stockpile) and stockpile fugitive emissions for active and inactive hours. During barge loading hours, process emissions are zero and emissions are limited to stockpile fugitive emissions.

- **Volume Source 12** – consists of a stacking conveyor and the south ferrous metal stockpile and includes process emissions from stockpile loading, truck loading (out of the stockpile) and stockpile fugitive emissions for active and inactive hours. During barge loading hours, process emissions are zero and emissions are limited to stockpile fugitive emissions.

- **Volume Source 13** – consists of three conveyor transfer points and the barge loading conveyor that direct recovered ferrous metal from the manual picking station to the barge. During barge loading hours, process emissions assume 100 % of recovered ferrous metal are directed to the barge. During Non-barge loading hours, the barge conveyors and barge loading emissions are zero.

Emissions from Volume Sources 1 through 9 were not changed.

Based on the identified changes to barge loading hours described above, metal emissions from the shredder RTO/Scrubber were modified to reflect the measured metal emission factors from the November 2019 emission testing at GII multiplied by a safety factor of 2.

Attachment A to this Supplement No. 1 identifies the revised hourly metal emission rates for the Ferrous Material Processing System described above.

- Revised Tables A-1a and A-1b present a summary of the revised hourly metal emission rates from the Ferrous Material Processing System during modeled operating hours.
- Revised Table A-1c presents a summary of hourly metal emissions from the Ferrous Material Processing System during modeled non-operating hours.
- Revised Table A-2 presents the revised hourly filterable PM process emission rates from each Volume Source in the Ferrous Material Processing System. As described above, changes are limited to Volume Sources V-10, V-11, V-12, and the Shredder RTO/Scrubber.
- Revised Table A-3 presents a summary of hourly fugitive stockpile filterable PM emission rates for active and inactive hours.
- Revised Table A-4 presents a summary of total hourly filterable PM emissions from process emission sources plus stockpile fugitive emissions for each Volume Source in the Ferrous Material Processing System.

Attachment B to this Supplement No. 1 presents the hourly metal emission rates for the Non-Ferrous material Processing System. The hourly emission rates do not change. The tables were updated only to identify the operating schedule identified above.

3.3 Ambient Air Boundaries

The following information is provided to replace existing Section 3.3 in the January 24, 2020, Air Dispersion Modeling Report for Assessment of Metal Emission Impacts (Report) describing the ambient air boundaries used in the modeling analysis.

The ambient air boundary for this modeling analysis is based primarily on the existing property lines of the RMG Industrial Campus as shown in the revised Figure 1-2 below.

West Boundary: The west boundary of the RMG Industrial Campus is defined by the Calumet River. This boundary has not changed from the information presented in the above referenced Report. The elevation difference between the surface of the Calumet River and the top of the existing retaining wall provides adequate access control and marks the ambient air boundary along the west property boundary. Additional signs prohibiting public access to the site will be placed as needed along the west boundary.

North Boundary: The existing fence along the length of the north boundary of the RMG Industrial Campus will prevent casual public access to the property and marks the ambient air boundary for modeling. This boundary has not changed from the information presented in the above referenced Report. Additional signs prohibiting public access to the site will be placed as needed along the north boundary.

East Boundary: The existing fence beginning at the northeast corner of the RMG Industrial Campus extending southward along the east boundary of the site to the existing guard shack will prevent casual public access to the property and marks the ambient air boundary on this portion of the east boundary. This description of this portion of the east boundary has not changed from the information presented in the above referenced Report. Additional signs prohibiting public access to the site will be placed as needed along the existing fence.

Several active rail spurs cross the east boundary of the site between the guard shack and southeast corner of the RMG Industrial Campus property. The installation of fencing along this portion of the east boundary is not practical due to the number of active rail spurs. The east boundary, south of the guard shack is visually observed by security personal located at the guard shack during working hours. When the site is closed, the southern portion of the east boundary (south of the guard shack) is visually observed by security personnel conducting periodic patrols either on foot or in a vehicle. There is also one camera located on a pole near the guard shack that is used to view southward from the guard shack along the eastern property line.

To address comments from IEPA, the boundary control described above will be supplemented with, a second elevated camera installed near the southeast corner of the RMG Industrial Campus property to view northward along the east boundary toward the guard shack. A monitor will also be installed in the guard shack to display the images from the existing camera and the proposed new camera to allow security personnel to regularly view the southern portion of the east boundary.

Additional signs prohibiting public access to the site will be placed as needed along the southern portion of the eastern boundary.

The existing and proposed controls described above will establish the ambient air boundary along the southern portion of the east boundary of the RMG Industrial Campus property.

South Boundary: The initial January 24, 2020 modeling report described the southern ambient air boundary as an existing earthen berm along the southern property line. To address concerns identified by IEPA, the ambient air boundary along the southern property line has been moved northward to parallel the southern exterior wall of an existing building. The existing building marks the ambient air boundary from the southeast corner of the RMG Industrial Campus property westward to the southwest corner of the existing building as shown in the revised Figure 1-2. A barrier, consisting of fencing or shipping containers, will be installed between the southwest corner of the existing building to the Calumet River. This combination of the proposed barrier and the exterior wall of the existing building will mark the southern ambient air boundary.

Signs prohibiting public access to the site will be placed as needed along the existing building and proposed barrier.

3.5 Building Downwash

The initial air modeling report described the use of building downwash parameters for the proposed GIII structures and existing structures on the RMG Industrial Campus property. At the request of IEPA, building downwash parameters provided by the Agency for existing structures on two off-list properties (Site ID Numbers 031600AFV and 031600FJQ), were included in the revised modeling described herein.

RK & Associates, Inc.
2S631 ROUTE 59
SUITE B
WARRENVILLE, IL 60555
630-393-9000/630-393-9111

COMMENTS:					FIGURE
Air Dispersion Modeling Report for the Assessment of Metal Emission Impacts		Revised Facility Map Ambient Air Boundaries General III, LLC 11600 South Burley, Chicago, IL			1-2
DRAWN BY:	APPROVED BY: JGP	PROJECT NUMBER: R19439-7.10	DATE DRAWN: 02-2020	REVISED DATE	

3.6 Lead Modeling

The updated version of Table 3-1 presented below identifies the updated source characteristics for offsite lead emission sources provided by IEPA for Sites 031600AFV and 031600FJQ. The updated source characteristics identified in Table 3-1 were used to re-run the air dispersion model for lead emissions. Updated modeling input and output files for lead modeling are presented on a CD ROM provided in Attachment C to this Supplement No. 1.

Table 3-1. Offsite Lead Emission Sources Identified by IEPA

Row #	ID Number	Stack Number	Stack ID	Stack Description	Lead Emissions (lb/hr)	Stack Diameter (ft)	Stack Height (ft)	Flow Rate (acfm)	Stack Temp (F)	UTM Zone	UTM Easting	UTM Northing
1	031600AAR	109	250881	4 Big foot air houses (19.4 million BTU/hr each)	0.00000335	1.76	37	3,000	442	16	453419	4612420
2	031600FGT	3	195877	Cement silo loading	0.000069	2.80	36	10,266	80	16	451809	4617532
3	031600FGT	6	195880	Mixer and/or truck loading	0.0002292	2.90	32	10,220	80	16	451809	4617532
4	031600FHQ	1	121260	Portland cement terminal: Cement silo loading	0.00037	2.25	203	3,000	70	16	452496.4	4612240
5	031600FHQ	2	121261	Portland cement terminal: Truck loading/unloading	0.00222	4.50	120	3,000	70	16	452461	4612136
6	031600GKE	9	222736	Backup generator EDG A	0.000277144	3.00	12	16,200	895	16	454708	4618584
7	031600GKE	10	222737	Backup generator EDG B	0.000277144	3.00	12	16,200	895	16	454708	4618571
8	031600GKE	11	222738	Backup generator EDG C	0.000277144	3.00	12	16,200	895	16	454708	4618559
9	031600AFV	5	118896	Kiln #1 & Kiln #2[a]	0.144	8.67	102	4,114	181	16	453769.8	4615224
10	031600AFV	27	184788	Crude zinc oxide bin loadout[a] (bag collector 5)	0.009000	8.99	98	123,228	81	16	453756.9	4615211
11	031600AFV	30	184791	Feed handling system[a]	0.0018	1.51	75	4,101	82	16	453837.9	4615177
12	031600GWV	7	234365	Boiler	0.00019	3.77	74	19,740	416	16	454218	4613685

3.7 Manganese Modeling

The updated version of Table 3-3 presented below identifies the updated source characteristics for offsite manganese emission sources provided by IEPA for Sites 031600AFV and 031600FJQ. The updated source characteristics identified in Table 3-3 were used to re-run the air dispersion model for manganese emissions described in this correspondence. Updated modeling input and output files for manganese modeling are presented on a CD ROM provided in Attachment B to this Supplement No. 1.

Table 3-3 - Offsite Manganese Sources Identified by IEPA

ID Number	Stack Number	Stack Id	Stack Description	Mn Emissions (lb/hr)	Stack Diameter (ft)	Stack Height (ft)	Flow Rate (acfm)	Stack Temp (F)	UTM Zone	UTM Northing	UTM Easting
031036AAA	0003	115247	Boiler #3	0.00000152	2.00	25	2,752	300	16	4610011	454809
031036AAA	0004	115248	Boiler #2	0.000000589	2.00	25	2,752	300	16	4610011	454809
031036AAA	0002	115246	Boiler stack #1	0.000000589	3.50	95	2,600	220	16	4610011	454809
031600AAR	0046	118716	60 million BTU/hr boiler	0	3.30	117	19,319	300	16	4612420	453419
031600AAR	0055	118725	Air supply	0	2.30	55	8,000	225	16	4612420	453419
031600AAR	0056	118726	Air supply	0	1.00	45	2,000	245	16	4612420	453419
031600AAR	0088	156582	2 Natural gas fired hot water heaters	0.000001026	3.70	85	17,345	361	16	4612420	453419
031600AAR	0109	250881	4 Big foot air houses (19.4 million BTU/hr each)	0.000002546	1.76	37	3,000	442	16	4612420	453419
031600AAR	0110	250882	2 Hot water stations	0.000001026	1.84	37	3,300	430	16	4612420	453419
031600AAR	0111	250883	Paint line water heater	0.000000266	1.84	37	3,300	430	16	4612420	453419
031600AAR	0112	250884	Other natural gas combustion (curing ovens, oxidizers, space heaters)	0.000039976	1.92	39	4,860	258	16	4612420	453419
031600AAR	0114	250886	Emergency generator	7.4565E-06	2.02	36	12,960	692	16	4612420	453419
031600AFV	0005	118896	Kiln #2	0.065776833	8.67	102	4,115	181	16	4615223.5	453769.8
031600AFV	0035	184796	Engine	0	4.80	56	73,901	503	16	4615216	453823
031600ALC	0002	118971	Boiler	0.000009272	2.50	112	9,520	470	16	4613531	454085
031600AOL	0015	209976	Natural gas combustion	0.000002964	3.40	30	25,373	324	16	4617392	450256
031600BIY	0001	119521	Boiler #1	0.000001748	5.00	90	7,970	565	16	4613129	451612
031600BIY	0024	241900	Boiler #3	0.00000209	2.00	28	4,936	395	16	4613129	451612
031600BRA	0001	119770	Gas heater	0.00000171	2.50	35	700	350	16	4618594	454528
031600DPK	0001	120674	Silo loading	0.000505	2.20	32	12,424	113	16	4619060	454722
031600DQO	0021	173045	Centrifuge Boilers #1 and #2	1.38624E-06	1.83	46	2,050	450	16	4613049	450146
031600FDK	0002	121107	2 Steam generators	0.000001482	2.60	34	1	400	16	4617978	453577
031600FGT	0003	195877	Cement silo loading	0.0189375	2.80	36	10,266	80	16	4617532	451809
031600FGT	0006	195880	Mixer and/or truck loading	0.03672	2.90	32	10,220	80	16	4617532	451809
031600FGT	0007	195881	Natural gas combustion	0.00000342	2.70	50	8,859	341	16	4617532	451809
031600FHQ	0001	121260	Portland cement terminal: Cement silo loading	0.000101	2.26	203	3,000	70	16	4612239.7	452496.4
031600FHQ	0002	121261	Portland cement terminal: Truck loading/unloading	0.000606	4.51	120	3,000	70	16	4612136	452461
031600FHQ	0003	190764	Portland cement terminal: Barge unloader	0	2.80	36	10,266	80	16	4612185	452489
031600FHQ	0004	215253	Slag dryer	0	5.33	157	74,700	183	16	4612141	452468
031600FHQ	0004	215253	Slag dryer	0.000011704	5.33	157	74,700	183	16	4612141	452468
031600FLD	0017	188346	Product collector from shaft dryers (T51-HG1), Cyclone (T51-CN1), and Separator (T61-SR1)	6.65E-09	2.20	90	20,000	205	16	4617602	454330
031600FLD	0016	188345	Polymers (Y-Chutes, top of T61-RP2 bin and T61-RP2), and Aux. dryers (T71-HG2 and T71-HG7)	1.672E-09	2.20	90	3,336	205	16	4617602	454330
031600FWM	0023	233161	Natural gas combustion	0.000005852	3.40	58	15,060	436	16	4613979	453740
031600GFX	0003	193349	Natural gas combustion	0.000006194	2.47	49	9,240	331	16	4617336	450418
031600GHA	0001	219682	Turbine CT-01	0.106666	20.00	90	1,658,000	997	16	4614792	453654
031600GHA	0001	219682	Turbine CT-01	0	20.00	90	1,658,000	997	16	4614792	453654
031600GHA	0003	222391	Turbine CT-02	0.10025	20.00	90	1,658,000	997	16	4614792	453697
031600GHA	0003	222391	Turbine CT-02	0	20.00	90	1,658,000	997	16	4614792	453697
031600GHV	0005	189629	2 Boilers	0.000005434	1.50	35	4,700	330	16	4612395	452774
031600GHV	0005	189629	2 Boilers	0.000004712	1.50	35	4,700	330	16	4612395	452774
031600GKE	0001	219577	Turbine CTG-5	0.0429471	12.14	84	611,000	1050	16	4618643	454621
031600GKE	0009	222736	Backup generator EDG A	0.01563884	3.00	12	16,200	895	16	4618584	454708
031600GKE	0010	222737	Backup generator EDG B	0.01563884	3.00	12	16,200	895	16	4618571	454708
031600GKE	0011	222738	Backup generator EDG C	0.01563884	3.00	12	16,200	895	16	4618559	454708
031600GKE	0002	219591	Turbine CTG-6	0.04244986	12.14	84	611,000	1050	16	4618616	454621
031600GKE	0003	219592	Turbine CTG-7	0.04277066	12.14	84	611,000	1050	16	4618590	454621
031600GKE	0004	219593	Turbine CTG-8	0.04341226	12.14	84	611,000	1050	16	4618564	454621
031600GKE	0005	219594	Turbine CTG-9	0.04197668	12.14	84	611,000	1050	16	4618643	454672
031600GKE	0006	219595	Turbine CTG-10	0.0420248	12.14	84	611,000	1050	16	4618617	454672
031600GKE	0007	219596	Turbine CTG-11	0.04220926	12.14	84	611,000	1050	16	4618590	454672
031600GKE	0008	219597	Turbine CTG-12	0.04207292	12.14	84	611,000	1050	16	4618564	454672
031600GKU	0001	209195	Combined boilers stack	0.00000494	3.00	30	5,150	350	16	4617728	451623
031600GWV	0007	234365	Boliler	0.000127848	3.78	74	19,740	416	16	4613685	454218

3.9 Volume Source Characteristics

This section 3.9 – Volume Source Characteristics has been added to the end of Section 3.0 of the referenced air dispersion modeling report to provide the characteristics of emission unit volume sources (Section 3.9.1.) and roadway volume sources (Section 3.9.2.) used in the model.

3.9.1 Emission Unit Volume Source Characteristics

The Volume Sources outlined in Figures A-1 and B-1 of the January 24, 2020, Air Dispersion Modeling Report, delineate the approximate location of the individual emission units included in each volume source. The model input requires the x and y dimensions for each volume source to be the same and have been input accordingly.

The height of the individual emission units that comprise each volume source was reviewed, and the maximum height is selected as the height of the volume source. The length of the group of sources is selected as the length of the volume source. The volume source parameters entered in the model were derived as follows:

- Release Height = Volume Source Height divided by 2.0
- Initial Lateral Dimensions = Volume Source Length divided by 4.3
- Initial Vertical Dimensions = Volume Source Height divided by 2.15

Table 3-6 provides a summary of the emission unit volume source dimensions used as model inputs.

Table 3-6 – Emission Unit Volume Source Characteristics

Volume Source	Height of Emission Sources (ft)	Length of Source Group (ft)	Release Height (ft)	Initial Lateral Dimensions (ft) (σ_{yo})	Initial Vertical Dimensions (ft) (σ_{zo})
V1	4	10	2.00	2.3256	1.8605
V2	60	84	30.00	19.5349	27.9070
V3	4	6	2.00	1.3953	1.8605
V4	25	50	12.50	11.6279	11.6279
V5	25	20	12.50	4.6512	11.6279
V6	35	60	17.50	13.9535	16.2791
V7	30	20	15.00	4.6512	13.9535
V8	30	20	15.00	4.6512	13.9535
V9	25	25	12.50	5.8140	11.6279
V10	6	20	3.00	4.6512	2.7907
V11	35	120	17.50	27.9070	16.2791
V12	35	120	17.50	27.9070	16.2791
V13	6	20	3.00	4.6512	2.7907
VN1	40	100	20.00	23.2558	18.6047
VN2	40	100	20.00	23.2558	18.6047
VN3	25	100	12.50	23.2558	11.6279
VN4	25	100	12.50	23.2558	11.6279
VN5	25	100	12.50	23.2558	11.6279
VN6	25	40	12.50	9.3023	11.6279

3.9.2 Roadway Volume Sources Characteristics

Roadway emissions are modeled as lines of adjacent volume sources. Haul road recommendations presented in US EPA Memorandum, Haul Road Workgroup Final Report Submission to EPA-OAQPS, are followed. The roadway volume source characteristics are presented in Table 3-7 below.

Table 3-7 –Roadway Volume Source Characteristics

Volume Source Characteristic	Description	Value
Typical vehicle height (VH)	Typical haul vehicle (10 ft)	3.05 m
Top-of-Plume	1.7 x VH	5.18 m
Release Height	½ x Top-of-Plume	2.59 m
Adjusted Road Width	Road width (6 m) + 6 m	12 m
Initial Lateral Dimension (σ_{yo})	Adjusted Road Width / 2.15	5.58 m
Initial Vertical Dimension (σ_{zo})	Top-of-Plume / 2.15	2.41 m
Distance between volume sources	Adjusted Road Width	12 m

4.1 Predicted Lead Impacts

Based on the information described above, the air dispersion modeling for predicted lead impacts was re-run and updated results are presented in Table 4-1 below. The revised modeling continues to show that the identified standards have not been exceeded.

4.2 Predicted Manganese Impacts

Based on the information described above, the air dispersion modeling for predicted manganese impacts was re-run and updated results are presented in Table 4-2 below. The revised modeling continues to show that the identified standards have not been exceeded.

4.3 Predicted Impacts for Other Metals

Based on the information described above, the air dispersion modeling for predicted impacts from other metals was re-run and updated results are presented in Table 4-3 below. The revised modeling continues to show that the identified standards have not been exceeded.

Table 4-1 – Summary of Predicted Impacts for Lead

Pollutant	Maximum 3-Month Rolling Average Period	Predicted Monthly Average (μg/m³)	Predicted Maximum 3-Month Rolling Average (μg/m³)	Design Value (Background) (μg/m³)	Total Predicted 3-Month Rolling Average (w/Background) (μg/m³)	East (X) (m)	North (Y) (m)
Lead	Oct-12	0.0499	0.0649	0.0200	0.0849	454091	464866
	Nov-12	0.0896					
	Dec-12	0.0552					

Comparison of Modeling Results to NAAQS Standard for Lead

Parameter	Units	3 Month Rolling Average
Pb NAAQS Standard (3-Month Rolling Avg)	u g/m³	0.15
Maximum Predicted Pb Impact	u g/m³	0.0849
Predicted Impact Meets Standard	Yes/No	Yes

Table 4-2 – Summary of Predicted Impacts for Manganese

Pollutant	Averaging Period	Year	AERMOD Predicted Conc.[a] (μg/m³)	Background Conc. (μg/m³)	Total Predicted Conc.[a] (μg/m³)	East (X) (m)	North (Y) (m)	Time yy/mm/dd/hh
Mn	24-HR	2012	0.336	0.370	0.706	452000	4617500	12011324
		2013	0.347		0.717	452000	4617500	13013124
		2014	0.326		0.696	452000	4617500	14012724
		2015	0.334		0.704	452000	4617500	15073024
		2016	**0.379**		**0.749**	452000	4617500	16120824
	ANNUAL	2012	0.035	0.070	0.105	452000	4617500	1 YEARS
		2013	0.034		0.104	452000	4617500	1 YEARS
		2014	0.038		0.108	452000	4617500	1 YEARS
		2015	0.030		0.100	452000	4617500	1 YEARS
		2016	**0.039**		**0.109**	452000	4617500	1 YEARS

a. Maximum 24 hour and annual predicted impacts are highlighed.

Comparison of Modeled Results to Identified Standards

Parameter	Units	24-hr Value	Annual Value
NR445 Standard	μg/m³	4.80	0.30
ATSDR Minimal Risk Level	μg/m³	NA	0.30
Total Predicted Impact	μg/m³	0.749	0.109
Impact Meets Standard	Yes/No	Yes	Yes

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc.[a] (µg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Antimony	24-HR	2012	0.00198	12.00 ug/m3 NR445	454126	4615088	178.19	12022024
		2013	**0.00253**		454085	4614965	176.36	13011024
		2014	0.00220		454168	4615111	178.19	14022824
		2015	0.00224	**Pass**	454126	4615088	178.19	15111724
		2016	0.00228		454126	4615088	178.19	16121624
	ANNUAL	2012	**0.00016**	0.30 ug/m3 ATSDR MRL	454251	4615156	178.19	1 YEARS
		2013	0.00013		454251	4615156	178.19	1 YEARS
		2014	0.00013		454251	4615156	178.19	1 YEARS
		2015	0.00014	**Pass**	454340	4615247	178.19	1 YEARS
		2016	0.00014		454251	4615156	178.19	1 YEARS
Arsenic	24-HR	2012	0.00080	No Standard Identified	454126	4615088	178.19	12122824
		2013	**0.00112**		454085	4614965	176.36	13011024
		2014	0.00085		454168	4615111	178.19	14022824
		2015	0.00085		454126	4615088	178.19	15111724
		2016	0.00094		454126	4615088	178.19	16121624
	ANNUAL	2012	0.00007	Unit Risk Factor 0.0043	454251	4615156	178.19	1 YEARS
		2013	**0.00008**		454596	4615044	178.19	1 YEARS
		2014	**0.00008**	Inhalation Impact[a] 3.87E-07	454596	4615044	178.19	1 YEARS
		2015	**0.00008**		454596	4615044	178.19	1 YEARS
		2016	**0.00008**	**Pass**	454596	4615044	178.19	1 YEARS
Barium	24-HR	2012	**0.09159**	12.00 ug/m3 NR445	454091	4614866	177.21	12110724
		2013	0.07107		454091	4614866	177.21	13121324
		2014	0.07181		454088	4614915	176.78	14010924
		2015	0.06763	**Pass**	454091	4614866	177.21	15110924
		2016	0.06038		454091	4614866	177.21	16031424
	ANNUAL	2012	**0.00977**	No Standard Identified	454091	4614866	177.21	1 YEARS
		2013	0.00909		454091	4614866	177.21	1 YEARS
		2014	0.00819		454091	4614866	177.21	1 YEARS
		2015	0.00902		454091	4614866	177.21	1 YEARS
		2016	0.00952		454091	4614866	177.21	1 YEARS

a. The maximum predicted 24 hour and annual impacts are highlighted

RK & Associates, Inc.

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc.[a] (µg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Beryllium	24-HR	2012	0.00062	No Standard Identified	454596	4614996	178.19	12121724
		2013	0.00086		454596	4615044	178.19	13011524
		2014	**0.00091**		454600	4615000	178.19	14010824
		2015	0.00068		454596	4615044	178.19	15012224
		2016	0.00056		454596	4615044	178.19	16112524
	ANNUAL	2012	0.00009	0.02 ug/m3 NR445 **Pass**	454596	4615044	178.19	1 YEARS
		2013	0.00010		454596	4615044	178.19	1 YEARS
		2014	**0.00011**	Unit Risk Factor 0.0024 Inhalation Impact[a] 3.60E-07 **Pass**	454596	4615044	178.19	1 YEARS
		2015	0.00010		454596	4615044	178.19	1 YEARS
		2016	0.00010		454596	4615044	178.19	1 YEARS
Cadmium	24-HR	2012	**0.00430**	No Standard Identified	454091	4614866	177.21	12110724
		2013	0.00345		454091	4614866	177.21	13121324
		2014	0.00350		454088	4614915	176.78	14010924
		2015	0.00325		454091	4614866	177.21	15110924
		2016	0.00296		454091	4614866	177.21	16031424
	ANNUAL	2012	**0.00047**	0.01 ug/m3 ATSDR MRL **Pass**	454091	4614866	177.21	1 YEARS
		2013	0.00044		454091	4614866	177.21	1 YEARS
		2014	0.00040	Unit Risk Factor 0.0018 Inhalation Impact[a] 7.20E-07 **Pass**	454091	4614866	177.21	1 YEARS
		2015	0.00044		454091	4614866	177.21	1 YEARS
		2016	**0.00047**		454091	4614866	177.21	1 YEARS
Chromium	24-HR	2012	**0.05308**	12.00 ug/m3 NR445 Standard **Pass**	454091	4614866	177.21	12110724
		2013	0.04369		454088	4614915	176.78	13011024
		2014	0.03918		454088	4614915	176.78	14010924
		2015	0.03325		454091	4614866	177.21	15110924
		2016	0.03280		454091	4614866	177.21	16031424
	ANNUAL	2012	**0.00505**	No Standard Identified	454091	4614866	177.21	1 YEARS
		2013	0.00474		454091	4614866	177.21	1 YEARS
		2014	0.00434		454596	4615044	178.19	1 YEARS
		2015	0.00468		454091	4614866	177.21	1 YEARS
		2016	0.00499		454091	4614866	177.21	1 YEARS

b. The maximum predicted 24 hour and annual impacts are highlighted

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc.[a] (µg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Cobalt	24-HR	2012	**0.00570**	0.48 ug/m3 NR445 Pass	454091	4614866	177.21	12110724
		2013	0.00465		454088	4614915	176.78	13011024
		2014	0.00448		454088	4614915	176.78	14010924
		2015	0.00412		454091	4614866	177.21	15022124
		2016	0.00380		454091	4614866	177.21	16031424
	ANNUAL	2012	**0.00059**	0.10 ug/m3 ATSDR MRL Pass	454091	4614866	177.21	1 YEARS
		2013	0.00055		454091	4614866	177.21	1 YEARS
		2014	0.00049		454091	4614866	177.21	1 YEARS
		2015	0.00054		454091	4614866	177.21	1 YEARS
		2016	0.00057		454091	4614866	177.21	1 YEARS
Copper	24-HR	2012	**0.20625**	24.00 ug/m3 NR445 Pass	454091	4614866	177.21	12110724
		2013	0.15740		454091	4614866	177.21	13121324
		2014	0.15695		454088	4614915	176.78	14010924
		2015	0.14908		454091	4614866	177.21	15110924
		2016	0.13420		454091	4614866	177.21	16031424
	ANNUAL	2012	**0.02178**	No Standard Identified	454091	4614866	177.21	1 YEARS
		2013	0.02029		454091	4614866	177.21	1 YEARS
		2014	0.01904		454596	4615044	178.19	1 YEARS
		2015	0.02016		454091	4614866	177.21	1 YEARS
		2016	0.02121		454091	4614866	177.21	1 YEARS
Mercury	24-HR	2012	0.07740	2.40 ug/m3 NR445 Pass	454126	4615088	178.19	12022024
		2013	**0.09787**		454085	4614965	176.36	13011024
		2014	0.08643		454168	4615111	178.19	14022824
		2015	0.08811		454126	4615088	178.19	15111724
		2016	0.08881		454126	4615088	178.19	16121624
	ANNUAL	2012	**0.00626**	0.30 ug/m3 NR445 Pass	454251	4615156	178.19	1 YEARS
		2013	0.00492		454251	4615156	178.19	1 YEARS
		2014	0.00494	0.20 ug/m3 ATSDR MRL Pass	454251	4615156	178.19	1 YEARS
		2015	0.00529		454340	4615247	178.19	1 YEARS
		2016	0.00527		454251	4615156	178.19	1 YEARS

c. The maximum predicted 24 hour and annual impacts are highlighted

RK & Associates, Inc.

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc.[a] (μg/m³)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Nickel	24-HR	2012	**0.03650**	No Standard Identified	454091	4614866	177.21	12110724
		2013	0.03038		454088	4614915	176.78	13011024
		2014	0.02770		454088	4614915	176.78	14010924
		2015	0.02406		454091	4614866	177.21	15110924
		2016	0.02357		454091	4614866	177.21	16031424
	ANNUAL	2012	**0.00366**	0.09 ug/m3 NR445/ATSDR MRL **Pass**	454091	4614866	177.21	1 YEARS
		2013	0.00342		454091	4614866	177.21	1 YEARS
		2014	0.00307	Unit Risk Factor 0.00026 Inhalation Impact[a] 9.52E-07 **Pass**	454091	4614866	177.21	1 YEARS
		2015	0.00339		454091	4614866	177.21	1 YEARS
		2016	0.00362		454091	4614866	177.21	1 YEARS
Phosphorus	24-HR	2012	0.23252	2.43 ug/m3 NR445 **Pass**	454126	4615088	178.19	12022024
		2013	**0.31775**		454085	4614965	176.36	13011024
		2014	0.25171		454168	4615111	178.19	14022824
		2015	0.25271		454126	4615088	178.19	15111724
		2016	0.27090		454126	4615088	178.19	16121624
	ANNUAL	2012	**0.02051**	No Standard Identified	454251	4615156	178.19	1 YEARS
		2013	0.01597		454251	4615156	178.19	1 YEARS
		2014	0.01627		454251	4615156	178.19	1 YEARS
		2015	0.01676		454340	4615247	178.19	1 YEARS
		2016	0.01771		454091	4614866	177.21	1 YEARS
Selenium	24-HR	2012	0.01049	4.80 ug/m3 NR445 **Pass**	454126	4615088	178.19	12022024
		2013	**0.01327**		454085	4614965	176.36	13011024
		2014	0.01171		454168	4615111	178.19	14022824
		2015	0.01194		454126	4615088	178.19	15111724
		2016	0.01203		454126	4615088	178.19	16121624
	ANNUAL	2012	**0.00085**	No Standard Identified	454251	4615156	178.19	1 YEARS
		2013	0.00067		454251	4615156	178.19	1 YEARS
		2014	0.00067		454251	4615156	178.19	1 YEARS
		2015	0.00072		454340	4615247	178.19	1 YEARS
		2016	0.00071		454251	4615156	178.19	1 YEARS

d. The maximum predicted 24 hour and annual impacts are highlighted

& Associates, Inc.

Table 4-3 - Comparison of Predicted Maximum Metal Impacts to Identified Standards (cont'd)

Pollutant	Averaging Period	Met Data Year	AERMOD Maximum Predicted Conc.[a] (μg/m^3)	Identified Standard and Source (Pass/Fail)	East (X) (m)	North (Y) (m)	Elevation (m)	Time yy/mm/dd/hh
Silver	24-HR	2012	0.00213	2.40 ug/m3 NR445 Standard	454126	4615088	178.19	12122824
		2013	**0.00302**		454085	4614965	176.36	13011024
		2014	0.00231		454082	4615014	175.94	14010924
		2015	0.00219	**Pass**	454126	4615088	178.19	15111724
		2016	0.00246		454126	4615088	178.19	16121624
	ANNUAL	2012	0.00026	No Standard Identified	454596	4615044	178.19	1 YEARS
		2013	0.00029		454596	4615044	178.19	1 YEARS
		2014	**0.00030**		454596	4615044	178.19	1 YEARS
		2015	0.00028		454596	4615044	178.19	1 YEARS
		2016	0.00029		454596	4615044	178.19	1 YEARS
Thallium	24-HR	2012	0.00024	No Standard Identified	454126	4615088	178.19	12122824
		2013	**0.00034**		454085	4614965	176.36	13011024
		2014	0.00026		454082	4615014	175.94	14010924
		2015	0.00026		454126	4615088	178.19	15111724
		2016	0.00028		454126	4615088	178.19	16121624
	ANNUAL	2012	**0.00003**	No Standard Identified	454596	4615044	178.19	1 YEARS
		2013	**0.00003**		454596	4615044	178.19	1 YEARS
		2014	**0.00003**		454596	4615044	178.19	1 YEARS
		2015	**0.00003**		454596	4615044	178.19	1 YEARS
		2016	**0.00003**		454596	4615044	178.19	1 YEARS
Zinc	24-HR	2012	**3.56760**	No Standard Identified	454091	4614866	177.21	12110724
		2013	2.83587		454088	4614915	176.78	13011024
		2014	2.90149		454088	4614915	176.78	14010924
		2015	2.69618		454091	4614866	177.21	15110924
		2016	2.44070		454091	4614866	177.21	16031424
	ANNUAL	2012	**0.38076**	No Standard Identified	454091	4614866	177.21	1 YEARS
		2013	0.35366		454091	4614866	177.21	1 YEARS
		2014	0.31644		454091	4614866	177.21	1 YEARS
		2015	0.34893		454091	4614866	177.21	1 YEARS
		2016	0.36716		454091	4614866	177.21	1 YEARS

e. The maximum predicted 24 hour and annual impacts are highlighted

If you have any questions or need any additional information, please don't hesitate to contact me at 630-393-9000 or by e-mail at jpinion@hotmail.com.

Yours very truly,
RK & Associates

cc: Mr. Bob Bernoteit – IEPA Bureau of Air – Springfield, Illinois – (Hard Copies)
Mr. Jim Kallas – General III, LLC – Chicago, Illinois (via e-mail)

RK
& ASSOCIATES, INC.

Supplement No. 1 to the January 24, 2019 Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – 11600 South Burley - Chicago, Illinois
Construction Permit Application 19090021; Site ID No.: 031600SFX

February 12, 2020

Attachment A

Revised Ferrous Material Processing System Hourly Metal Emission Rates to Reflect Changes in Operating Schedule

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Table A-1a - Ferrous Material Processing - Metal Emissions in Active Hours
General III, LLC - Chicago, Illinois

Active Hours - Barge Loading 7 AM to 3 PM Monday through Saturday

Volume Source	Units	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13	RTO[b]
PM (Active)	**lb/hr**	**1.161000**	**0.140000**	**0.140000**	**0.012000**	**0.188100**	**0.208700**	**0.145800**	**0.024400**	**0.041100**	**0.241200**	**0.199600**	**0.199600**	**0.567300**	**4.700000**
Source of Metals Conc. Data[a]	**Sample No.**	**3**	**3**	**4**	**4**	**4**	**5**	**4**	**4**	**5**	**4**	**4**	**4**	**4**	**Nov 2019 Emission Test Data**
	Sample Name	**0.0000000**	**0.0000000**	**Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Non-Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Non-Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	
Lead	lb/hr	0.000610	0.000074	0.000592	0.000051	0.000796	0.000985	0.000617	0.000103	0.000194	0.001020	0.000844	0.000844	0.002400	1.383E-03
Manganese	lb/hr	0.000846	0.000102	0.000309	0.000027	0.000416	0.000367	0.000322	0.000054	0.000072	0.000533	0.000441	0.000441	0.001254	1.990E-03
Mercury	lb/hr	0.000003	0.000000	0.000003	0.000000	0.000004	0.000002	0.000003	0.000000	0.000000	0.000005	0.000004	0.000004	0.000011	4.464E-02
Nickel	lb/hr	0.000123	0.000015	0.000043	0.000004	0.000057	0.000065	0.000044	0.000007	0.000013	0.000073	0.000061	0.000061	0.000172	3.296E-03
Antimony	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	1.124E-03
Arsenic	lb/hr	0.000003	0.000000	0.000000	0.000000	0.000001	0.000001	0.000000	0.000000	0.000000	0.000001	0.000001	0.000001	0.000002	3.971E-04
Beryllium	lb/hr	0.000006	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	8.901E-05
Cadmium	lb/hr	0.000006	0.000001	0.000007	0.000001	0.000009	0.000007	0.000007	0.000001	0.000001	0.000011	0.000010	0.000010	0.000027	4.256E-04
Chromium [c]	lb/hr	0.000201	0.000024	0.000056	0.000005	0.000076	0.000089	0.000059	0.000010	0.000017	0.000097	0.000080	0.000080	0.000228	3.452E-03
Cobalt	lb/hr	0.000012	0.000001	0.000007	0.000001	0.000010	0.000012	0.000008	0.000001	0.000002	0.000013	0.000010	0.000010	0.000029	1.064E-04
Phosphorus	lb/hr	0.000313	0.000038	0.000117	0.000010	0.000157	0.000195	0.000121	0.000020	0.000038	0.000201	0.000166	0.000166	0.000473	1.215E-01
Selenium	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	6.047E-03
Zinc	lb/hr	0.003576	0.000431	0.005222	0.000448	0.007016	0.007096	0.005438	0.000910	0.001397	0.008997	0.007445	0.007445	0.021160	2.673E-02
Barium	lb/hr	0.000269	0.000032	0.000138	0.000012	0.000185	0.000143	0.000143	0.000024	0.000028	0.000237	0.000196	0.000196	0.000558	3.841E-03
Copper	lb/hr	0.000976	0.000118	0.000294	0.000025	0.000395	0.000344	0.000306	0.000051	0.000068	0.000507	0.000419	0.000419	0.001191	3.893E-03
Silver	lb/hr	0.000013	0.000002	0.000002	0.000000	0.000002	0.000003	0.000002	0.000000	0.000000	0.000003	0.000002	0.000002	0.000007	1.002E-03
Thallium	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	1.194E-04

Active Hours - Non-Barge Loading 3 PM to 7 PM Monday through Friday and 3 PM to 5 PM Saturday

Volume Source	Units	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10[d]	V-11[d]	V-12[d]	V-13[d]	RTO[b]
PM (Active)	**lb/hr**	**1.161000**	**0.140000**	**0.140000**	**0.012000**	**0.188100**	**0.208700**	**0.145800**	**0.024400**	**0.041100**	**0.421030**	**0.431854**	**0.431854**	**0.000000**	**4.700000**
Source of Metals Conc. Data[a]	**Sample No.**	**3**	**3**	**4**	**4**	**4**	**5**	**4**	**4**	**5**	**4**	**4**	**4**	**4**	**Nov 2019 Emission Test Data**
	Sample Name	**0.0000000**	**0.0000000**	**Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Non-Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Non-Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	**Ferrous Transfer**	
Lead	lb/hr	0.000610	0.000074	0.000592	0.000051	0.000796	0.000985	0.000617	0.000103	0.000194	0.001020	0.000844	0.000844	0.002400	1.383E-03
Manganese	lb/hr	0.000846	0.000102	0.000309	0.000027	0.000416	0.000367	0.000322	0.000054	0.000072	0.000533	0.000441	0.000441	0.001254	1.990E-03
Mercury	lb/hr	0.000003	0.000000	0.000003	0.000000	0.000004	0.000002	0.000003	0.000000	0.000000	0.000005	0.000004	0.000004	0.000011	4.464E-02
Nickel	lb/hr	0.000123	0.000015	0.000043	0.000004	0.000057	0.000065	0.000044	0.000007	0.000013	0.000073	0.000061	0.000061	0.000172	3.296E-03
Antimony	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	1.124E-03
Arsenic	lb/hr	0.000003	0.000000	0.000000	0.000000	0.000001	0.000001	0.000000	0.000000	0.000000	0.000001	0.000001	0.000001	0.000002	3.971E-04
Beryllium	lb/hr	0.000006	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	8.901E-05
Cadmium	lb/hr	0.000006	0.000001	0.000007	0.000001	0.000009	0.000007	0.000007	0.000001	0.000001	0.000011	0.000010	0.000010	0.000027	4.256E-04
Chromium [c]	lb/hr	0.000201	0.000024	0.000056	0.000005	0.000076	0.000089	0.000059	0.000010	0.000017	0.000097	0.000080	0.000080	0.000228	3.452E-03
Cobalt	lb/hr	0.000012	0.000001	0.000007	0.000001	0.000010	0.000012	0.000008	0.000001	0.000002	0.000013	0.000010	0.000010	0.000029	1.064E-04
Phosphorus	lb/hr	0.000313	0.000038	0.000117	0.000010	0.000157	0.000195	0.000121	0.000020	0.000038	0.000201	0.000166	0.000166	0.000473	1.215E-01
Selenium	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	6.047E-03
Zinc	lb/hr	0.003576	0.000431	0.005222	0.000448	0.007016	0.007096	0.005438	0.000910	0.001397	0.008997	0.007445	0.007445	0.021160	2.673E-02
Barium	lb/hr	0.000269	0.000032	0.000138	0.000012	0.000185	0.000143	0.000143	0.000024	0.000028	0.000237	0.000196	0.000196	0.000558	3.841E-03
Copper	lb/hr	0.000976	0.000118	0.000294	0.000025	0.000395	0.000344	0.000306	0.000051	0.000068	0.000507	0.000419	0.000419	0.001191	3.893E-03
Silver	lb/hr	0.000013	0.000002	0.000002	0.000000	0.000002	0.000003	0.000002	0.000000	0.000000	0.000003	0.000002	0.000002	0.000007	1.002E-03
Thallium	lb/hr	0.000001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000001	1.194E-04

a. Metal emissions from Volume Sources V-1 through V-13 calculated by multiplying total Volume Soure PM (lb/hr) by the metal concentrations from corresponding samples of material deposition at GII collected and analyzed in December 2019.

b. Metal emissions from the Shredder RTO calculated using the measured metal emission factors from November 2019 metals compliance testing of the RTO performed at GII multiplied by the maximum hourly shredder feed and a safety factor.

c. Chromium (metal) and compounds other than Chromium VI

d. Only values in blue text are changed from Barge Loading values.

Table A-1b - Ferrous Material Processing - Metal Emissions in Inactive Hours
General III, LLC - Chicago, Illinois

Inactive Hours - 7 PM to 7 AM Monday through Friday, 5 PM to 7AM Saturday, and All Day Sunday

Volume Source	Units	V-1	V-2	V-3	V-4	V-5	V-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13	RTOb
PM (Inactive)	lb/hr	0.079400	-	-	0.001200	-	0.037100	-	-	0.000800	-	0.052900	0.052900	-	-
Source of Metals Conc. Data[a]	Sample No.	3	3	4	4	4	5	4	4	5	4	4	4	4	Nov 2019 Emission Test Data
	Sample Name	0.0000000	0.0000000	Ferrous Transfer	Ferrous Transfer	Ferrous Transfer	Non-Ferrous Transfer	Ferrous Transfer	Ferrous Transfer	Non-Ferrous Transfer	Ferrous Transfer	Ferrous Transfer	Ferrous Transfer	Ferrous Transfer	
Lead	lb/hr	0.000042			0.000005		0.000175			0.000004		0.000224	0.000224		
Manganese	lb/hr	0.000058			0.000003		0.000065			0.000001		0.000117	0.000117		
Mercury	lb/hr	-			-		-			-		0.000001	0.000001		
Nickel	lb/hr	0.000008			-		0.000012			-		0.000016	0.000016		
Antimony	lb/hr	-			-		-			-		-	-		
Arsenic	lb/hr	-			-		-			-		-	-		
Beryllium	lb/hr	-			-		-			-		-	-		
Cadmium	lb/hr	-			-		0.000001			-		0.000003	0.000003		
Chromium [c]	lb/hr	0.000014			-		0.000016			-		0.000021	0.000021		
Cobalt	lb/hr	0.000001			-		0.000002			-		0.000003	0.000003		
Phosphorus	lb/hr	0.000021			0.000001		0.000035			0.000001		0.000044	0.000044		
Selenium	lb/hr	-			-		-			-		-	-		
Zinc	lb/hr	0.000245			0.000045		0.001261			0.000027		0.001973	0.001973		
Barium	lb/hr	0.000018			0.000001		0.000025			0.000001		0.000052	0.000052		
Copper	lb/hr	0.000067			0.000003		0.000061			0.000001		0.000111	0.000111		
Silver	lb/hr	0.000001			-		-			-		0.000001	0.000001		
Thallium	lb/hr	-			-		-			-		-	-		

a. Metal emissions from Volume Sources V-1 through V-13 calculated by multiplying total Volume Soure PM (lb/hr) by the metal concentrations from corresponding samples of material deposition at GII collected and analyzed in December 2019.

b. Shredder/RTO does not operate during inactive hours.

c. Chromium (metal) and compounds other than Chromium VI

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

Volume Source Grouping	Row No.	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	Barge Loading 7 AM to 3 PM Mon - Sat: Material Throughput Rates tph	Barge Loading: PM Emission Factors lb/ton	Barge Loading: Filterable PM Emissions lb/hr	Non-Barge Loading 3 PM to 7 PM Mon - Fri and 3 PM to 5 PM Saturdays (Changes only to V-10 thru V-13 (see blue text below).): Material Throughput Rates tph	Non-Barge Loading: PM Emission Factors lb/ton	Non-Barge Loading: Filterable PM Emissions lb/hr
V-1	55		Truck Dumping of Raw Feed	Unprepared	5.4 [a2]	Outside	N		0%	0%	Drop	300	0.00127 [c]	0.3797	300	0.00127 [c]	0.3797
V-1	56		Raw Feed from Ground after Truck Dumping	Unprepared	5.4 [a2]	Outside	N		0%	0%	Drop	300	0.00127 [c]	0.3797	300	0.00127 [c]	0.3797
V-1	59	Magnet/	Drop Raw Scrap to Infeed Conveyor	Unprepared	N [a4]	Outside	N		NA	0%	D	500	0.00020 [f]	0.1022	500	0.00020 [f]	0.1022
											Total Filterable PM Emissions			0.8616			0.8616
V-2	37	E-01	Drop Raw Scrap onto Shredder Feed Chute	Unprepared	Y [a4]	Outside	N		NA	0%	A	500	0.00014 [d]	0.0700	500	0.00014 [d]	0.0700
V-2	40	E-05	Shredder Under Mill Vibratory Conveyor	Shred	Y	Inside	N		NA	0%	A	500	0.00014 [d]	0.0700	500	0.00014 [d]	0.0700
V-2	79	E-02	Shredder Bottom Discharge	Shred	Y [0]	shredder emissions	0	-	0%	0%	A		Emissions captured and controlled by shredder emission control system			Emissions captured and controlled by shredder emission control system	
V-2	81	E-02	Shredder Chute	Unprepared	Y [0]	shredder emissions	0	-	0%	0%	A		Emissions captured and controlled by shredder emission control system			Emissions captured and controlled by shredder emission control system	
											Total Filterable PM Emissions			0.1400			0.1400
V-3	4	C-001	Shredded Material Transfer Conveyor	Shred	Y	Outside	N		NA	0%	A	500	0.00014 [d]	0.0700	500	0.00014 [d]	0.0700
V-3	5	C-002	Shredded Material Transfer Conveyor	Shred	Y	Outside	N		NA	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-3	6	C-002	Mat'l Not Removed by Poker Picker	Shred	Y	Outside	N		NA	0%	A	499	0.00014 [d]	0.0699	499	0.00014 [d]	0.0699
											Total Filterable PM Emissions			0.1400			0.1400
V-4	58	-	Poker Loadout	Pokers	N	Outside	N		0%	0%	D	1	0.00020 [f]	0.0002	1	0.00020 [f]	0.0002
V-4	62	E-06	Poker Picker Chute to Stockpile	Shred	1.5% [a1]	Outside	N		0%	0%	Drop	1	0.00761 [c]	0.0076	1	0.00761 [c]	0.0076
											Total Filterable PM Emissions			0.0078			0.0078

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

												Barge Loading 7 AM to 3 PM Mon - Sat			Non-Barge Loading 3 PM to 7 PM Mon - Fri and 3 PM to 5 PM Saturdays Changes only to V-10 thru V-13 (see blue text below).		
Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emission Factors lb/ton	Filterable PM Emissions lb/hr	Material Throughput Rates tph	PM Emission Factors lb/ton	Filterable PM Emissions lb/hr
V-5	7	C-003	Ferrous Transfer Conveyor	Residue	Y	Outside	N		NA	0%	A	130	0.00014 [d]	0.0182	130	0.00014 [d]	0.0182
V-5	8	C-003	Ferrous Transfer Conveyor	Ferrous	Y	Outside	N		NA	0%	A	369	0.00014 [d]	0.0517	369	0.00014 [d]	0.0517
V-5	31	C-032	ASR Transfer Conveyor	Residue	Y	Outside	N		NA	0%	A	4	0.00014 [d]	0.0006	4	0.00014 [d]	0.0006
V-5	32	C-033	Magnetic Material	Shred	Y	Outside	N		NA	0%	A	5	0.00014 [d]	0.0007	5	0.00014 [d]	0.0007
V-5	33	C-033	ASR Not Removed by Magnet E-12	Residue	Y	Outside	N		NA	0%	A	129	0.00014 [d]	0.0181	129	0.00014 [d]	0.0181
V-5	34	C-034	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA	0%	A	5	0.00014 [d]	0.0007	5	0.00014 [d]	0.0007
V-5	35	C-035	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA	0%	A	5	0.00014 [d]	0.0007	5	0.00014 [d]	0.0007
V-5	36	C-036	ASR Transfer Conveyor	Residue	Y	Outside	N		NA	0%	A	129	0.00014 [d]	0.0181	129	0.00014 [d]	0.0181
V-5	41	E-07	Magnet Discharge to Chute	Shred	Y	Outside	N		NA	0%	A	187	0.00014 [d]	0.0262	187	0.00014 [d]	0.0262
V-5	42	E-07	Magnet Discharge to Chute	Shred	Y	Outside	N		NA	0%	A	187	0.00014 [d]	0.0262	187	0.00014 [d]	0.0262
V-5	49	E-12	Ferrous Removed by Magnet	Ferrous	Y	Outside	N		NA	0%	A	5	0.00014 [d]	0.0007	5	0.00014 [d]	0.0007
V-5	53	E-7	ASR Not Removed by Magnet	Shred	Y [a3]	Outside	N		NA	0%	A	2	0.00014 [d]	0.0003	2	0.00014 [d]	0.0003
V-5	54	E-7	Ferrous Removed by Magnet E-7	Residue	Y	Outside	N		NA	0%	A	185	0.00014 [d]	0.0259	185	0.00014 [d]	0.0259
											Total Filterable PM Emissions			0.1881			0.1881
V-6	61	C-037	ASR Transfer Conveyor to Stockpile	Residue	10 [a3]	Outside	N		0%	0%	Drop	129	0.00053 [c]	0.0689	129	0.00053 [c]	0.0689

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

												Barge Loading 7 AM to 3 PM Mon - Sat			Non-Barge Loading 3 PM to 7 PM Mon - Fri and 3 PM to 5 PM Saturdays Changes only to V-10 thru V-13 (see blue text below).		
Volume Source Grouping	Row No.	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	Material Throughput Rates tph	PM Emission Factors lb/ton	Filterable PM Emissions lb/hr	Material Throughput Rates tph	PM Emission Factors lb/ton	Filterable PM Emissions lb/hr
V-7	9	C-006	Ferrous Transfer Conveyor	Shred	Y	Outside	Y	Z-Box Air Loop	100%	100%	A	183	0.00014 [d]	0.0000	183	0.00014 [d]	0.0000
V-7	10	C-007	Ferrous Transfer Conveyor	Shred	Y	Outside	Y	Z-Box Air Loop	100%	100%	A	183	0.00014 [d]	0.0000	183	0.00014 [d]	0.0000
V-7	21	C-022	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	55	0.00014 [d]	0.0077	55	0.00014 [d]	0.0077
V-7	22	C-023	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	55	0.00014 [d]	0.0077	55	0.00014 [d]	0.0077
V-7	23	C-024	Non-metallic transfer conveyor	Ferrous	Y	Outside	N		NA	0%	A	4	0.00014 [d]	0.0006	4	0.00014 [d]	0.0006
V-7	30	C-031	ASR Transfer Conveyor	Residue	Y	Outside	N		NA	0%	A	4	0.00014 [d]	0.0006	4	0.00014 [d]	0.0006
V-7	38	E-015	Z-Box Separator Cyclone	Ferrous	Y	Outside	N		NA	0%	A	2	0.00014 [d]	0.0003	2	0.00014 [d]	0.0003
V-7	39	E-016	Z-Box Separator Cyclone	Ferrous	Y	Outside	N		NA	0%	A	2	0.00014 [d]	0.0003	2	0.00014 [d]	0.0003
V-7	43	E-08	ASR Not Removed by Magnet	Shred	Y	Outside	N		NA	0%	A	2	0.00014 [d]	0.0003	2	0.00014 [d]	0.0003
V-7	44	E-08	Ferrous Removed by Magnet E-7	Residue	Y	Outside	N		NA	0%	A	185	0.00014 [d]	0.0259	185	0.00014 [d]	0.0259
V-7	45	E-10	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-7	46	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-7	47	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA	0%	A	55	0.00014 [d]	0.0077	55	0.00014 [d]	0.0077
V-7	48	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA	0%	A	55	0.00014 [d]	0.0077	55	0.00014 [d]	0.0077
V-7	64	SC-001	Supplemental Conveyor	Shred	Y	Outside	N		NA	0%	A	183	0.00014 [d]	0.0256	183	0.00014 [d]	0.0256
V-7	66	SC-002	Supplemental Conveyor	Shred	Y	Outside	N		NA	0%	A	183	0.00014 [d]	0.0256	183	0.00014 [d]	0.0256
V-7	70	C-004	Ferrous Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A		Emissions captured by inward air flow at inlet to Z-Box separator			Emissions captured by inward air flow at inlet to Z-Box separator	
V-7	72	C-005	Ferrous Transfer Conveyor	Shred	Y [0]	Outside	N	-	NA	0%	A		Emissions captured by inward air flow at inlet to Z-Box separator			Emissions captured by inward air flow at inlet to Z-Box separator	
												Total Filterable PM Emissions		0.1458			0.1458

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

Volume Source Grouping	Row No.	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	Barge Loading 7 AM to 3 PM Mon - Sat: Material Throughput Rates tph	Barge Loading: PM Emission Factors lb/ton	Barge Loading: Filterable PM Emissions lb/hr	Non-Barge Loading 3 PM to 7 PM Mon - Fri and 3 PM to 5 PM Saturdays (Changes only to V-10 thru V-13 (see blue text below).): Material Throughput Rates tph	Non-Barge Loading: PM Emission Factors lb/ton	Non-Barge Loading: Filterable PM Emissions lb/hr
V-8	24	C-025	Non-metallic not removed by magnet E-13	Ferrous	Y	Outside	N		NA	0%	A	2	0.00014 [d]	0.0003	2	0.00014 [d]	0.0003
V-8	25	C-025	material removed by first magnet to second magnet	Ferrous	Y [a2]	Outside	N		NA	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-8	26	C-026	Ferrous Transfer Conveyor	Ferrous	Y [a2]				0%	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-8	27	C-027	Ferrous Transfer Conveyor	Ferrous	Y [a2]	Outside	N		NA	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-8	28	C-028	Non-metallic Transfer Conveyor	Ferrous	Y	Outside	N		NA	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-8	29	C-029	Non-metallic Transfer Conveyor	Ferrous	Y				0%	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-8	50	E-13	Ferrous Removed by E-13	Ferrous	Y [a2]	Outside	N		NA	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-8	51	E-13	Ferrous Removed by E-13	Ferrous	Y	Outside	N		NA	0%	A	1	0.00014 [d]	0.0001	1	0.00014 [d]	0.0001
V-8	52	E-14	Mat'l Not removed by Separator	Ferrous	Y	Outside	N		NA	0%	A	0.25	0.00014 [d]	0.0000	0.25	0.00014 [d]	0.0000
V-8	60	C-030	Mat'l not Removed by Separator	Ferrous	1.5 [a1]	Outside	Y	Cover	0%	0%	Drop	2.25	0.00761 [c]	0.0171	2.25	0.00761 [c]	0.0171
V-8	63	E-14	Final Discharge from Mat'l Separator	Ferrous	1.5 [a1]	Outside	N		0%	0%	Drop	0.75	0.00761 [c]	0.0057	0.75	0.00761 [c]	0.0057
V-8	65	SC-009	Supplemental Conveyor	Ferrous	Y	Outside	N		NA	0%	A	2	0.00014 [d]	0.0003	2	0.00014 [d]	0.0003
V-8	67	SC-010	Supplemental Conveyor	Ferrous	Y	Outside	N		NA	0%	A	2	0.00014 [d]	0.0003	2	0.00014 [d]	0.0003
											Total Filterable PM Emissions			**0.0244**			**0.0244**
V-9	57	-	Non-metallic Loadout	Non-metallic	N	Outside	N		0%	0%	D	187	0.00020 [f]	**0.0382**	187	0.00020 [f]	**0.0382**

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

Volume Source Grouping	Row No.	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	Barge Loading 7 AM to 3 PM Mon - Sat: Material Throughput Rates tph	PM Emission Factors lb/ton	Filterable PM Emissions lb/hr	Non-Barge Loading 3 PM to 7 PM Mon - Fri and 3 PM to 5 PM Saturdays (Changes only to V-10 thru V-13 (see blue text below).): Material Throughput Rates tph	PM Emission Factors lb/ton	Filterable PM Emissions lb/hr
V-10	11	C-008	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	56	0.00014 [d]	0.0078	56	0.00014 [d]	0.0078
V-10	12	C-009	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-10	13	C-010	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-10	14	C-011	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	55	0.00014 [d]	0.0077	55	0.00014 [d]	0.0077
V-10	15	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	56	0.00014 [d]	0.0078	56	0.00014 [d]	0.0078
V-10	16	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-10	17	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-10	18	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	55	0.00014 [d]	0.0077	55	0.00014 [d]	0.0077
V-10	19	C-016	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	367	0.00014 [d]	0.0514	367	0.00014 [d]	0.0514
V-10	20	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	367	0.00014 [d]	0.0514	367	0.00014 [d]	0.0514
V-10	68	SC-005	Supplemental Conveyor	Shred	Y	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-10	69	SC-008	Supplemental Conveyor	Shred	Y	Outside	N		NA	0%	A	128	0.00014 [d]	0.0179	128	0.00014 [d]	0.0179
V-10	71	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A		No material to discharged to conveyor during barge loading.		184	0.00014 [d]	0.0257
V-10	73	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A		No material to discharged to conveyor during barge loading.		184	0.00014 [d]	0.0257
V-10	74	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A		No material to discharged to conveyor during barge loading.		184	0.00014 [d]	0.0257
V-10	75	C-019	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A		No material to discharged to conveyor during barge loading.		184	0.00014 [d]	0.0257
V-10	76	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A		No material to discharged to conveyor during barge loading.		184	0.00014 [d]	0.0257
V-10	77	C-017	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A		No material to discharged to conveyor during barge loading.		184	0.00014 [d]	0.0257
V-10	78	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A		No material to discharged to conveyor during barge loading.		184	0.00014 [d]	0.0257
											Total Filterable PM Emissions			0.2412			0.4210

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

Volume Source Grouping	Row No.	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	Barge Loading 7 AM to 3 PM Mon - Sat: Material Throughput Rates tph	Barge Loading: PM Emission Factors lb/ton	Barge Loading: Filterable PM Emissions lb/hr	Non-Barge Loading 3 PM to 7 PM Mon - Fri and 3 PM to 5 PM Saturdays (Changes only to V-10 thru V-13 (see blue text below).): Material Throughput Rates tph	Non-Barge Loading: PM Emission Factors lb/ton	Non-Barge Loading: Filterable PM Emissions lb/hr
V-11	82	C-018	Ferrous Transfer Conveyor to stockpile	Shred	5.4% [a2]	Outside	N	-	NA	0%	Drop		No material to discharged to stockpile during barge loading.		184	0.00127	0.2323
V-12	80	C-21	Ferrous Transfer Conveyor to stockpile	Shred	5.4% [a2]	Outside	N	-	NA	0%	Drop		No material to discharged to stockpile during barge loading.		184	0.00127	0.2323
V-13	1	Barge 1	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	367	0.00014 [d]	0.0514	No material routed to barge during non-barge loading hours.		
V-13	2	Barge 2	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA	0%	A	367	0.00014 [d]	0.0514	No material routed to barge during non-barge loading hours.		
V-13	3	Barge 3	Ferrous Transfer Conveyor to barge (stockpile)	Shred	5.4% [a2]	Outside	N		0%	0%	Drop	367	0.00127 [c]	0.4645	No material routed to barge during non-barge loading hours.		
											Total Filterable PM Emissions			0.5673			0.0000

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% moisture.

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 calculations conservatively assume dust collector emission are vented to the atmosphere.

h Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

Table A-3 Ferrous Plant Stockpile - Particulate Emissions
General III, LLC - Chicago, Illinois

Volume Source Grouping	Stock Pile	Stock Pile Area Acres	Control Factor[b]	Inactive Emissions[a,d] PM lb/hr	Active Emissions[a,d] PM lb/hr
V-1	Raw Material Truck Dumping (Drop 1)	0.3630	1.00	0.0529	0.1996
V-1	Raw Material Movement from Truck Dumping Area to Stockpile (Drop 2)	0.1815	1.00	0.0265	0.0998
			Total	0.0794	0.2994
V-4	Poker North	0.0115	0.33	0.0006	0.0021
V-4	Poker South	0.0115	0.33	0.0006	0.0021
			Total	0.0012	0.0042
V-6	ASR	0.2541	1.00	0.0371	0.1398
V-9	Fluff (Bin)	0.0161	0.33	0.0008	0.0029
V-11	Ferrous North	0.3630	1.00	0.0529	0.1996
V-12	Ferrous South	0.3630	1.00	0.0529	0.1996

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

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.

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.

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
Active Day PM Emission Factor =	13.20	lb-PM/acre-day

Table A-4 - Ferrous Material Processing - PM Emission Summary
General III, LLC - Chicago, Illinois

Barge Loading Hours[a,b]

Volume Source	Filterable PM Emissions: Material Handling Emissions During Barge Loading Hours, Active lb/hr	Material Handling Emissions During Barge Loading Hours, Inactive lb/hr	Stockpile, Active lb/hr	Stockpile, Inactive lb/hr	Total, Active lb/hr	Total, Inactive lb/hr
V-1	0.8616		0.2994	0.0794	1.1610	0.0794
V-2	0.1400				0.1400	
V-3	0.1400				0.1400	
V-4	0.0078		0.0042	0.0012	0.0120	0.0012
V-5	0.1881				0.1881	
V-6	0.0689		0.1398	0.0371	0.2087	0.0371
V-7	0.1458				0.1458	
V-8	0.0244				0.0244	
V-9	0.0382		0.0029	0.0008	0.0411	0.0008
V-10	0.2412				0.2412	
V-11	0.0000		0.1996	0.0529	0.1996	0.0529
V-12	0.0000		0.1996	0.0529	0.1996	0.0529
V-13	0.5673				0.5673	

a. Barge Loading Hours - 7 AM to 3 PM Monday through Saturday.

b. Inactive Hours - 7 PM to 7 AM Monday through Friday, 5 PM to 7AM Saturday, and All Day Sunday.

Non-Barge Loading Hours[a,b]

Volume Source	Filterable PM Emissions: Material Handling Emissions During Non Barge Loading Hours, Active lb/hr	Material Handling Emissions During Non Barge Loading Hours, Inactive lb/hr	Stockpile, Active lb/hr	Stockpile, Inactive lb/hr	Total, Active lb/hr	Total, Inactive lb/hr
V-1	0.8616		0.2994	0.0794	1.1610	0.0794
V-2	0.1400				0.1400	
V-3	0.1400				0.1400	
V-4	0.0078		0.0042	0.0012	0.0120	0.0012
V-5	0.1881				0.1881	
V-6	0.0689		0.1398	0.0371	0.2087	0.0371
V-7	0.1458				0.1458	
V-8	0.0244				0.0244	
V-9	0.0382		0.0029	0.0008	0.0411	0.0008
V-10	0.4210				0.4210	
V-11	0.2323		0.1996	0.0529	0.4319	0.0529
V-12	0.2323		0.1996	0.0529	0.4319	0.0529
V-13	0.0000				0.0000	

a. Non-Barge Loading Hours - 3 PM to 7 PM Monday through Friday and 3 PM to 5 PM Saturday.

b. Inactive Hours - 7 PM to 7 AM Monday through Friday, 5 PM to 7AM Saturday, and All Day Sunday.

Supplement No. 1 to the January 24, 2019
Air Dispersion Modeling Report for
Assessment of Metal Emission Impacts

General III, LLC – 11600 South Burley - Chicago, Illinois
Construction Permit Application 19090021; Site ID No.: 031600SFX

February 12, 2020

Attachment B

Non-Ferrous Material Processing System
Hourly Metal Emission Rates Tables

The hourly emission rates in these tables have not changed from the January 24, 2020 modeling report. Only the titles of the tables have been changed to identify the operating schedule

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Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Active Hours 5 AM through 11 PM Monday through Saturday.

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-1	113	C-001	Conveyor	Residue	Y	Outside	Y	N	NA		0%	70	0.000140 [d]	0.0098
VN-1	114	C-002	Conveyor	Residue	N	Outside	Y	N	NA		0%	68	0.003000 [0]	0.2037
VN-1	115	C-002	Conveyor	Ferrous	N	Outside	Y	N	NA		0%	2	0.003000 [0]	0.0063
VN-1	116	C-003	Conveyor	Residue	N	Outside	Y	N	NA		0%	67.90	0.003000 [0]	0.2037
VN-1	117	C-004	Conveyor	Residue	N	Outside	Y	N	NA		0%	60.90	0.003000 [0]	0.1827
VN-1	118	C-005	Conveyor	Residue	N	Outside	Y	N	NA		0%	30.45	0.003000 [0]	0.0914
VN-1	119	C-006	Conveyor	Residue	N	Outside		N	NA		0%	30.45	0.003000 [0]	0.0914
VN-1	122	C-009	Conveyor	Residue	N	Outside		N	NA		0%	9.14	0.003000 [0]	0.0274
VN-1	123	C-010	Conveyor	Residue	N	Outside		N	NA		0%	9.14	0.003000 [0]	0.0274
VN-1	124	C-011	Conveyor	Residue	N	Outside	Y	N	NA		0%	8.40	0.003000 [0]	0.0252
VN-1	129	C-016	Conveyor	Residue	N	Outside	Y	N	NA		0%	2.7	0.003000 [0]	0.0081
VN-1	174	E-01	Vibratory Batch Feeder	Residue	Y	Outside		N	NA		0%	70	0.000140 [d]	0.0098
VN-1	175	E-03	Screener	Residue	Y	Outside		N	NA		0%	60.90	0.002200 [e]	0.1340
VN-1	176	E-03	Screener	Residue	Y	Outside		N	NA		0%	6.80	0.002200 [e]	0.0150
VN-1	177	E-03	Screener	Residue	Y	Outside		N	NA		0%	2.70	0.002200 [e]	0.0059
VN-1	178	E-04	Screener	Residue	Y	Outside		N	NA		0%	15.75	0.002200 [e]	0.0347
VN-1	179	E-04	Screener	Residue	Y	Outside		N	NA		0%	9.14	0.002200 [e]	0.0201
VN-1	180	E-04	Screener	Residue	Y	Outside		N	NA		0%	4.20	0.002200 [e]	0.0092
VN-1	190	E-11	Screener	Residue	N	Outside		N	NA		0%	15.75	0.025000 [d]	0.3938
VN-1	191	E-11	Screener	Residue	N	Outside		N	NA		0%	9.14	0.025000 [d]	0.2285
VN-1	192	E-11	Screener	Residue	N	Outside		N	NA		0%	4.20	0.025000 [d]	0.1050
VN-1	244	End Loader	Drop ASR into feed hopper	Residue into Hopper	N	Outside		Y	Cover		0%	70.00	0.000204 [d]	0.0143
VN-1	246	SC-001	Supplemental Conveyor	Residue							0%	15.75	0.003000	0.0473
VN-1	247	SC-002	Supplemental Conveyor	Residue							0%	16	0.003000	0.0473
												Total Filterable PM Emissions		**1.9420**

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Active Hours 5 AM through 11 PM Monday through Saturday.

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	120	C-007	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	15.75	0.003000 [0]	0.0095
VN-2	121	C-008	Conveyor	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	15.75	0.003000 [0]	0.0095
VN-2	125	C-012	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	9.14	0.003000 [0]	0.0055
VN-2	126	C-013	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	9.14	0.003000 [0]	0.0055
VN-2	127	C-014	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	8.40	0.003000 [0]	0.0050
VN-2	128	C-015	Conveyor	Ferrous	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	.25	0.003000 [0]	0.0002
VN-2	130	C-017	Conveyor	Ferrous	N	Outside		N	NA		0%	1.75	0.003000 [0]	0.0053
VN-2	131	C-018	Conveyor	Ferrous	N	Outside	Y	N	NA		0%	1.75	0.003000 [0]	0.0053
VN-2	132	C-019	Conveyor	Lights	N	Outside	Y	N	NA		0%	0.25	0.003000 [0]	0.0008
VN-2	133	C-020	Conveyor	Residue	N	Outside	Y	N	NA		0%	11.12	0.003000 [0]	0.0334
VN-2	134	C-021	Conveyor	Residue	N	Outside	Y	N	NA		0%	11.12	0.003000 [0]	0.0334
VN-2	135	C-022	Conveyor to Wind Sifter	Mixed Non-Ferrous	N	Outside	Y	Y	Wind Sifter	100%	100%	0.80	0.003000 [0]	0.0024
VN-2	136	C-023	Conveyor to Wind Sifter	Residue	N	Outside	Y	Y	Wind Sifter	100%	100%	7.29	0.000140 [0]	0.0010
VN-2	137	C-024	Conveyor to Wind Sifter	Residue	N	Outside	Y	Y	Wind Sifter	100%	100%	7.29	0.000140 [0]	0.0010
VN-2	139	C-035	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	2.7	0.003000 [0]	0.0016
VN-2	147	C-044	Conveyor	Residue	N	Outside	Y	N	NA		0%	24.87	0.003000 [0]	0.0746
VN-2	181	E-05	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	14.87	0.003000	0.0089
VN-2	182	E-05	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.87	0.003000	0.0059
VN-2	183	E-05	Magnetic Separation	Ferrous	N	Inside		N	NA		0%	0.88	0.003000	0.0026
VN-2	184	E-05	Magnetic Separation	Ferrous	N	Inside		N	NA		0%	5.00	0.003000	0.0150
VN-2	185	E-06	Eddy Current Separator	Residue	N	Outside		N	NA		0%	6.12	0.003000 [d]	0.0184
VN-2	186	E-06	Eddy Current Separator	Mids	N	Outside		N	NA		0%	3.50	0.003000 [d]	0.0105
VN-2	187	E-06	Eddy Current Separator	Zorba	N	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-2	188	E-07	Wind Sifter	Lights	N	Outside		Y	Cover		0%	0.25	0.002200 [d]	0.0006
VN-2	189	E-07	Wind Sifter	Heavies	1.5 [a]	Outside		Y	Wind Sifter	90%	100%	1.50	0.007606 [c]	0.0103
VN-2	193	E-12	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	14.87	0.003000	0.0089

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Active Hours 5 AM through 11 PM Monday through Saturday.

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	194	E-12	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.87	0.003000	0.0059
VN-2	195	E-12	Magnetic Separation	Ferrous	N	Inside		N	NA		0%	0.88	0.003000	0.0026
VN-2	196	E-12	Magnetic Separation	Ferrous	N	Inside		N	NA		0%	5.00	0.003000	0.0150
VN-2	197	E-12	Magnetic Separation	Zorba	N	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-2	198	E-13	Eddy Current Separator	Residue	N	Outside		N	NA		0%	6.12	0.003000 [d]	0.0184
VN-2	199	E-13	Eddy Current Separator	Mids	N	Outside		N	NA		0%	3.50	0.003000 [d]	0.0105
VN-2	200	E-14	Wind Sifter	Lights	N	Outside		Y	Cover		0%	0.20	0.002200 [d]	0.0004
VN-2	201	E-14	Wind Sifter	Heavies	1.5 [a]	Outside		Y	Wind Sifter	100%	100%	0.60	0.007606 [c]	0.0046
VN-2	202	E-15	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	9.09	0.003000	0.0055
VN-2	203	E-15	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.29	0.003000	0.0050
VN-2	204	E-15	Magnetic Separation	Ferrous	N	Outside		N	NA		0%	0.05	0.003000 [d]	0.0002
VN-2	205	E-15	Magnetic Separation	Mixed Non-Ferrous	N	Outside		N	NA		0%	0.40	0.003000 [d]	0.0012
VN-2	206	E-16	Eddy Current Separator	Residue	N	Outside		N	NA		0%	7.29	0.003000 [d]	0.0219
VN-2	207	E-16	Eddy Current Separator	Zorba	N	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-2	208	E-17	Wind Sifter	Lights	N	Outside		Y	Cover		0%	1.09	0.002200 [d]	0.0024
VN-2	209	E-17	Wind Sifter	Residue	N	Outside		Y	Wind Sifter	100%	100%	6.20	0.002200 [d]	0.0136
VN-2	210	E-21	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.29	0.003000	0.0050
VN-2	211	E-21	Magnetic Separation	Ferrous	N	Outside		N	NA		0%	0.05	0.003000 [d]	0.0002
VN-2	212	E-21	Magnetic Separation	Mixed Non-Ferrous	N	Outside		N	NA		0%	0	0.003000 [d]	0.0012
VN-2	213	E-22	Eddy Current Separator	Zorba	N	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-2	214	E-22	Eddy Current Separator	Residue	N	Outside		N	NA		0%	7.29	0.003000 [d]	0.0219
VN-2	215	E-23	Wind Sifter	Lights	N	Outside		Y	Cover		0%	1	0.002200 [d]	0.0024
VN-2	216	E-23	Wind Sifter	Residue	N	Outside		Y	Wind Sifter	100%	100%	6.20	0.002200 [d]	0.0136
VN-2	217	E-27	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.15	0.003000	0.0049
VN-2	219	E-28	Eddy Current Separator	Residue	N	Outside		N	NA		0%	7.15	0.003000 [d]	0.0215
VN-2	221	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	6.55	0.003000	0.0039

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Active Hours 5 AM through 11 PM Monday through Saturday.

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-2	222	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	6.55	0.003000	0.0039
VN-2	224	E-35	Eddy Current Separator	Residue	N	Outside		N	NA		0%	5.05	0.003000 [d]	0.0152
VN-2	231	E-43	Vibratory Feeder	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	2.70	0.003000	0.0016
VN-2	232	E-44	Eddy Current Separator drop to stockpile	Zorba	1.5 [a]	Inside		N	NA		0%	0.50	0.007600	0.0038
VN-2	240	E-49	Transfer Conveyor	Residue onto ECS	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	8.15	0.003000	0.0049
VN-2	242	ECS	Eddy Current Separator drop to container	Zorba	1.5 [a]	Inside		N	NA		0%	0.04	0.007600	0.0003
VN-2	243	ECS	Eddy Current Separator drop to container	Zorba	1.5 [a]	Inside		N	NA		0%	0.18	0.007600	0.0014
VN-2	248	SC-003	Supplemental Conveyor	Residue							0%	7.34	0.003000	0.0220
VN-2	249	SC-004	Supplemental Conveyor	Residue							0%	7.34	0.003000	0.0220
												Total Filterable PM Emissions		**0.5395**

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Active Hours 5 AM through 11 PM Monday through Saturday.

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-3	138	C-034	Conveyor	Material Separator	N	Outside	Y	N	NA		0%	0.55	0.003000 [0]	0.0017
VN-3	140	C-039	Conveyor	Mixed Non-Ferrous	N	Outside		N	NA		0%	0.80	0.003000 [0]	0.0024
VN-3	141	C-040	Conveyor	Residue	N	Outside		N	NA		0%	2.80	0.003000 [0]	0.0084
VN-3	142	C-040	Conveyor	Mids	N	Outside		N	NA		0%	7	0.003000 [0]	0.0210
VN-3	143	C-040	Conveyor	Residue	N	Outside		N	NA		0%	4.20	0.003000 [0]	0.0126
VN-3	144	C-041	Conveyor	Zorba	N	Outside		N	NA		0%	0.50	0.003000 [0]	0.0015
VN-3	145	C-042	Conveyor	Zorba	N	Outside		N	NA		0%	1.50	0.003000 [0]	0.0045
VN-3	146	C-043	Conveyor	Zorba	N	Outside		N	NA		0%	3	0.003000 [0]	0.0090
VN-3	148	C-044	Conveyor	Lights Zuric	N	Outside	Y	N	NA		0%	0.30	0.003000 [0]	0.0009
VN-3	149	C-045	Conveyor	Residue	N	Outside	Y	N	NA		0%	24.87	0.003000 [0]	0.0746
VN-3	150	C-047	Conveyor	To SSI	N	Outside		N	NA		0%	0.55	0.003000 [0]	0.0017
VN-3	151	C-048	Conveyor	Out of SSI	N	Outside		N	NA		0%	0.55	0.003000 [0]	0.0017
VN-3	152	C-050	Conveyor	Residue	N	Outside	Y	N	NA		0%	25.07	0.003000 [0]	0.0752
VN-3	153	C-052	Conveyor	Residue	N	Outside		N	NA		0%	2	0.003000 [0]	0.0068
VN-3	154	C-055	Conveyor	Wire	N	Outside	Y	N	NA		0%	1.00	0.003000 [0]	0.0030
VN-3	155	C-058	Conveyor	Zuric drops	N	Outside	Y	N	NA		0%	0.30	0.003000 [0]	0.0009
VN-3	156	C-060	Conveyor	Zone	N	Outside	Y	N	NA		0%	1.20	0.003000 [0]	0.0036
VN-3	162	C-064	Conveyor drop to container	Zorba	1.5 [a]	Outside		N	NA		0%	0.70	0.007606 [c]	0.0053
VN-3	163	C-065	Conveyor	Residue	N	Outside	Y	N	NA		0%	2.2	0.003000 [d]	0.0066
VN-3	164	C-066	Conveyor	Residue	N	Outside	Y	N	NA		0%	54.39	0.003000 [d]	0.1632
VN-3	165	C-067	Conveyor	Residue	N	Outside	Y	N	NA		0%	54.39	0.003000 [d]	0.1632
VN-3	168	C-071	Conveyor	Lights	N	Outside	Y	Y	Cover		0%	0.03	0.000140 [d]	
VN-3	169	C-072	Conveyor	Lights	N	Outside	Y	Y	Cover		0%	0	0.000140 [d]	
VN-3	170	DC-01 Cyc	DC-01 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover		0%	0.01	0.000140 [d]	
VN-3	171	DC-02 Cyc	DC-02 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover		0%	0.01	0.000140 [d]	
VN-3	172	DC-03 Cyc	DC-03 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover		0%	0.01	0.000140 [d]	

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Active Hours 5 AM through 11 PM Monday through Saturday.

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-3	173	DC-04 Cyc	DC-04 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover		0%	0.01	0.000140 [d]	
VN-3	218	E-27	Magnetic Separation	Ferrous	N	Outside		N	NA		0%	0.25	0.003000 [d]	0.0008
VN-3	220	E-28	Eddy Current Separator	Zorba	N	Outside		N	NA		0%	1.00	0.003000 [d]	0.0030
VN-3	223	E-35	Eddy Current Separator	Zorba	N	Outside		N	NA		0%	1.50	0.003000 [d]	0.0045
VN-3	225	E-40	Separator	Lights Zuric	N	Outside		N	NA		0%	0.24	0.025000 [d]	0.0060
VN-3	226	E-40	Separator	Heavies Zuric	N	Outside		N	NA		0%	0.96	0.025000 [d]	0.0240
VN-3	227	E-40	Separator	Lights Zuric	N	Outside		N	NA		0%	0.35	0.025000 [d]	0.0088
VN-3	228	E-41	Separator	Lights	N	Outside		N	NA		0%	0.95	0.025000 [d]	0.0238
VN-3	229	E-41	Separator drop to container	Heavies	1.5 [a]	Outside		N	NA		0%	0.05	0.007606 [c]	0.0004
VN-3	230	E-42	Low speed shredder for size reduction	Out of SSI	N	Outside		N	NA		0%	0.55	0.003000 [d]	0.0017
VN-3	234	E-46	Separator	Heavier Zorba	N	Outside		N	NA		0%	1.25	0.02500 [d]	0.0313
VN-3	235	E-46	Separator	Lights Zorba	N	Outside		N	NA		0%	0.25	0.02500 [d]	0.0063
VN-3	236	E-47	Separator	Zorba	N	Outside		N	NA		0%	2.70	0.02500 [d]	0.0675
VN-3	237	E-47	Separator	Heavies Zorba	N	Outside		N	NA		0%	0.85	0.02500 [d]	0.0213
VN-3	238	E-47	Separator	Lights Zorba	N	Outside		N	NA		0%	0.15	0.02500 [d]	0.0038
VN-3	239	E-47	Separator	Light Zorba	N	Outside		N	NA		0%	0.30	0.02500 [d]	0.0075
VN-3	241	E-50	Air Vibe	To Infeed SSI	N	Outside		Y	Cover		0%	0.55	0.00014 [d]	0.0001
VN-3	250	SC-005	Supplemental Conveyor	Residue							0%	54.39	0.00300	0.1632
VN-3	251	SC-006	Supplemental Conveyor	Residue							0%	54.39	0.00300	0.1632
												Total Filterable PM Emissions		1.1050

Table B-1 - Non-Ferrous Material Processing - Particulate Emissions
General III, LLC - Chicago, Illinois

Active Hours 5 AM through 11 PM Monday through Saturday.

Grouping	Row No.	Equipment Generating Emissions ID#	Description	Material Conveyed	Moisture > 1.5% Y/N	Transfer Point Location (Inside / Outside)	Conveyor Covered Y/N	Transfer Point Controlled (Y/N)	Type of Transfer Point Control	Dust Pickup Capture Eff. (%)	Dust Control Eff. (%)	Material Throughput Rates tph	PM Emissions Factor lb/ton	Filterable PM Emissions lb/hr
VN-4	159	C-062	Conveyor	Heavier Zorba	N	Outside		N	NA		0%	1.25	0.003000 [d]	0.0038
VN-4	160	C-063	Conveyor drop to stockpile	Zorba	1.5 [a]	Outside		N	NA		0%	2.70	0.007606 [c]	0.0205
VN-4	161	C-063	Conveyor drop to stockpile	Heavies Zorba	1.5% [a]	Outside		N	NA		0%	0.85	0.00761 [c]	0.0065
VN-4	233	E-44	Eddy Current Separator	Residue	N	Outside		N	NA		0%	2.2	0.00300 [d]	0.0066
												Total Filterable PM Emissions		**0.0374**
VN-5	157	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA		0%	0.96	0.00761 [c]	0.0073
VN-5	158	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA		0%	0.30	0.00761 [c]	0.0023
VN-5	167	C-070	Conveyor drop to stockpile	Waste to Stockpile	1.5% [a]	Outside		N	NA		0%	0.55	0.00761 [c]	0.0042
												Total		**0.0138**
VN-6	166	C-068	Conveyor drop to stockpile	Residue	1.5 [a]	Outside	Y	N	NA		0%	54.39	0.007606 [c]	0.4137
VN-6	245	End Loader	load waste to truck	Waste	N	Outside		N	NA		0%	54.39	0.00020	0.0111
												Total		**0.4248**

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

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 the atmosphere through Dust Collection DC-01. Emissions are estimated by 12,000

g Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

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Table B-2 - Non-Ferrous Plant Stockpile - Particulate Emissions
General III, LLC - Chicago, Illinois

Volume Source Grouping	Stock Pile	Stock Pile Area Acres	Control Factor[b]	Inactive Emissions[a,d] PM lb/hr	Active Emissions[a,d] PM lb/hr
VN-1	FE from E-02	0.0047	0.33	0.0002	0.0009
VN-4	5" + Zorba	0.0189	0.33	0.0009	0.0034
VN-4	2-1/2" - 5" Zorba	0.0189	0.33	0.0009	0.0034
VN-4	5/8" - 2-1/2" Zorba	0.0189	0.33	0.0009	0.0034
			Total	0.0027	0.0102
VN-5	Tailings	0.0195	0.33	0.0009	0.0035
VN-5	Open	0.0195	0.33	0.0009	0.0035
VN-5	Wire	0.0195	0.33	0.0009	0.0035
VN-5	Wire Rich Solids	0.0195	0.33	0.0009	0.0035
VN-5	Zurick	0.0195	0.33	0.0009	0.0035
			Total	0.0045	0.0175
VN-6	Waste	0.0868	0.33	0.0042	0.0158

a. Stockpile emissions calculation from TCEQ for crushed stone downloaded August 2019.
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/emiss-calc-rock1.xlsx

b. Control Factor of 0.1 (90% control) for partial enclosure consisting of walls on three sides of bin. Control Factor of 1.0 for no control.

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.

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
Active Day PM Emission Factor =	13.20	lb-PM/acre-day

Table B-3 - Non-Ferrous Material Processing - PM Emission Summary
General III, LLC - Chicago, Illinois

Sources	PM Emissions					
	Material Handling		Stockpile		Totals	
	Active[a] lb/hr	Inactive[b] lb/hr	Active[a] lb/hr	Inactive[b] lb/hr	Active[a] lb/hr	Inactive[b] lb/hr
VN-1	1.9420	1.9420	0.0009	0.0002	1.9429	1.9422
VN-2	0.5395	0.5395			0.5395	0.5395
VN-3	1.1050	1.1050			1.1050	1.1050
VN-4	0.0374	0.0374	0.0102	0.0027	0.0476	0.0401
VN-5	0.0138	0.0138	0.0175	0.0045	0.0313	0.0183
VN-6	0.4248	0.4248	0.0158	0.0042	0.4406	0.4290

a. Active hours 5 AM to 11 PM Monday through Saturday.

b. Inactive hours 11 PM to 5 AM Monday through Saturday and all day Sunday.

Table B-4a - Non-Ferrous Material Processing - Metal Emissions in Active Hours
General III, LLC - Chicago, Illinois

5 AM to 11 PM Monday through Saturday

Volume Source	Units	VN-1	VN-2	VN-3	VN-4	VN-5	VN-6	DC-1[b]
PM (Active)	lb/hr	1.942900	0.539528	1.105000	0.047600	0.031300	0.440600	0.514300
Source of Metals Conc. Data[a]	Sample No.	5	5	5	5	5	5	5
	Sample Name	0.0000000	Non-Ferrous Transfer	Non-Ferrous Transfer	Non-Ferrous Transfer	Non-Ferrous Transfer	Non-Ferrous Transfer	Non-Ferrous Transfer
Lead	lb/hr	0.009170	0.002547	0.005216	0.000225	0.000148	0.002080	0.002427
Manganese	lb/hr	0.003420	0.000950	0.001945	0.000084	0.000055	0.000775	0.000905
Mercury	lb/hr	0.000018	0.000005	0.000010	0.000000	0.000000	0.000004	0.000005
Nickel	lb/hr	0.000604	0.000168	0.000344	0.000015	0.000010	0.000137	0.000160
Antimony	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001
Arsenic	lb/hr	0.000009	0.000002	0.000005	0.000000	0.000000	0.000002	0.000002
Beryllium	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001
Cadmium	lb/hr	0.000067	0.000019	0.000038	0.000002	0.000001	0.000015	0.000018
Chromium[c]	lb/hr	0.000826	0.000229	0.000470	0.000020	0.000013	0.000187	0.000219
Cobalt	lb/hr	0.000108	0.000030	0.000062	0.000003	0.000002	0.000025	0.000029
Phosphorus	lb/hr	0.001815	0.000504	0.001032	0.000044	0.000029	0.000412	0.000480
Selenium	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001
Zinc	lb/hr	0.066059	0.018344	0.037570	0.001618	0.001064	0.014980	0.017486
Barium	lb/hr	0.001329	0.000369	0.000756	0.000033	0.000021	0.000301	0.000352
Copper	lb/hr	0.003206	0.000890	0.001823	0.000079	0.000052	0.000727	0.000849
Silver	lb/hr	0.000024	0.000007	0.000013	0.000001	0.000000	0.000005	0.000006
Thallium	lb/hr	0.000002	0.000001	0.000001	0.000000	0.000000	0.000001	0.000001

a. Metal emissions from Volume Sources V-1 through V-13 calculated by multiplying total Volume Source PM (lb/hr) by the metal concentrations from corresponding samples of material deposition at GII collected and analyzed in December 2019.

b. Metal emissions from DC-1 are calculated by multiplying the estimated dust collector PM emission rate (lb/hr) by the metal concentrations from corresponding samples of material deposition at GII collected and analyzed in December 2019.

c. Chromium (metal) and compounds other than Chromium VI

Table B-4b - Non-Ferrous Material Processing - Metal Emissions in Inactive Hours
General III, LLC - Chicago, Illinois

11 PM to 5 AM Monday through Saturday and All Day Sunday

Volume Source	Units	VN-1	VN-2	VN-3	VN-4	VN-5	VN-6	DC-1[b]
PM (Inactive)	**lb/hr**	**1.942200**	**0.539528**	**1.105000**	**0.040100**	**0.018300**	**0.429000**	**0.514300**
Source of Metals Conc. Data[a]	**Sample No.**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
	Sample Name	**0.0000000**	**0.0000000**	**0.0000000**	**0.0000000**	**0.0000000**	**0.0000000**	**0.0000000**
Lead	lb/hr	0.009167	0.002547	0.005216	0.000189	0.000086	0.002025	0.002427
Manganese	lb/hr	0.003418	0.000950	0.001945	0.000071	0.000032	0.000755	0.000905
Mercury	lb/hr	0.000018	0.000005	0.000010	-	-	0.000004	0.000005
Nickel	lb/hr	0.000604	0.000168	0.000344	0.000012	0.000006	0.000133	0.000160
Antimony	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001
Arsenic	lb/hr	0.000009	0.000002	0.000005	-	-	0.000002	0.000002
Beryllium	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001
Cadmium	lb/hr	0.000067	0.000019	0.000038	0.000001	0.000001	0.000015	0.000018
Chromium [c]	lb/hr	0.000825	0.000229	0.000470	0.000017	0.000008	0.000182	0.000219
Cobalt	lb/hr	0.000108	0.000030	0.000062	0.000002	0.000001	0.000024	0.000029
Phosphorus	lb/hr	0.001814	0.000504	0.001032	0.000037	0.000017	0.000401	0.000480
Selenium	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001
Zinc	lb/hr	0.066035	0.018344	0.037570	0.001363	0.000622	0.014586	0.017486
Barium	lb/hr	0.001328	0.000369	0.000756	0.000027	0.000013	0.000293	0.000352
Copper	lb/hr	0.003205	0.000890	0.001823	0.000066	0.000030	0.000708	0.000849
Silver	lb/hr	0.000024	0.000007	0.000013	-	-	0.000005	0.000006
Thallium	lb/hr	0.000002	0.000001	0.000001	-	-	0.000001	0.000001

a. Metal emissions from Volume Sources V-1 through V-13 calculated by multiplying total Volume Source PM (lb/hr) by the metal concentrations from corresponding samples of material deposition at GII collected and analyzed in December 2019.

b. Metal emissions from DC-1 are calculated by multiplying the estimated dust collector PM emission rate (lb/hr) by the metal concentrations from corresponding samples of material deposition at GII collected and analyzed in December 2019.

c. Chromium (metal) and compounds other than Chromium VI

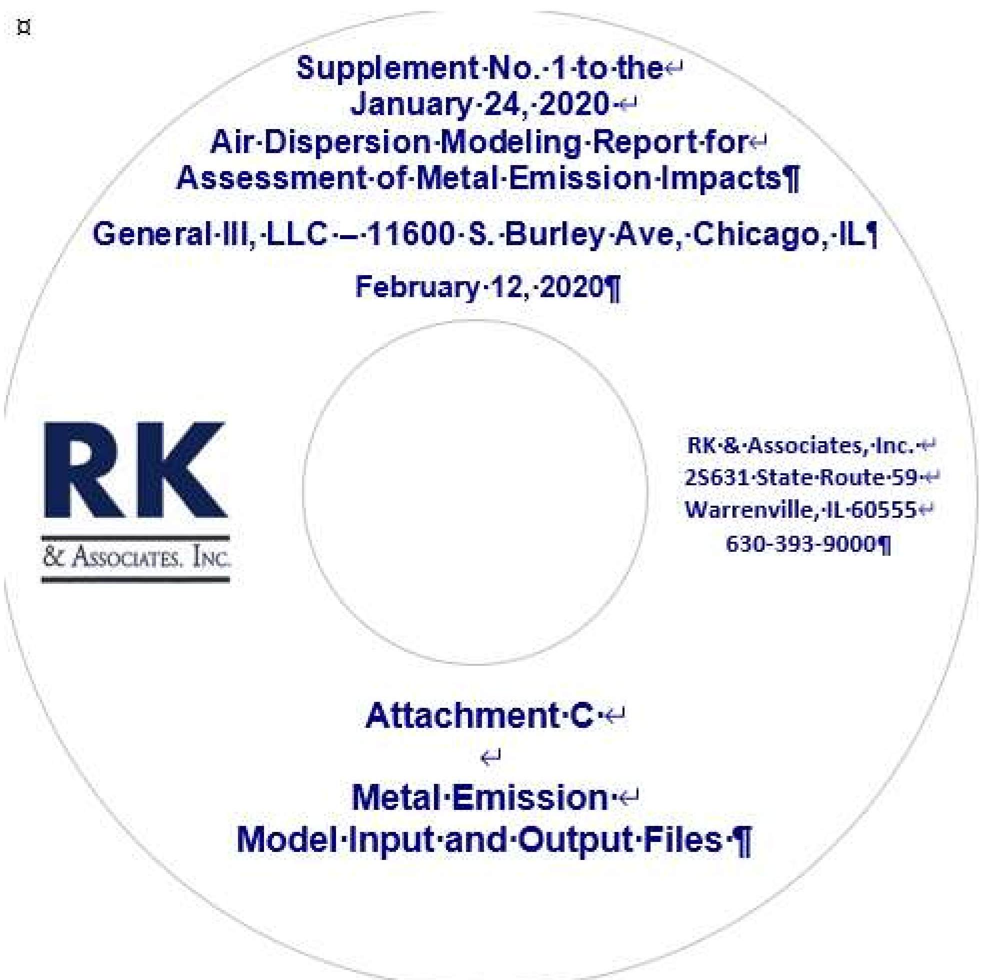
Supplement No. 1 to the January 24, 2019 Air Dispersion Modeling Report for Assessment of Metal Emission Impacts

General III, LLC – 11600 South Burley - Chicago, Illinois
Construction Permit Application 19090021; Site ID No.: 031600SFX

February 12, 2020

Attachment C

Metal Emission Modeling Input and Output Files (CD-ROM)



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ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
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JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

R_001912

EXHIBIT 13

MEMORANDUM

IEPA - DIVISION OF RECORDS MANAGEMENT RELEASABLE
MAR 13 2020
REVIEWER: JMR

DATE: March 2, 2020

TO: German Barria, FESOP/LOP Unit, Permit Section/BOA

FROM: Jeffrey Sprague, Modeling Unit, AQPS/BOA JWS

SUBJECT: General III, LLC (State ID# 031600SFX), Permit Application #19090021

General III, LLC (GIII) through its consultant RK & Associates, Inc. (RKA), has submitted an air quality analysis in support of a construction permit for a new scrap metal recycling facility to be located at 11600 South Burley in Chicago, Illinois. The Illinois EPA (IEPA) requested the air quality analysis to assure that ambient air impacts of hazardous air pollutant (HAP) metal emissions from the proposed facility and existing nearby facilities were addressed. The contributions of facilities other than the proposed scrap metal recycling facility were evaluated only in conjunction with the lead (Pb) and manganese (Mn) analyses. RKA submitted a modeling protocol on November 18, 2019 (*Air Dispersion Modeling Protocol to Assess Metal Emission Impacts, General III, LLC – Chicago, Illinois*) to which the IEPA provided comment on November 20, 2019 (email from Jeff Sprague to John Pinion). An initial air quality analysis was submitted on January 24, 2020 (*Air Dispersion Modeling Report for Assessment of Metal Emission Impacts, General III, LLC – Chicago, Illinois*), with a subsequent submittal on February 12, 2020 (*Supplement No. 1 to the January 24, 2020 Air Dispersion Modeling Report for Assessment of Metal Emission Impacts, General III, LLC – 11600 South Burley – Chicago, Illinois*.) The supplemental submittal incorporated and described adjustments to ambient air boundaries (fenceline receptors), operating schedules, source coordinates, stack parameters, building downwash parameter inputs, emission factors for the shredder RTO/scrubber, and emissions allocations in selected modeled "Volume Sources". Modeling input and output files accompanying both submittals were provided on compact disc. The analyses evaluated the lead (Pb) air quality impacts against the 2008 National Ambient Air Quality Standard (NAAQS), and all other HAPs against the Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels, hazardous air contaminant air quality standards in the Wisconsin Department of Natural Resources air toxics rule (Wisconsin Administrative Code, Chapter NR 445 – Control of Hazardous Pollutants), and/or an inhalation risk greater than 1 in 1,000,000 for carcinogenic substances with a unit risk factor established by USEPA or the California Air Resources Board.

Modeling Methodology and Emissions

The consultant's modeling procedure conformed with generally accepted air dispersion modeling practices and with recommendations made by the IEPA in written and spoken communications. The most recent version of the American Meteorological Society/Environmental Protection

Agency Regulatory Model (AERMOD, version 19191) was used in conjunction with five consecutive years of regionally representative meteorological data (2012-2016: Midway Airport, Chicago, IL surface observations; Davenport, IA upper air soundings) processed using AERMET, version 19191. LEADPOST (version 13262) was used to post-process AERMOD output for determining maximum three-month rolling average lead (Pb) concentrations. The receptor network was of sufficient density and extent to capture the impacts of local contributing sources and to adequately represent air quality around the proposed facility. The modeling conducted by RKA evaluated HAP emissions from the proposed facility operations including the shredder RTO/Scrubber, baghouse exhaust from the "Non-Ferrous System Operation", scrap material dumping, material handling/transfer operations (conveyors, endloader activity, truck loadout, etc.), screeners, sifters, separators, stockpiles and haul truck movement on roadways. With limited exception, these sources were modeled based upon the operating schedule identified in the following table (Table 1):

Table 1 - Modeled Facility Operating Schedule

Site Operation	Monday - Friday		Saturday	
Ferrous System Operation (includes Shredder)	7 AM to 7 PM	12 hrs/day	7 AM to 5 PM	12 hrs/day
Barge Loading	7 AM to 3 PM	8 hrs/day	7 AM to 3 PM	8 hrs/day
Non-Ferrous System Operation	5 AM to 11 PM	18 hrs/day	5 AM to 11 PM	18 hrs/day
Roadway Fugitive Emissions (Facility Vehicular Traffic)	5 AM to 7 PM	14 hrs/day	5 AM to 5 PM	12 hrs/day

Offsite lead-emitting facilities included fuel combustion emission sources, Portland cement usage and transfer operations, and metals processing and recovery. Offsite manganese-emitting facilities were the same, but included a greater number and much broader range of fuel combustion emission sources. Lead and manganese emission rates for offsite-emitting facilities were provided by the IEPA from its statewide inventory database. The fractional components of particulate matter emissions comprising the various HAP metal emission estimates for the proposed GIII operations are based upon: (1) Measured metal emission factors from the November 2019 compliance testing of the shredder RTO at the General Iron Industries, Inc. (General Iron) facility at 1909 North Clifton Avenue, Chicago, Illinois, and/or (2) analysis of the metal composition of selected samples of "material deposition" at the General Iron facility collected in December, 2019. The former used to estimate metal emissions from the GIII shredder RTO/Scrubber, whereas the latter was primarily used to assign HAP metal estimates for process and fugitive emissions comprising modeled GIII "Volume Sources".

Modeling Results

The applicant's maximum predicted HAP metal impacts typically occurred at receptors that were fenceline or near-fenceline locations. These included receptors on western, northern, and eastern boundaries of the proposed GIII site. The exception to this pattern were the modeled impacts for manganese, which showed maximum 24-hour and annual average values occurring to the northwest at a distance of more than three kilometers. This difference is attributed to the contributing impacts of offsite facilities included in the manganese modeling analysis.

The lead air quality analysis, which included GII emissions and offsite facilities in proximity to GIII, as well as a monitored background concentration (2016-2018 design value - Washington High School monitor), resulted in a maximum impact of 0.0849 $\mu g/m^3$ along the western fenceline. This value is less than 60% of the NAAQS. Table 2 provides a summary of the lead analysis results from both the consultant's submittal and the Agency's independent audit.

Table 2 - Summary of Predicted Lead (Pb) Air Quality Impacts

Modeling Source	Maximum Modeled 3-Month Rolling Average ($\mu g/m^3$)	Background Concentration [Monitored Design Value] ($\mu g/m^3$)	Total Concentration [Modeled + Background] ($\mu g/m^3$)	Receptor (UTM Zone 16)	Pb NAAQS [3-Month Rolling Average] ($\mu g/m^3$)
Consultant (RKA)	0.0649	0.0200	0.0849	454091.0 E, 4614866.0 N	0.15
Illinois EPA	0.0649	0.0200	0.0849	454091.0 E, 4614866.0 N	0.15

As noted above, the consultant's manganese analysis also incorporated emissions from offsite facilities in proximity to the proposed GIII location. Monitored background concentrations were obtained from the Washington High School monitor and reflect the maximum 24-hour average and annual average concentrations during the past three years. Table 3 provides summary results of the analysis conducted by RKA and the independent audit conducted by IEPA. The maximum 24-hour average value is approximately 16% of the NR445 hazardous air contaminant standard, whereas the maximum annual average value is approximately one-third of the NR445 and ATSDR MRL standards.

Table 3 - Summary of Predicted Manganese (Mn) Air Quality Impacts

Modeling Source	Averaging Period	Maximum Modeled Concentration [AERMOD] ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration [Modeled + Background] ($\mu g/m^3$)	Receptor (UTM Zone 16)	Human Health Standard	
						Source	Value ($\mu g/m^3$)
Consultant (RKA)	24-Hour[1]	0.379	0.370	0.749	452000.0 E, 4617500.0 N	NR445	4.80
	Annual[1]	0.039	0.070	0.109	452000.0 E, 4617500.0 N	NR445 / ATSDR MRL	0.30 / 0.30
Illinois EPA	24-Hour[1]	0.379	0.370	0.749	452000.0 E, 4617500.0 N	NR445	4.80
	Annual[2]	0.035	0.070	0.105	452000.0 E, 4617500.0 N	NR445 / ATSDR MRL	0.30 / 0.30

[1]The reported maximum modeled concentration is the highest value for any year of the five years modeled.

[2]The reported maximum modeled concentration is for that receptor with the highest average of the individual five yearly concentrations.

For the large group of remaining HAP metals, modeling was conducted for both 24-hour and annual averaging periods. For some of the metals (arsenic, barium, beryllium, cadmium, chromium, copper, nickel, phosphorus, selenium, and silver) only a 24-hour average health standard or an annual average health standard was available for comparison against maximum modeled impacts. For other metals (thallium and zinc), neither an NR445 standard nor an ATSDR MRL was available for comparison. For carcinogenic metals, an inhalation risk estimate of 1×10^{-6} based upon established unit risk factors and modeled concentrations serves as an additional standard. In all instances in which a standard was available for comparison, the maximum modeled impacts were lower, and typically, significantly lower than the specified level of the standard. Tables 4 and 5 provide summary results of the maximum predicted impacts and the corresponding health-based standards.

Table 4 - Maximum Predicted 24-Hour Average Concentrations of Selected Metal HAPs, and Related Health Standards

	Consultant (RKA) Modeling Submittal		Health Standard		Illinois EPA Modeling Audit Results	
Metal HAP	Concentration ($\mu g/m^3$)	Receptor (UTM Zone 16)	Source	Concentration ($\mu g/m^3$)	Concentration ($\mu g/m^3$)	Receptor (UTM Zone 16)
Antimony	0.00253	454085.0 E, 4614965.0 N	NR445	12.00	0.00253	454085.1 E, 4614964.0 N
Arsenic	0.00112	454085.0 E, 4614965.0 N	None Identified	------	0.00112	454085.1 E, 4614964.6 N
Barium	0.09159	454091.0 E, 4614866.0 N	NR445	12.00	0.09159	454091.0 E, 4614865.5 N
Beryllium	0.00091	454600.0 E, 4615000.0 N	None Identified	------	0.00091	454600.0 E, 4615000.0 N
Cadmium	0.00430	454091.0 E, 4614866.0 N	None Identified	------	0.00430	454091.0 E, 4614865.5 N
Chromium	0.05308	454091.0 E, 4614866.0 N	NR445	12.00	0.05308	454091.0 E, 4614865.5 N
Cobalt	0.00570	454091.0 E, 4614866.0 N	NR445	0.48	0.00570	454091.0 E, 4614865.5 N
Copper	0.20625	454091.0 E, 4614866.0 N	NR445	24.00	0.20625	454091.0 E, 4615865.5 N
Mercury	0.09787	454085.0 E, 4614965.0 N	NR445	2.40	0.09787	454085.1 E, 4614964.6 N
Nickel	0.03650	454091.0 E, 4614866.0 N	None Identified	------	0.03650	454091.0 E, 4614865.5 N
Phosphorus	0.31775	454085.0 E, 4614965.0 N	NR445	2.43	0.31775	454085.1 E, 4614964.6 N
Selenium	0.01327	454085.0 E, 4614965.0 N	NR445	4.80	0.01327	454085.1 E, 4614964.6 N
Silver	0.00302	454085.0 E, 4614965.0 N	NR445	2.40	0.00302	454085.1 E, 4614964.6 N
Thallium	0.00034	454085.0 E, 4614965.0 N	None Identified	------	0.00034	454085.1 E, 4614964.6 N
Zinc	3.56760	454091.0 E, 4614866.0 N	None Identified	------	3.56760	454091.0 E, 4614865.5 N

Table 5 - Maximum Predicted Annual Average Concentrations of Selected Metal HAPs, and Related Health Standards

	Applicant/Consultant Modeling Submittal[1]		Health Standard		Illinois EPA Modeling Audit Results[7]	
Metal HAP	Concentration ($\mu g/m^3$)	Receptor (UTM Zone 16)	Source	Concentration ($\mu g/m^3$)	Concentration ($\mu g/m^3$)	Receptor (UTM Zone 16)
Antimony	0.00016	454251.0 E, 4615156.0 N	ATSDR MRL	0.30	0.00014	454251.0 E, 4615155.9 N
Arsenic	0.00008	454596.0 E, 4615044.0 N	IUR[2]	[0.0043 X 0.00008 < 1E-06]	0.00008	454595.8 E, 4615044.4N
Barium	0.00977	454091.0 E, 4614866.0 N	None Identified	------	0.00912	454091.0 E, 4614865.5 N
Beryllium	0.00011	454596.0 E, 4615044.0 N	NR445[3]	0.02	0.00010	454595.8 E, 4615044.4 N
Cadmium	0.00047	454091.0 E, 4614866.0 N	ATSDR MRL[4]	0.01	0.00044	454091.0 E, 4614865.5 N
Chromium	0.00505	454091.0 E, 4614866.0 N	None Identified	------	0.00474	454091.0 E, 4614865.5 N
Cobalt	0.00059	454091.0 E, 4614866.0 N	ATSDR MRL	0.10	0.00055	454091.0 E, 4614865.5 N
Copper	0.02178	454091.0 E, 4614866.0 N	None Identified	------	0.02034	454091.0 E, 4614865.5 N
Mercury	0.00626	454251.0 E, 4615156.0 N	NR445[5]	0.30	0.00523	454251.0 E, 4615155.9 N
Nickel	0.00366	454091.0 E, 4614866.0 N	NR445/ATSDR MRL[6]	0.09	0.00343	454091.0 E, 4614865.5 N
Phosphorus	0.02051	454251.0 E, 4615156.0 N	None Identified	------	0.01710	454251.0 E, 4615155.9 N
Selenium	0.00085	454251.0 E, 4615156.0 N	None Identified	------	0.00071	454251.0 E, 4615155.9 N
Silver	0.00030	454596.0 E, 4615044.0 N	None Identified	------	0.00029	454595.8 E, 4615044.4 N
Thallium	0.00003	454596.0 E, 4615044.0 N	None Identified	------	0.00003	454595.8 E, 4615044.4 N
Zinc	0.38076	454091.0 E, 4614866.0 N	None Identified	------	0.35341	454091.0 E, 4614865.5 N

[1] The reported AERMOD concentration is the maximum individual year concentration of the five years modeled.

[2] Using a 0.0043 Unit Risk Factor and 0.00008 $\mu g/m^3$ modeled concentration yields a 3.87E-07 inhalation impact which is less than 1-in-a-million.

[3] Additionally, using a 0.0024 Unit Risk Factor and 0.00011 $\mu g/m^3$ modeled concentration yields a 3.60E-07 inhalation impact which is less than 1-in-a-million.

[4] Additionally, using a 0.0018 Unit Risk Factor and 0.00047 $\mu g/m^3$ modeled concentration yields a 7.20E-07 inhalation impact which is less than 1-in-a-million.

[5] A 0.20 $\mu g/m^3$ ATSDR MRL is also an applicable standard to evaluate mercury annual average impacts.

[6] Additionally, using a 0.00026 Unit Risk Factor and 0.00366 $\mu g/m^3$ modeled concentration yields a 9.52E-07 inhalation impact which is less than 1-in-a-million.

[7] The reported AERMOD concentration is for that receptor with the highest average of the individual five yearly concentrations.

Remarks and Recommendations

The following dot-point entries provide concluding comments regarding the modeling assessment, with particular emphasis on conditions for acceptability and notable uncertainties in the analysis.

- The applicant's consultant submitted a modeling analysis that was consistent with the directives of Illinois EPA staff, addressing through modeling those metal HAPs previously identified at the General Iron Industries, Inc. facility. The current analysis focused on lead (Pb) and manganese (Mn) emissions, while also evaluating other metal HAPs. A more exhaustive assessment would include incorporating offsite facilities in the modeling analysis for these other metal HAPs, and, if available, monitored background concentrations for a fuller accounting of potential ambient loadings.
- Illinois EPA acceptance of "ambient air boundary" receptor placement, as implemented in the modeling analysis, is contingent upon additional signage, visual control equipment, and a physical barrier (fencing or shipping containers) as described on pages 3 and 4 of *Supplement No. 1 to the January 24, 2020 Air Dispersion Modeling Report for Assessment of Metal Emission Impacts, General III, LLC – 11600 South Burley – Chicago, Illinois.*
- The modeling analysis was not structured to allow evaluation of ambient air concentrations for all possible hours from the five-year meteorological dataset. Rather, those hours of meteorological data that fell outside the operating schedules for General III emission sources in Table 1 of this memorandum were excluded from the analysis. Consequently, permit conditions are necessary that restrict the facility's operation to the days and hours specified in Table 1 (largely reproduced from page 1 of *Supplement No. 1 to the January 24, 2020 Air Dispersion Modeling Report for Assessment of Metal Emission Impacts, General III, LLC – 11600 South Burley – Chicago, Illinois*). For certain emission sources, the meteorological hours modeled by the consultant extended beyond the operational hours specified in Table 1. Accordingly, the permit conditions should be adjusted to reflect this expanded assessment.
- The roadway fugitive emissions calculations reflect haul truck travel (semi-trailers) on specified road segments accompanying deliveries of metal scrap and removal of waste material. It is highly uncertain as to how well small truck deliveries by "peddlers" are represented in the number of vehicles and in the choice of parameters for estimating emissions. Additionally, the roadway fugitives do not include emission estimates of personal (employee) vehicle travel or possible product transfer by trucks offsite that may be occurring on these roadways. The unquantified emissions from these mobile sources, though likely insignificant, adds some uncertainty to the modeled HAP metal concentrations.
- The Reserve Management Group (RMG) industrial campus includes four existing facilities that are directly south of the proposed General III, LLC location. These

facilities---Reserve Marine Terminals, Regency Technologies, Napuck Salvage of Waupaca, and South Shore Recycling---were not incorporated directly into the modeling analysis. They may, however, be indirectly represented by the monitored background values used for some of the HAP metals. It is uncertain to what extent the unquantified emissions from these facilities are contributing to ambient loadings of HAP metals.

Based upon the applicant's submittal, and the Illinois EPA's review and audits, the air quality analysis adequately demonstrates that the proposed General III, LLC scrap metal recycling facility will not cause or contribute to violations of the lead (Pb) NAAQS, nor exceed human health-based HAP standards that include ATSDR MRLs and concentration or risk-based limits codified in Chapter NR445 of the Wisconsin Administrative Code.

cc: David Bloomberg, Section Manager, AQPS/BOA
Chris Romaine, CAAPP Construction Unit Manager, Permit Section/BOA
Bob Bernoteit, FESOP/State Permits Unit Manager, Permit Section/BOA
Robb Layman, Assistant Counsel, Division of Legal Counsel

RK & ASSOCIATES, INC.

EXHIBIT 14

March 20, 2020

R17421-7.0

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

Final Metal Emissions from South Chicago Property Management, Ltd.
General III, LLC - 11600 South Burley - Chicago, Illinois
Site ID No. 031600SFX; Application No. 19090021

Dear Mr. Sprague:

The following information is provided at your request to quantify estimated metals emissions associated with South Chicago Property Management, Ltd. (SCPM) operations at 11600 S. Burley Avenue in Chicago, Illinois.

Metal HAP emissions from SCPM are a function of particulate emissions. The primary sources of PM emissions from SCPM are material handling activities and roadway emissions.

SCPM recently submitted an application for a Lifetime Operating Permit that included particulate matter emission rates. Metals emissions were estimated by collecting site specific samples of particulate matter from the site that are assumed to best represent the anticipated metal content of the particulate matter emissions from each emission unit. Samples were submitted to a certified laboratory for metals analysis and the reported metal concentrations from each sample were combined with corresponding particulate matter emission rates to estimate total metals emissions. The metal analytical reports are presented in Attachment A.

Table 1 below identifies the particulate matter emission units for each operating entity at SCPM and identifies the sample used to estimate metal emissions. The following briefly describes the samples collected and submitted for metals analysis.

RMT Material Handling:

A representative sample of particulate matter captured in the baghouse controlling emissions from RMT's sand processing unit was collected and analyzed to represent the metal content of particulate matter emissions from RMT's material handling activities (shredding and screening and materials drops). No screening for particle size was performed in preparation of the composite sample.

Table 1 Identification of Particulate Matter Samples Used to Estimate Metal Emissions from Existing Emission Units

Emission Unit/Activity	Reserve Marine Terminals (RMT)	Napuck Salvage of Waupaca (NSW)	South Shore Recycling (SSR)	Regency Technologies (RSR)
Shredding & Screening	SPB	ASB		
Material Drops (inside)	SPB	ASB		
Internal Combustion Engines	Note 1			
AL Dryer Propane Combustion		Note 1		
Torch Cutting	PR		PR	
Paved Roads - Controlled	PR	PR		PR
Unpaved Roads - Controlled	UP		UP	
Campus Wide AST 500-gal Gas	NA			
Campus Wide AST	NA			

SPB = Sand Processing Baghouse UP = Unpaved Road Dust

ASB = Aluminum Shredding Baghouse PR = Paved Road Dust

1. For the purposes of this estimate, metal HAP emissions from fuel combustion sources (internal combustion engine/generators and the propane aluminum dryer) are assumed to be negligible and are not included in this estimate.

NSW Material Handling:

A representative sample of particulate matter captured in the baghouse controlling emissions from NSW's aluminum shredding system was collected and analyzed to represent the metal content of particulate matter emissions from NSW's material handling activities (shredding and screening and materials drops). No screening for particle size was performed in preparation of the composite sample.

Paved Roads:

Particulate matter samples were collected from multiple locations on paved roads within SCPM. The samples were composited in the field and a single sample was collected and submitted for analysis. The metals content of the paved road particulate samples was assumed to represent particulate matter emissions from paved roads as well as torching emissions because torching is performed on a paved surface. No screening for particle size was performed in preparation of the composite sample.

Unpaved Roads:

Particulate matter samples were collected from multiple locations on unpaved roads within SCPM. The samples were composited in the field and a single sample was collected and submitted for analysis. The metals content of the unpaved road particulate samples was assumed to represent particulate matter emissions from paved roads. No screening for particle size was performed in preparation of the composite sample.

Table 2 presents a summary of metals concentrations from each sample analyzed.

Table 2 Summary of Metal Concentrations from SCPM Particulate Samples

HAP Y/N	Metal	Paved Roads PPM	Unpaved Roads PPM	NSW Baghouse Dust PPM	RMT Baghouse Dust PPM
Y	Antimony	<1.19	<1.24	24.9	<1.18
Y	Arsenic	<1.19	<1.24	<1.17	<1.18
Y	Beryllium	<1.19	<1.24	<0.117	<1.18
Y	Cadmium	0.724	0.834	15.3	0.962
Y	Chromium	346	303	106	527
Y	Cobalt	2.74	2.14	116	6.2
Y	Lead	50.6	72	595	46.1
Y	Manganese	4,760	5,040	624	4,000
Y	Mercury	<0.095	0.104	<0.095	0.547
Y	Nickel	25.5	20.2	101	74.5
Y	Phosphorus	40.1	184	1540	869
Y	Selenium	<1.19	<1.24	<1.17	<1.18
N	Barium	57.2	51.6	321	367
N	Copper	95.3	72.4	1760	373
N	Silver	<1.19	<1.24	<3.75	<1.18
N	Titanium	256	166	699	183
N	Zinc	249	178	3,560	1,660

Table 3 presents a summary of annual particulate matter emission rates from identified SCPM emission units and the corresponding annual metal emission rates.

RK & Associates, Inc.

Table 3 Summary of Maximum PM Emissions Used to Estimate Metal Emissions

POTENTIAL PM Emissions with Controlled Roadway PM

Activity/Emission Unit	RMT PM (tpy)	NSW PM (tpy)	SSR PM (tpy)	RSR PM (tpy)	SCPM Employee (tpy)	SCPM Total (tpy)
Shredding & Screening	1.5339	0.6222				2.1561
Material Drops (inside)	0.0142	0.0001				0.0143
Internal Combustion Engines	0.5300					
AL Dryer Propane Combustion		0.2010				
Torch Cutting	1.6824		0.0087			1.6911
Paved Roads - Controlled	1.3895	1.1496		0.9184	0.0860	3.5435
Unpaved Roads - Controlled	21.3129		1.6807			22.9936
Campus Wide AST 500-gal Gas						
Campus Wide AST 1000-gal Diesel						
Totals Emissions	**26.46**	**1.97**	**1.69**	**0.92**	**0.09**	**30.40**

Total PM Emissions (tpy) Used to Estimate Corresponding Metal Emissions	RMT Material Handling	NSW Material Handling	SCPM Paved Roads & Torch Cutting	SCPM Unpaved Roads	Totals
	1.5481	0.6223	5.2346	22.9936	30.3986

Table 4 presents the estimated maximum annual metal emission rates, which were determined by multiplying the particulate emission rate (tpy) by the corresponding weight percent (Wt %) of each metal in the corresponding sample analyzed. Metal concentrations in Table 2 are reported in milligrams per kilogram (mg/kg), which is equivalent to parts per million (PPM). The weight percent of each metal is calculated by dividing the reported metal concentration by 1,000,000.

Table 4 Summary of Maximum SCPM Metal Emissions

HAP (Y/N)	Metal	RMT Material Handling (tpy)	NSW Material Handling (tpy)	SCPM Paved Roads and Torch Cutting (tpy)	SCPM Unpaved Roads (tpy)	SCPM Totals (tpy)	SCPM Totals lb/yr
Y	Antimony	1.81E-06	1.55E-05	6.23E-06	2.85E-05	5.20E-05	0.10
Y	Arsenic	1.81E-06	7.28E-07	6.23E-06	2.85E-05	3.73E-05	0.07
Y	Beryllium	7.74E-07	7.28E-08	6.23E-06	2.85E-05	3.56E-05	0.07
Y	Cadmium	1.49E-06	9.52E-06	3.79E-06	1.92E-05	3.40E-05	0.07
Y	Chromium	8.16E-04	6.60E-05	1.81E-03	6.97E-03	9.66E-03	19.32
Y	Cobalt	9.60E-06	7.22E-05	1.43E-05	4.92E-05	1.45E-04	0.29
Y	Lead	7.14E-05	3.70E-04	2.65E-04	1.66E-03	2.36E-03	4.72
Y	Manganese	6.19E-03	3.88E-04	2.49E-02	1.16E-01	1.47E-01	294.77
Y	Mercury	8.47E-07	5.91E-08	4.97E-07	2.39E-06	3.79E-06	0.01
Y	Nickel	1.15E-04	6.29E-05	1.33E-04	4.64E-04	7.76E-04	1.55
Y	Phosphorus	1.35E-03	9.58E-04	2.10E-04	4.23E-03	6.74E-03	13.49
Y	Selenium	1.83E-06	7.28E-07	6.23E-06	2.85E-05	3.73E-05	0.07
N	Barium	5.68E-04	2.00E-04	2.99E-04	1.19E-03	2.25E-03	4.51
N	Copper	5.77E-04	1.10E-03	4.99E-04	1.66E-03	3.84E-03	7.67
N	Silver	1.83E-06	2.33E-06	6.23E-06	2.85E-05	3.89E-05	0.08
N	Titanium	2.83E-04	4.35E-04	1.34E-03	3.82E-03	5.88E-03	11.75
N	Zinc	2.57E-03	2.22E-03	1.30E-03	4.09E-03	1.02E-02	20.36

The highest total SCPM metal emission rate is Manganese (Mn) at 294.77 lb/yr. Actual emissions are estimated to be approximately 276.38 lb/yr.

Installation of GIII is expected to add approximately 74.18 lb/yr of additional Mn emissions to this site. At the same time, the installation of pavement for the GIII project will replace existing unpaved roads used by SCPM with paved roads, as described below. This improvement will reduce SCPM's annual Mn emissions by approximately 117.5 lb/yr, which will offset the increase in Mn emissions from GIII, resulting in an overall decrease in site-wide Mn emissions of 43.32 lb/yr from the addition of GIII.

The community impacts associated with SCPM's current Mn emissions are documented by IEPA's ambient air quality monitoring station located at Washington High School. The IEPA's 2018 Air Quality Report identifies that the annual mean ambient air concentration of Mn measured at Washington High School was 0.048 ug/m^3, which is just 16% of USEPA's recommended limit of 0.30 ug/m^3.

Future Reduction in SCPM Mn Emissions:

The top portion of Table 5 identifies the estimated fugitive roadway PM emissions based on existing paved and unpaved roadways. The bottom portion of the table identifies the future projected PM emissions after GIII paving.

The estimated fugitive roadway PM emissions are multiplied by the measured Mn concentration (Wt %) in recent particulate matter samples from SCPM as described above.

The estimated Mn emissions from the vehicle miles traveled on current roadway surfaces was compared to the estimated Mn emissions from vehicle miles traveled on future roadway surfaces. This comparison shows a reduction of 44.3% in the estimated Mn emissions associated with fugitive roadway PM emissions due to road paving that will be performed in conjunction construction of GIII.

The majority of fugitive roadway PM emissions are generated from interior plant roadways that are removed from the ambient air boundary. The estimates in roadway emissions are conservative because they do not account for the portion of particulate emissions that settle to the ground before reaching the property line.

Table 5 - Summary of Current and Future Estimated Mn Emissions from SCPM

Entity	Current Paved Roadway PM Emissions[a] lb/VMT	miles/day	tons/yr	miles/yr	Current Unpaved Roadway PM Emissions[a] lb/VMT	miles/day	tons/yr	miles/yr
RMT	0.6408	16.68	1.39	4,336.77	2.8531	57.46	21.31	14,940.17
NSW	0.6408	13.80	1.15	3,588.01				
SSR					0.6671	19.38	1.68	5,038.82
RSR	0.6408	2.56	0.92	2,866.42				
Employees	0.0200	33.07	0.09	8,600.00				
Current Maximum Roadway PM Emissions		**tpy**	**3.54**				**22.99**	
Current Maximum Roadway Mn Emissions		ppm	4,760				5,040	
		lb/yr	33.73				231.78	
		lb/yr	265.51					
Current Maximum SCPM Mn Emissions		**lb/yr**	**294.77 (includes process emissions and roadway emissions)**					

Entity	Future Paved Roadway Emissions PM (After GIII Paving) lb/VMT	miles/day	tons/yr	miles/yr[a]	Future Unpaved Roadway PM Emissions (After GIII Paving) lb/VMT	miles/day	tons/yr	miles/yr
RMT	0.6408	41.95	3.49	10,907.30	2.8531	25.06	9.29	6,514.74
NSW	0.6408	13.80	1.15	3,588.01				
SSR	0.0238	18.88	0.06	4,907.56	All unpaved roads eliminated by GIII.			
RSR	0.6408	2.56	0.92	2,866.42				
Employees	0.0200	33.07	0.09	8,600.00				
Future Maximum Roadway PM Emissions		**tpy**	**5.71**				**9.29**	
Future Maximum Roadway Mn Emissions (After GIII Paving)		ppm	4,760				5,040	
		lb/yr	54.33				93.68	
		lb/yr	148.01					
Reduction in Roadway Mn Due to GIII Paving		lb/yr	117.50					
		%	44.3%					
Future Maximum SCPM Mn Emissions (After GIII Paving)		**lb/yr**	**177.27 (includes process and roadway emissions)**					
Estimated Maximum Mn Emissions from GIII		**lb/yr**	**74.18 (includes process and roadway emissions from GIII Construction Permit)**					
Estimated Maximum Mn Emissions Site-Wide (SCPM + GIII)		**lb/yr**	**251.45 (includes process and roadway emissions)**					

Decrease in Site-Wide Mn Emissions After Adding GIII
43.32 lb/yr

a. Emission estimates are conservative because they are based on maximum material throughputs and do not take credit for the portion of PM that will settle to the ground before crossing the property line.

If you have any questions or need any additional information, please don't hesitate to contact me at 630-393-9000 or by e-mail at jpinion@hotmail.com.

Yours very truly,
RK & Associates

cc: Dennis Stropko – SCPM – Chicago, Illinois
Jim Kallas – General III – Chicago, Illinois
Rob Layman – IEPA – Springfield
Bob Bernoteit – IEPA – Springfield.

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Final Metal Emissions from South Chicago Property Management, Ltd.
General III, LLC - 11600 South Burley - Chicago, Illinois
Site ID No. 031600SFX; Application No. 19090021

General III, LLC
11600 S. Burley Avenue
Chicago, Illinois 60614

March 19, 2020

ATTACHMENT A

Metal Analytical Results for Particulate Samples Collected from South Chicago Property Management Ltd.

R 001928

Environmental Monitoring and Technologies, Inc.

509 N. 3rd Avenue Des Plaines, Illinois 60016 **P** 847.967.6666 800.246.0663 **F** 847.967.6735 www.emt.com

Analytical Report

Mark Weintraub
Reserve Management Group
4550 Darrow Road
Stow, OH 44224

March 10, 2020

Work Order: 20C0342, 20C0343, 20C0344, 20C0345

RE: SCPM
Napuck Dust

Dear Mark Weintraub:

Enclosed are the analytical reports for the EMT Work Order listed. Also included with this analytical report is a copy of the chain of custody associated with these samples. If you have any questions, please contact me.

Sincerely,

Mark Steuer
Project Manager
847.967.6666
MSteuer@emt.com
Approved for release: 3/10/2020 12:55:44PM

Approved by,

Nathan Fey
Laboratory Operations Manager

State of Illinois, NELAP Accredited Lab No. 100256, Cert No. 1002562020-1

Table of Contents

Cover Letter	*1*
Sample Summary	*3*
Case Narrative	*4*
Client Sample Results	*5*
Dates Report	*9*
Quality Control	*11*
Certified Analyses	*25*
List of Certifications	*25*
Qualifiers and Definitions	*26*
Chain of Custody	*27*

R 001930

Environmental Monitoring and Technologies, Inc.

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Sample Summary

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Napuck Dust	20C0344-01	Soil	03/05/20 00:00	03/05/20 16:00
Paved	20C0342-01	Soil	03/05/20 00:00	03/05/20 16:00
RMT Dust	20C0345-01	Soil	03/05/20 00:00	03/05/20 16:00
Unpaved	20C0343-01	Soil	03/05/20 00:00	03/05/20 16:00

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Case Narrative

Client:	Reserve Management Group	**Date:**	03/10/2020
Project:	SCPM		
	Paved		
Work Order:	20C0342, 20C0343, 20C0344, 20C0345		

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

Sample results only relate to the sample(s) received at the laboratory and analytes of interest tested.

Work Order: 20C0342
The samples were received on 03/05/20 16:00. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	23.3

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

Work Order: 20C0343
The samples were received on 03/05/20 16:00. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	23.3

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

Work Order: 20C0344
The samples were received on 03/05/20 16:00. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	23.3

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

Work Order: 20C0345
The samples were received on 03/05/20 16:00. The samples arrived in good condition and properly preserved. The temperature of the cooler at receipt was:

Cooler	Temp C°
Default Cooler	23.3

Refer to Qualifiers and Definitions for quality and analytical clarifications or deviations.

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Client Sample Results

Client:	Reserve Management Group	**Client Sample ID:**	Paved
Project:	SCPM Paved	**Report Date:**	03/10/2020
		Collection Date:	03/05/2020 00:00
Work Order:	20C0342, 20C0343, 20C0344, 20C0345	**Matrix:**	Soil
		Lab ID:	20C0342-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.19	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Arsenic	< 1.19	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Barium	**57.2**	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Beryllium	< 1.19	1.19		mg/Kg	03/06/20 17:32	B0C0225	KJ1
Cadmium	**0.724**	0.119		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Chromium	**346**	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Cobalt	**2.74**	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Copper	**95.3**	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Lead	**50.6**	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Manganese	**4760**	11.9		mg/Kg	03/06/20 17:32	B0C0225	KJ1
Nickel	**25.5**	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Phosphorus	**401**	59.6	Q, S3	mg/Kg	03/06/20 17:32	B0C0225	KJ1
Selenium	< 1.19	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Silver	< 1.19	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Titanium	**256**	1.19		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Zinc	**249**	4.76		mg/Kg	03/06/20 18:23	B0C0225	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	< 0.095	0.095		mg/Kg	03/09/20 14:08	B0C0297	GSB

Environmental Monitoring and Technologies, Inc.

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Client Sample Results

(Continued)

Client:	Reserve Management Group	**Client Sample ID:**	Unpaved
Project:	SCPM Unpaved	**Report Date:**	03/10/2020
		Collection Date:	03/05/2020 00:00
Work Order:	20C0342, 20C0343, 20C0344, 20C0345	**Matrix:**	Soil
		Lab ID:	20C0343-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.24	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Arsenic	< 1.24	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Barium	**51.6**	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Beryllium	< 1.24	1.24		mg/Kg	03/06/20 17:36	B0C0225	KJ1
Cadmium	**0.834**	0.124		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Chromium	**303**	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Cobalt	**2.14**	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Copper	**72.4**	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Lead	**72.0**	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Manganese	**5040**	12.4		mg/Kg	03/06/20 17:36	B0C0225	KJ1
Nickel	**20.2**	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Phosphorus	**184**	6.19	Q, S3	mg/Kg	03/06/20 18:27	B0C0225	KJ1
Selenium	< 1.24	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Silver	< 1.24	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Titanium	**166**	1.24		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Zinc	**178**	4.95		mg/Kg	03/06/20 18:27	B0C0225	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	**0.104**	0.095		mg/Kg	03/09/20 14:09	B0C0297	GSB

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Monitoring and
Technologies, Inc.

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Client Sample Results

(Continued)

Client:	Reserve Management Group	**Client Sample ID:**	Napuck Dust
Project:	SCPM Napuck Dust	**Report Date:**	03/10/2020
		Collection Date:	03/05/2020 00:00
Work Order:	20C0342, 20C0343, 20C0344, 20C0345	**Matrix:**	Soil
		Lab ID:	20C0344-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	**24.9**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Arsenic	< 1.17	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Barium	**321**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Beryllium	< 0.117	0.117		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Cadmium	**15.3**	0.117		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Chromium	**106**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Cobalt	**116**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Copper	**1760**	11.7		mg/Kg	03/06/20 17:41	B0C0225	KJ1
Lead	**595**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Manganese	**624**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Nickel	**101**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Phosphorus	**1540**	58.6	Q, S3	mg/Kg	03/06/20 17:41	B0C0225	KJ1
Selenium	< 1.17	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Silver	< 3.75	3.75		mg/Kg	03/06/20 17:41	B0C0225	KJ1
Titanium	**699**	1.17		mg/Kg	03/06/20 18:32	B0C0225	KJ1
Zinc	**3560**	46.9		mg/Kg	03/06/20 17:41	B0C0225	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	**0.547**	0.099		mg/Kg	03/09/20 14:11	B0C0297	GSB

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Client Sample Results

(Continued)

Client:	Reserve Management Group	**Client Sample ID:**	RMT Dust
Project:	SCPM RMT Dust	**Report Date:**	03/10/2020
		Collection Date:	03/05/2020 00:00
Work Order:	20C0342, 20C0343, 20C0344, 20C0345	**Matrix:**	Soil
		Lab ID:	20C0345-01

Analyses	Result	EMT Reporting Limit	Qual	Units	Date/Time Analyzed	Batch	Analyst
Metals by ICP-AES							
Method: SW6010C / SW3050							
Antimony	< 1.18	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Arsenic	< 1.18	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Barium	**367**	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Beryllium	< 0.500	0.500		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Cadmium	**0.962**	0.118		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Chromium	**527**	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Cobalt	**6.20**	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Copper	**373**	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Lead	**46.1**	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Manganese	**4000**	11.8		mg/Kg	03/06/20 17:45	B0C0225	KJ1
Nickel	**74.5**	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Phosphorus	**869**	58.9	Q, S3	mg/Kg	03/06/20 17:45	B0C0225	KJ1
Selenium	< 1.18	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Silver	< 1.18	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Titanium	**183**	1.18		mg/Kg	03/06/20 18:37	B0C0225	KJ1
Zinc	**1660**	47.2		mg/Kg	03/06/20 17:45	B0C0225	KJ1
Mercury by CVAA							
Method: SW7471B							
Mercury	< 0.095	0.095		mg/Kg	03/09/20 14:13	B0C0297	GSB

R 001936

Environmental Monitoring and Technologies, Inc.

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Dates Report

Client: Reserve Management Group **Report Date:** 03/10/2020
Project: SCPM
Paved
Work Order: 20C0342,20C0343,20C0344,20C0345

Sample ID	Client Sample ID	Collection	Matrix	Test Name	Leached Prep Date	Prep Date	Analysis Date	Batch ID	Sequence
20C0342-01	Paved	03/05/20	Soil	Lead, Total ICP-AES		03/06/20 09:49	03/06/20 18:23	B0C0225	S0C0113
				Silver, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Zinc, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Titanium, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Antimony, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Phosphorus, Total ICP-AES		03/06/20 09:49	03/06/20 17:32		
				Nickel, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Manganese, Total ICP-AES		03/06/20 09:49	03/06/20 17:32		
				Barium, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Selenium, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Arsenic, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Copper, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Beryllium, Total ICP-AES		03/06/20 09:49	03/06/20 17:32		
				Cadmium, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Cobalt, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Chromium, Total ICP-AES		03/06/20 09:49	03/06/20 18:23		
				Mercury, Total CVAA		03/09/20 10:30	03/09/20 14:08	B0C0297	S0C0130
20C0343-01	Unpaved			Manganese, Total ICP-AES		03/06/20 09:49	03/06/20 17:36	B0C0225	S0C0113
				Selenium, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Antimony, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Lead, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Phosphorus, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Nickel, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Titanium, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Copper, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Chromium, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Cobalt, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Cadmium, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Beryllium, Total ICP-AES		03/06/20 09:49	03/06/20 17:36		
				Barium, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Silver, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Zinc, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Arsenic, Total ICP-AES		03/06/20 09:49	03/06/20 18:27		
				Mercury, Total CVAA		03/09/20 10:30	03/09/20 14:09	B0C0297	S0C0130
20C0344-01	Napuck Dust			Lead, Total ICP-AES		03/06/20 09:49	03/06/20 18:32	B0C0225	S0C0113
				Silver, Total ICP-AES		03/06/20 09:49	03/06/20 17:41		
				Zinc, Total ICP-AES		03/06/20 09:49	03/06/20 17:41		
				Titanium, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Antimony, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Phosphorus, Total ICP-AES		03/06/20 09:49	03/06/20 17:41		
				Nickel, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Manganese, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		

Environmental Monitoring and Technologies, Inc.

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Dates Report

(Continued)

Client: Reserve Management Group **Report Date:** 03/10/2020

Project: SCPM
Napuck Dust

Work Order: 20C0342,20C0343,20C0344,20C0345

Sample ID	Client Sample ID	Collection	Matrix	Test Name	Leached Prep Date	Prep Date	Analysis Date	Batch ID	Sequence
20C0344-01	Napuck Dust	03/05/20	Soil	Barium, Total ICP-AES		03/06/20 09:49	03/06/20 18:32	B0C0225	S0C0113
				Chromium, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Cobalt, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Cadmium, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Beryllium, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Copper, Total ICP-AES		03/06/20 09:49	03/06/20 17:41		
				Selenium, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Arsenic, Total ICP-AES		03/06/20 09:49	03/06/20 18:32		
				Mercury, Total CVAA		03/09/20 10:30	03/09/20 14:11	B0C0297	S0C0130
20C0345-01	RMT Dust			Nickel, Total ICP-AES		03/06/20 09:49	03/06/20 18:37	B0C0225	S0C0113
				Phosphorus, Total ICP-AES		03/06/20 09:49	03/06/20 17:45		
				Lead, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Antimony, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Selenium, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Zinc, Total ICP-AES		03/06/20 09:49	03/06/20 17:45		
				Manganese, Total ICP-AES		03/06/20 09:49	03/06/20 17:45		
				Titanium, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Copper, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Chromium, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Cobalt, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Cadmium, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Beryllium, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Barium, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Silver, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Arsenic, Total ICP-AES		03/06/20 09:49	03/06/20 18:37		
				Mercury, Total CVAA		03/09/20 10:30	03/09/20 14:13	B0C0297	S0C0130

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Quality Control

Client: Reserve Management Group **Report Date:** 03/10/2020
Project: SCPM **Matrix:** Solid
Napuck Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Metals by ICP-AES

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual

Batch: B0C0225 - SW3050

Blank (B0C0225-BLK1) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 16:56*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Antimony	< 2.50	2.50	mg/Kg							
Antimony	< 2.50	2.50	mg/Kg							
Antimony	< 2.50	2.50	mg/Kg							
Antimony	< 2.50	2.50	mg/Kg							
Arsenic	< 2.50	2.50	mg/Kg							
Arsenic	< 2.50	2.50	mg/Kg							
Arsenic	< 2.50	2.50	mg/Kg							
Arsenic	< 2.50	2.50	mg/Kg							
Barium	< 2.50	2.50	mg/Kg							
Barium	< 2.50	2.50	mg/Kg							
Barium	< 2.50	2.50	mg/Kg							
Barium	< 2.50	2.50	mg/Kg							
Beryllium	< 0.250	0.250	mg/Kg							
Beryllium	< 0.250	0.250	mg/Kg							
Beryllium	< 0.250	0.250	mg/Kg							
Beryllium	< 0.250	0.250	mg/Kg							
Cadmium	< 0.250	0.250	mg/Kg							
Cadmium	< 0.250	0.250	mg/Kg							
Cadmium	< 0.250	0.250	mg/Kg							
Cadmium	< 0.250	0.250	mg/Kg							
Chromium	< 2.50	2.50	mg/Kg							
Chromium	< 2.50	2.50	mg/Kg							
Chromium	< 2.50	2.50	mg/Kg							
Chromium	< 2.50	2.50	mg/Kg							
Cobalt	< 2.50	2.50	mg/Kg							
Cobalt	< 2.50	2.50	mg/Kg							
Cobalt	< 2.50	2.50	mg/Kg							
Cobalt	< 2.50	2.50	mg/Kg							
Copper	< 2.50	2.50	mg/Kg							
Copper	< 2.50	2.50	mg/Kg							
Copper	< 2.50	2.50	mg/Kg							
Copper	< 2.50	2.50	mg/Kg							
Lead	< 2.50	2.50	mg/Kg							
Lead	< 2.50	2.50	mg/Kg							
Lead	< 2.50	2.50	mg/Kg							
Lead	< 2.50	2.50	mg/Kg							
Manganese	< 2.50	2.50	mg/Kg							
Manganese	< 2.50	2.50	mg/Kg							
Manganese	< 2.50	2.50	mg/Kg							
Manganese	< 2.50	2.50	mg/Kg							
Nickel	< 2.50	2.50	mg/Kg							
Nickel	< 2.50	2.50	mg/Kg							

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Quality Control

(Continued)

Client: Reserve Management Group
Project: SCPM RMT Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345
Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES

(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Blank (B0C0225-BLK1) (Continued) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 16:56*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Nickel	< 2.50	2.50	mg/Kg							
Nickel	< 2.50	2.50	mg/Kg							
Phosphorus	< 12.5	12.5	mg/Kg							
Phosphorus	< 12.5	12.5	mg/Kg							
Phosphorus	< 12.5	12.5	mg/Kg							
Phosphorus	< 12.5	12.5	mg/Kg							
Selenium	< 2.50	2.50	mg/Kg							
Selenium	< 2.50	2.50	mg/Kg							
Selenium	< 2.50	2.50	mg/Kg							
Selenium	< 2.50	2.50	mg/Kg							
Silver	< 2.50	2.50	mg/Kg							
Silver	< 2.50	2.50	mg/Kg							
Silver	< 2.50	2.50	mg/Kg							
Silver	< 2.50	2.50	mg/Kg							
Titanium	< 2.50	2.50	mg/Kg							
Titanium	< 2.50	2.50	mg/Kg							
Titanium	< 2.50	2.50	mg/Kg							
Titanium	< 2.50	2.50	mg/Kg							
Zinc	< 10.0	10.0	mg/Kg							
Zinc	< 10.0	10.0	mg/Kg							
Zinc	< 10.0	10.0	mg/Kg							
Zinc	< 10.0	10.0	mg/Kg							

LCS (B0C0225-BS1) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:00*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Antimony	43.7	2.50	mg/Kg	50.00		87.3	80-109			
Antimony	43.7	2.50	mg/Kg	50.00		87.3	80-109			
Antimony	43.7	2.50	mg/Kg	50.00		87.3	80-109			
Antimony	43.7	2.50	mg/Kg	50.00		87.3	80-109			
Arsenic	41.3	2.50	mg/Kg	50.00		82.6	80-108			
Arsenic	41.3	2.50	mg/Kg	50.00		82.6	80-108			
Arsenic	41.3	2.50	mg/Kg	50.00		82.6	80-108			
Arsenic	41.3	2.50	mg/Kg	50.00		82.6	80-108			
Barium	40.2	2.50	mg/Kg	50.00		80.5	80-112			
Barium	40.2	2.50	mg/Kg	50.00		80.5	80-112			
Barium	40.2	2.50	mg/Kg	50.00		80.5	80-112			
Barium	40.2	2.50	mg/Kg	50.00		80.5	80-112			
Beryllium	4.22	0.250	mg/Kg	5.000		84.3	80.1-110			
Beryllium	4.22	0.250	mg/Kg	5.000		84.3	80.1-110			
Beryllium	4.22	0.250	mg/Kg	5.000		84.3	80.1-110			
Beryllium	4.22	0.250	mg/Kg	5.000		84.3	80.1-110			
Cadmium	4.26	0.250	mg/Kg	5.000		85.3	80-110			
Cadmium	4.26	0.250	mg/Kg	5.000		85.3	80-110			

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Quality Control

(Continued)

Client: Reserve Management Group
Project: SCPM
RMT Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES

(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

LCS (B0C0225-BS1) (Continued) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:00*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Cadmium	4.26	0.250	mg/Kg	5.000		85.3	80-110			
Cadmium	4.26	0.250	mg/Kg	5.000		85.3	80-110			
Chromium	41.8	2.50	mg/Kg	50.00		83.5	80-112			
Chromium	41.8	2.50	mg/Kg	50.00		83.5	80-112			
Chromium	41.8	2.50	mg/Kg	50.00		83.5	80-112			
Chromium	41.8	2.50	mg/Kg	50.00		83.5	80-112			
Cobalt	42.5	2.50	mg/Kg	50.00		85.1	80-110			
Cobalt	42.5	2.50	mg/Kg	50.00		85.1	80-110			
Cobalt	42.5	2.50	mg/Kg	50.00		85.1	80-110			
Cobalt	42.5	2.50	mg/Kg	50.00		85.1	80-110			
Copper	42.2	2.50	mg/Kg	50.00		84.4	80.8-111			
Copper	42.2	2.50	mg/Kg	50.00		84.4	80.8-111			
Copper	42.2	2.50	mg/Kg	50.00		84.4	80.8-111			
Copper	42.2	2.50	mg/Kg	50.00		84.4	80.8-111			
Lead	41.5	2.50	mg/Kg	50.00		83.0	80-112			
Lead	41.5	2.50	mg/Kg	50.00		83.0	80-112			
Lead	41.5	2.50	mg/Kg	50.00		83.0	80-112			
Lead	41.5	2.50	mg/Kg	50.00		83.0	80-112			
Manganese	41.1	2.50	mg/Kg	50.00		82.2	80.1-109			
Manganese	41.1	2.50	mg/Kg	50.00		82.2	80.1-109			
Manganese	41.1	2.50	mg/Kg	50.00		82.2	80.1-109			
Manganese	41.1	2.50	mg/Kg	50.00		82.2	80.1-109			
Nickel	41.5	2.50	mg/Kg	50.00		83.1	80-109			
Nickel	41.5	2.50	mg/Kg	50.00		83.1	80-109			
Nickel	41.5	2.50	mg/Kg	50.00		83.1	80-109			
Nickel	41.5	2.50	mg/Kg	50.00		83.1	80-109			
Phosphorus	218	12.5	mg/Kg	250.0		87.1	80-120			
Phosphorus	218	12.5	mg/Kg	250.0		87.1	80-120			
Phosphorus	218	12.5	mg/Kg	250.0		87.1	80-120			
Phosphorus	218	12.5	mg/Kg	250.0		87.1	80-120			
Selenium	41.7	2.50	mg/Kg	50.00		83.5	80-109			
Selenium	41.7	2.50	mg/Kg	50.00		83.5	80-109			
Selenium	41.7	2.50	mg/Kg	50.00		83.5	80-109			
Selenium	41.7	2.50	mg/Kg	50.00		83.5	80-109			
Silver	4.22	2.50	mg/Kg	5.000		84.4	80-115			
Silver	4.22	2.50	mg/Kg	5.000		84.4	80-115			
Silver	4.22	2.50	mg/Kg	5.000		84.4	80-115			
Silver	4.22	2.50	mg/Kg	5.000		84.4	80-115			
Zinc	42.8	10.0	mg/Kg	50.00		85.6	80.2-111			
Zinc	42.8	10.0	mg/Kg	50.00		85.6	80.2-111			
Zinc	42.8	10.0	mg/Kg	50.00		85.6	80.2-111			
Zinc	42.8	10.0	mg/Kg	50.00		85.6	80.2-111			

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Quality Control
(Continued)

Client: Reserve Management Group **Report Date:** 03/10/2020
Project: SCPM Unpaved **Matrix:** Solid
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Metals by ICP-AES
(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

LCS (B0C0225-BS1) (Continued) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:00*

Serial Dilution (B0C0225-DUP1) **Source: 20C0340-02RE1** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 18:10*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Beryllium	< 0.939	5.87	mg/Kg		ND				10	
Beryllium	< 0.939	5.87	mg/Kg		ND				10	
Beryllium	< 0.939	5.87	mg/Kg		ND				10	
Beryllium	< 0.939	5.87	mg/Kg		ND				10	
Cadmium	< 1.17	5.87	mg/Kg		ND				10	
Cadmium	< 1.17	5.87	mg/Kg		ND				10	
Cadmium	< 1.17	5.87	mg/Kg		ND				10	
Cadmium	< 1.17	5.87	mg/Kg		ND				10	
Chromium	13.8	58.7	mg/Kg		12.1			13.4	10	P
Chromium	13.8	58.7	mg/Kg		12.1			13.4	10	P
Chromium	13.8	58.7	mg/Kg		12.1			13.4	10	P
Chromium	13.8	58.7	mg/Kg		12.1			13.4	10	P
Lead	< 12.7	58.7	mg/Kg		ND				10	
Lead	< 12.7	58.7	mg/Kg		ND				10	
Lead	< 12.7	58.7	mg/Kg		ND				10	
Lead	< 12.7	58.7	mg/Kg		ND				10	
Phosphorus	142	293	mg/Kg		142			0.595	10	
Phosphorus	142	293	mg/Kg		142			0.595	10	
Phosphorus	142	293	mg/Kg		142			0.595	10	
Phosphorus	142	293	mg/Kg		142			0.595	10	
Selenium	< 23.5	58.7	mg/Kg		ND				10	
Selenium	< 23.5	58.7	mg/Kg		ND				10	
Selenium	< 23.5	58.7	mg/Kg		ND				10	
Selenium	< 23.5	58.7	mg/Kg		ND				10	

Serial Dilution (B0C0225-DUP2) **Source: 20C0340-02RE2** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 19:03*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Antimony	< 1.43	5.87	mg/Kg		ND				10	
Antimony	< 1.43	5.87	mg/Kg		ND				10	
Antimony	< 1.43	5.87	mg/Kg		ND				10	
Antimony	< 1.43	5.87	mg/Kg		ND				10	
Arsenic	< 2.35	5.87	mg/Kg		ND				10	
Arsenic	< 2.35	5.87	mg/Kg		ND				10	
Arsenic	< 2.35	5.87	mg/Kg		ND				10	
Arsenic	< 2.35	5.87	mg/Kg		ND				10	
Barium	16.4	5.87	mg/Kg		15.4			6.38	10	
Barium	16.4	5.87	mg/Kg		15.4			6.38	10	
Barium	16.4	5.87	mg/Kg		15.4			6.38	10	
Barium	16.4	5.87	mg/Kg		15.4			6.38	10	
Cobalt	16.8	5.87	mg/Kg		14.1			17.5	10	P
Cobalt	16.8	5.87	mg/Kg		14.1			17.5	10	P

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Quality Control
(Continued)

Client: Reserve Management Group
Report Date: 03/10/2020
Project: SCPM RMT Dust
Matrix: Solid
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Metals by ICP-AES
(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Serial Dilution (B0C0225-DUP2) (Continued) **Source: 20C0340-02RE2** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 19:03*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Cobalt	16.8	5.87	mg/Kg		14.1			17.5	10	P
Cobalt	16.8	5.87	mg/Kg		14.1			17.5	10	P
Copper	7.18	5.87	mg/Kg		6.97			3.02	10	
Copper	7.18	5.87	mg/Kg		6.97			3.02	10	
Copper	7.18	5.87	mg/Kg		6.97			3.02	10	
Copper	7.18	5.87	mg/Kg		6.97			3.02	10	
Manganese	180	5.87	mg/Kg		158			13.1	10	P
Manganese	180	5.87	mg/Kg		158			13.1	10	P
Manganese	180	5.87	mg/Kg		158			13.1	10	P
Manganese	180	5.87	mg/Kg		158			13.1	10	P
Nickel	40.7	5.87	mg/Kg		33.6			18.9	10	P
Nickel	40.7	5.87	mg/Kg		33.6			18.9	10	P
Nickel	40.7	5.87	mg/Kg		33.6			18.9	10	P
Nickel	40.7	5.87	mg/Kg		33.6			18.9	10	P
Silver	< 1.17	5.87	mg/Kg		ND				10	
Silver	< 1.17	5.87	mg/Kg		ND				10	
Silver	< 1.17	5.87	mg/Kg		ND				10	
Silver	< 1.17	5.87	mg/Kg		ND				10	
Titanium	107	5.87	mg/Kg		95.2			11.2	10	P
Titanium	107	5.87	mg/Kg		95.2			11.2	10	P
Titanium	107	5.87	mg/Kg		95.2			11.2	10	P
Titanium	107	5.87	mg/Kg		95.2			11.2	10	P

MRL Check (B0C0225-MRL1) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:04*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Antimony	2.55	2.50	mg/Kg	2.500		102	70-130			
Antimony	2.55	2.50	mg/Kg	2.500		102	70-130			
Antimony	2.55	2.50	mg/Kg	2.500		102	70-130			
Antimony	2.55	2.50	mg/Kg	2.500		102	70-130			
Arsenic	2.28	2.50	mg/Kg	2.500		91.2	70-130			
Arsenic	2.28	2.50	mg/Kg	2.500		91.2	70-130			
Arsenic	2.28	2.50	mg/Kg	2.500		91.2	70-130			
Arsenic	2.28	2.50	mg/Kg	2.500		91.2	70-130			
Barium	2.13	2.50	mg/Kg	2.500		85.2	70-130			
Barium	2.13	2.50	mg/Kg	2.500		85.2	70-130			
Barium	2.13	2.50	mg/Kg	2.500		85.2	70-130			
Barium	2.13	2.50	mg/Kg	2.500		85.2	70-130			
Beryllium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			
Beryllium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			
Beryllium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			
Beryllium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			
Cadmium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			
Cadmium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			

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Quality Control

(Continued)

Client: Reserve Management Group
Project: SCPM
RMT Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES

(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

MRL Check (B0C0225-MRL1) (Continued) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:04*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Cadmium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			
Cadmium	0.225	0.250	mg/Kg	0.2500		90.0	70-130			
Chromium	2.20	2.50	mg/Kg	2.500		87.8	70-130			
Chromium	2.20	2.50	mg/Kg	2.500		87.8	70-130			
Chromium	2.20	2.50	mg/Kg	2.500		87.8	70-130			
Chromium	2.20	2.50	mg/Kg	2.500		87.8	70-130			
Cobalt	1.72	2.50	mg/Kg	2.000		86.2	70-130			
Cobalt	1.72	2.50	mg/Kg	2.000		86.2	70-130			
Cobalt	1.72	2.50	mg/Kg	2.000		86.2	70-130			
Cobalt	1.72	2.50	mg/Kg	2.000		86.2	70-130			
Copper	2.20	2.50	mg/Kg	2.500		88.0	70-130			
Copper	2.20	2.50	mg/Kg	2.500		88.0	70-130			
Copper	2.20	2.50	mg/Kg	2.500		88.0	70-130			
Copper	2.20	2.50	mg/Kg	2.500		88.0	70-130			
Lead	2.29	2.50	mg/Kg	2.500		91.6	70-130			
Lead	2.29	2.50	mg/Kg	2.500		91.6	70-130			
Lead	2.29	2.50	mg/Kg	2.500		91.6	70-130			
Lead	2.29	2.50	mg/Kg	2.500		91.6	70-130			
Manganese	2.20	2.50	mg/Kg	2.500		88.2	70-130			
Manganese	2.20	2.50	mg/Kg	2.500		88.2	70-130			
Manganese	2.20	2.50	mg/Kg	2.500		88.2	70-130			
Manganese	2.20	2.50	mg/Kg	2.500		88.2	70-130			
Nickel	2.22	2.50	mg/Kg	2.500		88.6	70-130			
Nickel	2.22	2.50	mg/Kg	2.500		88.6	70-130			
Nickel	2.22	2.50	mg/Kg	2.500		88.6	70-130			
Nickel	2.22	2.50	mg/Kg	2.500		88.6	70-130			
Selenium	2.50	2.50	mg/Kg	2.500		100	70-130			
Selenium	2.50	2.50	mg/Kg	2.500		100	70-130			
Selenium	2.50	2.50	mg/Kg	2.500		100	70-130			
Selenium	2.50	2.50	mg/Kg	2.500		100	70-130			
Titanium	1.96	2.50	mg/Kg	2.500		78.6	70-130			
Titanium	1.96	2.50	mg/Kg	2.500		78.6	70-130			
Titanium	1.96	2.50	mg/Kg	2.500		78.6	70-130			
Titanium	1.96	2.50	mg/Kg	2.500		78.6	70-130			
Zinc	2.44	10.0	mg/Kg	2.500		97.8	70-130			
Zinc	2.44	10.0	mg/Kg	2.500		97.8	70-130			
Zinc	2.44	10.0	mg/Kg	2.500		97.8	70-130			
Zinc	2.44	10.0	mg/Kg	2.500		97.8	70-130			

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Quality Control

(Continued)

Client: Reserve Management Group
Project: SCPM Napuck Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES

(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Matrix Spike (B0C0225-MS1) **Source: 20C0340-02RE1** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:58*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Beryllium	2.56	1.21	mg/Kg	2.413	0.446	87.5	75-125			
Beryllium	2.56	1.21	mg/Kg	2.413	0.446	87.5	75-125			
Beryllium	2.56	1.21	mg/Kg	2.413	0.446	87.5	75-125			
Beryllium	2.56	1.21	mg/Kg	2.413	0.446	87.5	75-125			
Cadmium	2.08	1.21	mg/Kg	2.413	ND	86.0	75-125			
Cadmium	2.08	1.21	mg/Kg	2.413	ND	86.0	75-125			
Cadmium	2.08	1.21	mg/Kg	2.413	ND	86.0	75-125			
Cadmium	2.08	1.21	mg/Kg	2.413	ND	86.0	75-125			
Chromium	32.0	12.1	mg/Kg	24.13	12.1	82.6	75-125			
Chromium	32.0	12.1	mg/Kg	24.13	12.1	82.6	75-125			
Chromium	32.0	12.1	mg/Kg	24.13	12.1	82.6	75-125			
Chromium	32.0	12.1	mg/Kg	24.13	12.1	82.6	75-125			
Lead	26.8	12.1	mg/Kg	24.13	5.42	88.4	75-125			
Lead	26.8	12.1	mg/Kg	24.13	5.42	88.4	75-125			
Lead	26.8	12.1	mg/Kg	24.13	5.42	88.4	75-125			
Lead	26.8	12.1	mg/Kg	24.13	5.42	88.4	75-125			
Phosphorus	261	60.3	mg/Kg	120.7	142	98.2	75-125			
Phosphorus	261	60.3	mg/Kg	120.7	142	98.2	75-125			
Phosphorus	261	60.3	mg/Kg	120.7	142	98.2	75-125			
Phosphorus	261	60.3	mg/Kg	120.7	142	98.2	75-125			
Selenium	19.9	12.1	mg/Kg	24.13	ND	82.6	75-125			
Selenium	19.9	12.1	mg/Kg	24.13	ND	82.6	75-125			
Selenium	19.9	12.1	mg/Kg	24.13	ND	82.6	75-125			
Selenium	19.9	12.1	mg/Kg	24.13	ND	82.6	75-125			

Matrix Spike (B0C0225-MS2) **Source: 20C0340-02RE2** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 18:50*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Antimony	6.33	1.21	mg/Kg	24.13	ND	26.2	75-125			S
Antimony	6.33	1.21	mg/Kg	24.13	ND	26.2	75-125			S
Antimony	6.33	1.21	mg/Kg	24.13	ND	26.2	75-125			S
Antimony	6.33	1.21	mg/Kg	24.13	ND	26.2	75-125			S
Arsenic	19.5	1.21	mg/Kg	24.13	0.777	77.8	75-125			
Arsenic	19.5	1.21	mg/Kg	24.13	0.777	77.8	75-125			
Arsenic	19.5	1.21	mg/Kg	24.13	0.777	77.8	75-125			
Arsenic	19.5	1.21	mg/Kg	24.13	0.777	77.8	75-125			
Barium	35.8	1.21	mg/Kg	24.13	15.4	84.6	75-125			
Barium	35.8	1.21	mg/Kg	24.13	15.4	84.6	75-125			
Barium	35.8	1.21	mg/Kg	24.13	15.4	84.6	75-125			
Barium	35.8	1.21	mg/Kg	24.13	15.4	84.6	75-125			
Cobalt	31.6	1.21	mg/Kg	24.13	14.1	72.3	75-125			S
Cobalt	31.6	1.21	mg/Kg	24.13	14.1	72.3	75-125			S
Cobalt	31.6	1.21	mg/Kg	24.13	14.1	72.3	75-125			S
Cobalt	31.6	1.21	mg/Kg	24.13	14.1	72.3	75-125			S

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Quality Control

(Continued)

Client: Reserve Management Group
Project: SCPM
Napuck Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES

(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Matrix Spike (B0C0225-MS2) (Continued) **Source: 20C0340-02RE2** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 18:50*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Copper	27.1	1.21	mg/Kg	24.13	6.97	83.2	75-125			
Copper	27.1	1.21	mg/Kg	24.13	6.97	83.2	75-125			
Copper	27.1	1.21	mg/Kg	24.13	6.97	83.2	75-125			
Copper	27.1	1.21	mg/Kg	24.13	6.97	83.2	75-125			
Manganese	165	1.21	mg/Kg	24.13	158	32.2	75-125			S
Manganese	165	1.21	mg/Kg	24.13	158	32.2	75-125			S
Manganese	165	1.21	mg/Kg	24.13	158	32.2	75-125			S
Manganese	165	1.21	mg/Kg	24.13	158	32.2	75-125			S
Nickel	57.2	1.21	mg/Kg	24.13	33.6	97.8	75-125			
Nickel	57.2	1.21	mg/Kg	24.13	33.6	97.8	75-125			
Nickel	57.2	1.21	mg/Kg	24.13	33.6	97.8	75-125			
Nickel	57.2	1.21	mg/Kg	24.13	33.6	97.8	75-125			
Silver	1.11	1.21	mg/Kg	2.413	ND	46.1	75-125			S
Silver	1.11	1.21	mg/Kg	2.413	ND	46.1	75-125			S
Silver	1.11	1.21	mg/Kg	2.413	ND	46.1	75-125			S
Silver	1.11	1.21	mg/Kg	2.413	ND	46.1	75-125			S
Titanium	97.6	1.21	mg/Kg	24.13	95.2	9.84	75-125			S
Titanium	97.6	1.21	mg/Kg	24.13	95.2	9.84	75-125			S
Titanium	97.6	1.21	mg/Kg	24.13	95.2	9.84	75-125			S
Titanium	97.6	1.21	mg/Kg	24.13	95.2	9.84	75-125			S
Zinc	51.0	4.83	mg/Kg	24.13	26.9	99.6	75-125			
Zinc	51.0	4.83	mg/Kg	24.13	26.9	99.6	75-125			
Zinc	51.0	4.83	mg/Kg	24.13	26.9	99.6	75-125			
Zinc	51.0	4.83	mg/Kg	24.13	26.9	99.6	75-125			

Matrix Spike Dup (B0C0225-MSD1) **Source: 20C0340-02RE1** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 18:02*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Beryllium	2.63	1.15	mg/Kg	2.307	0.446	94.7	75-125	2.80	20	
Beryllium	2.63	1.15	mg/Kg	2.307	0.446	94.7	75-125	2.80	20	
Beryllium	2.63	1.15	mg/Kg	2.307	0.446	94.7	75-125	2.80	20	
Beryllium	2.63	1.15	mg/Kg	2.307	0.446	94.7	75-125	2.80	20	
Cadmium	2.08	1.15	mg/Kg	2.307	ND	90.0	75-125	0.0679	20	
Cadmium	2.08	1.15	mg/Kg	2.307	ND	90.0	75-125	0.0679	20	
Cadmium	2.08	1.15	mg/Kg	2.307	ND	90.0	75-125	0.0679	20	
Cadmium	2.08	1.15	mg/Kg	2.307	ND	90.0	75-125	0.0679	20	
Chromium	36.7	11.5	mg/Kg	23.07	12.1	107	75-125	13.6	20	
Chromium	36.7	11.5	mg/Kg	23.07	12.1	107	75-125	13.6	20	
Chromium	36.7	11.5	mg/Kg	23.07	12.1	107	75-125	13.6	20	
Chromium	36.7	11.5	mg/Kg	23.07	12.1	107	75-125	13.6	20	
Lead	26.9	11.5	mg/Kg	23.07	5.42	93.2	75-125	0.619	20	
Lead	26.9	11.5	mg/Kg	23.07	5.42	93.2	75-125	0.619	20	
Lead	26.9	11.5	mg/Kg	23.07	5.42	93.2	75-125	0.619	20	
Lead	26.9	11.5	mg/Kg	23.07	5.42	93.2	75-125	0.619	20	

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Quality Control

(Continued)

Client: Reserve Management Group
Project: SCPM Napuck Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345
Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES

(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Matrix Spike Dup (B0C0225-MSD1) (Continued) **Source: 20C0340-02RE1** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 18:02*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Phosphorus	294	57.7	mg/Kg	115.4	142	131	75-125	11.9	20	S
Phosphorus	294	57.7	mg/Kg	115.4	142	131	75-125	11.9	20	S
Phosphorus	294	57.7	mg/Kg	115.4	142	131	75-125	11.9	20	S
Phosphorus	294	57.7	mg/Kg	115.4	142	131	75-125	11.9	20	S
Selenium	20.4	11.5	mg/Kg	23.07	ND	88.3	75-125	2.19	20	
Selenium	20.4	11.5	mg/Kg	23.07	ND	88.3	75-125	2.19	20	
Selenium	20.4	11.5	mg/Kg	23.07	ND	88.3	75-125	2.19	20	
Selenium	20.4	11.5	mg/Kg	23.07	ND	88.3	75-125	2.19	20	

Matrix Spike Dup (B0C0225-MSD2) **Source: 20C0340-02RE2** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 18:55*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Antimony	6.77	1.15	mg/Kg	23.07	ND	29.3	75-125	6.65	20	S
Antimony	6.77	1.15	mg/Kg	23.07	ND	29.3	75-125	6.65	20	S
Antimony	6.77	1.15	mg/Kg	23.07	ND	29.3	75-125	6.65	20	S
Antimony	6.77	1.15	mg/Kg	23.07	ND	29.3	75-125	6.65	20	S
Arsenic	18.7	1.15	mg/Kg	23.07	0.777	77.5	75-125	4.59	20	
Arsenic	18.7	1.15	mg/Kg	23.07	0.777	77.5	75-125	4.59	20	
Arsenic	18.7	1.15	mg/Kg	23.07	0.777	77.5	75-125	4.59	20	
Arsenic	18.7	1.15	mg/Kg	23.07	0.777	77.5	75-125	4.59	20	
Barium	35.0	1.15	mg/Kg	23.07	15.4	84.9	75-125	2.28	20	
Barium	35.0	1.15	mg/Kg	23.07	15.4	84.9	75-125	2.28	20	
Barium	35.0	1.15	mg/Kg	23.07	15.4	84.9	75-125	2.28	20	
Barium	35.0	1.15	mg/Kg	23.07	15.4	84.9	75-125	2.28	20	
Cobalt	35.3	1.15	mg/Kg	23.07	14.1	91.6	75-125	11.0	20	
Cobalt	35.3	1.15	mg/Kg	23.07	14.1	91.6	75-125	11.0	20	
Cobalt	35.3	1.15	mg/Kg	23.07	14.1	91.6	75-125	11.0	20	
Cobalt	35.3	1.15	mg/Kg	23.07	14.1	91.6	75-125	11.0	20	
Copper	26.9	1.15	mg/Kg	23.07	6.97	86.3	75-125	0.628	20	
Copper	26.9	1.15	mg/Kg	23.07	6.97	86.3	75-125	0.628	20	
Copper	26.9	1.15	mg/Kg	23.07	6.97	86.3	75-125	0.628	20	
Copper	26.9	1.15	mg/Kg	23.07	6.97	86.3	75-125	0.628	20	
Manganese	175	1.15	mg/Kg	23.07	158	76.2	75-125	5.76	20	
Manganese	175	1.15	mg/Kg	23.07	158	76.2	75-125	5.76	20	
Manganese	175	1.15	mg/Kg	23.07	158	76.2	75-125	5.76	20	
Manganese	175	1.15	mg/Kg	23.07	158	76.2	75-125	5.76	20	
Nickel	65.5	1.15	mg/Kg	23.07	33.6	138	75-125	13.5	20	S
Nickel	65.5	1.15	mg/Kg	23.07	33.6	138	75-125	13.5	20	S
Nickel	65.5	1.15	mg/Kg	23.07	33.6	138	75-125	13.5	20	S
Nickel	65.5	1.15	mg/Kg	23.07	33.6	138	75-125	13.5	20	S
Silver	1.01	1.15	mg/Kg	2.307	ND	43.8	75-125	9.59	20	S
Silver	1.01	1.15	mg/Kg	2.307	ND	43.8	75-125	9.59	20	S
Silver	1.01	1.15	mg/Kg	2.307	ND	43.8	75-125	9.59	20	S
Silver	1.01	1.15	mg/Kg	2.307	ND	43.8	75-125	9.59	20	S

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Quality Control
(Continued)

Client: Reserve Management Group
Project: SCPM Napuck Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345
Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES
(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Matrix Spike Dup (B0C0225-MSD2) (Continued)		**Source: 20C0340-02RE2**		*Prepared: 03/06/2020 09:49*		*Analyzed: 03/06/2020 18:55*				
Titanium	108	1.15	mg/Kg	23.07	95.2	57.2	75-125	10.5	20	S
Titanium	108	1.15	mg/Kg	23.07	95.2	57.2	75-125	10.5	20	S
Titanium	108	1.15	mg/Kg	23.07	95.2	57.2	75-125	10.5	20	S
Titanium	108	1.15	mg/Kg	23.07	95.2	57.2	75-125	10.5	20	S
Zinc	45.8	4.61	mg/Kg	23.07	26.9	81.8	75-125	10.6	20	
Zinc	45.8	4.61	mg/Kg	23.07	26.9	81.8	75-125	10.6	20	
Zinc	45.8	4.61	mg/Kg	23.07	26.9	81.8	75-125	10.6	20	
Zinc	45.8	4.61	mg/Kg	23.07	26.9	81.8	75-125	10.6	20	
Post Spike (B0C0225-PS1)		**Source: 20C0340-02RE1**		*Prepared: 03/06/2020 09:49*		*Analyzed: 03/06/2020 18:06*				
Beryllium	121	1.17	mg/Kg	117.3	0.446	102	80-120			
Beryllium	121	1.17	mg/Kg	117.3	0.446	102	80-120			
Beryllium	121	1.17	mg/Kg	117.3	0.446	102	80-120			
Beryllium	121	1.17	mg/Kg	117.3	0.446	102	80-120			
Cadmium	113	1.17	mg/Kg	117.3	ND	96.1	80-120			
Cadmium	113	1.17	mg/Kg	117.3	ND	96.1	80-120			
Cadmium	113	1.17	mg/Kg	117.3	ND	96.1	80-120			
Cadmium	113	1.17	mg/Kg	117.3	ND	96.1	80-120			
Chromium	129	11.7	mg/Kg	117.3	12.1	99.4	80-120			
Chromium	129	11.7	mg/Kg	117.3	12.1	99.4	80-120			
Chromium	129	11.7	mg/Kg	117.3	12.1	99.4	80-120			
Chromium	129	11.7	mg/Kg	117.3	12.1	99.4	80-120			
Lead	114	11.7	mg/Kg	117.3	5.42	92.4	80-120			
Lead	114	11.7	mg/Kg	117.3	5.42	92.4	80-120			
Lead	114	11.7	mg/Kg	117.3	5.42	92.4	80-120			
Lead	114	11.7	mg/Kg	117.3	5.42	92.4	80-120			
Phosphorus	260	58.7	mg/Kg	117.3	142	100	80-120			
Phosphorus	260	58.7	mg/Kg	117.3	142	100	80-120			
Phosphorus	260	58.7	mg/Kg	117.3	142	100	80-120			
Phosphorus	260	58.7	mg/Kg	117.3	142	100	80-120			
Selenium	117	11.7	mg/Kg	117.3	ND	99.5	80-120			
Selenium	117	11.7	mg/Kg	117.3	ND	99.5	80-120			
Selenium	117	11.7	mg/Kg	117.3	ND	99.5	80-120			
Selenium	117	11.7	mg/Kg	117.3	ND	99.5	80-120			
Post Spike (B0C0225-PS2)		**Source: 20C0340-02RE2**		*Prepared: 03/06/2020 09:49*		*Analyzed: 03/06/2020 18:59*				
Antimony	11.0	1.30	mg/Kg	13.04	ND	84.6	80-120			
Antimony	11.0	1.30	mg/Kg	13.04	ND	84.6	80-120			
Antimony	11.0	1.30	mg/Kg	13.04	ND	84.6	80-120			
Antimony	11.0	1.30	mg/Kg	13.04	ND	84.6	80-120			
Arsenic	13.1	1.30	mg/Kg	13.04	0.777	94.8	80-120			
Arsenic	13.1	1.30	mg/Kg	13.04	0.777	94.8	80-120			

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Quality Control
(Continued)

Client:	Reserve Management Group	**Report Date:**	03/10/2020
Project:	SCPM RMT Dust	**Matrix:**	Solid
Work Order:	20C0342, 20C0343, 20C0344, 20C0345		

Metals by ICP-AES
(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Post Spike (B0C0225-PS2) (Continued) **Source: 20C0340-02RE2** *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 18:59*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Arsenic	13.1	1.30	mg/Kg	13.04	0.777	94.8	80-120			
Arsenic	13.1	1.30	mg/Kg	13.04	0.777	94.8	80-120			
Barium	26.6	1.30	mg/Kg	13.04	15.4	86.4	80-120			
Barium	26.6	1.30	mg/Kg	13.04	15.4	86.4	80-120			
Barium	26.6	1.30	mg/Kg	13.04	15.4	86.4	80-120			
Barium	26.6	1.30	mg/Kg	13.04	15.4	86.4	80-120			
Cobalt	24.8	1.30	mg/Kg	13.04	14.1	82.2	80-120			
Cobalt	24.8	1.30	mg/Kg	13.04	14.1	82.2	80-120			
Cobalt	24.8	1.30	mg/Kg	13.04	14.1	82.2	80-120			
Cobalt	24.8	1.30	mg/Kg	13.04	14.1	82.2	80-120			
Copper	19.0	1.30	mg/Kg	13.04	6.97	92.0	80-120			
Copper	19.0	1.30	mg/Kg	13.04	6.97	92.0	80-120			
Copper	19.0	1.30	mg/Kg	13.04	6.97	92.0	80-120			
Copper	19.0	1.30	mg/Kg	13.04	6.97	92.0	80-120			
Manganese	170	1.30	mg/Kg	13.04	158	91.9	80-120			
Manganese	170	1.30	mg/Kg	13.04	158	91.9	80-120			
Manganese	170	1.30	mg/Kg	13.04	158	91.9	80-120			
Manganese	170	1.30	mg/Kg	13.04	158	91.9	80-120			
Nickel	44.3	1.30	mg/Kg	13.04	33.6	81.7	80-120			
Nickel	44.3	1.30	mg/Kg	13.04	33.6	81.7	80-120			
Nickel	44.3	1.30	mg/Kg	13.04	33.6	81.7	80-120			
Nickel	44.3	1.30	mg/Kg	13.04	33.6	81.7	80-120			
Silver	8.65	1.30	mg/Kg	13.04	ND	66.3	80-120			S
Silver	8.65	1.30	mg/Kg	13.04	ND	66.3	80-120			S
Silver	8.65	1.30	mg/Kg	13.04	ND	66.3	80-120			S
Silver	8.65	1.30	mg/Kg	13.04	ND	66.3	80-120			S
Titanium	106	1.30	mg/Kg	13.04	95.2	84.2	80-120			
Titanium	106	1.30	mg/Kg	13.04	95.2	84.2	80-120			
Titanium	106	1.30	mg/Kg	13.04	95.2	84.2	80-120			
Titanium	106	1.30	mg/Kg	13.04	95.2	84.2	80-120			
Zinc	39.1	5.22	mg/Kg	13.04	26.9	93.0	80-120			
Zinc	39.1	5.22	mg/Kg	13.04	26.9	93.0	80-120			
Zinc	39.1	5.22	mg/Kg	13.04	26.9	93.0	80-120			
Zinc	39.1	5.22	mg/Kg	13.04	26.9	93.0	80-120			

Reference (B0C0225-SRM1) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:08*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Antimony	19.6	25.0	mg/Kg	27.03		72.3	50-150			
Antimony	19.6	25.0	mg/Kg	27.03		72.3	50-150			
Antimony	19.6	25.0	mg/Kg	27.03		72.3	50-150			
Antimony	19.6	25.0	mg/Kg	27.03		72.3	50-150			
Arsenic	37.6	25.0	mg/Kg	52.55		71.7	50-150			
Arsenic	37.6	25.0	mg/Kg	52.55		71.7	50-150			

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Quality Control
(Continued)

Client: Reserve Management Group
Project: SCPM
RMT Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Report Date: 03/10/2020
Matrix: Solid

Metals by ICP-AES
(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Reference (B0C0225-SRM1) (Continued) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:08*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Arsenic	37.6	25.0	mg/Kg	52.55		71.7	50-150			
Arsenic	37.6	25.0	mg/Kg	52.55		71.7	50-150			
Barium	116	25.0	mg/Kg	148.7		77.9	50-150			
Barium	116	25.0	mg/Kg	148.7		77.9	50-150			
Barium	116	25.0	mg/Kg	148.7		77.9	50-150			
Barium	116	25.0	mg/Kg	148.7		77.9	50-150			
Beryllium	73.6	2.50	mg/Kg	109.7		67.1	50-150			
Beryllium	73.6	2.50	mg/Kg	109.7		67.1	50-150			
Beryllium	73.6	2.50	mg/Kg	109.7		67.1	50-150			
Beryllium	73.6	2.50	mg/Kg	109.7		67.1	50-150			
Cadmium	37.0	2.50	mg/Kg	48.65		76.0	50-150			
Cadmium	37.0	2.50	mg/Kg	48.65		76.0	50-150			
Cadmium	37.0	2.50	mg/Kg	48.65		76.0	50-150			
Cadmium	37.0	2.50	mg/Kg	48.65		76.0	50-150			
Chromium	106	25.0	mg/Kg	142.2		74.2	50-150			
Chromium	106	25.0	mg/Kg	142.2		74.2	50-150			
Chromium	106	25.0	mg/Kg	142.2		74.2	50-150			
Chromium	106	25.0	mg/Kg	142.2		74.2	50-150			
Cobalt	27.8	25.0	mg/Kg	36.65		76.0	50-150			
Cobalt	27.8	25.0	mg/Kg	36.65		76.0	50-150			
Cobalt	27.8	25.0	mg/Kg	36.65		76.0	50-150			
Cobalt	27.8	25.0	mg/Kg	36.65		76.0	50-150			
Copper	16.6	25.0	mg/Kg	27.08		61.3	50-150			
Copper	16.6	25.0	mg/Kg	27.08		61.3	50-150			
Copper	16.6	25.0	mg/Kg	27.08		61.3	50-150			
Copper	16.6	25.0	mg/Kg	27.08		61.3	50-150			
Lead	112	25.0	mg/Kg	148.1		75.7	50-150			
Lead	112	25.0	mg/Kg	148.1		75.7	50-150			
Lead	112	25.0	mg/Kg	148.1		75.7	50-150			
Lead	112	25.0	mg/Kg	148.1		75.7	50-150			
Manganese	400	25.0	mg/Kg	600.1		66.7	50-150			
Manganese	400	25.0	mg/Kg	600.1		66.7	50-150			
Manganese	400	25.0	mg/Kg	600.1		66.7	50-150			
Manganese	400	25.0	mg/Kg	600.1		66.7	50-150			
Nickel	45.4	25.0	mg/Kg	58.38		77.8	50-150			
Nickel	45.4	25.0	mg/Kg	58.38		77.8	50-150			
Nickel	45.4	25.0	mg/Kg	58.38		77.8	50-150			
Nickel	45.4	25.0	mg/Kg	58.38		77.8	50-150			
Selenium	91.5	25.0	mg/Kg	123.3		74.2	50-150			
Selenium	91.5	25.0	mg/Kg	123.3		74.2	50-150			
Selenium	91.5	25.0	mg/Kg	123.3		74.2	50-150			
Selenium	91.5	25.0	mg/Kg	123.3		74.2	50-150			

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Quality Control

(Continued)

Client: Reserve Management Group **Report Date:** 03/10/2020
Project: SCPM **Matrix:** Solid
Napuck Dust
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Metals by ICP-AES

(Continued)

Batch: B0C0225 - SW3050 *(Continued)*

Reference (B0C0225-SRM1) (Continued) *Prepared: 03/06/2020 09:49 Analyzed: 03/06/2020 17:08*

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Silver	11.8	25.0	mg/Kg	13.52		87.7	50-150			
Silver	11.8	25.0	mg/Kg	13.52		87.7	50-150			
Silver	11.8	25.0	mg/Kg	13.52		87.7	50-150			
Silver	11.8	25.0	mg/Kg	13.52		87.7	50-150			
Titanium	291	25.0	mg/Kg	460.1		63.3	50-150			
Titanium	291	25.0	mg/Kg	460.1		63.3	50-150			
Titanium	291	25.0	mg/Kg	460.1		63.3	50-150			
Titanium	291	25.0	mg/Kg	460.1		63.3	50-150			
Zinc	378	100	mg/Kg	483.3		78.2	50-150			
Zinc	378	100	mg/Kg	483.3		78.2	50-150			
Zinc	378	100	mg/Kg	483.3		78.2	50-150			
Zinc	378	100	mg/Kg	483.3		78.2	50-150			

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Quality Control

(Continued)

Client: Reserve Management Group **Report Date:** 03/10/2020
Project: SCPM Napuck Dust **Matrix:** Solid
Work Order: 20C0342, 20C0343, 20C0344, 20C0345

Mercury by CVAA

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch: B0C0297										
Blank (B0C0297-BLK1)				*Prepared: 03/09/2020 10:30 Analyzed: 03/09/2020 14:02*						
Mercury	< 0.100	0.100	mg/Kg							
Mercury	< 0.100	0.100	mg/Kg							
Mercury	< 0.100	0.100	mg/Kg							
Mercury	< 0.100	0.100	mg/Kg							
LCS (B0C0297-BS1)				*Prepared: 03/09/2020 10:30 Analyzed: 03/09/2020 14:04*						
Mercury	0.546	0.100	mg/Kg	0.5000		109	89.7-115			
Mercury	0.546	0.100	mg/Kg	0.5000		109	89.7-115			
Mercury	0.546	0.100	mg/Kg	0.5000		109	89.7-115			
Mercury	0.546	0.100	mg/Kg	0.5000		109	89.7-115			
MRL Check (B0C0297-MRL1)				*Prepared: 03/09/2020 10:30 Analyzed: 03/09/2020 13:52*						
Mercury	0.236	0.100	mg/Kg	0.2000		118	70-130			
Mercury	0.236	0.100	mg/Kg	0.2000		118	70-130			
Mercury	0.236	0.100	mg/Kg	0.2000		118	70-130			
Mercury	0.236	0.100	mg/Kg	0.2000		118	70-130			
Matrix Spike (B0C0297-MS1)		**Source: 20C0340-02**		*Prepared: 03/09/2020 10:30 Analyzed: 03/09/2020 14:22*						
Mercury	0.491	0.096	mg/Kg	0.4790	ND	102	75-125			
Mercury	0.491	0.096	mg/Kg	0.4790	ND	102	75-125			
Mercury	0.491	0.096	mg/Kg	0.4790	ND	102	75-125			
Mercury	0.491	0.096	mg/Kg	0.4790	ND	102	75-125			
Matrix Spike Dup (B0C0297-MSD1)		**Source: 20C0340-02**		*Prepared: 03/09/2020 10:30 Analyzed: 03/09/2020 14:24*						
Mercury	0.489	0.096	mg/Kg	0.4781	ND	102	75-125	0.498	20	
Mercury	0.489	0.096	mg/Kg	0.4781	ND	102	75-125	0.498	20	
Mercury	0.489	0.096	mg/Kg	0.4781	ND	102	75-125	0.498	20	
Mercury	0.489	0.096	mg/Kg	0.4781	ND	102	75-125	0.498	20	
Reference (B0C0297-SRM1)				*Prepared: 03/09/2020 10:30 Analyzed: 03/09/2020 14:06*						
Mercury	0.200	0.100	mg/Kg	0.1991		101	50-150			
Mercury	0.200	0.100	mg/Kg	0.1991		101	50-150			
Mercury	0.200	0.100	mg/Kg	0.1991		101	50-150			
Mercury	0.200	0.100	mg/Kg	0.1991		101	50-150			

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Certified Analyses included in this Report

Analyte	CAS #	Certifications
SW6010C in Solid		
Antimony	7440-36-0	DoD,ISO,WDNR,ILEPA
Arsenic	7440-38-2	DoD,ISO,AKDEC,WDNR,ILEPA
Barium	7440-39-3	DoD,ISO,AKDEC,WDNR,ILEPA
Beryllium	7440-41-7	DoD,ISO,WDNR,ILEPA
Cadmium	7440-43-9	DoD,ISO,AKDEC,WDNR,ILEPA
Chromium	7440-47-3	DoD,ISO,AKDEC,WDNR,ILEPA
Cobalt	7440-48-4	DoD,ISO,WDNR,ILEPA
Copper	7440-50-8	DoD,ISO,WDNR,ILEPA
Lead	7439-92-1	DoD,ISO,AKDEC,WDNR,ILEPA
Manganese	7439-96-5	DoD,ISO,WDNR,ILEPA
Nickel	7440-02-0	DoD,ISO,AKDEC,WDNR,ILEPA
Phosphorus	7723-14-0	DoD
Selenium	7782-49-2	DoD,ISO,WDNR,ILEPA
Silver	7440-22-4	DoD,ISO,WDNR,ILEPA
Titanium	7440-32-6	DoD,WDNR,ILEPA
Zinc	7440-66-6	DoD,ISO,WDNR,ILEPA
SW7471B in Solid		
Mercury	7439-97-6	ISO,DoD,WDNR,ILEPA

List of Certifications

Code	Description	Number	Expires
AKDEC	State of Alaska, Dept. Environmental Conservation	17-011	04/30/2020
CPSC	US Consumer Product Safety Commission, Accredited by PJLA Lab No. 1050	L18-184-R1	04/30/2020
DoD	Department of Defense, Accredited by PJLA	L18-183-R3	04/30/2020
ILEPA	State of Illinois, NELAP Accredited Lab No. 100256	1002562020-1	07/27/2020
ISO	ISO/IEC 17025, Accredited by PJLA	L18-184-R1	04/30/2020
TX	Texas Commission of Environmental Quality	T104704554-19-4	10/31/2020
WA	Washington State Department of Ecology	C1057	01/05/2021
WDNR	State of Wisconsin Dept of Natural Resources	999888890	08/31/2020

R 001953

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Qualifiers and Definitions

Item	Description
P	The quality control sample %RPD is above the laboratory control limit.
Q	One or more quality control results were outside of the acceptance limits (e.g. LCS recovery, surrogate spike recovery, or CCV recovery).
S	The quality control sample recovery is outside of the laboratory control limits.
S3	The percent recovery was outside the limits, but the analyte is reported within the calibration range. Data is acceptable.
%Rec	Percent Recovery

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509 N. 3rd Avenue
Des Plaines, IL 60016

20C0342
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

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847-967-6735
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...ain of Custody Record

TURNAROUND TIME:
☒ RUSH
_____ day turnaround
☐ ROUTINE

Due Date: 3 - 10 - 20 COC #: 233102

Company: RMG
Address:

Phone #: 440) 287 - 7209 Fax #: ( ) -
P.O. #: Proj. #: -
Client Contact: MARK WEINTRAUB
Project ID / Location: SCPM

Sample Type: 1. Waste Water 2. Drinking Water 3. Soil 4. Sludge 5. Oil 6. Groundwater 7. Groundwater (filtered) (8) Other

Container Type: P - Plastic G - Glass V - VOC Vial B - Tedlar Bag (O) - Other

Preservative: (1) None 2. H_2SO_4 3. HNO_3 4. NaOH 5. HCl 6. MeOH 7. Zn Ace 8. Other

Analyses

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	Sampling pH	Sampling Temp.	Preservation Field	Preservation Lab	SB, AS, BA, BE	CD, CR, CO, CU	PB, MN, NI, P, HG	SE, TI, ZN, AG								EMT USE ONLY EMT WORKORDER #20C0342
PAVED				1		3/5/20						X	X	X	X								01A

Relinquished By:	Date / Time	Received By:	Date / Time		
Relinquished By:	Date: 3-5-20 Time: 16:00	Received By:	Date: - - Time: :	EMT USE ONLY Client Code:	☐ SAMPLE RECEIVED ON ICE ☒ TEMPERATURE 23.3
Relinquished By:	Date: - - Time: :	Received By:	Date: - - Time: :	EMT Project I.D.	
Relinquished By:	Date: - - Time: :	Received For Lab By:	Date: 3-5-20 Time: 16:00	Jar Lot No.	EMT SAMPLE RETURN POLICY ON BACK

SPECIAL INSTRUCTIONS:

R 001954

Sample Receipt Checklist

Work Order: 20C0342

Printed: 3/5/2020 4:20:46PM

Client:	**Reserve Management Group**		
Project:	**Residential Soil Analysis**	Date Due:	**Tuesday, March 10, 2020**

Received By:	**Agnieszka B. Zabawa**	Date Received:	**03/05/20 16:00**
Logged In By:	**Agnieszka B. Zabawa**	Date Logged In:	**03/05/20 16:02**

Sample Temperature at Receipt:	**23.3°C**
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Containers Intact	Yes
COC Present and Complete	Yes
COC agrees with Sample Labels	Yes
Containers Properly Preserved	Yes
Samples Received Within Holdtime	Yes
Cooler Temp Within Limits	Yes
VOA Water Vials Received	No

Comments

ABZ
3/5/20

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20C0343
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

Chain of Custody Record

TURNAROUND TIME:
☒ RUSH
_____ day turnaround
☐ ROUTINE

Due Date: 3 - 10 - 20 COC #: 233105

Company: RMG
Address:

Phone #: (440) 287 - 7209 Fax #: ( ) -
P.O. #: Proj. #: -
Client Contact: MARK WEINTRAUB
Project ID / Location: SCPM

Sample Type:
1. Waste Water 4. Sludge 7. Groundwater (filtered)
2. Drinking Water 5. Oil 8. Other
3. Soil 6. Groundwater

Container Type:
P - Plastic V - VOC Vial O - Other
G - Glass B - Tedlar Bag

Preservative:
1. None 4. NaOH 7. Zn Ace
2. H_2SO_4 5. HCl 8. Other
3. HNO_3 6. MeOH

Analyses

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	pH	Temp.	Preservation Field	Preservation Lab	SB, AS, BA, BE	CD, CR, CO, CU	PB, MN, NI, P, HG	SE, TI, ZN, AG	EMT USE ONLY / EMT WORKORDER # 20C0343
UNPAVED			[illegible]	1		3/5/20						X	X	X	X	01A

Relinquished By:	Date / Time	Received By:	Date / Time
[signature]	Date: 3-5-20 Time: 16:00		Date: - - Time: :
	Date: - - Time: :		Date: - - Time: :
	Date: - - Time: :	Received For Lab By: [signature]	Date: 3-5-20 Time: 16:00

EMT USE ONLY
Client Code:
EMT Project I.D.
Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE
23.3

EMT SAMPLE RETURN POLICY ON BACK

R 001956

SPECIAL INSTRUCTIONS:

Sample Receipt Checklist

Work Order: 20C0343

Printed: 3/5/2020 4:15:45PM

Client:	**Reserve Management Group**		
Project:	**Residential Soil Analysis**	Date Due:	**Tuesday, March 10, 2020**

Received By:	**Agnieszka B. Zabawa**	**Date Received:**	**03/05/20 16:00**
Logged In By:	**Agnieszka B. Zabawa**	**Date Logged In:**	**03/05/20 16:13**

Sample Temperature at Receipt:	**23.3°C**
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Containers Intact	Yes
COC Present and Complete	Yes
COC agrees with Sample Labels	Yes
Containers Properly Preserved	Yes
Samples Received Within Holdtime	Yes
Cooler Temp Within Limits	Yes
VOA Water Vials Received	No

Comments

ABZ
3/5/20

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: 847-967-6735
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20C0344
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

hain of Custody Record

TURNAROUND TIME:
☒ RUSH
_____ day turnaround
☐ ROUTINE

Due Date: 3-10-20 COC #: 233103

Company: RMG
Address:

Phone #: (440) 287 - 7209 Fax #: ( ) -
P.O. #: Proj. #: -
Client Contact: MARK WEINTRAUB
Project ID / Location: SCPM

Sample Type:
1. Waste Water 4. Sludge 7. Groundwater (filtered)
2. Drinking Water 5. Oil (8) Other
3. Soil 6. Groundwater

Container Type:
P - Plastic V - VOC Vial (O) - Other
G - Glass B - Tedlar Bag

Preservative:
(1) None 4. NaOH 7. Zn Ace
2. H_2SO_4 5. HCl 8. Other
3. HNO_3 6. MeOH

Analyses: SB, AS, BA, BE / CD, CR, CO, CU / PB, MN, NI, P, HG / SE, TI, ZN, AG

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	Sampling pH	Sampling Temp.	Preservation Field	Preservation Lab	SB, AS, BA, BE	CD, CR, CO, CU	PB, MN, NI, P, HG	SE, TI, ZN, AG	EMT USE ONLY — EMT WORKORDER #20C0344
NAPUCK DUST				1		3/5/20						X	X	X	X	01A

Relinquished By: [signature]	Date: 3-5-20 Time: 16:00	Received By:	Date: - - Time: :	EMT USE ONLY Client Code:
Relinquished By:	Date: - - Time: :	Received By:	Date: - - Time: :	EMT Project I.D.
Relinquished By:	Date: - - Time: :	Received For Lab By: [signature]	Date: 3-5-20 Time: 16:00	Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE 23.3

EMT SAMPLE RETURN POLICY ON BACK

R 001958

SPECIAL INSTRUCTIONS:

Sample Receipt Checklist

Work Order: 20C0344

Printed: 3/5/2020 4:17:27PM

Client: **Reserve Management Group**
Project: **Residential Soil Analysis**

Date Due: **Tuesday, March 10, 2020**

Received By: **Agnieszka B. Zabawa**
Logged In By: **Agnieszka B. Zabawa**

Date Received: **03/05/20 16:00**
Date Logged In: **03/05/20 16:16**

Sample Temperature at Receipt:	**23.3°C**
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Containers Intact	Yes
COC Present and Complete	Yes
COC agrees with Sample Labels	Yes
Containers Properly Preserved	Yes
Samples Received Within Holdtime	Yes
Cooler Temp Within Limits	Yes
VOA Water Vials Received	No

Comments

ABZ
3/5/20

ENVIRONM
MONITORI
TECHNOLOG

509 N. 3rd Avenue
Des Plaines, IL 60016

47-967-6666
AX: 847-967-6735
www.emt.com

20C0345
PM: Mark Steuer
Reserve Management Group
Residential Soil Analysis

Chain of Custody Record

TURNAROUND TIME:
☒ RUSH
_____ day turnaround
☐ ROUTINE

Due Date: 3 - 10 - 20 COC #: 233101

Company: RMG
Address:

Phone #: (440) 287 - 7209 Fax #: ( ) -
P.O. #: Proj.#: -
Client Contact: MARK WEINTRAUB
Project ID / Location: SCPM

Sample Type:
1. Waste Water 4. Sludge 7. Groundwater (filtered)
2. Drinking Water 5. Oil 8. Other
3. Soil 6. Groundwater

Container Type:
P - Plastic V - VOC Vial O - Other
G - Glass B - Tedlar Bag

Preservative:
1. None 4. NaOH 7. Zn Ace
2. H2SO4 5. HCl 8. Other
3. HNO3 6. MeOH

Analyses

Sample I.D.	Sample Type	Container Size	Container Type	Container No.	Sampling By	Sampling Date	Sampling Time	Sampling pH	Sampling Temp.	Preservation Field	Preservation Lab	SB, AS, BA, BE	CD, CR, CO, CU	PB, MN, NI, P, HG	SE, TI, ZN, AG	EMT USE ONLY EMT WORKORDER #20C0345
RMT DUST				1		3/5/20						X	X	X	X	01A

Relinquished By:	Date: 3-5-20 Time: 16:00	Received By:	Date: - - Time: :	EMT USE ONLY Client Code:
Relinquished By:	Date: - - Time: :	Received By:	Date: - - Time: :	EMT Project I.D.
Relinquished By:	Date: - - Time: :	Received For Lab By:	Date: 3-5-20 Time: 16:00	Jar Lot No.

☐ SAMPLE RECEIVED ON ICE
☒ TEMPERATURE
23.3

EMT SAMPLE RETURN POLICY ON BACK

R 001960

SPECIAL INSTRUCTIONS:

Sample Receipt Checklist

Work Order: 20C0345 **Printed: 3/5/2020 4:19:35PM**

Client: Reserve Management Group
Project: Residential Soil Analysis **Date Due:** Tuesday, March 10, 2020

Received By: Agnieszka B. Zabawa **Date Received:** 03/05/20 16:00
Logged In By: Agnieszka B. Zabawa **Date Logged In:** 03/05/20 16:18

Sample Temperature at Receipt:	23.3°C
How were samples received?	Client
Custody Seals Present	No
Custody Seals Intact	NA
Sample Containers Intact	Yes
COC Present and Complete	Yes
COC agrees with Sample Labels	Yes
Containers Properly Preserved	Yes
Samples Received Within Holdtime	Yes
Cooler Temp Within Limits	Yes
VOA Water Vials Received	No

Comments

ABZ
3/5/20

Exhibit 15

From: Guy, Jeff on behalf of EPA.PublicHearingCom
To: Meleah Geertsma
Bcc: Frost, Brad; Pressnall, Chris
Subject: RE: Update on metals recyclers?
Date: Wednesday, June 3, 2020 12:26:57 PM
Attachments: image001.png

Ms. Geertsma,

Thank you for your comments, which will be included as an exhibit with the hearing record. The Agency will prepare a responsiveness summary that will include a summary of all the views, significant comments, criticisms, and suggestions - in addition to the Agency's specific response and final action. You will be notified of the final decision in this matter and of the availability of the responsiveness summary.

Thanks,

Jeffrey J. Guy
Hearing Officer, Illinois Environmental Protection Agency
Office of Community Relations
(217) 785-8724
Jeff.Guy@illinois.gov

From: Geertsma, Meleah <mgeertsma@nrdc.org>
Sent: Tuesday, June 2, 2020 1:44 PM
To: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Subject: [External] Re: Update on metals recyclers?

Hi Chris - following up on this thread from back in April. Were you able to clear up the questions I had on the various versions of the Fugitive Particulate Operating Program? As I note below, the draft permit incorporates by reference a Dec 2019 version, but only a March 2020 version is included in the repository documents.

It appears to me that either the draft permit is incorrect/out of date and should reference the March version, or the repository docs are incomplete and should have included the Dec 2019 plan version. Or I somehow missed the Dec 2019 version in the repository docs.

Thanks so much,
Meleah

From: Geertsma, Meleah <mgeertsma@nrdc.org>
Sent: Monday, April 20, 2020 3:20 PM
To: Pressnall, Chris <Chris.Pressnall@Illinois.gov>

Subject: Re: Update on metals recyclers?

Thanks Chris, glad it was a good presentation! I can never tell on webinars, it's so hard to gauge audience reaction. An unfortunate part of life these days...

Anyway, thanks re your response to my question on the S Burley facilities; I did see that there are emissions estimates sent to Jeff Sprague in March among the repository docs on IEPA's website for the proposed draft permit.

One question on the repository documents: I see that on page 11 of the draft permit, cond 10(h) incorporates by reference the Dec 11, 2019 Fugitive Particulate Operating Program. But on a review of the repository documents, I only found a March 20, 2020 version of the fugitives operating program (it's the third repository doc among the links). Is that text on page 11 of the draft permit in error and should it instead incorporate by reference the March 2020 program? Or is there also a Dec 2019 fugitives operating program that I should be looking at, and the March 2020 program is automatically incorporated by reference as a subsequent version per draft condition 10(i)... just trying to make sure I'm looking at the right docs and understand what the permit is referring to...

Best,
Meleah

From: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Sent: Friday, April 17, 2020 9:59 AM
To: Geertsma, Meleah <mgeertsma@nrdc.org>
Subject: RE: Update on metals recyclers?

Hello Meleah –

I thought your webinar a week ago was excellent, very good overview of the issues.

At any rate, after talking to folks, I do not believe any modelling of the current facilities in conjunction with the proposed facility has been required to date. Certainly, technical staff have been thinking about this issue but not sure if there is an official position.

Chris Pressnall
Environmental Justice Coordinator
Illinois EPA

(217) 524-1284
(217) 785-8346 (fax)

chris.pressnall@illinois.gov

From: Geertsma, Meleah <mgeertsma@nrdc.org>
Sent: Wednesday, April 8, 2020 6:41 AM
To: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Subject: [External] Re: Update on metals recyclers?

Thanks Chris - appreciate your internal advocating, and hopefully we can improve things together.

One related question: can you clarify, I think with Jeff Sprague, whether there's any air quality modeling being required of the four S Burley facilities (previously Reserve Management Group, now South Chicago Property Management)? I haven't seen any modeling references or documents/files in the productions so far, but given the issues with modeling records in particular, would like to get an answer from the staff working on that project.

Best,
Meleah

From: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Sent: Thursday, April 2, 2020 9:03 AM
To: Geertsma, Meleah <mgeertsma@nrdc.org>
Subject: RE: Update on metals recyclers?

Good morning Meleah –

I wholeheartedly agree and obviously I am frustrated as well. This is why I have parroted internally what Keith has been saying for a while, which is to get more information online. Unfortunately, in discussing this with the Records Unit and others it is not that simple to have everything scanned up front and on the web. For General Iron, various people are maintaining files and the Records Unit does not know who those people are unless someone tells them. Furthermore, I do not know either since I am not in the Bureau of Air actively working on the project. In my old role, I would have had a better idea who exactly was doing what on a project. As you can see, this whole process is very dependent on humans catching things thus the issues.

At any rate, yes, let's continue to work together and brainstorm on ways to improve the process.

Best,

Chris Pressnall
Environmental Justice Coordinator
Illinois EPA

(217) 524-1284
(217) 785-8346 (fax)

chris.pressnall@illinois.gov

From: Geertsma, Meleah <mgeertsma@nrdc.org>
Sent: Wednesday, April 1, 2020 10:20 AM
To: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Subject: [External] Re: Update on metals recyclers?

Hi Chris - circling round on this prior exchange to note that, in the course of reviewing materials from IEPA sent in response to our most request FOIA request, there are a number of items that appear to date between our Jan meeting with IEPA and early Feb when I circled around with you below. This is on top of the air quality modeling protocol that was mistakenly left out of early FOIA responses due to it appears lack of checking with the modeling folks.

This is not to critique your role, but to simply point out that there's a need for greater transparency, clarity and timeliness around permitting documents on the agency's side. Look forward to working with you to try to improve the situation!

Best,
Meleah

From: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Sent: Friday, February 7, 2020 5:02 PM
To: Geertsma, Meleah <mgeertsma@nrdc.org>
Subject: RE: Update on metals recyclers?

Hello Meleah –

I checked with legal and permits and they did not think anything new has been submitted since the last FOIA although we will probably receive its response to the VN very soon. I will be out on Monday and back in the office on Tuesday, although it seems you may be traveling by then.

Chris Pressnall
Environmental Justice Coordinator
Illinois EPA

(217) 524-1284
(217) 785-8346 (fax)

chris.pressnall@illinois.gov

From: Geertsma, Meleah <mgeertsma@nrdc.org>
Sent: Wednesday, February 5, 2020 9:23 AM
To: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Subject: [External] Update on metals recyclers?

Hi Chris –
Circling around to see if you have any updates that you can share on the metals recyclers, both/either the permitting for General III and the permitting/investigation of the S Burley facilities. I also wanted to touch bases to see if you have any thoughts on the best way for us to keep current on records requests, re our discussion of FOIAs on the call with IEPA staff.

It would be great if we could connect before this upcoming Tues, as I then head into a stretch of work travel and vacation.

Thanks,
Meleah

MELEAH GEERTSMA
Senior Attorney, Environmental Justice

NATURAL RESOURCES
DEFENSE COUNCIL
20 N. WACKER DRIVE, SUITE 1600
CHICAGO, IL 60606
T 312.651.7904
F 312.332.1908
mgeertsma@NRDC.ORG
NRDC.ORG

R 001967

EXHIBIT 16

General Iron
1909 N. Clifton Avenue | Chicago, IL 60614-4803 | 773-327-9600

November 14, 2019

RECEIVED
STATE OF ILLINOIS
NOV 15 2019
Environmental Protection Agency
BUREAU OF AIR

VIA OVERNIGHT DELIVERY

Mr. Bob Bernoteit
Illinois Environmental Protect Agency
Division of Air Pollution Control
PO Box 19506 - 1021 North Grand Avenue East
Springfield, IL 62794-9506

Claim of TRADE SECRET and Justification of Claim for TRADE SECRET Designation
Supplemental Information for Construction Permit Application 19090021
General III, LLC – 11600 South Burley Avenue – Chicago, Illinois - Site ID No.: 031600SFX

Mr. Bernoteit:

The attached supplemental information was requested by the IEPA to support the Agency's review of the above-referenced construction permit application. The supplemental information consists of (a) a table with detailed equipment listings for the Ferrous Material Processing System and Non-Ferrous Material Processing System, identifying equipment identification numbers, process throughput rates, emission factors, and particulate matter emission calculations for each individual piece of equipment and (b) detailed equipment layout drawings for the proposed scrap metal recycling facility described in the above-referenced construction permit application.

General III, LLC's (GIII) Claim for Trade Secret designation is limited to the equipment layout drawings for the Ferrous Material Processing System and the Non-Ferrous Material Processing System. These drawings are claimed by GIII to represent trade secret information as defined in 35 IAC 101.202 and Section 3.490 of the Illinois Environmental Protection Act [415 ILCS 5/3.490].

The drawings, included in the attached submittal, are hereby claimed as trade secret information in accordance with 35 IAC 130 and are clearly marked with the words "Trade Secret" in red letters on each page of the drawings (total of four pages). Two copies of the supplemental information submittal are attached to this claim, one including the clearly marked drawings claimed as trade secret and one copy with the drawings redacted noting that they have been claimed as trade secret information.

Pursuant to 35 IAC 130.203, GIII is providing the following information as its statement of justification for the claim of trade secret information. Each specific element, identified in 35 IAC 130.203(a) through (e), required for a statement of justification for the trade secret claim is identified below.

§130.203(a) *A detailed description of the procedures used by the owner to safeguard the article from becoming available to persons other than those selected by the owner to have access thereto for limited purposes*;

The equipment layout drawings, prepared under a strict confidentiality agreement between GIII and a prospective equipment manufacturer, have only been provided to select GIII management personnel and outside consultants as required for preparation of facility permit applications and other information required for local governmental approval. This information is maintained on a password protected server at GIII with limited access. All equipment drawings produced to date have been labeled as confidential. to protect this information and prevent its public dissemination.

§130.203(b) *A detailed statement identifying the persons or class of persons to whom the article has been disclosed*;

This information has only been disclosed to the top management of GIII and select outside consultants.

§130.203(c) *A certification that the owner has no knowledge that the article has ever been published or disseminated or has otherwise become a matter of general public knowledge*;

GIII hereby certifies that it has no knowledge that these identified articles claimed as trade secret information have been published or disseminated or have otherwise become a matter of general public information.

§130.203(d) *A detailed discussion of why the owner believes the article to be of competitive value; and*

The equipment drawings claimed as trade secret information were produced at great expense to GIII and represent months of intense effort by GIII and a prospective equipment manufacturer. The final design is a product of GIII's over 60 years of experience recycling scrap metal in the Chicago market and the considerable technological expertise of the prospective equipment manufacturer and represents a state-of-the-art recycling process that will maximize recovery and production of high value ferrous and non-ferrous metals in a sustainable and economic manner. GIII believes that the specific design and equipment layout will provide GIII with a significant competitive advantage over its competitors by providing increased metal recovery at reduced operating expense.

§130.203(e) *Any other information that will support the claim.*

The equipment layout drawings represent a process design that is unique to GIII and is not available in any market.

We believe that the above information is sufficient to justify a claim of trade secret for the equipment layout drawings described herein. If you believe that additional information is required to approve this designation, please contact Mr. Adam Labkon of GIII at 773-868-3491 (adamlabkon@general-iron.com).

Yours very truly,
General III, LLC

Mr. Adam Labkon
V.P.

cc: Ms. Ann Zwick – Freeborn & Peters – Chicago, Illinois

R 001970
SID: 70491

Illinois EPA FOIA Exemption Reference Sheet

Agency ID: 170002390446 Media File Type: AIR
Bureau ID: 031600SFX
Site Name: General III LLC
Site Address1: 11600 S Burley Ave
Site Address2:
Site City: Chicago State: IL Zip: 60617-

This record has been determined to be partially or wholly exempt from public disclosure

Exemption Type:

Portion Removed

Exempt Doc #: 2 **Document Date:** 11/15/2019 **Staff:** JMR

Document Description: PERMIT FILE - SUPPLEMENTAL INFORMATION (TRADE SECRET CLAIM ON EQUIPMENT LAYOUT DRAWINGS)

Category ID: 03M **Category Description:** AIR PERMIT - CONSTRUCTION/JOINT **Exempt Type:** Portion Removed
Permit ID: 19090021 **Date of Determination:** 12/6 /2019

TRADE SECRET

Figure 3-2A Redacted

Figure 3-2A - Ferrous Processing System Layout

General III, LLC
11600 South Burley Avenue
Chicago, Illinois

TRADE SECRET

Figure 3-2B Redacted

WENDT CORPORATION RESERVES THE RIGHT TO ALTER AND/OR IMPROVE THE DESIGN OR MANUFACTURE OF ITS EQUIPMENT WITHOUT PRIOR NOTICE

Figure 3-2B - Ferrous Material Processing Flow Diagram

General III, LLC
11600 South Burley Avenue
Chicago, Illinois

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	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
Row #	Equipment Generating Emissions		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	Material Throughput Rates			PM Emissions					PM10 Emissions				PM2.5 Emissions			
	ID #	Description									tph	tpm	tpy	lb/ton		lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy
1	Barge 1	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	0.00014 [d]		0.0514	0.0051	0.0514	0.000046 [d]	0.0169	0.0017	0.0169	0.000013 [d]	0.0048	0.0005	0.0048
2	C-001	Shredded Material Transfer Conveyor	Shred	Y	Outside	N		NA		A	500	100,000	1,000,000	0.00014 [d]		0.0700	0.0070	0.0700	0.000046 [e]	0.0230	0.0023	0.0230	0.000013 [d]	0.0065	0.0007	0.0065
3	C-002	Shredded Material Transfer Conveyor	Shred	Y	Outside	N		NA		A	1.0	200.0	2,000	0.00014 [d]		0.0001	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
4	C-002	Mat'l Not Removed by Poker Picker	Shred	Y	Outside	N		NA		A	499	99,800	998,000	0.00014 [d]		0.0699	0.0070	0.0699	0.000046 [e]	0.0230	0.0023	0.0230	0.000013 [d]	0.0065	0.0006	0.0065
5	C-003	Ferrous Transfer Conveyor	Residue	Y	Outside	N		NA		A	130	26,000	260,000	0.00014 [d]		0.0182	0.0018	0.0182	0.000046 [e]	0.0060	0.0006	0.0060	0.000013 [d]	0.0017	0.0002	0.0017
6	C-003	Ferrous Transfer Conveyor	Ferrous	Y	Outside	N		NA		A	369	73,800	738,000	0.00014 [d]		0.0517	0.0052	0.0517	0.000046 [e]	0.0170	0.0017	0.0170	0.000013 [d]	0.0048	0.0005	0.0048
7	C-006	Ferrous Transfer Conveyor	Shred	Y	Outside	Y	Z-Box Air Loop	100%	100%	A	183	36,600	366,000	0.00014 [d]		0.0000	0.0026	0.0000	0.000046 [e]	0.0000	0.0008	0.0000	0.000013 [d]	0.0000	0.0002	0.0000
8	C-007	Ferrous Transfer Conveyor	Shred	Y	Outside	Y	Z-Box Air Loop	100%	100%	A	183	36,600	366,000	0.00014 [d]		0.0000	0.0026	0.0000	0.000046 [e]	0.0000	0.0008	0.0000	0.000013 [d]	0.0000	0.0002	0.0000
9	C-008	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	56	11,200	112,000	0.00014 [d]		0.0078	0.0008	0.0078	0.000046 [e]	0.0026	0.0003	0.0026	0.000013 [d]	0.0007	0.0001	0.0007
10	C-009	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]		0.0179	0.0018	0.0179	0.000046 [e]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
11	C-010	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]		0.0179	0.0018	0.0179	0.000046 [e]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
12	C-011	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	55	11,000	110,000	0.00014 [d]		0.0077	0.0008	0.0077	0.000046 [e]	0.0025	0.0003	0.0025	0.000013 [d]	0.0007	0.0001	0.0007
13	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	56	11,200	112,000	0.00014 [d]		0.0078	0.0008	0.0078	0.000046 [e]	0.0026	0.0003	0.0026	0.000013 [d]	0.0007	0.0001	0.0007
14	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]		0.0179	0.0018	0.0179	0.000046 [e]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
15	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]		0.0179	0.0018	0.0179	0.000046 [e]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
16	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	55	11,000	110,000	0.00014 [d]		0.0077	0.0008	0.0077	0.000046 [e]	0.0025	0.0003	0.0025	0.000013 [d]	0.0007	0.0001	0.0007
17	C-016	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	0.00014 [d]		0.0514	0.0051	0.0514	0.000046 [e]	0.0169	0.0017	0.0169	0.000013 [d]	0.0048	0.0005	0.0048
18	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	0.00014 [d]		0.0514	0.0051	0.0514	0.000046 [e]	0.0169	0.0017	0.0169	0.000013 [d]	0.0048	0.0005	0.0048
19	C-022	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	55	11,000	110,000	0.00014 [d]		0.0077	0.0008	0.0077	0.000046 [e]	0.0025	0.0003	0.0025	0.000013 [d]	0.0007	0.0001	0.0007
20	C-023	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	55	11,000	110,000	0.00014 [d]		0.0077	0.0008	0.0077	0.000046 [e]	0.0025	0.0003	0.0025	0.000013 [d]	0.0007	0.0001	0.0007
21	C-024	Non-metallic transfer conveyor	Ferrous	Y	Outside	N		NA		A	4	800	8,000	0.00014 [d]		0.0006	0.0001	0.0006	0.000046 [e]	0.0002	0.0000	0.0002	0.000013 [d]	0.0001	0.0000	0.0001
22	C-025	Non-metallic not removed by magnet E-	Ferrous	Y	Outside	N		NA		A	2	400	4,000	0.00014 [d]		0.0003	0.0000	0.0003	0.000046 [e]	0.0001	0.0000	0.0001	0.000013 [d]	0.0000	0.0000	0.0000
23	C-025	material removed by first magnet to second	Ferrous	Y [a2]	Outside	N		NA		A	1	200	2,000	0.00014 [d]		0.0001	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
24	C-026	Ferrous Transfer Conveyor	Ferrous	Y [a2]						A	1	200	2,000	0.00014 [d]		0.0001	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
25	C-027	Ferrous Transfer Conveyor	Ferrous	Y [a2]	Outside	N		NA		A	1	200	2,000	0.00014 [d]		0.0001	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
26	C-028	Non-metallic Transfer Conveyor	Ferrous	Y	Outside	N		NA		A	1	200	2,000	0.00014 [d]		0.0001	0.0000	0.0001	0.000046 [e]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000

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	Material Throughput Rates tph	Material Throughput Rates tpm	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 lb/hr	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions lb/hr	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
27	C-029	Non-metallic Transfer Conveyor	Ferrous	Y						A	1	200	2,000	0.00014 [d]	0.0001	0.0000	0.0001	0.000046 [D]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
28	C-031	ASR Transfer Conveyor	Residue	Y	Outside	N		NA		A	4	800	8,000	0.00014 [d]	0.0006	0.0001	0.0006	0.000046 [D]	0.0002	0.0000	0.0002	0.000013 [d]	0.0001	0.0000	0.0001
29	C-032	ASR Transfer Conveyor	Residue	Y	Outside	N		NA		A	4	800	8,000	0.00014 [d]	0.0006	0.0001	0.0006	0.000046 [D]	0.0002	0.0000	0.0002	0.000013 [d]	0.0001	0.0000	0.0001
30	C-033	Magnetic Material	Shred	Y	Outside	N		NA		A	5	1,000	10,000	0.00014 [d]	0.0007	0.0001	0.0007	0.000046 [D]	0.0002	0.0000	0.0002	0.000013 [d]	0.0001	0.0000	0.0001
31	C-033	ASR Not Removed by Magnet E-12	Residue	Y	Outside	N		NA		A	129	25,800	258,000	0.00014 [d]	0.0181	0.0018	0.0181	0.000046 [D]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
32	C-034	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	5	1,000	10,000	0.00014 [d]	0.0007	0.0001	0.0007	0.000046 [D]	0.0002	0.0000	0.0002	0.000013 [d]	0.0001	0.0000	0.0001
33	C-035	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	5	1,000	10,000	0.00014 [d]	0.0007	0.0001	0.0007	0.000046 [D]	0.0002	0.0000	0.0002	0.000013 [d]	0.0001	0.0000	0.0001
34	C-036	ASR Transfer Conveyor	Residue	Y	Outside	N		NA		A	129	25,800	258,000	0.00014 [d]	0.0181	0.0018	0.0181	0.000046 [D]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
35	E-01	Drop Raw Scrap onto Shredder Feed Chute	Unprepared	Y [a4]	Outside	N		NA		A	500	100,000	1,000,000	0.00014 [d]	0.0700	0.0070	0.0700	0.000046 [D]	0.0230	0.0023	0.0230	0.000013 [d]	0.0065	0.0007	0.0065
36	E-015	Z-Box Separator Cyclone	Ferrous	Y	Outside	N		NA		A	2	400	4,000	0.00014 [d]	0.0003	0.0000	0.0003	0.000046 [D]	0.0001	0.0000	0.0001	0.000013 [d]	0.0000	0.0000	0.0000
37	E-016	Z-Box Separator Cyclone	Ferrous	Y	Outside	N		NA		A	2	400	4,000	0.00014 [d]	0.0003	0.0000	0.0003	0.000046 [D]	0.0001	0.0000	0.0001	0.000013 [d]	0.0000	0.0000	0.0000
38	E-05	Shredder Under Mill Vibratory Conveyor	Shred	Y	Inside	N		NA		A	500	100,000	1,000,000	0.00014 [d]	0.0700	0.0070	0.0700	0.000046 [D]	0.0230	0.0023	0.0230	0.000013 [d]	0.0065	0.0007	0.0065
39	E-07	Magnet Discharge to Chute	Shred	Y	Outside	N		NA		A	187	37,400	374,000	0.00014 [d]	0.0262	0.0026	0.0262	0.000046 [D]	0.0086	0.0009	0.0086	0.000013 [d]	0.0024	0.0002	0.0024
40	E-07	Magnet Discharge to Chute	Shred	Y	Outside	N		NA		A	187	37,400	374,000	0.00014 [d]	0.0262	0.0026	0.0262	0.000046 [D]	0.0086	0.0009	0.0086	0.000013 [d]	0.0024	0.0002	0.0024
41	E-08	ASR Not Removed by Magnet	Shred	Y	Outside	N		NA		A	2	400	4,000	0.00014 [d]	0.0003	0.0000	0.0003	0.000046 [D]	0.0001	0.0000	0.0001	0.000013 [d]	0.0000	0.0000	0.0000
42	E-08	Ferrous Removed by Magnet E-7	Residue	Y	Outside	N		NA		A	185	37,000	370,000	0.00014 [d]	0.0259	0.0026	0.0259	0.000046 [D]	0.0085	0.0009	0.0085	0.000013 [d]	0.0024	0.0002	0.0024
43	E-10	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]	0.0179	0.0018	0.0179	0.000046 [D]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
44	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]	0.0179	0.0018	0.0179	0.000046 [D]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
45	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	55	11,000	110,000	0.00014 [d]	0.0077	0.0008	0.0077	0.000046 [D]	0.0025	0.0003	0.0025	0.000013 [d]	0.0007	0.0001	0.0007
46	E-11	Ferrous Removed by Magnet	Shred	Y [a2]	Outside	N		NA		A	55	11,000	110,000	0.00014 [d]	0.0077	0.0008	0.0077	0.000046 [D]	0.0025	0.0003	0.0025	0.000013 [d]	0.0007	0.0001	0.0007
47	E-12	Ferrous Removed by Magnet	Ferrous	Y	Outside	N		NA		A	5	1,000	10,000	0.00014 [d]	0.0007	0.0001	0.0007	0.000046 [D]	0.0002	0.0000	0.0002	0.000013 [d]	0.0001	0.0000	0.0001
48	E-13	Ferrous Removed by E-13	Ferrous	Y [a2]	Outside	N		NA		A	1	200	2,000	0.00014 [d]	0.0001	0.0000	0.0001	0.000046 [D]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
49	E-13	Ferrous Removed by E-13	Ferrous	Y	Outside	N		NA		A	1	200	2,000	0.00014 [d]	0.0001	0.0000	0.0001	0.000046 [D]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
50	E-14	Mat'l Not removed by Separator	Ferrous	Y	Outside	N		NA		A	0.25	50.00	500	0.00014 [d]	0.0000	0.0000	0.0000	0.000046 [D]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
51	E-7	ASR Not Removed by Magnet	Shred	Y [a3]	Outside	N		NA		A	2	400	4,000	0.00014 [d]	0.0003	0.0000	0.0003	0.000046 [D]	0.0001	0.0000	0.0001	0.000013 [d]	0.0000	0.0000	0.0000
52	E-7	Ferrous Removed by Magnet E-7	Residue	Y	Outside	N		NA		A	185	37,000	370,000	0.00014 [d]	0.0259	0.0026	0.0259	0.000046 [D]	0.0085	0.0009	0.0085	0.000013 [d]	0.0024	0.0002	0.0024

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

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

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	Material Throughput Rates tph	tpm	tpy	PM Emissions lb/ton	lb/hr	ton/mo	tpy	PM10 Emissions lb/ton	lb/hr	ton/mo	tpy	PM2.5 Emissions lb/ton	lb/hr	ton/mo	tpy
53		Truck Dumping of Raw Feed	Unprepared	5.4 [a3]	Outside	N				Drop	300	100,000	1,000,000	0.00127 [e]	0.3797	0.0633	0.6328	0.00060 [e]	0.1796	0.0299	0.2993	0.00009 [e]	0.0272	0.0045	0.0453
54		Raw Feed from Ground after Truck Dumping	Unprepared	5.4 [a3]	Outside	N				Drop	300	100,000	1,000,000	0.00127 [e]	0.3797	0.0633	0.6328	0.00060 [e]	0.1796	0.0299	0.2993	0.00009 [e]	0.0272	0.0045	0.0453
55		Non-metallic Loadout	Non-metallic	N	Outside	N				D	187	37,400	374,000	0.00020 [f]	0.0382	0.0038	0.0382	0.000100 [f]	0.0187	0.0019	0.0187	0.000015 [f]	0.0028	0.0003	0.0028
56		Poker Loadout	Pokers	N	Outside	N				D	183	36,600	366,000	0.00020 [f]	0.0374	0.0037	0.0374	0.000100 [f]	0.0183	0.0018	0.0183	0.000015 [f]	0.0028	0.0003	0.0028
57	Magnet/ Clam	Drop Raw Scrap to Infeed Conveyor	Unprepared	N [a4]	Outside	N		NA		D	500	100,000	1,000,000	0.00020 [f]	0.1022	0.0102	0.1022	0.000100 [f]	0.0500	0.0050	0.0500	0.000015 [f]	0.0076	0.0008	0.0076
58	Barge 2	Ferrous Transfer Conveyor	Shred	5.4% [a2]	Outside	N		0%		Drop	367	73,400	734,000	0.00127 [e]	0.4645	0.0465	0.4645	0.00060 [e]	0.2197	0.0220	0.2197	0.00009 [e]	0.0333	0.0033	0.0333
59	C-030	Mat'l not Removed by Separator	Ferrous	1.5% [a1]	Outside	Y	Cover	0%		Drop	2.25	450.00	4,500	0.00761 [e]	0.0171	0.0017	0.0171	0.00360 [e]	0.0081	0.0008	0.0081	0.00054 [e]	0.0012	0.0001	0.0012
60	C-037	ASR Transfer Conveyor to Stockpile	Residue	10.0% [a8]	Outside	N		0%		Drop	129	25,800	258,000	0.00053 [e]	0.0689	0.0069	0.0689	0.00025 [e]	0.0326	0.0033	0.0326	0.00004 [e]	0.0049	0.0005	0.0049
61	E-06	Poker Picker Chute to Stockpile	Shred	1.5% [a1]	Outside	N		0%		Drop	1	200	2,000	0.00761 [e]	0.0076	0.0008	0.0076	0.00360 [e]	0.0036	0.0004	0.0036	0.00054 [e]	0.0005	0.0001	0.0005
62	E-14	Final Discharge from Mat'l Separator	Ferrous	1.5% [a1]	Outside	N		0%		Drop	0.75	150.00	1,500	0.00761 [e]	0.0057	0.0006	0.0057	0.00360 [e]	0.0027	0.0003	0.0027	0.00054 [e]	0.0004	0.0000	0.0004
63	SC-001	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	183	36,600	366,000	0.00014 [d]	0.0256	0.0026	0.0256	0.000046 [g]	0.0084	0.0008	0.0084	0.000013 [d]	0.0024	0.0002	0.0024
64	SC-009	Supplemental Conveyor	Ferrous	Y	Outside	N		NA		A	2	400	4,000	0.00014 [d]	0.0003	0.0000	0.0003	0.000046 [g]	0.0001	0.0000	0.0001	0.000013 [d]	0.0000	0.0000	0.0000
64	SC-002	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	183	36,600	366,000	0.00014 [d]	0.0256	0.0026	0.0256	0.000046 [g]	0.0084	0.0008	0.0084	0.000013 [d]	0.0024	0.0002	0.0024
65	SC-010	Supplemental Conveyor	Ferrous	Y	Outside	N		NA		A	2	400	4,000	0.00014 [d]	0.0003	0.0000	0.0003	0.000046 [g]	0.0001	0.0000	0.0001	0.000013 [d]	0.0000	0.0000	0.0000
65	SC-005	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]	0.0179	0.0018	0.0179	0.000046 [g]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
66	SC-008	Supplemental Conveyor	Shred	Y	Outside	N		NA		A	128	25,600	256,000	0.00014 [d]	0.0179	0.0018	0.0179	0.000046 [g]	0.0059	0.0006	0.0059	0.000013 [d]	0.0017	0.0002	0.0017
69	C-004	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	185	37,000	370,000	Emissions captured by inward air flow at inlet to Z-Box separator											
70	C-014	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	Alternate to C-014 to C-016. Emissions from 100% of material throughput assigned to C-014 to C-016.											
70	C-005	Ferrous Transfer Conveyor	Shred	Y	Outside	N		NA		A	185	37,000	370,000	Emissions captured by inward air flow at inlet to Z-Box separator											
71	C-012	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	Alternate to C-012 to C-016. Emissions from 100% of material throughput assigned to C-012 to C-016.											
71	C-015	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	Alternate to C-015 to C-016. Emissions from 100% of material throughput assigned to C-015 to C-016.											
71	C-019	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	Alternate to C-016 top C-017. Emissions from 100% of material throughput assigned to C-016 to C-017.											
72	C-013	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	Alternate to C-013 to C-016. Emissions from 100% of material throughput assigned to C-013 to C-016.											
72	C-017	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	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.											
72	C-020	Ferrous Transfer Conveyor	Shred	Y [a2]	Outside	N		NA		A	367	73,400	734,000	Alternate to C-017 to C-018. Emissions from 100% of material throughput assigned to C-017 to C-018.											
72	E-02	Shredder Bottom Discharge	Shred	Y	shredder emissions captured by shredder hood and controlled by RTO/Scrubber					A	500	100,000	1,000,000	Emissions captured and controlled by shredder emission control system											

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	Material Throughput Rates tph	tpm	tpy	PM Emissions lb/ton	lb/hr	ton/mo	tpy	PM10 Emissions lb/ton	lb/hr	ton/mo	tpy	PM2.5 Emissions lb/ton	lb/hr	ton/mo	tpy
73	C-018	Ferrous Transfer Conveyor	Shred	5.4% a3	Outside	N		NA		Drop	367	73,400	734,000	Alternate to C-021 to S Ferrous Stockpile or Barge 2 to Barge. Emissions from 100% of material throughput assigned to Barge 2 to Barge.											
73	C-21	Ferrous Transfer Conveyor	Shred	5.4% a3	Outside	N		NA		Drop	367	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.											
74	E-02	Shredder Chute	Unprepared	Y	shredder emissions captured by shredder hood and controlled by RTO/Scrubber					A	500	100,000	1,000,000	Emissions captured and controlled by shredder emission control system											
					Totals Ferrous Plant Material Handling PM Emissions										2.41	0.30	2.92		1.01	0.13	1.25		0.19	0.02	0.23
					Totals Ferrous Plant Material Handling HAP Metal Emissions									1.67% h	0.0003	0.0000	0.0488	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% moisture.
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 calculations conservatively assume dust collector emission
h Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

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.

Figure 3-3A Redacted

TRADE SECRET

Figure 3-3A - Non-Ferrous Processing System Layout

General III, LLC
11600 South Burley Avenue
Chicago, Illinois

Figure 3-3B Redacted

TRADE SECRET

Figure 3-3B - Non-Ferrous Material Processing Flow Diagram

General III, LLC
11600 South Burley Avenue
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	99.80%	DC PM_{10} Control Eff	99.00%	DC $PM_{2.5}$ Control Eff	98.00%

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

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	AA
Row	Equipment Generating Emissions		Material	Moisture > 1.5%	Transfer Point Location	Conveyor	Transfer Point	Type of Transfer Point	Dust Pickup Capture Eff.	Dust Control Eff.	Emission Factor	Material Throughput Rates			PM Emissions				PM10 Emissions				PM2.5 Emissions			
#	ID #	Description	Conveyed	Y / N	(Inside / Outside)	Covered	Controlled (Y/N)	Control	(%)	(%)	Source	tph	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy
1	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	0.25	92.1	921	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
2	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	0.25	92.1	921	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
3	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	1.00	368.6	3,686	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
4	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	1.00	368.6	3,686	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
5	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	0.42	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
6	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	0.42	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
7	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	0.42	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
8	Shaker		Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	B	0.42	154.8	1,548	0.002200	Note f	Note f	Note f.	0.000740	Note f	Note f	Note f	0.000050	Note f	Note f	Note f
9	E-19	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	5.84	2,152.5	21,525	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
10	E-19	Induction Sorter	Wire Fuzz	N	Inside		Y	Dust Collector	100%	DC Eff.	A	1.5	552.9	5,529	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
11	E-20	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	1	368.6	3,686	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
12	E-20	Induction Sorter	Wire	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.5	184.3	1,843	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
13	E-25	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	5.84	2,152.5	21,525	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
14	E-25	Induction Sorter	Wire Fuzz	N	Inside		Y	Dust Collector	100%	DC Eff.	A	1.5	552.9	5,529	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
15	E-26	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	1	368.6	3,686	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
16	E-26	Induction Sorter	Wire	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.5	184.3	1,843	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
17	E-30	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	6.5	2,395.7	23,957	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
18	E-30	Induction Sorter	Zuric	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.65	239.6	2,396	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
19	E-31	Induction Sorter	Zuric	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.65	239.6	2,396	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
20	E-37	Induction Sorter	Zone	N	Inside		Y	Dust Collector	100%	DC Eff.	A	1.5	552.9	5,529	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
21	E-37	Induction Sorter	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	3.55	1,308.4	13,084	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
22	E-39	Induction Sorter	Drops Zuric Recov Finder	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.3	110.6	1,106	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
23	E-39	Induction Sorter	Zone	N	Inside		Y	Dust Collector	100%	DC Eff.	A	1.2	442.3	4,423	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
24	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.22	81.1	811	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
25	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.22	81.1	811	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
26	Material Separator	Drop to container	Residue	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.03	11.1	111	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
27	Material Separator	Drop to container	Residue	1.5% *	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.03	11.1	111	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f

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%

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	AA
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: tph	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: lb/hr	PM10 Emissions: ton/mo	PM10 Emissions: tpy	PM2.5 Emissions: lb/ton	PM2.5 Emissions: lb/hr	PM2.5 Emissions: ton/mo	PM2.5 Emissions: tpy
28	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.94	346.5	3,465	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
29	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.94	346.5	3,465	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
30	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.06	22.1	221	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
31	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.06	22.1	221	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
32	Shaker Fines		Zorba	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.19	70.0	700	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
33	Shaker Mids		Zorba	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.12	44.2	442	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
34	Shaker Mids		Zorba	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.12	44.2	442	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
35	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.02	7.4	74	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
36	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.02	7.4	74	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
37	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.10	36.9	369	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
38	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.10	36.9	369	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
39	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.05	18.4	184	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
40	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.41	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
41	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.41	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
42	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.41	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
43	Material Separator	Transfer Conveyor	Residue	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.41	151.1	1,511	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
44	Material Separator	Drop to container	Zorba	1.5% e	Inside		Y	Dust Collector	100%	DC Eff.	Drop	0.14	51.6	516	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
45	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.0084	3.1	31	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
46	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.0084	3.1	31	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
47	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.0084	3.1	31	0.000140	Note f	Note f	Note f.	0.000046	Note f	Note f	Note f	0.000013	Note f	Note f	Note f
48	Material Separator	Transfer Conveyor	Product	N	Inside		Y	Dust Collector	100%	DC Eff.	A	0.0084	3.1	31	0.000140	Note f	Note f	Note f.	0.000046 e	Note f	Note f	Note f	0.000013 e	Note f	Note f	Note f
49	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	1.40	516.0	5,160	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f
50	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	1.40	516.0	5,160	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f
51	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	1.05	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f
52	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	1.05	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f
53	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	1.05	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f
54	Shaker		Residue	N	Inside		N	Dust Collector	100%	DC Eff.	B	1.05	387.0	3,870	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f

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%

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	AA
Row #	Equipment Generating Emissions ID #	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 tph	ton/mo	tpy	PM Emissions lb/ton	lb/hr	ton/mo	tpy	PM10 Emissions lb/ton	lb/hr	ton/mo	tpy	PM2.5 Emissions lb/ton	lb/hr	ton/mo	tpy
55	Shaker	Drop to container	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.10	36.9	369	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
56	Shaker	Drop to container	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.10	36.9	369	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
57	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.42	154.8	1,548	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
58	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.42	154.8	1,548	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
59	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.42	154.8	1,548	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
60	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.42	154.8	1,548	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
61	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.21	77.4	774	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
62	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.21	77.4	774	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
63	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.21	77.4	774	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
64	Shaker	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.21	77.4	774	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
65	C-031	Conveyor	Wire	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	1	368.6	3,686	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
66	C-025	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	7.15	2,635.3	26,353	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
67	C-026	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	5.05	1,861.3	18,613	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
68	C-027	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	7.34	2,705.3	27,053	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
69	C-028	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	7.34	2,705.3	27,053	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
70	C-032	Conveyor	Zone	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.50	552.9	5,529	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
71	C-053	Conveyor	Wire	N	Inside		N	Dust Collector	100%	DC Eff.	A	1	368.6	3,686	0.003000 e	Note f	Note f	Note f.	0.001100 e	Note f	Note f	Note f	0.000167 e	Note f	Note f	Note f
72	C-069	Conveyor	Lights Zuric	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.35	129.0	1,290	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
73	E-18	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	7.34	2,705.3	27,053	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
74	E-24	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	7.34	2,705.3	27,053	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
75	E-29	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	7.15	2,635.3	26,353	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
76	E-36	Vibratory Feeder	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	5.05	1,861.3	18,613	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
77	E-38	Vibratory Feeder	Zone	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.50	552.9	5,529	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
78	E-51	Separator	Heavies Zuric	N	Inside		N	Dust Collector	100%	DC Eff.	B	0.30	110.6	1,106	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f
79	E-51	Separator	Lights Zuric	N	Inside		N	Dust Collector	100%	DC Eff.	B	0.35	129.0	1,290	0.025000	Note f	Note f	Note f.	0.008700	Note f	Note f	Note f	0.001317	Note f	Note f	Note f
80	ECS	Eddy Current Separator	Residue/Drops	N	Inside		N	Dust Collector	100%	DC Eff.	A	3.34	1,231.0	12,310	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
81	ECS	Eddy Current Separator	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.40	147.4	1,474	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f

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%

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	AA
Row	Equipment Generating Emissions		Material	Moisture > 1.5%	Transfer Point Location	Conveyor	Transfer Point Controlled	Type of Transfer Point	Dust Pickup Capture Eff.	Dust Control Eff.	Emission Factor	Material Throughput Rates			PM Emissions				PM10 Emissions				PM2.5 Emissions			
#	ID #	Description	Conveyed	Y / N	(Inside / Outside)	Covered	(Y/N)	Control	(%)	(%)	Source	tph	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy
82	Elevator	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.44	162.2	1,622	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
83	Elevator	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	3.52	1,297.4	12,974	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
84	FC-01	Conveyor	Zorba	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	0.50	184.3	1,843	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
85	FC-02	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	2.80	1,032.0	10,320	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
86	FC-03	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.88	692.9	6,929	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
87	FC-04	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.44	162.2	1,622	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
88	FC-05	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.88	692.9	6,929	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
89	FC-06	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	3.52	1,297.4	12,974	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
90	FC-07	Conveyor	Residue	N	Inside	Y	N	Dust Collector	100%	DC Eff.	A	4.20	1,548.0	15,480	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
91	FC-08	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	4.20	1,548.0	15,480	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
92	FC-09	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.68	619.2	6,192	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
93	FC-10	Conveyor drop to stockpile	Residue	1.5% *	Inside		N	Dust Collector	100%	DC Eff.	Drop	0.42	154.8	1,548	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
94	FC-11	Conveyor drop to stockpile	Residue	1.5% *	Inside		N	Dust Collector	100%	DC Eff.	Drop	0.42	154.8	1,548	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
95	FC-12	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.0168	6.2	62	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
96	FC-13	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.0168	6.2	62	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
97	FC-14	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.0336	12.4	124	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
98	FC-15	Conveyor	Product	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.0336	12.4	124	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
99	FC-16	Conveyor drop to container	Product	1.5% *	Inside		N	Dust Collector	100%	DC Eff.	Drop	0.0336	12.4	124	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
100	FC-17	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.64	604.5	6,045	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
101	FC-18	Conveyor transfer to shaker	Residue/ Drops	N	Inside		N	Dust Collector	100%	DC Eff.	A	3.34	1,231.0	12,310	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
102	FC-20	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	3.34	1,231.0	12,310	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
103	FC-21	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	2.28	840.3	8,403	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
104	FC-22	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.14	420.2	4,202	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
105	FC-23	Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	1.14	420.2	4,202	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
106	Feeder	Discharge to conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	9.09	3,350.3	33,503	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
107	Feeder	Transfer to Eddy Current Separator	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.44	162.2	1,622	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
108	Feeder	Transfer to Eddy Current Separator	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	3.52	1,297.4	12,974	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f

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	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 tph	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 lb/hr	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions lb/hr	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
109	Shaker Fines	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	2.94	1,083.6	10,836	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
110	Shaker Overs	Transfer Conveyor	Residue	N	Inside		N	Dust Collector	100%	DC Eff.	A	0.40	147.4	1,474	0.003000	Note f	Note f	Note f.	0.001100	Note f	Note f	Note f	0.000167	Note f	Note f	Note f
111	Shaker Overs	Drop to container	Zorba	1.5% e	Inside		N	Dust Collector	100%	DC Eff.	Drop	0.07	25.8	258	0.00760	Note f	Note f	Note f.	0.00360	Note f	Note f	Note f	0.00050	Note f	Note f	Note f
112	Total Emissions for Sources Inside Building															0.5143	0.1364	1.3639		0.5143	0.1364	1.3639		0.5143	0.1364	1.3639
113	C-001	Conveyor	Residue	Y	Outside	Y	N	NA			A	70	25,800.0	258,000	0.000140 d	0.0098	0.0018	0.0181	0.000046 d	0.0032	0.0006	0.0059	0.000013 d	0.0009	0.0002	0.0017
114	C-002	Conveyor	Residue	N	Outside	Y	N	NA			A	68	25,026.0	250,260	0.003000 e	0.2037	0.0375	0.3754	0.001100 e	0.0747	0.0138	0.1376	0.000167 e	0.0113	0.0021	0.0208
115	C-002	Conveyor	Ferrous	N	Outside	Y	N	NA			A	2	774.0	7,740	0.003000 e	0.0063	0.0012	0.0116	0.001100 e	0.0023	0.0004	0.0043	0.000167 e	0.0003	0.0001	0.0006
116	C-003	Conveyor	Residue	N	Outside	Y	N	NA			A	67.90	25,026.0	250,260	0.003000 e	0.2037	0.0375	0.3754	0.001100 e	0.0747	0.0138	0.1376	0.000167 e	0.0113	0.0021	0.0208
117	C-004	Conveyor	Residue	N	Outside	Y	N	NA			A	60.90	22,446.0	224,460	0.003000 e	0.1827	0.0337	0.3367	0.001100 e	0.0670	0.0123	0.1235	0.000167 e	0.0101	0.0019	0.0187
118	C-005	Conveyor	Residue	N	Outside	Y	N	NA			A	30.45	11,223.0	112,230	0.003000 e	0.0914	0.0168	0.1683	0.001100 e	0.0335	0.0062	0.0617	0.000167 e	0.0051	0.0009	0.0093
119	C-006	Conveyor	Residue	N	Outside		N	NA			A	30.45	11,223.0	112,230	0.003000 e	0.0914	0.0168	0.1683	0.001100 e	0.0335	0.0062	0.0617	0.000167 e	0.0051	0.0009	0.0093
120	C-007	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	15.75	5,805.0	58,050	0.003000 e	0.0095	0.0017	0.0174	0.001100 e	0.0035	0.0006	0.0064	0.000167 e	0.0005	0.0001	0.0010
121	C-008	Conveyor	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	15.75	5,805.0	58,050	0.003000 e	0.0095	0.0017	0.0174	0.001100 e	0.0035	0.0006	0.0064	0.000167 e	0.0005	0.0001	0.0010
122	C-009	Conveyor	Residue	N	Outside		N	NA			A	9.14	3,368.7	33,687	0.003000 e	0.0274	0.0051	0.0505	0.001100 e	0.0101	0.0019	0.0185	0.000167 e	0.0015	0.0003	0.0028
123	C-010	Conveyor	Residue	N	Outside		N	NA			A	9.14	3,368.7	33,687	0.003000 e	0.0274	0.0051	0.0505	0.001100 e	0.0101	0.0019	0.0185	0.000167 e	0.0015	0.0003	0.0028
124	C-011	Conveyor	Residue	N	Outside	Y	N	NA			A	8.40	3,096.0	30,960	0.003000 e	0.0252	0.0046	0.0464	0.001100 e	0.0092	0.0017	0.0170	0.000167 e	0.0014	0.0003	0.0026
125	C-012	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	9.14	3,368.7	33,687	0.003000 e	0.0055	0.0010	0.0101	0.001100 e	0.0020	0.0004	0.0037	0.000167 e	0.0003	0.0001	0.0006
126	C-013	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	9.14	3,368.7	33,687	0.003000 e	0.0055	0.0010	0.0101	0.001100 e	0.0020	0.0004	0.0037	0.000167 e	0.0003	0.0001	0.0006
127	C-014	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	8.40	3,096.0	30,960	0.003000 e	0.0050	0.0009	0.0093	0.001100 e	0.0018	0.0003	0.0034	0.000167 e	0.0003	0.0001	0.0005
128	C-015	Conveyor	Ferrous	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	.25	92.1	921	0.003000 e	0.0002	0.0000	0.0003	0.001100 e	0.0001	0.0000	0.0001	0.000167 e	0.0000	0.0000	0.0000
129	C-016	Conveyor	Residue	N	Outside	Y	N	NA			A	2.7	995.1	9,951	0.003000 e	0.0081	0.0015	0.0149	0.001100 e	0.0030	0.0005	0.0055	0.000167 e	0.0004	0.0001	0.0008
130	C-017	Conveyor	Ferrous	N	Outside		N	NA			A	1.75	645.0	6,450	0.003000 e	0.0053	0.0010	0.0097	0.001100 e	0.0019	0.0004	0.0035	0.000167 e	0.0003	0.0001	0.0005
131	C-018	Conveyor	Ferrous	N	Outside	Y	N	NA			A	1.75	645.0	6,450	0.003000 e	0.0053	0.0010	0.0097	0.001100 e	0.0019	0.0004	0.0035	0.000167 e	0.0003	0.0001	0.0005
132	C-019	Conveyor	Lights	N	Outside	Y	N	NA			A	0.25	92.1	921	0.003000 e	0.0008	0.0001	0.0014	0.001100 e	0.0003	0.0001	0.0005	0.000167 e	0.0000	0.0000	0.0001
133	C-020	Conveyor	Residue	N	Outside	Y	N	NA			A	11.12	4,098.5	40,985	0.003000 e	0.0334	0.0061	0.0615	0.001100 e	0.0122	0.0023	0.0225	0.000167 e	0.0019	0.0003	0.0034
134	C-021	Conveyor	Residue	N	Outside	Y	N	NA			A	11.12	4,098.5	40,985	0.003000 e	0.0334	0.0061	0.0615	0.001100 e	0.0122	0.0023	0.0225	0.000167 e	0.0019	0.0003	0.0034
135	C-022	Conveyor to Wind Sifter	Mixed Non-Ferrous	N	Outside	Y	Y	Wind Sifter	100%	100%	A	0.80	294.9	2,949	0.003000 e	0.0024	0.0004	0.0000	0.001100 e	0.0000	0.0002	0.0000	0.000167 e	0.0000	0.0000	0.0000

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

Max Monthly Thruput 23,800 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	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	Z	AA
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 tph	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 lb/hr	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions lb/hr	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	7.29	2,686.9	26,869	0.000140 [a]	0.0010	0.0002	0.0000	0.000046 [a]	0.0000	0.0001	0.0000	0.000013 [a]	0.0000	0.0000	0.0000
137	C-024	Conveyor to Wind Sifter	Residue	N	Outside	Y	Y	Wind Sifter	100%	100%	A	7.29	2,686.9	26,869	0.000140 [a]	0.0010	0.0002	0.0000	0.000046 [a]	0.0000	0.0001	0.0000	0.000013 [a]	0.0000	0.0000	0.0000
138	C-034	Conveyor	Material Separator	N	Outside	Y	N	NA			A	0.55	202.7	2,027	0.003000 [a]	0.0017	0.0003	0.0030	0.001100 [a]	0.0006	0.0001	0.0011	0.000167 [a]	0.0001	0.0000	0.0002
139	C-035	Conveyor	Residue	N	Inside	Y	N	ECS Enclosure	100%	Bldg Eff.	A	2.7	995.1	9,951	0.003000 [a]	0.0016	0.0003	0.0030	0.001100 [a]	0.0006	0.0001	0.0011	0.000167 [a]	0.0001	0.0000	0.0002
140	C-039	Conveyor	Mixed Non-Ferrous	N	Outside		N	NA			A	0.80	294.9	2,949	0.003000 [a]	0.0024	0.0004	0.0044	0.001100 [a]	0.0009	0.0002	0.0016	0.000167 [a]	0.0001	0.0000	0.0002
141	C-040	Conveyor	Residue	N	Outside		N	NA			A	2.80	1,032.0	10,320	0.003000 [a]	0.0084	0.0015	0.0155	0.001100 [a]	0.0031	0.0006	0.0057	0.000167 [a]	0.0005	0.0001	0.0009
142	C-040	Conveyor	Mids	N	Outside		N	NA			A	7	2,580.0	25,800	0.003000 [a]	0.0210	0.0039	0.0387	0.001100 [a]	0.0077	0.0014	0.0142	0.000167 [a]	0.0012	0.0002	0.0021
143	C-040	Conveyor	Residue	N	Outside		N	NA			A	4.20	1,548.0	15,480	0.003000 [a]	0.0126	0.0023	0.0232	0.001100 [a]	0.0046	0.0009	0.0085	0.000167 [a]	0.0007	0.0001	0.0013
144	C-041	Conveyor	Zorba	N	Outside		N	NA			A	0.50	184.3	1,843	0.003000 [a]	0.0015	0.0003	0.0028	0.001100 [a]	0.0006	0.0001	0.0010	0.000167 [a]	0.0001	0.0000	0.0002
145	C-042	Conveyor	Zorba	N	Outside		N	NA			A	1.50	552.9	5,529	0.003000 [a]	0.0045	0.0008	0.0083	0.001100 [a]	0.0017	0.0003	0.0030	0.000167 [a]	0.0002	0.0000	0.0005
146	C-043	Conveyor	Zorba	N	Outside		N	NA			A	3	1,105.7	11,057	0.003000 [a]	0.0090	0.0017	0.0166	0.001100 [a]	0.0033	0.0006	0.0061	0.000167 [a]	0.0005	0.0001	0.0009
147	C-044	Conveyor	Residue	N	Outside	Y	N	NA			A	24.87	9,166.4	91,664	0.003000 [a]	0.0746	0.0137	0.1375	0.001100 [a]	0.0274	0.0050	0.0504	0.000167 [a]	0.0041	0.0008	0.0076
148	C-044	Conveyor	Lights Zuric	N	Outside	Y	N	NA			A	0.30	110.6	1,106	0.003000 [a]	0.0009	0.0002	0.0017	0.001100 [a]	0.0003	0.0001	0.0006	0.000167 [a]	0.0000	0.0000	0.0001
149	C-045	Conveyor	Residue	N	Outside	Y	N	NA			A	24.87	9,166.4	91,664	0.003000 [a]	0.0746	0.0137	0.1375	0.001100 [a]	0.0274	0.0050	0.0504	0.000167 [a]	0.0041	0.0008	0.0076
150	C-047	Conveyor	To SSI	N	Outside		N	NA			A	0.55	202.7	2,027	0.003000 [a]	0.0017	0.0003	0.0030	0.001100 [a]	0.0006	0.0001	0.0011	0.000167 [a]	0.0001	0.0000	0.0002
151	C-048	Conveyor	Out of SSI	N	Outside		N	NA			A	0.55	202.7	2,027	0.003000 [a]	0.0017	0.0003	0.0030	0.001100 [a]	0.0006	0.0001	0.0011	0.000167 [a]	0.0001	0.0000	0.0002
152	C-050	Conveyor	Residue	N	Outside	Y	N	NA			A	25.07	9,240.1	92,401	0.003000 [a]	0.0752	0.0139	0.1386	0.001100 [a]	0.0276	0.0051	0.0508	0.000167 [a]	0.0042	0.0008	0.0077
153	C-052	Conveyor	Residue	N	Outside		N	NA			A	2.25	829.3	8,293	0.003000 [a]	0.0068	0.0012	0.0124	0.001100 [a]	0.0025	0.0005	0.0046	0.000167 [a]	0.0004	0.0001	0.0007
154	C-055	Conveyor	Wire	N	Outside	Y	N	NA			A	1	368.6	3,686	0.003000 [a]	0.0030	0.0006	0.0055	0.001100 [a]	0.0011	0.0002	0.0020	0.000167 [a]	0.0002	0.0000	0.0003
155	C-058	Conveyor	Zuric drops	N	Outside	Y	N	NA			A	0.30	110.6	1,106	0.003000 [a]	0.0009	0.0002	0.0017	0.001100 [a]	0.0003	0.0001	0.0006	0.000167 [a]	0.0000	0.0000	0.0001
156	C-060	Conveyor	Zone	N	Outside	Y	N	NA			A	1.20	442.3	4,423	0.003000 [a]	0.0036	0.0007	0.0066	0.001100 [a]	0.0013	0.0002	0.0024	0.000167 [a]	0.0002	0.0000	0.0004
157	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA			Drop	0.96	353.8	3,538	0.00761 [c]	0.0073	0.0013	0.0135	0.00360 [c]	0.0035	0.0006	0.0064	0.00054 [c]	0.0005	0.0001	0.0010
158	C-061	Conveyor drop to stockpile	Heavies Zuric	1.5% [a]	Outside		N	NA			Drop	0.30	110.6	1,106	0.00761 [c]	0.0023	0.0004	0.0042	0.00360 [c]	0.0011	0.0002	0.0020	0.00054 [c]	0.0002	0.0000	0.0003
159	C-062	Conveyor	Heavier Zorba	N	Outside		N	NA			A	1.25	460.7	4,607	0.003000 [d]	0.0038	0.0007	0.0069	0.001100 [d]	0.0014	0.0003	0.0025	0.000167 [d]	0.0002	0.0000	0.0004
160	C-063	Conveyor drop to stockpile	Zorba	1.5% [a]	Outside		N	NA			Drop	2.70	995.1	9,951	0.00761 [c]	0.0205	0.0038	0.0378	0.00360 [c]	0.0097	0.0018	0.0179	0.00054 [c]	0.0015	0.0003	0.0027
161	C-063	Conveyor drop to stockpile	Heavies Zorba	1.5% [a]	Outside		N	NA			Drop	0.85	313.3	3,133	0.00761 [c]	0.0065	0.0012	0.0119	0.00360 [c]	0.0031	0.0006	0.0056	0.00054 [c]	0.0005	0.0001	0.0009
162	C-064	Conveyor drop to container	Zorba	1.5% [a]	Outside		N	NA			drop	0.70	258.0	2,580	0.00761 [c]	0.0053	0.0010	0.0098	0.00360 [c]	0.0025	0.0005	0.0046	0.00054 [c]	0.0004	0.0001	0.0007

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	98.80%	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 tph	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 lb/hr	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions lb/hr	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
163	C-065	Conveyor	Residue	N	Outside	Y	N	NA			A	2.2	810.9	8,109	0.003000 [d]	0.0066	0.0012	0.0122	0.001100 [d]	0.0024	0.0004	0.0045	0.000167 [d]	0.0004	0.0001	0.0007
164	C-066	Conveyor	Residue	N	Outside	Y	N	NA			A	54.39	20,046.6	200,466	0.003000 [d]	0.1632	0.0301	0.3007	0.001100 [d]	0.0598	0.0110	0.1103	0.000167 [d]	0.0091	0.0017	0.0167
165	C-067	Conveyor	Residue	N	Outside	Y	N	NA			A	54.39	20,046.6	200,466	0.003000 [d]	0.1632	0.0301	0.3007	0.001100 [d]	0.0598	0.0110	0.1103	0.000167 [d]	0.0091	0.0017	0.0167
166	C-068	Conveyor drop to stockpile	Residue	1.5% [a]	Outside	Y	N	NA			drop	54.39	20,046.6	200,466	0.00761 [c]	0.4137	0.0762	0.7624	0.00360 [c]	0.1957	0.0361	0.3606	0.00054 [c]	0.0296	0.0055	0.0546
167	C-070	Conveyor drop to stockpile	Waste to Stockpile	1.5% [a]	Outside		N	NA			Drop	0.55	202.7	2,027	0.00761 [c]	0.0042	0.0008	0.0077	0.00360 [c]	0.0020	0.0004	0.0036	0.00054 [c]	0.0003	0.0001	0.0006
168	C-071	Conveyor	Lights	N	Outside	Y	Y	Cover			A	0.03	11.1	111	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
169	C-072	Conveyor	Lights	N	Outside	Y	Y	Cover			A	0.03	11.1	111	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
170	DC-01 Cyc	DC-01 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	0.008	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
171	DC-02 Cyc	DC-02 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	0.008	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
172	DC-03 Cyc	DC-03 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	0.008	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
173	DC-04 Cyc	DC-04 fines discharge to covered coneyor	Lights	N	Outside		Y	Cover			A	0.008	2.9	29	0.000140 [d]	0.0000	0.0000	0.0000	0.000046 [d]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
174	E-01	Vibratory Batch Feeder	Residue	Y	Outside		N	NA			A	70	25,800.0	258,000	0.000140 [d]	0.0098	0.0018	0.0181	0.000046 [d]	0.0032	0.0006	0.0059	0.000013 [d]	0.0009	0.0002	0.0017
175	E-03	Screener	Residue	Y	Outside		N	NA			B	60.90	22,446.0	224,460	0.002200 [e]	0.1340	0.0247	0.2469	0.000740 [e]	0.0451	0.0083	0.0831	0.000050 [e]	0.0030	0.0006	0.0056
176	E-03	Screener	Residue	Y	Outside		N	NA			B	6.80	2,506.3	25,063	0.002200 [e]	0.0150	0.0028	0.0276	0.000740 [e]	0.0050	0.0009	0.0093	0.000050 [e]	0.0003	0.0001	0.0006
177	E-03	Screener	Residue	Y	Outside		N	NA			B	2.70	995.1	9,951	0.002200 [e]	0.0059	0.0011	0.0109	0.000740 [e]	0.0020	0.0004	0.0037	0.000050 [e]	0.0001	0.0000	0.0002
178	E-04	Screener	Residue	Y	Outside		N	NA			B	15.75	5,805.0	58,050	0.002200 [e]	0.0347	0.0064	0.0639	0.000740 [e]	0.0117	0.0021	0.0215	0.000050 [e]	0.0008	0.0001	0.0015
179	E-04	Screener	Residue	Y	Outside		N	NA			B	9.14	3,368.7	33,687	0.002200 [e]	0.0201	0.0037	0.0371	0.000740 [e]	0.0068	0.0012	0.0125	0.000050 [e]	0.0005	0.0001	0.0008
180	E-04	Screener	Residue	Y	Outside		N	NA			B	4.20	1,548.0	15,480	0.002200 [e]	0.0092	0.0017	0.0170	0.000740 [e]	0.0031	0.0006	0.0057	0.000050 [e]	0.0002	0.0000	0.0004
181	E-05	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	14.87	5,480.7	54,807	0.003000	0.0089	0.0016	0.0164	0.001100	0.0033	0.0006	0.0060	0.000167	0.0005	0.0001	0.0009
182	E-05	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	9.87	3,637.8	36,378	0.003000	0.0059	0.0011	0.0109	0.001100	0.0022	0.0004	0.0040	0.000167	0.0003	0.0001	0.0006
183	E-05	Magnetic Separation	Ferrous	N	Inside		N	NA			A	0.88	324.3	3,243	0.003000	0.0026	0.0005	0.0049	0.001100	0.0010	0.0002	0.0018	0.000167	0.0001	0.0000	0.0003
184	E-05	Magnetic Separation	Ferrous	N	Inside		N	NA			A	5	1,842.9	18,429	0.003000	0.0150	0.0028	0.0276	0.001100	0.0055	0.0010	0.0101	0.000167	0.0008	0.0002	0.0015
185	E-06	Eddy Current Separator	Residue	N	Outside		N	NA			A	6.12	2,255.7	22,557	0.003000 [d]	0.0184	0.0034	0.0338	0.001100 [d]	0.0067	0.0012	0.0124	0.000167 [d]	0.0010	0.0002	0.0019
186	E-06	Eddy Current Separator	Mids	N	Outside		N	NA			A	3.50	1,290.0	12,900	0.003000 [d]	0.0105	0.0019	0.0194	0.001100 [d]	0.0039	0.0007	0.0071	0.000167 [d]	0.0006	0.0001	0.0011
187	E-06	Eddy Current Separator	Zorba	N	Outside		N	NA			A	0.25	92.1	921	0.003000 [d]	0.0008	0.0001	0.0014	0.001100 [d]	0.0003	0.0001	0.0005	0.000167 [d]	0.0000	0.0000	0.0001
188	E-07	Wind Sifter	Lights	N	Outside		Y	Cover			B	0.25	92.1	921	0.002200 [d]	0.0006	0.0001	0.0010	0.000740 [d]	0.0002	0.0000	0.0003	0.000050 [d]	0.0000	0.0000	0.0000
189	E-07	Wind Sifter	Heavies	1.5% [a]	Outside		Y	Wind Sifter	90%	100%	Drop	1.50	552.9	5,529	0.00761 [c]	0.0103	0.0021	0.0000	0.00360 [c]	0.0000	0.0010	0.0000	0.00054 [c]	0.0000	0.0002	0.0000

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%

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	AA
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 tph	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 lb/hr	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions lb/hr	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
190	E-11	Screener	Residue	N	Outside		N	NA			B	15.75	5,805.0	58,050	0.025000 [d]	0.3938	0.0726	0.7256	0.008700 [d]	0.1370	0.0253	0.2525	0.001317 [d]	0.0207	0.0038	0.0382
191	E-11	Screener	Residue	N	Outside		N	NA			B	9.14	3,368.7	33,687	0.025000 [d]	0.2285	0.0421	0.4211	0.008700 [d]	0.0795	0.0147	0.1465	0.001317 [d]	0.0120	0.0022	0.0222
192	E-11	Screener	Residue	N	Outside		N	NA			B	4.20	1,548.0	15,480	0.025000 [d]	0.1050	0.0194	0.1935	0.008700 [d]	0.0365	0.0067	0.0673	0.001317 [d]	0.0055	0.0010	0.0102
193	E-12	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	14.87	5,480.7	54,807	0.003000	0.0089	0.0016	0.0164	0.001100	0.0033	0.0006	0.0060	0.000167	0.0005	0.0001	0.0009
194	E-12	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	9.87	3,637.8	36,378	0.003000	0.0059	0.0011	0.0109	0.001100	0.0022	0.0004	0.0040	0.000167	0.0003	0.0001	0.0006
195	E-12	Magnetic Separation	Ferrous	N	Inside		N	NA			A	0.88	324.3	3,243	0.003000	0.0026	0.0005	0.0049	0.001100	0.0010	0.0002	0.0018	0.000167	0.0001	0.0000	0.0003
196	E-12	Magnetic Separation	Ferrous	N	Inside		N	NA			A	5	1,842.9	18,429	0.003000	0.0150	0.0028	0.0276	0.001100	0.0055	0.0010	0.0101	0.000167	0.0008	0.0002	0.0015
197	E-12	Magnetic Separation	Zorba	N	Outside		N	NA			A	0.25	92.1	921	0.003000 [d]	0.0008	0.0001	0.0014	0.001100 [d]	0.0003	0.0001	0.0005	0.000167 [d]	0.0000	0.0000	0.0001
198	E-13	Eddy Current Separator	Residue	N	Outside		N	NA			A	6.12	2,255.7	22,557	0.003000 [d]	0.0184	0.0034	0.0338	0.001100 [d]	0.0067	0.0012	0.0124	0.000167 [d]	0.0010	0.0002	0.0019
199	E-13	Eddy Current Separator	Mids	N	Outside		N	NA			A	3.50	1,290.0	12,900	0.003000 [d]	0.0105	0.0019	0.0194	0.001100 [d]	0.0039	0.0007	0.0071	0.000167 [d]	0.0006	0.0001	0.0011
200	E-14	Wind Sifter	Lights	N	Outside		Y	Cover			B	0.20	73.7	737	0.002200 [d]	0.0004	0.0001	0.0008	0.000740 [d]	0.0001	0.0000	0.0003	0.000050 [d]	0.0000	0.0000	0.0000
201	E-14	Wind Sifter	Heavies	1.5% [e]	Outside		Y	Wind Sifter	100%	100%	Drop	0.60	221.1	2,211	0.00761 [e]	0.0046	0.0008	0.0000	0.00360 [e]	0.0000	0.0004	0.0000	0.00054 [e]	0.0000	0.0001	0.0000
202	E-15	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	9.09	3,350.3	33,503	0.003000	0.0055	0.0010	0.0101	0.001100	0.0020	0.0004	0.0037	0.000167	0.0003	0.0001	0.0006
203	E-15	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	8.29	3,055.5	30,555	0.003000	0.0050	0.0009	0.0092	0.001100	0.0018	0.0003	0.0034	0.000167	0.0003	0.0001	0.0005
204	E-15	Magnetic Separation	Ferrous	N	Outside		N	NA			A	0.05	18.4	184	0.003000 [d]	0.0002	0.0000	0.0003	0.001100 [d]	0.0001	0.0000	0.0001	0.000167 [d]	0.0000	0.0000	0.0000
205	E-15	Magnetic Separation	Mixed Non-Ferrous	N	Outside		N	NA			A	0.40	147.4	1,474	0.003000 [d]	0.0012	0.0002	0.0022	0.001100 [d]	0.0004	0.0001	0.0008	0.000167 [d]	0.0001	0.0000	0.0001
206	E-16	Eddy Current Separator	Residue	N	Outside		N	NA			A	7.29	2,686.9	26,869	0.003000 [d]	0.0219	0.0040	0.0403	0.001100 [d]	0.0080	0.0015	0.0148	0.000167 [d]	0.0012	0.0002	0.0022
207	E-16	Eddy Current Separator	Zorba	N	Outside		N	NA			A	1	368.6	3,686	0.003000 [d]	0.0030	0.0006	0.0055	0.001100 [d]	0.0011	0.0002	0.0020	0.000167 [d]	0.0002	0.0000	0.0003
208	E-17	Wind Sifter	Lights	N	Outside		Y	Cover			B	1.09	401.7	4,017	0.002200 [d]	0.0024	0.0004	0.0044	0.000740 [d]	0.0008	0.0001	0.0015	0.000050 [d]	0.0001	0.0000	0.0001
209	E-17	Wind Sifter	Residue	N	Outside		Y	Wind Sifter	100%	100%	B	6.20	2,285.1	22,851	0.002200 [d]	0.0136	0.0025	0.0000	0.000740 [d]	0.0000	0.0008	0.0000	0.000050 [d]	0.0000	0.0001	0.0000
210	E-21	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	8.29	3,055.5	30,555	0.003000	0.0050	0.0009	0.0092	0.001100	0.0018	0.0003	0.0034	0.000167	0.0003	0.0001	0.0005
211	E-21	Magnetic Separation	Ferrous	N	Outside		N	NA			A	0.05	18.4	184	0.003000 [d]	0.0002	0.0000	0.0003	0.001100 [d]	0.0001	0.0000	0.0001	0.000167 [d]	0.0000	0.0000	0.0000
212	E-21	Magnetic Separation	Mixed Non-Ferrous	N	Outside		N	NA			A	0.40	147.4	1,474	0.003000 [d]	0.0012	0.0002	0.0022	0.001100 [d]	0.0004	0.0001	0.0008	0.000167 [d]	0.0001	0.0000	0.0001
213	E-22	Eddy Current Separator	Zorba	N	Outside		N	NA			A	1	368.6	3,686	0.003000 [d]	0.0030	0.0006	0.0055	0.001100 [d]	0.0011	0.0002	0.0020	0.000167 [d]	0.0002	0.0000	0.0003
214	E-22	Eddy Current Separator	Residue	N	Outside		N	NA			A	7.29	2,686.9	26,869	0.003000 [d]	0.0219	0.0040	0.0403	0.001100 [d]	0.0080	0.0015	0.0148	0.000167 [d]	0.0012	0.0002	0.0022
215	E-23	Wind Sifter	Lights	N	Outside		Y	Cover			B	1.09	401.7	4,017	0.002200 [d]	0.0024	0.0004	0.0044	0.000740 [d]	0.0008	0.0001	0.0015	0.000050 [d]	0.0001	0.0000	0.0001
216	E-23	Wind Sifter	Residue	N	Outside		Y	Wind Sifter	100%	100%	B	6.20	2,285.1	22,851	0.002200 [d]	0.0136	0.0025	0.0000	0.000740 [d]	0.0000	0.0008	0.0000	0.000050 [d]	0.0000	0.0001	0.0000

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	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	Z	AA
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 tph	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 lb/hr	PM10 Emissions ton/mo	PM10 Emissions tpy	PM2.5 Emissions lb/ton	PM2.5 Emissions lb/hr	PM2.5 Emissions ton/mo	PM2.5 Emissions tpy
217	E-27	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	8.15	3,003.9	30,039	0.003000	0.0049	0.0009	0.0090	0.001100	0.0018	0.0003	0.0033	0.000167	0.0003	0.0001	0.0005
218	E-27	Magnetic Separation	Ferrous	N	Outside		N	NA			A	0.25	92.1	921	0.003000 [d]	0.0008	0.0001	0.0014	0.001100 [d]	0.0003	0.0001	0.0005	0.000167 [d]	0.0000	0.0000	0.0001
219	E-28	Eddy Current Separator	Residue	N	Outside		N	NA			A	7.15	2,635.3	26,353	0.003000 [d]	0.0215	0.0040	0.0395	0.001100 [d]	0.0079	0.0014	0.0145	0.000167 [d]	0.0012	0.0002	0.0022
220	E-28	Eddy Current Separator	Zorba	N	Outside		N	NA			A	1	368.6	3,686	0.003000 [d]	0.0030	0.0006	0.0055	0.001100 [d]	0.0011	0.0002	0.0020	0.000167 [d]	0.0002	0.0000	0.0003
221	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	6.55	2,414.1	24,141	0.003000	0.0039	0.0007	0.0072	0.001100	0.0014	0.0003	0.0027	0.000167	0.0002	0.0000	0.0004
222	E-34	Magnetic Separation	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	6.55	2,414.1	24,141	0.003000	0.0039	0.0007	0.0072	0.001100	0.0014	0.0003	0.0027	0.000167	0.0002	0.0000	0.0004
223	E-35	Eddy Current Separator	Zorba	N	Outside		N	NA			A	1.50	552.9	5,529	0.003000 [d]	0.0045	0.0008	0.0083	0.001100 [d]	0.0017	0.0003	0.0030	0.000167 [d]	0.0002	0.0000	0.0005
224	E-35	Eddy Current Separator	Residue	N	Outside		N	NA			A	5.05	1,861.3	18,613	0.003000 [d]	0.0152	0.0028	0.0279	0.001100 [d]	0.0056	0.0010	0.0102	0.000167 [d]	0.0008	0.0002	0.0016
225	E-40	Separator	Lights Zuric	N	Outside		N	NA			B	0.24	88.5	885	0.025000 [d]	0.0060	0.0011	0.0111	0.008700 [d]	0.0021	0.0004	0.0038	0.001317 [d]	0.0003	0.0001	0.0006
226	E-40	Separator	Heavies Zuric	N	Outside		N	NA			B	0.96	353.8	3,538	0.025000 [d]	0.0240	0.0044	0.0442	0.008700 [d]	0.0084	0.0015	0.0154	0.001317 [d]	0.0013	0.0002	0.0023
227	E-40	Separator	Lights Zuric	N	Outside		N	NA			B	0.35	129.0	1,290	0.025000 [d]	0.0088	0.0016	0.0161	0.008700 [d]	0.0030	0.0006	0.0056	0.001317 [d]	0.0005	0.0001	0.0008
228	E-41	Separator	Lights	N	Outside		N	NA			B	0.95	350.1	3,501	0.025000 [d]	0.0238	0.0044	0.0438	0.008700 [d]	0.0083	0.0015	0.0152	0.001317 [d]	0.0013	0.0002	0.0023
229	E-41	Separator drop to container	Heavies	1.5% [e]	Outside		N	NA			Drop	0.05	18.4	184	0.00761 [e]	0.0004	0.0001	0.0007	0.00360 [e]	0.0002	0.0000	0.0003	0.00054 [e]	0.0000	0.0000	0.0001
230	E-42	Low speed shredder for size reduction	Out of SSI	N	Outside		N	NA			A	0.55	202.7	2,027	0.003000 [d]	0.0017	0.0003	0.0030	0.001100 [d]	0.0006	0.0001	0.0011	0.000167 [d]	0.0001	0.0000	0.0002
231	E-43	Vibratory Feeder	Residue	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	2.70	995.1	9,951	0.003000	0.0016	0.0003	0.0030	0.001100 [f]	0.0006	0.0001	0.0011	0.000167 [f]	0.0001	0.0000	0.0002
232	E-44	Eddy Current Separator drop to stockpile	Zorba	1.5% [e]	Inside		N	NA			Drop	0.50	184.3	1,843	0.00760	0.0038	0.0007	0.0070	0.00360	0.0018	0.0003	0.0033	0.00050	0.0003	0.0000	0.0005
233	E-44	Eddy Current Separator	Residue	N	Outside		N	NA			A	2.2	810.9	8,109	0.003000 [d]	0.0066	0.0012	0.0122	0.001100 [d]	0.0024	0.0004	0.0045	0.000167 [d]	0.0004	0.0001	0.0007
234	E-46	Separator	Heavier Zorba	N	Outside		N	NA			B	1.25	460.7	4,607	0.025000 [d]	0.0313	0.0058	0.0576	0.008700 [d]	0.0109	0.0020	0.0200	0.001317 [d]	0.0016	0.0003	0.0030
235	E-46	Separator	Lights Zorba	N	Outside		N	NA			B	0.25	92.1	921	0.025000 [d]	0.0063	0.0012	0.0115	0.008700 [d]	0.0022	0.0004	0.0040	0.001317 [d]	0.0003	0.0001	0.0006
236	E-47	Separator	Zorba	N	Outside		N	NA			B	2.70	995.1	9,951	0.025000 [d]	0.0675	0.0124	0.1244	0.008700 [d]	0.0235	0.0043	0.0433	0.001317 [d]	0.0036	0.0007	0.0066
237	E-47	Separator	Heavies Zorba	N	Outside		N	NA			B	0.85	313.3	3,133	0.025000 [d]	0.0213	0.0039	0.0392	0.008700 [d]	0.0074	0.0014	0.0136	0.001317 [d]	0.0011	0.0002	0.0021
238	E-47	Separator	Lights Zorba	N	Outside		N	NA			B	0.15	55.3	553	0.025000 [d]	0.0038	0.0007	0.0069	0.008700 [d]	0.0013	0.0002	0.0024	0.001317 [d]	0.0002	0.0000	0.0004
239	E-47	Separator	Light Zorba	N	Outside		N	NA			B	0.30	110.6	1,106	0.025000 [d]	0.0075	0.0014	0.0138	0.008700 [d]	0.0026	0.0005	0.0048	0.001317 [d]	0.0004	0.0001	0.0007
240	E-49	Transfer Conveyor	Residue onto ECS	N	Inside		N	ECS Enclosure	100%	Bldg Eff.	A	8.15	3,003.9	30,039	0.003000	0.0049	0.0009	0.0090	0.001100	0.0018	0.0003	0.0033	0.000167	0.0003	0.0001	0.0005
241	E-50	Air Vibe	To Infeed SSI	N	Outside		Y	Cover			A	0.55	202.7	2,027	0.000140 [d]	0.0001	0.0000	0.0001	0.000046 [d]	0.0000	0.0000	0.0000	0.000013 [d]	0.0000	0.0000	0.0000
242	ECS	Eddy Current Separator drop to container	Zorba	1.5% [e]	Inside		N	NA			Drop	0.04	14.7	147	0.00760	0.0003	0.0001	0.0006	0.00360	0.0001	0.0000	0.0003	0.00050	0.0000	0.0000	0.0000
243	ECS	Eddy Current Separator drop to container	Zorba	1.5% [e]	Inside		N	NA			Drop	0.18	66.3	663	0.00760	0.0014	0.0003	0.0025	0.00360	0.0006	0.0001	0.0012	0.00050	0.0001	0.0000	0.0002

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	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	Z	AA
Row	Equipment Generating Emissions		Material	Moisture > 1.5%	Transfer Point Location (Inside / Outside)	Conveyor Covered	Transfer Point Controlled	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	Conveyed	Y / N			(Y/N)					tph	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy	lb/ton	lb/hr	ton/mo	tpy
244	End Loader	Drop ASR into feed hopper	Residue into Hopper	N	Outside		Y	Cover			D	70	25,800.0	258,000	0.000204 d	0.0143	0.0026	0.0264	0.000100 d	0.0070	0.0013	0.0129	0.000015 d	0.0011	0.0002	0.0020
245	End Loader	load waste to truck		N	Outside		N	NA			D	0.00	0.0	0	0.000204	0.0000	0.0000	0.0000	0.000100	0.0000	0.0000	0.0000	0.000015	0.0000	0.0000	0.0000
246	SC-001	Supplemental Conveyor	Residue								A	15.75	5,805.0	58,050	0.003000	0.0473	0.0087	0.0871	0.001100	0.0173	0.0032	0.0319	0.000167	0.0026	0.0005	0.0048
247	SC-002	Supplemental Conveyor	Residue								A	15.75	5,805.0	58,050	0.003000	0.0473	0.0087	0.0871	0.001100	0.0173	0.0032	0.0319	0.000167	0.0026	0.0005	0.0048
248	SC-003	Supplemental Conveyor	Residue								A	7.34	2,705.3	27,053	0.003000	0.0220	0.0041	0.0406	0.001100	0.0081	0.0015	0.0149	0.000167	0.0012	0.0002	0.0023
249	SC-0044	Supplemental Conveyor	Residue								A	7.34	2,705.3	27,053	0.003000	0.0220	0.0041	0.0406	0.001100	0.0081	0.0015	0.0149	0.000167	0.0012	0.0002	0.0023
250	SC-005	Supplemental Conveyor	Residue								A	54.39	20,046.6	200,466	0.003000	0.1632	0.0301	0.3007	0.001100	0.0598	0.0110	0.1103	0.000167	0.0091	0.0017	0.0167
251	SC-006	Supplemental Conveyor	Residue								A	54.39	20,046.6	200,466	0.003000	0.1632	0.0301	0.3007	0.001100	0.0598	0.0110	0.1103	0.000167	0.0091	0.0017	0.0167
								Totals Nonferrous Plant Material Handling PM Emissions								4.57	0.88	8.74		2.01	0.42	4.12		0.73	0.18	1.77
								Totals NonferrousPlant Material Handling HAP Metal Emissions							1.67% g	0.08	0.01	0.15	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 -
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 the atmosphere through Dust Collection DC-01. Emissions are estimated by 12,000
g Metal HAPs as percent of total PM measured at the discharge of the existing roll media filter in June 2018.

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

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

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)

EXHIBIT 17

From: Frost, Brad
To: EPA.PublicHearingCom
Cc: Guy, Jeff
Bcc: Zwick, Ann M.; John Pinion; Pressnall, Chris; Barria, German; jimkallas@general-iron.com; Adam Labkon; Walts.alan@Epa.gov; mdunn@atg.state.il.us; Harley, Keith; janzav34@gmail.com; george.cardenas@cityofchicago.org; samira.hanessian@cityofchicago.org; Committeeonenvironmentalprotectionandenergy@cityofchicago.org; Erica_DeAngelis@durbin.senate.gov; esims@senatorelglesims.com; office@repevans.com; Peter_Danos@duckworth.senate.gov; janzav34@gmail.com; jim@general-iron.com; rick.bryant@mail.house.gov; ward10@cityofchicago.org; chicagossnaacp@gmail.com; colleen@ilenviro.org; elindberg@uchicago.edu; mgeertsma@nrdc.org; crguerrer@gmail.com; sarahelizabethrichmond@gmail.com; imoreno@nrdc.org; Harley, Keith; kellynichols1@gmail.com; smedicherla@grummanbutkus.com; Sherrill, John; aflickinger@chicagoriver.org; cookcounty.board@cookcountyIL.gov; environment@cookcountyil.gov; nwarkenthien@cpilink.com; Cardick, Samuel; Bailey, Sabrina; mmarshall@delta-institute.org; Wendystarkriemer@gmail.com; lexmwinter@gmail.com; anna.schibrowsky@gmail.com; sarah.buchhorn@gmail.com; alfonso.martel@cityofchicago.org; indiancreekeec@outlook.com; Liliana.escarpita@cityofchicago.org; arturo@naaee.org; debbie.hays@simsmm.com; erhodes@delta-institute.org; Ajoycegolden@student.ccc.edu; ltargos@gmail.com; eknox@clccrul.org; Erica_DeAngelis@durbin.senate.gov; info@duckworth.senate.gov; angela.tin@lung.org; kareena.wasserman@comed.com; lfrede@cicil.net; dchizewer@earthjustice.org; jcassel@earthjustice.org; Jhammons@elpc.org; KCourtney@elpc.org; info@faithinplace.org; jwalling@ilenviro.org; iergstaff@ierg.org; gnorris@illinoisnaacp.org; thaley@illinoisnaacp.org; jpino@lvejo.org; nick.firmand@gmail.com; ltargos@gmail.com; BUrbaszewski@lungchicago.org; christine.nannicelli@sierraclub.org; jack.darin@sierraclub.org; katrina.phillips@sierraclub.org; cary.shepherd@law.northwestern.edu; ash.ngu@propublica.org; obautista58@gmail.com; gramirez@nrdc.org; loquita8@gmail.com; dgrable@kentlaw.iit.edu; n-loeb@northwestern.edu; cary.shepherd@law.northwestern.edu; webmaster@cookcountyil.gov; delta@delta-institute.org; Dave.Graham@cityofchicago.org; Jennifer.Hesse@cityofchicago.org; Mort.Ames@cityofchicago.org; cantello.nicole@epa.gov; frank.nathan@epa.gov
Subject: General III Comment Period and Public Hearing
Date: Monday, March 30, 2020 10:35:00 AM
Attachments: GIII Public Notice.pdf

All,

General III, LLC has applied to the Illinois Environmental Protection Agency (Illinois EPA) Bureau of Air for a permit to construct a scrap metal recycling facility proposed to be located at 11600 South Burley Avenue in Chicago. The Illinois EPA has reviewed the application and made a preliminary determination that the application meets the standards for issuance and has prepared a draft permit for public review and comment. The Illinois EPA is accepting public comments on the draft construction permit until June 13, 2020. The draft permit, public notice and other documents are available on our website http://bit.ly/2SiUSql.

In addition, the Illinois EPA is holding a public hearing to accept verbal comments into the written record. The public hearing will be held online on May 14, 2020. There will be a session starting at 1:30 pm and a second session starting at 6:00 pm. Computer and telephone connection options are available. Login instructions are found in the notice.

Anyone who wishes to make a comment at the hearing must contact the hearing officer and request to do so by 5:00 p.m. CST on Tuesday, May 12, 2020. The hearing officer contact information is jeff.guy@illinois.gov or call 217/785-8724

Details on the hearing and submission of comments are in the public notice which is attached to this e-mail and may be found at the link above.

ID #: 031600SFX
Permit #: 19090021
Source: General III, LLC

Illinois Environmental Protection Agency

Notice of Comment Period and Public Hearing Proposed Issuance of a Construction Permit to General III, LLC in Chicago

General III, LLC has applied to the Illinois Environmental Protection Agency (Illinois EPA) Bureau of Air for a permit to construct a scrap metal recycling facility proposed to be located at 11600 South Burley Avenue in Chicago. As part of the review of the construction permit application, the Illinois EPA requested the company develop a plan for controlling fugitive dust emissions at the facility and perform a modeling analysis. The Illinois EPA has reviewed the application and made a preliminary determination that the application meets the standards for issuance and has prepared a draft permit for public review and comment.

In addition to accepting written comments on the draft permit, **the Illinois EPA Bureau of Air will hold a public hearing on Thursday, May 14, 2020. The hearing will be held online with an afternoon session beginning at 1:30 pm and an evening session beginning at 6:00 pm.** Computer and telephone connection options are available. The first 30 minutes of each session will be the Illinois EPA presentation concerning the hearing and draft permit. Information on how to connect to the hearing is below.

If you would like to provide comment on the draft permit at the hearing: Requests to comment at the public hearing must be made **no later than 5:00 p.m. CST on Tuesday, May 12, 2020,** by contacting the hearing officer at jeff.guy@illinois.gov or calling 217/785-8724. Registering reserves you an opportunity to provide comment during the hearing. If you are limited on time, please contact the hearing officer for a more specific commenting time.

Access to the hearing

You may log in or call in to the hearing up to 15 minutes prior to the start or anytime during the hearing.

By Computer: click this link
https://illinois.webex.com/illinois/onstage/g.php?MTID=ede15d1e3bc40793e54ad27332af9805d
This will take you to the webex webpage for the hearing. Enter your information and click the Join Now button. You may be prompted for an Event Number or Event Password, below.

By Phone: call +1-312-535-8110 and when prompted enter the event number, below.

Event Number: 804 080 241
Event Password: cWpHgfRA248

If you have questions or need assistance with webex, please contact the Illinois EPA contact listed below prior to the day of the hearing.

The hearing will be held to receive comments and answer questions from the public concerning the application. The hearing will be held under the Illinois EPA's "Procedures for Permit and Closure Plans," 35 IAC 166, Subpart A. Lengthy comments and questions should be submitted in writing. Requests for interpretation (including sign language) must be made to the hearing officer by April 23, 2020. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer. Any questions about hearing procedures or requests to address special needs should be made to the Illinois EPA, Jeff Guy – Hearing Officer, Re: General III, 217/524-1628, TDD: 866/273-5488, epa.publichearingcom@illinois.gov

For information or requests about the draft permit, please contact Brad Frost, Community Relations, Illinois EPA, at 217/782-2113 or 217/782-9143 TDD or brad.frost@illinois.gov

The Illinois EPA will accept written public comments on the draft permit during the comment period. **Written comments must be received no later than midnight June 13, 2020, and must be submitted to epa.publichearingcom@illinois.gov or Illinois EPA, Attn: Jeff Guy, Hearing Officer, PO Box 19276, 1021 North Grand Avenue, Springfield, IL 62794-9276.**

A repository of documents for this permitting action is available on the Illinois EPA's website at https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/default.aspx and at Illinois EPA offices at 9511 Harrison Street in Des Plaines, 847/294-4000 and 1021 N. Grand Avenue East in Springfield, 217/782-7027 (you must call ahead to assure that someone will be available to assist you). Copies of the draft construction permit and its project summary are also available upon request.

The proposed facility would be located in an area of Environmental Justice concern. More information about Illinois EPA's Environmental Justice program may be found at https://www2.illinois.gov/epa/topics/environmental-justice/Pages/default.aspx

From: Frost, Brad
To: EPA.PublicHearingCom
Cc: Guy, Jeff
Bcc: Zwick, Ann M.; John Pinion; Pressnall, Chris; Barria, German; jimkallas@general-iron.com; Adam Labkon; Walts.alan@Epa.gov; mdunn@atg.state.il.us; Harley, Keith; janzav34@gmail.com; george.cardenas@cityofchicago.org; samira.hanessian@cityofchicago.org; Committeeonenvironmentalprotectionandenergy@cityofchicago.org; Erica_DeAngelis@durbin.senate.gov; esims@senatorelgiesims.com; office@repevans.com; Peter_Danos@duckworth.senate.gov; janzav34@gmail.com; jim@general-iron.com; rick.bryant@mail.house.gov; ward10@cityofchicago.org; chicagossnaacp@gmail.com; colleen@ilenviro.org; elindberg@uchicago.edu; mgeertsma@nrdc.org; crguerrer@gmail.com; sarahelizabethrichmond@gmail.com; imoreno@nrdc.org; Harley, Keith; kellynichols1@gmail.com; smedicherla@grummanbutkus.com; Sherrill, John; aflickinger@chicagoriver.org; cookcounty.board@cookcountyIL.gov; environment@cookcountyil.gov; nwarkenthien@cpilink.com; Cardick, Samuel; Bailey, Sabrina; mmarshall@delta-institute.org; Wendystarkriemer@gmail.com; lexmwinter@gmail.com; anna.schibrowsky@gmail.com; sarah.buchhorn@gmail.com; alfonso.martel@cityofchicago.org; indiancreekeec@outlook.com; Liliana.escarpita@cityofchicago.org; arturo@naaee.org; debbie.hays@simsmm.com; erhodes@delta-institute.org; Ajoycegolden@student.ccc.edu; ltargos@gmail.com; eknox@clccrul.org; Erica_DeAngelis@durbin.senate.gov; info@duckworth.senate.gov; angela.tin@lung.org; kareena.wasserman@comed.com; lfrede@cicil.net; dchizewer@earthjustice.org; jcassel@earthjustice.org; Jhammons@elpc.org; KCourtney@elpc.org; info@faithinplace.org; jwalling@ilenviro.org; ierqstaff@ierg.org; gnorris@illinoisnaacp.org; thaley@illinoisnaacp.org; jpino@lvejo.org; nick.firmand@gmail.com; ltargos@gmail.com; BUrbaszewski@lungchicago.org; christine.nannicelli@sierraclub.org; jack.darin@sierraclub.org; katrina.phillips@sierraclub.org; cary.shepherd@law.northwestern.edu; ash.ngu@propublica.org; obautista58@gmail.com; gramirez@nrdc.org; loquita8@gmail.com; dgrable@kentlaw.iit.edu; n-loeb@northwestern.edu; cary.shepherd@law.northwestern.edu; webmaster@cookcountyil.gov; delta@delta-institute.org; Dave.Graham@cityofchicago.org; Jennifer.Hesse@cityofchicago.org; Mort.Ames@cityofchicago.org; cantello.nicole@epa.gov; frank.nathan@epa.gov
Subject: RE: General III Comment Period and Public Hearing
Date: Monday, March 30, 2020 3:45:00 PM
Attachments: GIII Public Notice.pdf
image001.png
image002.png
image003.png
image005.png

All,

Attached is a slightly modified notice. In the notice previously sent, the url for the hearing is correct; however, the characters of the url run to a second line. If the link is directly clicked on your browser will not pick up the characters on the second line. For ease of use, so that you do not have to cut and paste the url into a browser, I have attached a notice with the url on a single line. If you have any questions, please contact me.

Brad Frost
Manager, Office of Community Relations
217/782-7027

From: Frost, Brad
Sent: Monday, March 30, 2020 10:35 AM
To: EPA.PublicHearingCom <EPA.PublicHearingCom@Illinois.gov>
Cc: Guy, Jeff <Jeff.Guy@Illinois.gov>
Subject: General III Comment Period and Public Hearing

All,

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Details on the hearing and submission of comments are in the public notice which is attached to this e-mail and may be found at the link above.

ID #: 031600SFX
Permit #: 19090021
Source: General III, LLC

Illinois Environmental Protection Agency

Notice of Comment Period and Public Hearing Proposed Issuance of a Construction Permit to General III, LLC in Chicago

General III, LLC has applied to the Illinois Environmental Protection Agency (Illinois EPA) Bureau of Air for a permit to construct a scrap metal recycling facility proposed to be located at 11600 South Burley Avenue in Chicago. As part of the review of the construction permit application, the Illinois EPA requested the company develop a plan for controlling fugitive dust emissions at the facility and perform a modeling analysis. The Illinois EPA has reviewed the application and made a preliminary determination that the application meets the standards for issuance and has prepared a draft permit for public review and comment.

In addition to accepting written comments on the draft permit, **the Illinois EPA Bureau of Air will hold a public hearing on Thursday, May 14, 2020. The hearing will be held online with an afternoon session beginning at 1:30 pm and an evening session beginning at 6:00 pm.** Computer and telephone connection options are available. The first 30 minutes of each session will be the Illinois EPA presentation concerning the hearing and draft permit. Information on how to connect to the hearing is below.

If you would like to provide comment on the draft permit at the hearing: Requests to comment at the public hearing must be made **no later than 5:00 p.m. CST on Tuesday, May 12, 2020,** by contacting the hearing officer at jeff.guy@illinois.gov or calling 217/785-8724. Registering reserves you an opportunity to provide comment during the hearing. If you are limited on time, please contact the hearing officer for a more specific commenting time.

Access to the hearing

You may log in or call in to the hearing up to 15 minutes prior to the start or anytime during the hearing.

By Computer: click this link
https://illinois.webex.com/illinois/onstage/g.php?MTID=ede15d1e3bc40793e54ad27332af9805d
This will take you to the webex webpage for the hearing. Enter your information and click the Join Now button. You may be prompted for an Event Number or Event Password, below.

By Phone: call +1-312-535-8110 and when prompted enter the event number, below.

Event Number: 804 080 241
Event Password: cWpHgfRA248

If you have questions or need assistance with webex, please contact the Illinois EPA contact listed below prior to the day of the hearing.

The hearing will be held to receive comments and answer questions from the public concerning the application. The hearing will be held under the Illinois EPA's "Procedures for Permit and Closure Plans," 35 IAC 166, Subpart A. Lengthy comments and questions should be submitted in writing. Requests for interpretation (including sign language) must be made to the hearing officer by April 23, 2020. Email comments originating on third party systems or servers intended for submittal of multiple emails of the same or nearly the same content will not be accepted without prior approval from the hearing officer. Any questions about hearing procedures or requests to address special needs should be made to the Illinois EPA, Jeff Guy – Hearing Officer, Re: General III, 217/524-1628, TDD: 866/273-5488, epa.publichearingcom@illinois.gov

For information or requests about the draft permit, please contact Brad Frost, Community Relations, Illinois EPA, at 217/782-2113 or 217/782-9143 TDD or brad.frost@illinois.gov

The Illinois EPA will accept written public comments on the draft permit during the comment period. **Written comments must be received no later than midnight June 13, 2020, and must be submitted to epa.publichearingcom@illinois.gov or Illinois EPA, Attn: Jeff Guy, Hearing Officer, PO Box 19276, 1021 North Grand Avenue, Springfield, IL 62794-9276.**

A repository of documents for this permitting action is available on the Illinois EPA's website at https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/default.aspx and at Illinois EPA offices at 9511 Harrison Street in Des Plaines, 847/294-4000 and 1021 N. Grand Avenue East in Springfield, 217/782-7027 (you must call ahead to assure that someone will be available to assist you). Copies of the draft construction permit and its project summary are also available upon request.

The proposed facility would be located in an area of Environmental Justice concern. More information about Illinois EPA's Environmental Justice program may be found at https://www2.illinois.gov/epa/topics/environmental-justice/Pages/default.aspx

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397

JB PRITZKER, GOVERNOR **JOHN J. KIM**, DIRECTOR

Exhibit 19

Hearing Order
General III, LLC

On March 30, 2020, the Illinois Environmental Protection Agency ("Illinois EPA") posted a Public Notice (entitled "Notice of Comment Period and Public Hearing") for General III, LLC. General III, LLC has applied to the Illinois EPA Bureau of Air for a permit to construct a scrap metal recycling facility proposed to be located at 11600 South Burley Avenue in Chicago, Illinois. The Public Notice was posted on the Illinois EPA website at https://www2.illinois.gov/epa/public-notices/Pages/general-notices.aspx.

The Public Notice provided information related to the public hearing, which was conducted on May 14, 2020, and to information regarding the associated public comment period. Notably, the Public Notice observed that the Illinois EPA will accept written public comments on the draft permit during the comment period no later than midnight, June 13, 2020. Based on a recent inquiry concerning this time requirement, a clarification is warranted.

The date in the Public Notice for the submission of comments stems from the applicable regulations, which generally provides for closure of the record 30 days after the date of the hearing. [35 Ill. Adm. Code 166.191]. In the event of a time requirement (such as this one involving the date of record closure) that is set for a Saturday or Sunday, the time within which such action must be performed is extended by operation of law to the following Monday. [5 ILCS 70/Section 1.11]. For this reason, public comments must be submitted no later than midnight on Monday, June 15, 2020. Written comments must be submitted to epa.publichearingcom@illinois.gov, Jeff.Guy@illnois.gov, or Illinois EPA, Attn: Jeff Guy, Hearing Officer, PO Box 19276, 1021 North Grand Avenue, Springfield, Illinois 62794-9276 **no later than midnight, Monday, June 15, 2020**.

Jeffrey J. Guy, Illinois EPA Hearing Officer
Office of Community Relation

Date: 6/3/20

From:	Guy, Jeff
To:	EPA.PublicHearingCom
Subject:	Due date of GIII comments
Date:	Wednesday, June 3, 2020 11:41:36 AM
Attachments:	Exhibit 104 Hearing Order.pdf image001.png

From: Guy, Jeff
Sent: Wednesday, June 3, 2020 11:39 AM
To: Geertsma, Meleah <mgeertsma@nrdc.org>
Subject: RE: Due date of GIII comments

Ms. Geertsma,

Please see the attached document, which can be found at the link provided below, in regards to the comment period deadline.
https://www2.illinois.gov/epa/public-notices/boa-notices/Pages/default.aspx

Thanks,

Jeffrey J. Guy
Hearing Officer, Illinois Environmental Protection Agency
Office of Community Relations
(217) 785-8724
Jeff.Guy@illinois.gov

From: Geertsma, Meleah <mgeertsma@nrdc.org>
Sent: Tuesday, June 2, 2020 8:53 AM
To: Guy, Jeff <Jeff.Guy@Illinois.gov>
Subject: [External] Re: Due date of GIII comments

Thanks Jeff - will IEPA be sending out an updated notice with the Monday deadline?

From: Guy, Jeff <Jeff.Guy@Illinois.gov>
Sent: Tuesday, June 2, 2020 8:42 AM
To: Geertsma, Meleah <mgeertsma@nrdc.org>
Subject: Due date of GIII comments

Ms. Geertsma,

Regarding General III, LLC, written comments may be submitted by Monday, June 15, 2020 as the end of comment period falls on a Saturday (June 13, 2020).

Thank you,

Jeffrey J. Guy

Hearing Officer, Illinois Environmental Protection Agency
Office of Community Relations
(217) 785-8724
Jeff.Guy@illinois.gov

From: Geertsma, Meleah <mgeertsma@nrdc.org>
Sent: Friday, May 29, 2020 1:58 PM
To: Pressnall, Chris <Chris.Pressnall@Illinois.gov>
Subject: [External] Due date of GIII comments?

Hi Chris - can you confirm the due date for comments on the proposed GIII permit? The noticed date of June 13 falls on a Saturday, so does the date get bumped to that Monday, June 15?

Thanks,

Meleah