July 15, 2016

Albuquerque Environmental Health Department
Air Quality Division
11850 Sunset Gardens SW
Albuquerque, New Mexico 87121

Attn: Ms. Regan Eyerman, P.E., Environmental Health Scientist

RE: AMENDED Air Quality Permit #1529-M3 - Modification Application
Albuquerque Metal Recycling, Inc.
3339 Second Street SW
Albuquerque, New Mexico 87105

Dear Ms. Eyerman,

Please find attached an Amended Air Quality Permit Modification application for the above referenced facility. Please replace the application package you received previously with this version. This application is being submitted by Envirosure Solutions, LLC on behalf of Albuquerque Metals Recycling, Inc.

This modification is intended to amend Albuquerque Metal Recycling's Air Permit #1529-M3 to clarify the current list of equipment, and notify you of equipment that will be added within the next 12 months. Equipment shown as installed in 2011 was previously submitted to your department as attachments included in the 2010 air permit application. This application intends to clarify equipment that may be considered an emission source, and also provide advance notification of equipment upgrades planned for the near future.

The methodology used for process ratings are based upon a combination of industry knowledge, manufacturer's specifications, and conservative estimation. Process rates for the shredder system are based on the maximum capacity specifications from the manufacturer. The process rates account for an accepted industry standard of up to 25% of the shredder infeed material to be a combination of non-metallic ASR and non-ferrous metallic material. This 25% fraction is used as the maximum input for the downstream processing system. Per the manufacture's specifications, this downstream system is not equipped to handle the entire 25% fraction (50 tons per hour) in a one-to-one process rate with the shredder. However, for the purposes of this permit application, emissions rates and process rates for the downstream system were demonstrated at 25% of shredder input rate to provide a conservative estimate of emissions. Rating the downstream system for this full rate (50 tons per hour) is estimated to be 25% higher than what the downstream system is designed for (40 tons per hour), this provides a sufficiently conservative estimate of system emissions.

The non-ferrous downstream system begins with a trommel screening process to sort the material based on size. The screening process sorts the material into four groups which are then carried by a *combination* of conveyors to units (Eddy Current Systems #1-4) designed to further separate metallic materials from non-metallic materials. This process is a deductive process where material is being sorted out and removed from the process into commodity storage locations (light-fraction ferrous, zorba, ASR, et cetera) at various stages. Even though the process removes material at various stages the calculations in this application were on the basis of the entirety of the input remaining in process until the end of the sorting process. This assumption provides a conservative estimate of maximum possible emissions. As the downstream process has four separate paths based on size, the calculations were completed assuming an even distribution of the maximum infeed across the four paths (50/4 = 12.5 tons each). Based on this assumption, the entirety of the infeed is spread evenly in the process and all material infeed is accounted for at any given time. Accepted industry standards for material sorting shows the material would be expected to be within +/- 10% of the average in tons per hour. The accepted industry standard for downstream sorting is illustrated in Appendix 3B.

The fines-processing system, which is planned for installation within the next 12 months, is also included in this submission. While the shredder and downstream process rates are based upon a percentage of the shredder input feed rate using the methodology described above, the fines-processing system unit rates are based on the manufacture's specified maximum input rate of 20 tons per hour.

Albuquerque Metal Recycling, Inc. hereby requests confidentiality for any information included that relates to processes or production techniques which are unique to Owner/Operator, and any data relating to Owner/Operator profits and costs which have not previously been made public.

If you have questions or require further information, please contact me at your convenience.

Sincerely,

Jared Robinovitz
Environmental Engineer II
Jrobinovitz@envirosure.com

cc: *Steve Wood, Albuquerque Metal Recycling, Inc*
Paul Wynn, Albuquerque Metal Recycling, Inc
Hal D. Rosen, Envirosure Solutions, LLC

Albuquerque Metal Recycling, Inc.
Air Quality Permit No. 1529-M3
3339 Second Street SW, Albuquerque, New Mexico 87105
Air Permit #1529-M3

Amended Air Quality Permit Modification Package
(Replaced December 2015 Submittal)

TABLE OF CONTENTS

Application Form

Application for Air Pollution Sources in Bernalillo County
(Long Form)
Amended Air Quality Permit Modification

Albuquerque Environmental Health Department - Air Quality Division
11850 Sunset Gardens SW - Albuquerque, New Mexico 87121
(505) 768 - 1930 (Voice) (505) 768 - 2482 (TTY) (505) 768 - 1977 (Fax)

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Authority-to-Construct Permits (20.11.41 NMAC)

NOTE: Information relating to process or production techniques unique to owner, or data relating to profits and costs not previously made public can be protected as confidential. Check confidentiality box at signature line (page 6) if requesting confidentiality for this application.

Clearly handwrite or type **Corporate Information** **Submittal Date:** 07 / 15 /16

1. Company Name Albuquerque Metals Recycling, Inc.
2. Street Address 3339 Second Street SW Zip 87105
3. Company City Albuquerque 4. Company State NM 5. Company Phone 505-877-6110 6. Company Fax 505-873-5421
7. Company Mailing Address: 3339 Second Street SW, Albuquerque, NM Zip 87105
8. Company Contact Steve Wood 9. Phone 505-877-6110
10. Title Operations Manager

Stationary Source (Facility) Information: [provide a plot plan (legal description/drawing of facility property) with overlay sketch of facility processes;location of emission points;pollutant type&distances to property boundaries]

1. Facility Name Albuquerque Metal Recycling, Inc. 2. Street Address 3339 Second Street SW
3. City Albuquerque 4. State NM 5. Facility Phone (505) 877-6110 6. Facility Fax (505) 873-5421
7. Facility Mailing Address (Local) 3339 Second Street SW, Albuquerque, NM Zip 87105
8. Latitude - Longitude or UTM Coordinates of Facility Lat. 35 deg. 2' 3.1164" N, Lon. 106 deg. 39' 32.8818" W
9. Facility Contact Steve Wood 10. Phone (505) 877-6110 11.Title Operations Manager

General Operation Information (if any further information request does not pertain to your facility, write N/A on the line or in the box)

1. Facility Type (description of your facility operations) Metal recycling
2. Standard Industrial Classification (SIC 4 digit #) 5093
3. North American Industry Classification System (NAICS Code #) 423930
4. Is facility currently operating in Bernalillo Cnty. Yes If yes, date of original construction 5 / 21 / 2002 (Permit 1529-M1 issue date)
   If no, planned startup is ___/___/ ____
5. Is facility permanent Yes If no, give dates for requested temporary operation - from ____/____/____ through ____/____/____
6. Is facility process equipment new Yes and No If no, give actual or estimated manufacture or installation dates in the Process Equipment Table
7. Is application for a modification, expansion, or reconstruction (altering process, or adding, or replacing process equipment, etc.) to an existing facility which will result in a change in emissions Yes . If yes, give the manufacture date of modified, added, or replacement equipment in the Process Equipment Table modification date column , or the operation changes to existing process/equipment which cause an emission increase.

8. Is facility operation continuous, ~~intermittent, batch~~ circle one)

9. Estimated % of production Jan-Mar 25 Apr-Jun 25 Jul-Sep 25 Oct-Dec 25

10. Current or requested operating times of facility 24 hrs/day 6 days/wk 4.3 wks/mo 12 mos/yr

11. Business hrs 7:00 am ~~pm~~ to 7:00 am ~~pm~~ -- Day Shift: 7:00 AM-4:30 PM
Night Shift: Non-Ferrous Sorting crew of 3: 3:00 PM-11:00 PM.
3rd Shift: Ferrous crew of 3 at Z-box/Cyclone and Picking Stations: 11:00 PM-7:00 AM

12. Will there be special or seasonal operating times other than shown above No If yes, explain ______

13. Raw materials processed Automobiles, appliances (white goods), and other obsolete scrap metal.

14. Saleable item(s) produced Ferrous and non-ferrous metal commodities.

PROCESS EQUIPMENT TABLE

(Generator-Crusher-Screen-Conveyor-Boiler-Mixer-Spray Guns-Saws-Sander-Oven-Dryer-Furnace-Incinerator, etc.) Match the Process Equipment Units listed on this Table to the same numbered line if also listed on Emissions & Stack Table (page 6).

Process Equipment Unit	Manufacturer	Model #	Serial #	Manufacture Date	Installation Date	Modification Date	Size or Process Rate (Hp;kW;Btu;ft^3;lbs; tons;yd^3;etc.)	Fuel Type
Example 1. Generator	Unigen	B-2500	A56732195C-222	7/96	7/97	N/A	250 Hp - HR. ~~YR.~~	Diesel
Example 2. Spray Gun	HVLP Systems	Spra –N-Stay 1100	k26-56-95	01/97	11/97	N/A	0.25 gal. - HR. ~~YR.~~	Electric Compressor
1. Shredder	Metso	98x104		2011	2011	N/A	200 tons/ HR. ~~YR.--~~	Electric
2. Cyclone/Z-box	Metso	250 HP		2011	2011	N/A	60,000 CFM ~~HR.~~ ~~YR.~~	Electric
3. Ferrous Conveyors (3)	Metso			2011	2011	N/A	HR. YR.	Electric
4. Ferrous In Process Material Conveyor	Metso			2011	2011	N/A	HR. YR.	Electric
5. Post-Trommel NF Conveyors (17)	Metso			2011	2011	N/A	HR. YR.	Electric
6. Non-Ferrous Trommel (1)	Metso			2011	2011	N/A	HR. YR.	Electric
7. Post-Trommel ECS, & ISS (5)	Metso			2011	2011	N/A	HR. YR.	Electric
8. Fines ECS	Metso			2011	2016	N/A	HR. YR.	Electric
9. ASR Pile Forming	Metso			2011	2011	N/A	HR. YR.	Electric
10. Unpaved Vehicle Miles Traveled	N/A			N/A	N/A	N/A	HR. YR.	N/A
11. Gasoline above-ground storage tank	Unknown			Unk	Unk	N/A	3703 Gal. ~~HR.--~~ YR.	Gasoline storage
12. Pre-Trommel NF Conveyor	Metso			2011	2011	N/A	HR. YR.	Electric
13. Fines Processing Conveyors (3)	IST & Metso			2016 & 2011	2016	N/A	HR. YR.	Electric
14.							HR. YR.	
15.							HR. YR.	

1. Basis for Equipment Size or Process Rate (Manufacturers data, Field Observation/Test, etc.) Manufacturer's data. See manufacturer's plan sheets.
Submit information for each unit as an attachment

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
Example 1. Generator	1. 9.1 lbs/hr	27.7 lbs/hr	1.3 lbs/hr	0.5 lbs/hr	2.0 lbs/hr	AP-42
	1a. 39.9 tons/yr	121.3 tons/yr	5.7 tons/yr	2.2 tons/yr	8.8 tons/yr	
1. Shredder	1. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	2.37 lbs/hr	Similar equipment stack test at Capital City, back calculated w/80% efficiency
	1a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	10.38 tons/yr	
2. Cyclone/Z-Box	2. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	4.28 lbs/hr	ISRI Manual Title V Workbook, Table D-11.A, back calculated w/80% efficiency
	2a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	18.76 tons/yr	
3. Ferrous Conveyor Drops (3)	3. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.63 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 90% efficiency
	3a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	2.76 tons/yr	
4. Ferrous In Process Material Conveyor	4. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.07 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 90% efficiency
	4a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.31 tons/yr	
5. Post-Trommel NF Conveyors (17)	5. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.30 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 90% efficiency
	5a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	1.30 tons/yr	
6. Non-Ferrous Trommel (1)	6. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	1.10 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 90% efficiency
	6a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	4.82 tons/yr	
7. Post-Trommel ECS & ISS (5)	7. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	1.38 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 90% efficiency
	7a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	6.02 tons/yr	
8. Fines ECS (1)	8. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.44 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 77.8% efficiency
	8a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	1.93 tons/yr	
9. ASR Pile Forming, (4) and Windblown Fugitive Emissions	9. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.075 lbs/hr	AP-42, Section 13.2 for pile forming, and AzDEQ wind blown fugitive from piles
	9a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.328 tons/yr	
10. Vehicle Miles Traveled (Haul Roads)	10. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	9.90 lbs/hr	AzDEQ VMT EF, back calculated w/80% efficiency from water dust control
	10a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	43.36 tons/yr	
Totals of Uncontrolled Emissions (1 - 13)	0 lbs/hr	0 lbs/hr	0.0156 lbs/hr	0 lbs/hr	20.8 lbs/hr	
	0 tons/yr	0 tons/yr	0.0681 tons/yr	0 tons/yr	90.9 tons/yr	

*** If any one (1) of these process units, <u>or</u> combination of units, has an uncontrolled emission greater than (>) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. <u>Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)</u>**

*** If all of these process units, individually <u>and</u> in combination, have an uncontrolled emission less than or equal to (≤) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but > 1 ton/yr for any of the above pollutants - then a source registration is required.**

<u>If your facility does not require a registration or permit, based on above emissions, complete the remainder of this application to determine if a registration or permit would be required for Toxic or Hazardous air pollutants used at your facility.</u>

UNCONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Process potential under physical/operational limitations during a 24 hr/day and 365 day/year = 8,760 hrs)

Process Equipment Unit*	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Method(s) used for Determination of Emissions (AP-42, Material balance, field tests, manufacturers data, etc.)
Example	1. 9.1 lbs/hr	27.7 lbs/hr	1.3 lbs/hr	0.5 lbs/hr	2.0 lbs/hr	AP-42
1. Generator	1a. 39.9 tons/yr	121.3 tons/yr	5.7 tons/yr	2.2 tons/yr	8.8 tons/yr	
11. Gasoline above-ground storage tank	1. 0 lbs/hr	0 lbs/hr	0.0156 lbs/hr	0 lbs/hr	0 lbs/hr	EPA TANKS 4.0.9d software
	1a. 0 tons/yr	0 tons/yr	0.0681 tons/yr	0 tons/yr	0 tons/yr	
12. Pre-Trommel NF Conveyor (1)	2. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.07 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 90% efficiency
	2a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.31 tons/yr	
13. Fines Processing Conveyors (3)	3. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.14 lbs/hr	AP-42, Table 11.19.2-2 back calculated with 90% efficiency
	3a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.61 tons/yr	
4.	4. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	
	4a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
5.	5. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	
	5a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
6.	6. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	
	6a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
7.	7. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	
	7a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
8.	8. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	
	8a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
9.	9. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	
	9a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
10.	10. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr	
	10a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr	
Totals of Uncontrolled Emissions (1 - 13)	0 lbs/hr	0 lbs/hr	0.0156 lbs/hr	0 lbs/hr	0 lbs/hr	
	0 tons/yr	0 tons/yr	0.0681 tons/yr	0 tons/yr	tons/yr	

*** If any one (1) of these process units, or combination of units, has an uncontrolled emission greater than (>) 10 lbs/hr or 25 tons/yr for any of the above pollutants (based on 8760 hrs of operation), then a permit will be required. Complete this application along with additional checklist information requested on accompanying instruction sheet. Copy this Table if additional space is needed (begin numbering with 11., 12., etc.)**

*** If all of these process units, individually and in combination, have an uncontrolled emission less than or equal to (≤) 10 lbs/hr or 25 tons/yr for all of the above pollutants (based on 8760 hrs of operation), but > 1 ton/yr for any of the above pollutants - then a source registration is required.**

If your facility does not require a registration or permit, based on above emissions, complete the remainder of this application to determine if a registration or permit would be required for Toxic or Hazardous air pollutants used at your facility.

CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Based on current operations with emission controls OR requested operations with emission controls)

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOC's)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
Example 1. Generator	1. 9.1 lbs/hr	27.7 lbs/hr	1.3 lbs/hr	0.5 lbs/hr	2.0 lbs/hr	Operating Hours	N/A
	1a. 18.2 tons/yr	55.4 tons/yr	2.6 tons/yr	1.0 tons/yr	4.0 tons/yr		
1. Shredder	1. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.474 lbs/hr	Water Injection	80%
	1a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.474 tons/yr		
2. Cyclone/Z-Box	2. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.857 lbs/hr	Cyclone	80%
	2a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.857 tons/yr		
3. Ferrous Conveyor Drops (3)	3. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.063 lbs/hr	Wet in-process material	90%
	3a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.063 tons/yr		
4. Ferrous In Process Material Conveyor	4. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.007 lbs/hr	Wet in-process material	90%
	4a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.007 tons/yr		
5. Post-Trommel NF Conveyor Drops (17)	5. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.030 lbs/hr	Wet in-process material	90%
	5a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.030 tons/yr		
6. Non-Ferrous Trommel (1)	6. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.110 lbs/hr	Wet in-process material	90%
	6a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.110 tons/yr		
7. Non-Ferrous ECS & Sand Jet (5)	7. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.138 lbs/hr	Wet in-process material	90%
	7a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.138 tons/yr		
8. Fines ECS	8. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.014 lbs/hr	Wet in-process material	90%
	8a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.014 tons/yr		
9. ASR Pile Forming, (4) and Windblown Fugitive Emissions	9. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.015 lbs/hr	Wet in-process material	80%
	9a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.015 tons/yr		
10. Vehicle Miles Traveled	10. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	1.98 lbs/hr	Dust Control, Water, Sweep	80%
	10a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	1.98 tons/yr		
Totals of Controlled Emissions (1 - 13)	0 lbs/hr	0 lbs/hr	0.0156 lbs/hr	0 lbs/hr	3.74 lbs/hr		
	0 tons/yr	0 tons/yr	0.0681 tons/yr	0 tons/yr	3.74 tons/yr		

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test,AP-42, etc.) Industry knowledge, EPA Fact Sheet, AP-42 11.19.2-2 and 13.2, and AzDEQ VMT and AzDEQ Windblown Pile emissions.

Submit information for each unit as an attachment

2. Explain and give estimated amounts of any Fugitive Emission associated with facility processes Only stack emission is from Cyclone bleed-off duct.

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

CONTROLLED EMISSIONS OF INDIVIDUAL AND COMBINED PROCESSES

(Based on current operations with emission controls OR requested operations with emission controls)

Process Equipment Units listed on this Table should match up to the same numbered line and Unit as listed on Uncontrolled Table (pg. 3)

Process Equipment Unit	Carbon Monoxide (CO)	Oxides of Nitrogen (NOx)	Nonmethane Hydrocarbons NMHC (VOCs)	Oxides of Sulfur (SOx)	Total Suspended Particulate Matter (TSP)	Control Method	% Efficiency
Example 1. Generator	1. 9.1 lbs/hr	27.7 lbs/hr	1.3 lbs/hr	0.5 lbs/hr	2.0 lbs/hr	Operating Hours	N/A
	1a. 18.2 tons/yr	55.4 tons/yr	2.6 tons/yr	1.0 tons/yr	4.0 tons/yr		
11. Gasoline above-ground storage tank	1. 0 lbs/hr	0 lbs/hr	0.0156 lbs/hr	0 lbs/hr	0 lbs/hr	Covered storage, limited fill and dispense	N/A
	1a. 0 tons/yr	0 tons/yr	0.0681 tons/yr	0 tons/yr	0 tons/yr		
12. Pre-Trommel NF Conveyor	2. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.007 lbs/hr	Wet in-process material	90%
	2a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.007 tons/yr		
13. Fines Processing Conveyors (3)	3. 0 lbs/hr	0 lbs/hr	0 lbs/hr	0 lbs/hr	0.014 lbs/hr	Wet in-process material	90%
	3a. 0 tons/yr	0 tons/yr	0 tons/yr	0 tons/yr	0.014 tons/yr		
4.	4. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		
	4a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr		
5.	5. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		
	5a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr		
6.	6. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		
	6a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr		
7.	7. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		
	7a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr		
8.	8. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		
	8a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr		
9.	9. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		
	9a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr		
10.	10. lbs/hr	lbs/hr	lbs/hr	lbs/hr	lbs/hr		
	10a. tons/yr	tons/yr	tons/yr	tons/yr	tons/yr		
Totals of Controlled Emissions (1 - 13)	0 lbs/hr	0 lbs/hr	0.0126 lbs/hr	0 lbs/hr	3.74 lbs/hr		
	0 tons/yr	0 tons/yr	0.0552 tons/yr	0 tons/yr	3.74 tons/yr		

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test,AP-42, etc.) Industry knowledge, EPA Fact Sheet, & AP-42 (transfer points).

Submit information for each unit as an attachment

2. Explain and give estimated amounts of any Fugitive Emission associated with facility processes Only stack emission is from Cyclone bleed-off duct, others are fugitive.

NOTE: Copy this table if additional space is needed (begin numbering with 16., 17., etc.)

TOXIC EMISSIONS

VOLATILE, HAZARDOUS, & VOLATILE HAZARDOUS AIR POLLUTANT EMISSION TABLE

Product Categories (Coatings, Solvents, Thinners, etc.)	Volatile Organic Compound (VOC), Hazardous Air Pollutant (HAP), or Volatile Hazardous Air Pollutant (VHAP) Primary To The Representative ✌As Purchased✍ Product	Chemical Abstract Service Number (CAS) Of VOC, HAP, Or VHAP From Representative ✌As Purchased✍ Product	VOC, HAP, Or VHAP Concentration Of Representative ✌As Purchased✍ Product (pounds/gallon, or %)	1. How were Concentrations Determined (CPDS, MSDS, etc.)	Total Product Purchases For Category	(-)	Quantity Of Product Recovered & Disposed For Category	(=)	Total Product Usage For Category
EXAMPLE 1. Surface Coatings	XYLENE	1330207	4.0 LBS./GAL	MSDS	lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					100 gal/yr		- 0 - gal/yr		100 gal/yr
EXAMPLE 2. Cleaning Solvents	TOLUENE	108883	70%	PRODUCT LABEL	lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					200 gal/yr		50 gal/yr		150 gal/yr
I. Gasoline dispensing	Gasoline	86290-81-5	100%	SDS	22857 lbs/yr	(-)	-0- lbs/yr	(=)	22857 lbs/yr
					3703 gal/yr		-0- gal/yr		3703 gal/yr
II.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
III.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
IV.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
V.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
VI.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
VII.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
VIII.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
IX.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
X.					lbs/yr	(-)	lbs/yr	(=)	lbs/yr
					gal/yr		gal/yr		gal/yr
TOTAL >>>>>>>					22857 lbs/yr	(-)	-0- lbs/yr	(=)	22857 lbs/yr
					3703 gal/yr		-0- gal/yr		3703 gal/yr

1. Basis for percent (%) determinations (Certified Product Data Sheets, Material Safety Data Sheets, etc.). Submit, as an attachment, information on one (1) product from each Category listed above which best represents the average of all the products purchased in that Category. Copy this Table if additional space is needed (begin numbering with XI., XII., etc.)

****NOTE: A REGISTRATION IS REQUIRED, AT MINIMUM, FOR ANY AMOUNT OF HAP OR VHAP EMISSION. A PERMIT MAY BE REQUIRED FOR THESE EMISSIONS, DETERMINED ON A CASE-BY-CASE EVALUATION.**

Application for Air Pollutant Sources in Bernalillo County
Source Registration (20.11.40 NMAC) and Authority-to-Construct Permits (20.11.41 NMAC)

MATERIAL AND FUEL STORAGE TABLE

(Tanks, barrels, silos, stockpiles, etc.) Copy this table if additional space is needed (begin numbering with 6., 7., etc.)

Storage Equipment	Product Stored	Capacity (bbls - tons gal - acres,etc)	Above or Below Ground	Construction (welded, riveted) & Color	Install Date	Loading Rate	Offloading Rate	True Vapor Pressure	Control Equipment	Seal Type	% Eff.
Example 1. Tank	diesel fuel	5,000 gal.	Below	welded/ brown	3/93	3000gal HR. ~~YR.~~	500 gal. - HR. ~~YR.~~	N/A Psia	N/A	N/A	N/A
Example 2. Barrels	Solvent	55 gal Drum	Above - in storage room	welded - green	N/A	N/A HR. YR.	N/A HR. YR.	N/A Psia	N/A	N/A	N/A
1. Tank	Used Oil	100 gals	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
2. Tank	Hyd oil	300 gals	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
3. Tank	Motor oil	300 gals	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
4. Tank	Trans fluid	300 gals	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
5. Tank	Gear oil	300 Gal	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
6. Tank	Gas	308 Gal	AST	Welded covered, red		309 gal per month	20 Gal/Hr	7.25 psia	N/A	N/A	N/A
7. Tank	Diesel	1,000 Gal	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
8. Tank	Used Oil	2,000 Gal	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
9. Tank	Liq Oxygen	5,000 Gal	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A
10. Tank	Propane	250 Gal	AST	Welded		N/A	N/A	N/A	N/A	N/A	N/A

1. Basis for Loading/Offloading Rate (Manufacturers data, Field Observation/Test, etc.) Submit information for each unit as an attachment
200 gallon delivery every 6 months. One pickup fuel tank or smaller dispensed at a time.

2. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test, AP-42, etc.) Submit information for each unit as an attachment
No control equipment.

STACK AND EMISSION MEASUREMENT TABLE

If any equipment from the Process Equipment Table (Page 2) is also listed in this Stack Table, use the same numbered line for the Process Equipment unit on both Tables to show the association between the Process Equipment and its Stack. Copy this table if additional space is needed (begin numbering with 6., 7., etc.).

Process Equipment	Pollutant (CO,NOx,TSP, Toluene,etc)	Control Equipment	Control Efficiency	Stack Height & Diameter in feet	Stack Temp.	Stack Velocity & Exit Direction	Emission Measurement Equipment Type	Range-Sensitivity-Accuracy-
Example 1. Generator	CO, NOx, TSP, SO_2, NMHC	N/A	N/A	18 ft. - H 0.8 ft. - D	225 °F	6,000 ft³/min - V Exit - upward	N/A	N/A
Example 2. Spray Gun	TSP, xylene, toluene, MIBK	Paint Booth	99% for TSP	9 ft. - H 0.5 ft. -D	ambient	10,000 ft³/min - V Exit - horizontal	N/A	N/A
1. Z-Box	TSP	Cyclone	80%	20' H, sq. duct	ambient	60,000 cfm	N/A	N/A
2.								
3.								
4.								

1. Basis for Control Equipment % Efficiency (Manufacturers data, Field Observation/Test,AP-42, etc.) Submit information for each unit as an attachment
EPA Fact Sheet, see Attachment 5.

I, the undersigned, a responsible officer of the applicant company, certify that to the best of my knowledge, the information stated on this application, together with associated drawings, specifications, and other data, give a true and complete representation of the existing, modified existing, or planned new stationary source with respect to air pollution sources and control equipment. I also understand that any significant omissions, errors, or misrepresentations in these data will be cause for revocation of part or all of the resulting registration or permit.

Signed this 15 day of July, 20 16

Paul Wynn
Print Name

President
Print Title

x [signature]
Signature

Note: The following shall be protected as confidential if requested by applicant: owner/operator

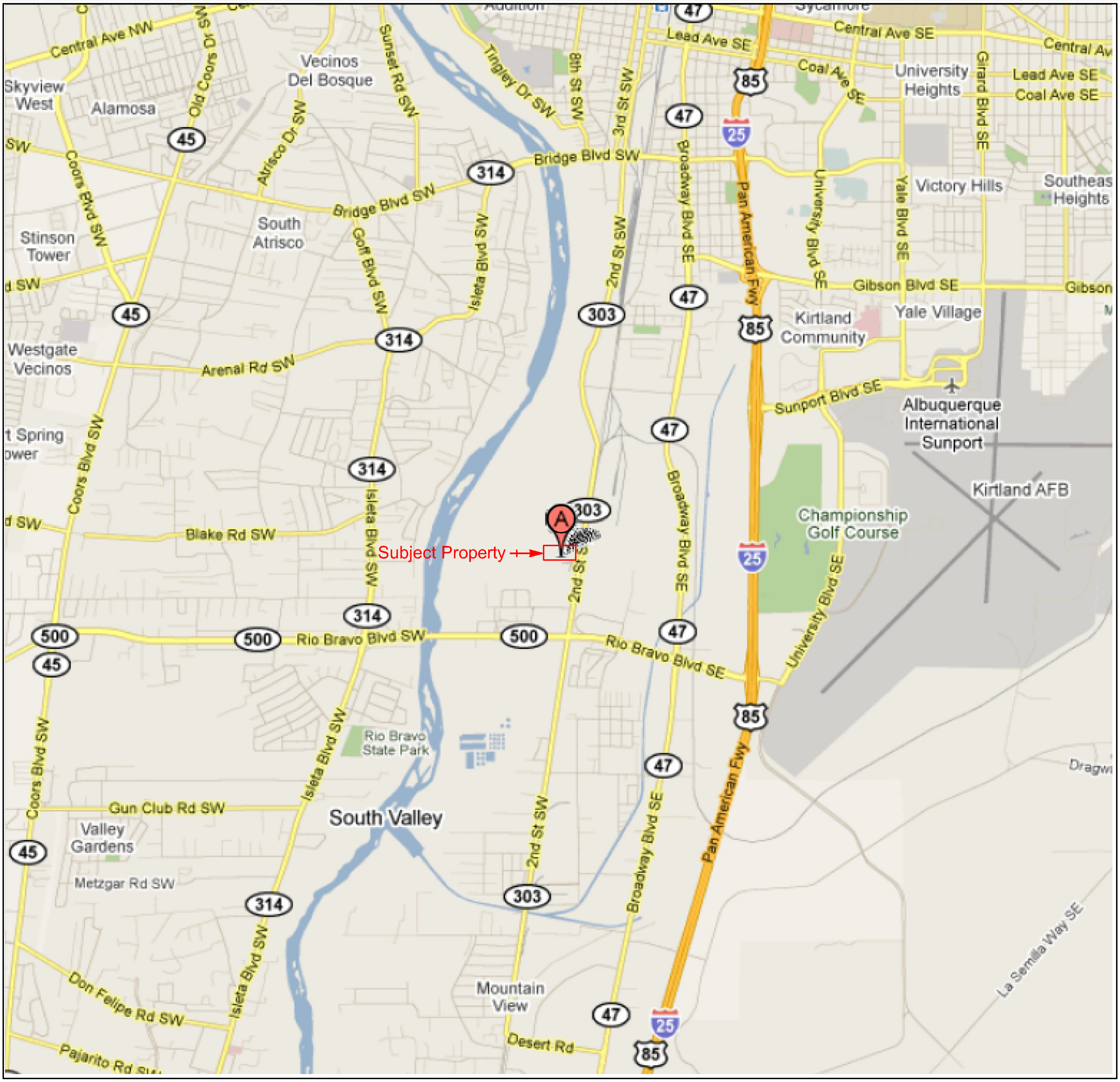
X Any information relating to processes or production techniques which are unique to owner/operator

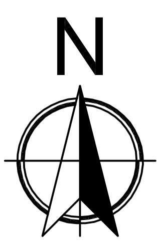
X Data relating to owner/operator profits and costs which have not previously been made public

Application can be mailed to address across the top front of this form (Page 1), or may be hand delivered (between the hours of 8:00am - 4:00pm Mon. through Fri.) to the same address.

Attachment 1

Vicinity Map and Site Map





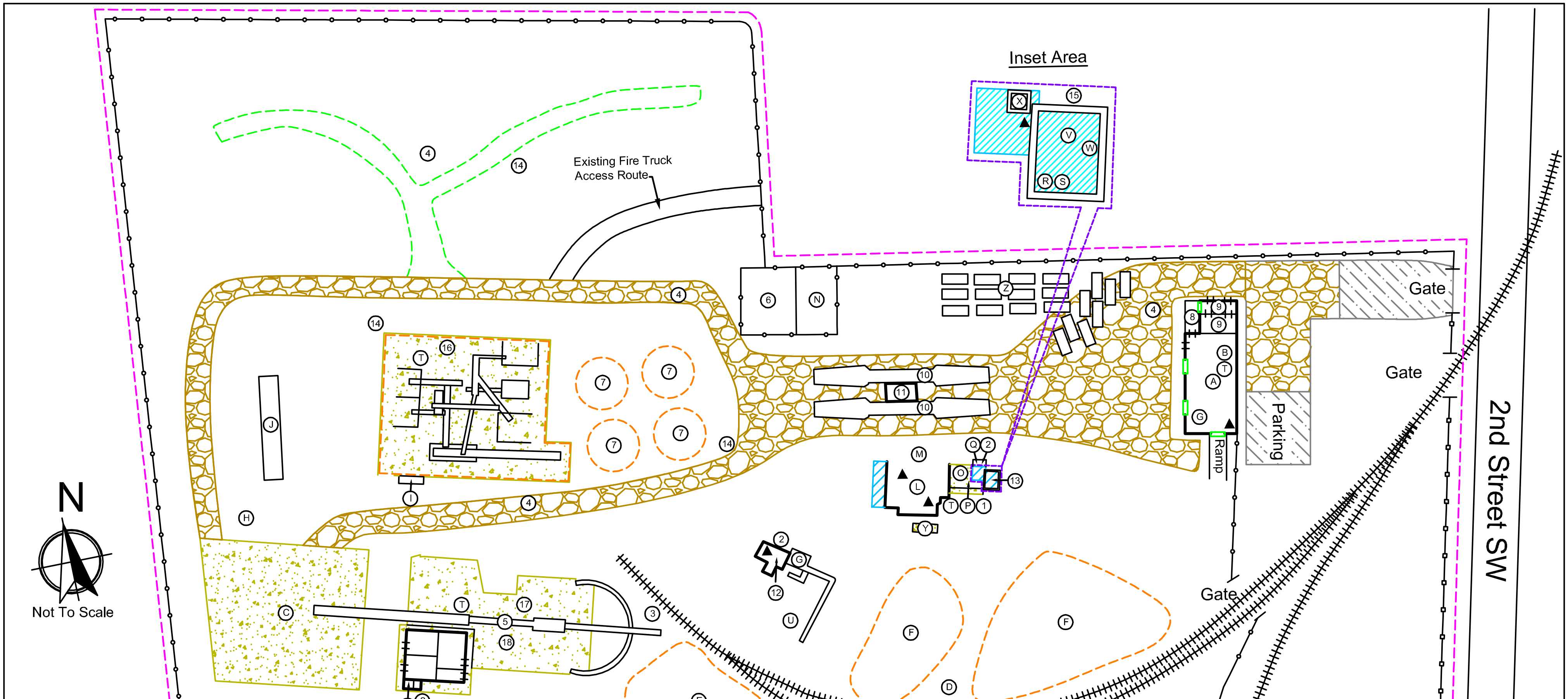
Not To Scale

enviro**sure** SOLUTIONS, LLC.

1979 E. Broadway Rd.
Tempe, Arizona 85282
480.784.4631
www.envirosure.com

Vicinity Map

Company - Albuquerque Metals Recycling, Inc.	
Address - 3339 2nd Street Southwest	
City - Albuquerque	State - New Mexico
County - Bernalillo	Date - 10/5/2010
Drawn By - ST	Approved By - MG
Project No - A058-10-08	



Notes:
1. Locations of all aboveground improvements are approximate.
2. The facility is composed of native soil except where otherwise noted.

Acreage Breakdown:

Total Acreage	20.00± AC
Building	0.13± AC
Concrete	1.26± AC
Asphalt	0.32± AC
Native Soil	16.27± AC
Asphalt Millings	2.02± AC

KEY

- A Non-ferrous Warehouse
- B Battery Storage
- C Tipping Pad
- D Torching Area
- E Ferrous Scrap Storage
- F Scrap Metal Pile
- G Shear
- H Crane
- I Electrical Equipment Enclosure
- J Container Loader
- K New Motorhouse & Control Tower
- L Maintenance Building
- M Compressed Gas Storage
- N PNM Metering Station
- O Equipment Wash Area
- P Sump
- Q Oil Storage
- R 300-Gallon Hydraulic Oil AST
- S 300-Gallon Motor Oil AST
- T Air Compressor
- U Yard Truck
- V 250-Gallon Unleaded Gasoline AST
- W 1,000-Gallon Dyed Diesel AST
- X 1,000-Gallon Used Oil AST
- Y 1,500-Gallon Liquid Oxygen AST
- Z Roll-Off Storage Area
- 1 Propane Storage
- 2 Oil Loading/Unloading Area
- 3 Railcar Loading/Unloading Area
- 4 Truck Staging Area
- 5 Shredder
- 6 Substation
- 7 Automobile Shredder Residue Pile
- 8 Dock
- 9 Office
- 10 Scale
- 11 Scale House
- 12 Shear Oil Storage
- 13 Fuel Depot**
- 14 Loading/Unloading Area
- 15 300-Gallon Dyed Diesel AST (Portable)
- 16 Non-ferrous Downstream Separation Equipment
- 17 Z Box
- 18 Cyclone
- Secondary Containment
- Awning Over Concrete
- Concrete
- Asphalt
- Chain-link Fence
- Metal Fence
- Asphalt Millings (Haul Road)
- Railroad Spur
- Inset Area
- Haul Road
- Area Boundary
- Approximate Site Boundary
- ** 55-Gallon Oil Drum Storage

envirosure SOLUTIONS, LLC.
1979 E. Broadway Rd.
Tempe, Arizona 85282
480.784.4621
www.envirosure.com

Facility Layout

Company - Albuquerque Metal Recycling

Address - 3339 2nd Street Southwest

City - Albuquerque | State - New Mexico

County - Bernalillo | Date - 10/21/2015

Drawn By - AR | Approved By - LH

Project No - A061-15-17

Attachment 2

Revised Equipment List

Revised Equipment List - 07-2016

Albuquerque Metals Recycling, Inc. | **Air Permit # 1529-M3**

Process #, 2016-07 Application Revision	Process #, 2015-10 Application Revision	Flow Chart Grid/Unit Number*	Process Equipment Unit	Manufacturer	Model #	Installation Date	Fuel Type	0.00237	0.00571	0.0012	0.00014	0.0022	Emission Factors By Process (lb/ton)	
								Shredder	Cyclone/Z-Box	Chopper (Tertiary Crushing)	Transfer Point	Screening	% of Total Shred	Tons/Hour
Ferrous Processing (Shredder System)														
		B3	Infeed Conveyor	Metso		2011	Electric						100%	200
1	1	D3	Shredder w/ water injection	Metso	98x104	2011	Electric	1					100%	200
		F3	Undermill Vibrator	Metso		2011	Electric						100%	200
		G3	Transfer Conveyor	Metso		2011	Electric						75%	150
		H3	Magnetic Drum	Metso		2011	Electric						75%	150
3-1	3-1	H1-J1	Creep Feeder & Conveyors	Metso		2011	Electric				1		75%	150
		I1	Creep Conveyor	Metso		2011	Electric						75%	150
		J1	2nd Transfer Conveyor	Metso		2011	Electric						75%	150
2	2	K1-K3	Cyclone / Z-Box	Metso	250 HP Fan	2011	Electric		1				75%	150
4-1	4-1	I5	In-Process Material (IPM) Conveyor	Metso		2011	Electric				1		25%	50
		H5	Ferrous Recovery Conveyor	Metso		2011	Electric						1%	2
3-2	3-2	N1	Picking Station Conveyor	Metso		2011	Electric				1		75%	150
3-3	3-3	O1	Stacking Conveyor	Metso		2011	Electric				1		75%	150
Non-Ferrous Processing														
		BF	Batch Feeder	Metso		2011	Electric						25%	50
12	4-2	NC1	First Transfer Conveyor, Trommel Feed	Metso		2011	Electric				1		25%	50
5-1		NC2	Second Transfer Conveyor, BiviTec Feed	Metso		2011	Electric				1		6.3%	12.5
5-2		NC3	Third Transfer Conveyor, Medium Fraction ECS #3 Feed	Metso		2011	Electric				1		6.3%	12.5
5-3		NC4	Fourth Transfer Conveyor Large Fraction ECS #4 Feed	Metso		2011	Electric				1		6.3%	12.5
5-4		NC5	Fines Fraction, ECS #1 Feed Conveyor	Metso		2011	Electric				1		6.3%	12.5
6	6	T1	Non-Ferrous (NF) Trommel	Metso		2011	Electric					1	25%	50
5-5	5-1	BT1	Non-Ferrous Bivi-Tec Screen	Bivi-Tec		2011	Electric				1		6.3%	12.5
		MAG 1	Vibrator Feeder	Metso		2011	Electric						6.3%	12.5
		MAG 1	Magnetic Drum	Metso		2011	Electric						6.3%	12.5
7-1	7-1	ECS1	Eddy Current Separator #1	Unk.		2011	Electric					1	6.3%	12.5
5-6	5-2	NC7	ASR Conveyor #1	Metso		2011	Electric				1		6.3%	12.5
5-7	5-3	NC8	ASR Conveyor #2	Metso		2011	Electric				1		6.3%	12.5
5-8	5-4	NC9	Zorba Conveyor # 1	Metso		2011	Electric				1		6.3%	12.5
		MAG 2	Vibrator Feeder	Metso		2011	Electric						6.3%	12.5
		MAG 2	Magnetic Drum	Metso		2011	Electric						6.3%	12.5
7-2	7-2	ECS 2	Eddy Current Separator #2	Metso		2011	Electric					1	6.3%	12.5
5-9	5-5	NC10	Zorba Conveyor # 2	Metso		2011	Electric				1		6.3%	12.5
5-10	5-6	NC6	ASR Conveyor #3	Metso		2011	Electric				1		6.3%	12.5
		ECS 3	Vibrator Feeder	Metso		2011	Electric						6.3%	12.5
7-3	7-3	ECS 3	Eddy Current Separator #3	Metso		2011	Electric					1	6.3%	12.5
5-11	5-7	NC11	Zorba Conveyor #3	Metso		2011	Electric				1		6.3%	12.5
5-12	5-8	NC16	IPM Conveyor #3	Metso		2011	Electric				1		6.3%	12.5
		VB 5	Vibrator Feeder	Metso		2011	Electric						6.3%	12.5
7-4	7-4	ISS	ISS 200 Separation	Metso		2011	Electric					1	6.3%	12.5

*See Appendix 3 for Flow Charts . Non-Ferrous System only showed in Appendix 3B

Revised Equipment List - 07-2016

Albuquerque Metals Recycling, Inc. **Air Permit # 1529-M3**

Process #, 2016-07 Application Revision	Process #, 2015-10 Application Revision	Flow Chart Grid/Unit Number*	Process / Equipment / Unit	Manufacturer	Model #	Installation Date	Fuel Type	Shredder	Cyclone/Z-Box	Chopper (Tertiary Crushing)	Transfer Point	Screening	% of Total Shred	Tons/Hour
								0.00237	0.00571	0.0012	0.00014	0.0022	Emission Factors By Process (lb/ton)	
5-13	5-9	NC13	Zurich Conveyor	Metso		2011	Electric				1		6.3%	12.5
5-14		NC14	ASR Conveyor #4	Metso		2011	Electric				1		6.3%	12.5
5-15		NC15	ASR Conveyor #5	Metso		2011	Electric				1		6.3%	12.5
5-16	5-10	NC17	ASR Conveyor #6	Metso		2011	Electric				1		6.3%	12.5
		ECS 4	Vibrator Feeder	Metso		2011	Electric						6.3%	12.5
7-5	7-5	ECS 4	Eddy Current Separator #4	Metso		2011	Electric					1	6.3%	12.5
5-17	5-11	NC12	Zorba Conveyor #4	Metso		2011	Electric				1		6.3%	12.5
Fines Processing & Container Loading														
		B14	Batch Feeder	Metso		2016	Electric							20
8		K14	Fines Eddy Current Separator	Steinert		2016	Electric					1		20
13-1	5-15	C14	Fines Bivitec Feed Conveyor	IST		2016	Electric				1			20
13-2	5-16	G14	Fines Aspirator Feed Conveyor	Metso		2016	Electric				1			20
13-3		L14	Fines ECS Waste Conveyor	IST		2016	Electric				1			20
13-4		D14	Fines Bivi-Tec	Bivi-Tec		2016	Electric				1			20
13-5	5-17	H14	Closed Loop Aspirator	Metso	Z-Box 80	2016	Electric				1			20
		F14	Aspirator Vibrator Feeder	Metso		2016	Electric							20
		J14	ECS Vibrator Feeder	Metso		2016	Electric							20
		B11	Container Loader Batch Feeder / shaker			2015	Electric						6.3%	12.5
		C11	Container Loader Conveyor			2015	Electric						6.3%	12.5

*See Appendix 3 for Flow Charts . Non-Ferrous System only showed in Appendix 3B

Attachment 3

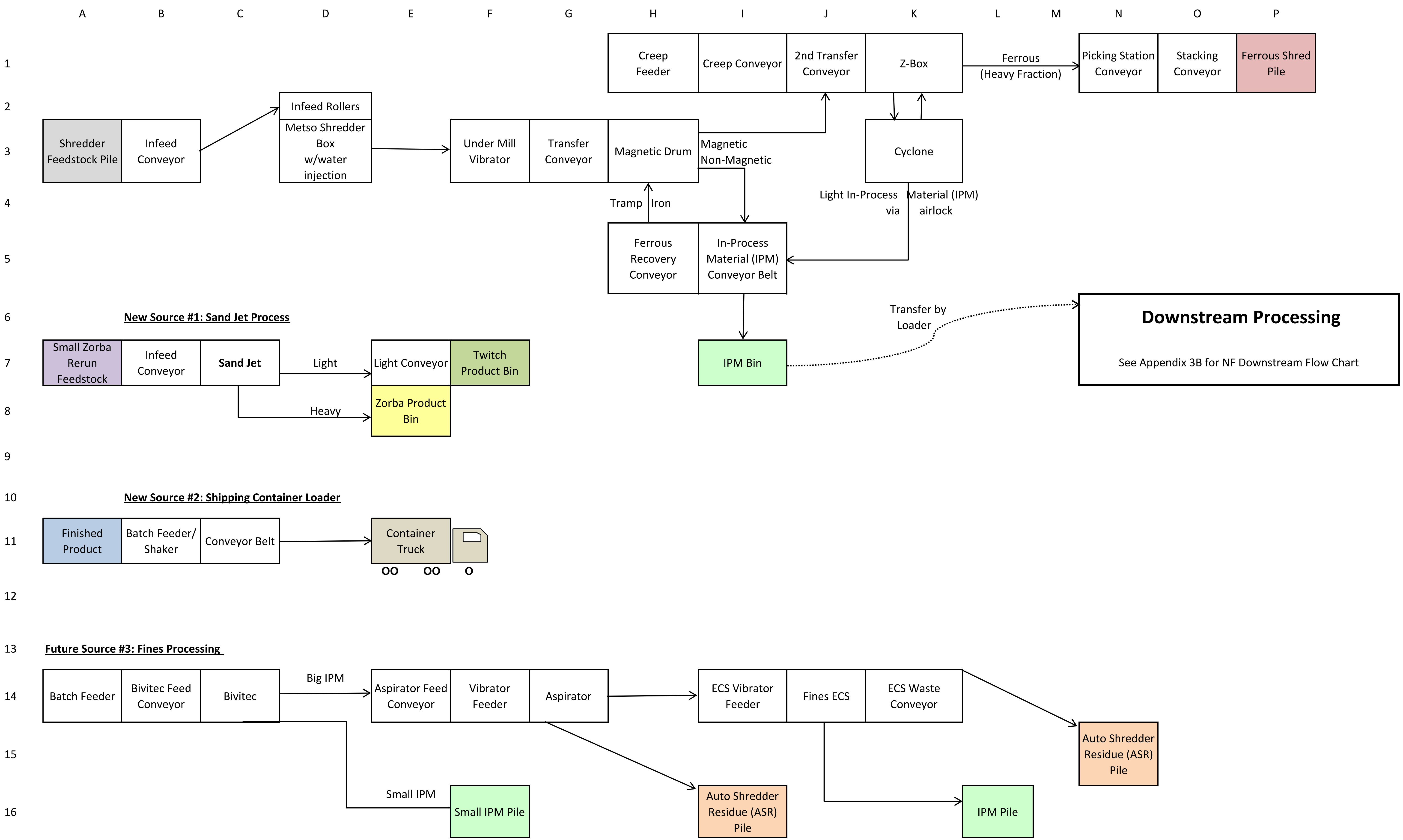
Process Flow Charts

Attachment 3A

Shredder System, Container Loader and Fines Processing Flow Chart

Albuquerque Metals: Process Equipment and Flow Diagram

July 2016

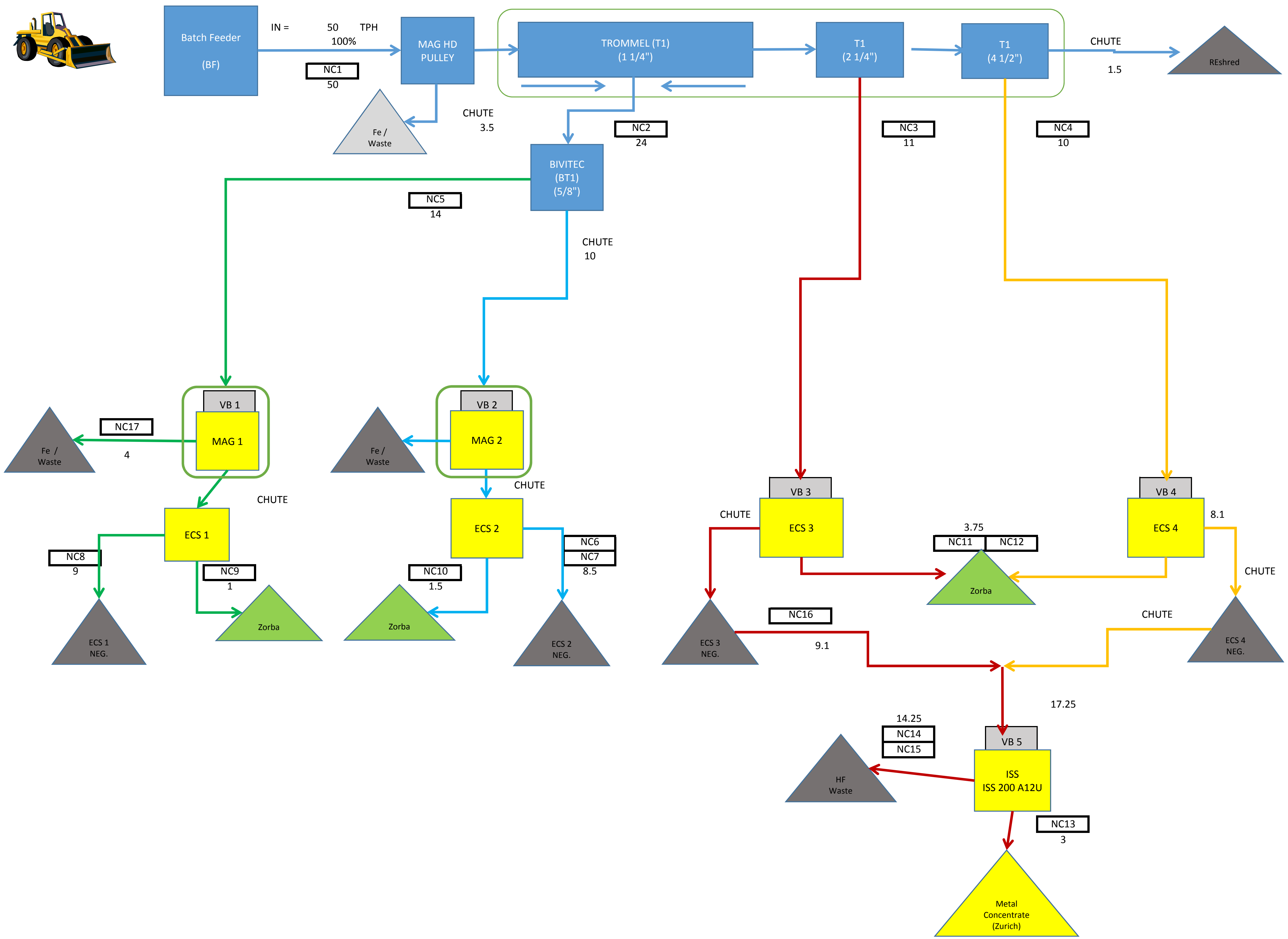


Attachment 3B

Non-Ferrous Downstream Flow Chart

Downstream Processing

July 2016



ft/min

	% IN	TPH	SPEED
INPUT	100%	50	
FEEDER (BF)	100%	50	125
NC1	100%	50	250
MAG1	7%	3.5	250
TROMMEL	93%	46.5	100
NC2	48%	24	250
BIVITEC	48%	24	150
NC3	22%	11	250
NC4	20%	10	250
NC5	28%	14	250
ECS1	28%	14	350
ECS2	20%	10	350
ECS3	22%	11	350
ECS4	20%	10	350
NC6	17%	8.5	250
NC7	17%	8.5	250
NC8	18%	9	250
NC9	2%	1	250
NC10	3%	1.5	250
NC11	8%	3.75	250
NC12	8%	3.75	250
NC13	6%	3	250
NC14	29%	14.25	250
NC15	29%	14.25	250
NC16	18%	9.1	250
NC17	8%	4	250
ISS 200	35%	17.25	400

Attachment 4

Normal and Maximum TSP Emission Calculations

ALBUQUERQUE METALS RECYCLING, INC
ANNUAL TOTAL SUSPENDED PARTICULATE MATTER (TSP) EMISSIONS
NORMAL OPERATION

Unit #	Annual TSP Emissions from the Shredder				Controlled					Uncontrolled	
Unit #	Emisison Unit	Tons / hr	hrs / yr	Tons / year	[1] EF lbs / ton	lb / year	lb/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
1	Shredder (100%)	200	2000	400,000	0.00237	948	**0.474**	**0.474**	**80%**	**2.37**	**2.37**

Unit #	Annual TSP Emissions from the Cyclone				Controlled					Uncontrolled	
Unit #	Emission Unit	Tons / hr	hrs / yr	Tons / year	[2] EF lbs / ton	lb / year	lb/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
2	Cyclone / Z-Box (75%)	150	2000	300,000	0.00571	1713	**0.857**	**0.857**	**80%**	**4.28**	**4.28**

Unit #	Annual TSP Emissions From Conveyor Transfer or Drop Points					Controlled				Uncontrolled	
Unit #	Emission Unit: Drop Points	Units	Tons / hr	hrs /yr	Tons / year	[3] EF lbs / ton	Lbs/hour	Tons/year	Control Efficiency	Lbs/hour	Tons/year
3	Ferrous System (75%)	3	150	2000	300,000	0.00014	0.063	0.063	90%	0.63	0.63
4	Ferrous System In Process Material Conveyor (25%)	1	50	2000	100,000	0.00014	0.007	0.007	90%	0.07	0.07
12	Non-Ferrous Pre-Trommel (25%)	1	50	2000	100,000	0.00014	0.007	0.007	90%	0.07	0.07
5	Non-Ferrous Post-Trommel (6.25%)	17	12.5	2000	25,000	0.00014	0.030	0.030	90%	0.30	0.30
13	Fines System Conveyors & Bivtec	5	20	2000	40,000	0.00014	0.014	0.014	90%	0.14	0.14
		22					**0.121**	**0.121**	90%	**1.21**	**1.21**

Unit #	Annual TSP Emissions From Separation Equipment					Controlled				Uncontrolled	
Unit #	Emission Unit: Separation Systems	Units	Tons / hr	hrs /yr	Tons / year	[4] EF lbs / ton	Lbs/hour	Tons/year	Control Efficiency	Lbs/hour	Tons/year
6	Non-Ferrous Trommel (25%)	1	50	2000	100,000	0.0022	0.11	0.110	90%	1.10	1.10
7	Post-Trommel ESC, & ISS (6.25%)	5	12.5	2000	25,000	0.0022	0.138	0.138	90%	1.38	1.38
8	Fines Processing: ECS	1	20	2000	40,000	0.0022	0.044	0.044	90%	0.44	0.44
		7					**0.292**	**0.292**	90%	**2.92**	**2.92**

Unit #	Annual TSP Emissions from Fluff Storage Pile Forming					Controlled				Uncontrolled	
Unit #	Emission Unit: Pile Storage	[6,8] EF Lbs / ton	Tons / hr	Hrs /yr	Lb/hour	Lbs/year	Lbs/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
9	ASR Pile Forming (22%)[6]	0.00034001	44	2000	0.0150	29.9	**0.015**	**0.015**	80%	**0.075**	**0.075**
9	ASR Pile Windblown Emissions (4 piles) [8]	NA	NA	2000	0.0004	0.800	**0.0004**	**0.0004**	80%	**0.0020**	**0.002**
							0.015	**0.015**	80%	**0.077**	**0.077**

Unit #	Annual TSP Emissions Vehicle Miles Traveled (VMT)					Controlled				Uncontrolled	
Unit #	Miles per day (@ 0.3 mi/load)	[7] EF Lbs / VMT	Lbs /day	Days/year	lb/hour	Lbs/year	Lbs/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
10	19.2	0.66	12.7	312	0.529	3,960	**1.980**	**1.980**	80%	**9.90**	**9.90**

Total TSP Emissions During Normal Operation	Controlled			Uncontrolled	
	Lbs/hour	Tons / year	Avg. Efficiency	Lbs/hour	Tons/year
	3.74	**3.74**	82%	**20.8**	**20.8**

Notes:
[1] Emission factor taken from Capitol City stack test. See Attachment F
[2] ISRI Manual Title V Workbook, Appendix D, Table D-11.A. Z-Box/Cyclone Throughput is 75% of shredder volume (does not include Non-Ferrous)
[3] Reference AP-42 Table 11.19.2-2, "Conveyor Transfer Point (controlled)" See Attachment F. Control Efficiency back calculated by comparing "controlled" and "uncontrolled" EFs.
[4] Reference AP-42 Table 11.19.2-2, "Screening (controlled)" See Attachment F. Control Efficiency back calculated by comparing "controlled" and "uncontrolled" EFs.
[5] Reference AP-42 Table 11.19.2-2, "Tertiary Crushing (controlled)" See Attachment F. Control Efficiency back calculated by comparing "controlled" and "uncontrolled" EFs.
[6] Reference AP-42 Section 13.2 Aggregate Handling and Storage Piles, pile forming using a K factor of 0.74 for TSP, mean wind speed of 5 mph, and a moisture content of 8%.
[7] Emission factor taken from Arizona DEQ's, 2014 Annual Emission Inventory Questionnaire Emission Factors.
[8] Emission factor taken from Arizona DEQ's, 2014 HMAP GP Emissions Spreadsheet.

ALBUQUERQUE METALS RECYCLING, INC
ANNUAL TOTAL SUSPENDED PARTICULATE MATTER (TSP) EMISSIONS
MAXIMUM OPERATION

Unit #	Annual TSP Emissions from the Shredder				Controlled					Uncontrolled	
Unit #	Emisison Unit	Tons / hr	hrs / yr	Tons / year	[1] EF lbs / ton	lb / year	lb/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
1	Shredder	200	8760	1,752,000	0.00237	4152	**0.474**	**2.076**	**80%**	**2.37**	**10.38**

Unit #	Annual TSP Emissions from the Cyclone				Controlled					Uncontrolled	
Unit #	Emission Unit	Tons / hr	hrs / yr	Tons / year	[2] EF lbs / ton	lb / year	lb/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
2	Cyclone / Z-Box	150	8760	1,314,000	0.00571	7503	**0.857**	**3.751**	**80%**	**4.28**	**18.76**

Unit #	Annual TSP Emissions From Conveyor Transfer or Drop Points					Controlled				Uncontrolled	
Unit #	Emission Unit: Drop Points	Units	Tons / hr	hrs /yr	Tons / year	[3] EF lbs / ton	Lbs/hour	Tons/year	Control Efficiency	Lbs/hour	Tons/year
3	Ferrous System (75%)	3	150	8760	1,314,000	0.00014	0.063	0.276	90%	0.63	2.76
4	Ferrous System In Process Material Conveyor (25%)	1	50	8760	438,000	0.00014	0.007	0.031	90%	0.07	0.31
12	Non-Ferrous Pre-Trommel (25%)	1	50	8760	438,000	0.00014	0.007	0.031	90%	0.07	0.31
5	Non-Ferrous Post-Trommel (6.25%)	17	12.5	8760	109,500	0.00014	0.030	0.130	90%	0.30	1.30
13	Fines System Conveyors & Bivtec	5	20	8760	175,200	0.00014	0.014	0.061	90%	0.14	0.61
		27					**0.121**	**0.529**	90%	**1.21**	**5.29**

Unit #	Annual TSP Emissions From Separation Equipment					Controlled				Uncontrolled	
Unit #	Emission Unit: Separation Systems	Units	Tons / hr	hrs /yr	Tons / year	[4] EF lbs / ton	Lbs/hour	Tons/year	Control Efficiency	Lbs/hour	Tons/year
6	Non-Ferrous Trommel (25%)	1	50	8760	438,000	0.0022	0.11	0.482	90%	1.10	4.82
7	Post-Trommel ESC, & ISS (6.25%)	5	12.5	8760	109,500	0.0022	0.138	0.602	90%	1.38	6.02
8	Fines Processing: ECS	1	20.0	8760	175,200	0.0022	0.044	0.193	90%	0.44	1.93
		7					**0.292**	**1.277**	90%	**2.92**	**12.77**

Unit #	Annual TSP Emissions from Fluff Storage Pile Forming					Controlled				Uncontrolled	
Unit #	Emission Unit: Pile Storage	[6,8] EF Lbs / ton	Tons / hr	Hrs /yr	Lb/hour	Lbs/year	Lbs/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
9	ASR Pile Forming (22%)[6]	0.00034001	44	8760	0.0150	131.1	**0.015**	**0.066**	80%	**0.075**	**0.328**
9	ASR Pile Windblown Emissions (4 piles)[8]	NA	NA	8760	0.0004	3.504	**0.0004**	**0.0018**	80%	**0.0020**	**0.009**
							0.015	**0.067**	80%	**0.077**	**0.336**

Unit #	Annual TSP Emissions Vehicle Miles Traveled (VMT)					Controlled				Uncontrolled	
Unit #	Miles per day (@ 0.3 mi/load)	[7] EF Lbs / VMT	Lbs /day	Days/year	lb/hour	Lbs/year	Lbs/hour	Tons / year	Control Efficiency	Lbs/hour	Tons/year
10	72.0	0.66	47.5	365	1.980	17,345	**1.980**	**8.672**	80%	**9.90**	**43.36**

Total TSP Emissions During Normal Operation	Controlled			Uncontrolled	
	Lbs/hour	Tons / year	Avg. Efficiency	Lbs/hour	Tons/year
	3.74	**16.37**	82%	**20.8**	**90.9**

Notes:

[1] Emission factor taken from Capitol City stack test. See Attachment F

[2] ISRI Manual Title V Workbook, Appendix D, Table D-11.A. Z-Box/Cyclone Throughput is 75% of shredder volume (does not include Non-Ferrous)

[3] Reference AP-42 Table 11.19.2-2, "Conveyor Transfer Point (controlled)" See Attachment F. Control Efficiency back calculated by comparing "controlled" and "uncontrolled" EFs.

[4] Reference AP-42 Table 11.19.2-2, "Screening (controlled)" See Attachment F. Control Efficiency back calculated by comparing "controlled" and "uncontrolled" EFs.

[5] Reference AP-42 Table 11.19.2-2, "Tertiary Crushing (controlled)" See Attachment F. Control Efficiency back calculated by comparing "controlled" and "uncontrolled" EFs.

[6] Reference AP-42 Section 13.2 Aggregate Handling and Storage Piles, pile forming using a K factor of 0.74 for TSP, mean wind speed of 5 mph, and a moisture content of 8%.

[7] Emission factor taken from Arizona DEQ's, 2014 Annual Emission Inventory Questionnaire Emission Factors.

[8] Emission factor taken from Arizona DEQ's, 2014 HMAP GP Emissions Spreadsheet.

Attachment 5

Emission Factor Supporting Documentation

(7)

INDIANAPOLIS OFFICE OF ENVIRONMENTAL SERVICES
STACK TEST SUMMARY REPORT

date(s) of stack test: 2/8/2005

Source Information:
company name: Capitol City Metals - Shredder
address: 311 S. Shelby St.
person to contact: Mark Imel
phone number: 634-7175

Tester Information:
company name: Almega Environmental
address: 9305 Snider Road
Mason, OH 45040
person to contact: David Wetmore (513)398-1880

Reason for Stack Test:
issued notice of violation/order: ______ installation permit requirement ______ requested by agency X

Process Information:
process description: Hammermill portion of Shredding Operation [D.1.b] with a maximum capacity of 66 tons/hr of metal
type of control equipment: Water Injection.

Stack Information:
diameter at sample site: 21" X 15"
approx. gas flow rate: 3,251 dscfm
approx. moisture: 3.7 % by volume
stack height: 18'
approx. gas temp.: 84 degF
average % isokinetic: 101.40%

Test Information:

pollutant/method	test #	emissions grains/dscf	emissions lb/hr	stack flow dscfm	throughput during testing	VE from Hammermill	Hammermill Water Injection Rate
PM / RM 5	1	0.004025	0.1113	3,225	67.9 ton/hr	No VE from hammermill	.154 - .275 gal/sec
	2	0.005866	0.1691	3,362	69.2 ton/hr	No VE from hammermill	.174 - .270 gal/sec
	3	0.006976	0.1894	3,167	66.5 ton/hr	No VE from hammermill	.237 - .275 gal/sec

Test Results:

point tested	emissions grains/dscf	allowable emissions grains/dscf	throughput during testing	permitted capacity
PM / RM 5	0.0056	0.03	67.9 ton/hr	66 ton/hr

Test Comments: No deficiencies were noted

Compliance Comments: Source demonstrated compliance with applicable permit limits.

Reviewer Information:
name: Jeffrey S. Hege title: Senior EnvironmentalScientist

signature ______________________ date ______________________

1.0 Executive Summary

Compliance emission tests were performed on February 8, 2005 to measure the filterable particulate matter (PM) emissions from the Hammermill at the Capitol City Metals, LLC facility in Indianapolis, Indiana. This testing was required to demonstrate that the alternative emission control system for the Hammermill proposed in FESOP application #097-17949-00111 will operate in compliance with the applicable PM emission limit. This permit limits particulate emissions to 0.03 grains per dry standard cubic foot (gr/dscf). The results of the testing are summarized below.

Test Repetition #	1	2	3	**Average**
Particulate (gr/dscf)	0.004	0.006	0.007	**0.006**
Opacity	0%	0%	0%	**0%**

Submitted and Approved by:
Almega Environmental, Inc.

David K. Wetmore
President

2.0 Introduction

Almega Environmental, Inc. was retained by Capitol City Metals, LLC (CCM) to conduct an emissions evaluation of the Hammermill at their metal recycling facility in Indianapolis, Indiana. Particulate matter testing was conducted at the exhaust from a temporary stack fabricated to draw dust from the Hammermill in order to determine the PM emissions potential. Messrs. David Wetmore, Chris Wetmore and Ryan Key, of Almega, conducted the testing on February 8, 2005. Mr. Mark Imel of CCM performed the visible emissions observations. Mr. Henry Johnson of CCM coordinated testing and process operations. Mr. Jeffrey Hege of the City of Indianapolis Environmental Resources and Mr. Jarrod Fisher of the IDEM observed the testing.

3.0 Process and Stack Description

Capitol City Metals is a resource recovery company that processes scrap vehicles and various other metal products. The resulting primary product is sold to foundries as a substitute for virgin materials. The process unit tested is a hammermill with emissions controlled by a water injection system. While the emission unit is currently permitted for use of a cyclone/scrubber system for emission control, CCM has installed an alternative emission control device known as the water injection system (WIS) that is believed to be equal or superior at suppressing the generation of particulate emissions. The purpose of this test was to demonstrate that the new system is able to achieve the permit required emission levels.

The process starts by loading crushed automobiles and other scrap onto a conveyor with a crane. These materials travel up the conveyor and are dumped into the Hammermill (0002). Here, large hammers shred the scrap into small pieces. The shredded pieces of ferrous, non-ferrous and fluff (non-metallics) are transferred out of the mill and onto a conveyor for further processing and separation. As currently operated, a collection hood pulls particulate matter generated by the shredding process from the discharge end of the hammermill and vents it to a cyclone/scrubber combination. However, the WIS is so effective at suppressing emissions that traditional air exhaust equipment is not necessary. In fact, operation of traditional air exhaust equipment (such as the existing cyclone/scrubber) actually dries the wetted particles and causes them to become airborne again, thereby *increasing* air emissions. As such, forced air ventilation will not be used during normal operation.

The WIS functions by delivering a precise, controlled rate of water flow into the hammermill at efficient locations thereby causing dirt particles contained in the scrap metal (raw material) to become wetted and stick together or onto the shredded pieces rather than becoming airborne. The agglomerated dirt particles are visibly noticeable on the shredded pieces exiting the mill. In addition, the water spray causes lower operating temperatures within the mill. As a result, there is less scorching of the non-metallic materials that could potentially generate smoke or organic vapors.

The system automatically comes on line when the shredder starts up. During operation, when the shredder motor is in the idle mode, one pipe in the manifold supplies a small amount of water to wet the mill walls. When the feed to the mill causes motor current to rise to a predetermined programmed level, a solenoid water valve opens injecting a known quantity of water into the mill near the hammer rotor. As mill motor amps increase due to more scrap metal feed, more solenoid valves open allowing additional water flow. In the event of a fire or explosion in the mill, the operator can press a "fire" button that immediately opens all flow valves and drives the water pump to maximum capacity. This serves to flood the mill and prevent or minimize further impact. Figure 3.1 depicts the Hammermill and the testing location.

A temporary stack was installed to facilitate measurement of the emissions. The stack utilized a fan/blower to draw the emissions from the Hammermill. The testing location was in the 15.25" x 21" rectangular duct (17.7" equivalent diameter) on the discharge side of the fan, 96" downstream from the nearest disturbance and 15" upstream of atmosphere.

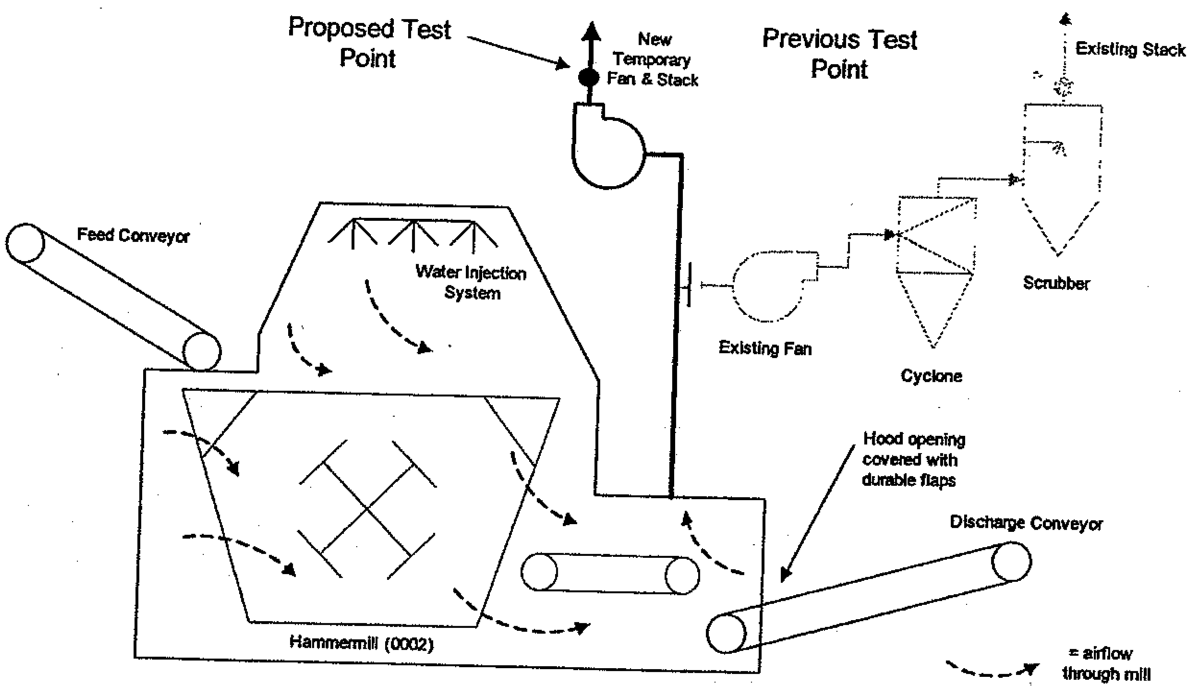


Figure 3.1 Schematic of Hammermill and testing location.

4.0 Test Results

Table 1 summarizes the particulate matter emissions.
Table 2 summarizes the exhaust stack gas conditions.

5.0 Test Methods

The sampling and analytical procedures conform to the most recent revisions of USEPA Reference Methods for stationary sources. Specifically, USEPA Reference Methods 1, 2, 3, 4, 5, and 9 were used. A brief description of each procedure is included below:

5.1 Measurement Sites - The location of measurement sites and the number of traverse points was determined as specified in USEPA Method 1, "Sample and Velocity Traverses for Stationary Sources." The site meets minimum Method 1 requirements.

5.2 Velocities and Volumetric Flow Rates - The stack gas velocities and volumetric flow rates were determined using USEPA Method 2, "Determination of Stack Gas Velocity and Volumetric Flow Rate." Velocities were measured with an s-type pitot tube and temperatures were measured with calibrated type 'K' thermocouples.

5.3 Dry Molecular Weight - The molecular weight of the stack gas was determined using USEPA Method 3. O_2 and CO_2 concentrations in the exhaust gas were determined using Fyrite gas analyzers.

5.4 Humidity - The humidity (moisture content) of the source was determined using USEPA Method 4, "Determination of Moisture Content in Stack Gases," in conjunction with the particulate matter testing.

5.5 Particulate Matter – The PM concentrations and emission rates were determined using USEPA Method 5, "Determination of Particulate Matter Emissions from Stationary Sources." Stack gas samples were withdrawn through a nozzle, a heated stainless steel probe, a tared glass fiber filter, and a series of chilled impingers. An impinger containing desiccant was located at the end of the sample train. The particulate adhering to the nozzle, probe liner, and front ½ of the filter holder was recovered by irrigating with acetone. The filter was recovered to a petri dish. Subsequently, the acetone was evaporated in a tared weighing dish, desiccated, and weighed to a constant weight to ascertain particulate concentration. The filter was also desiccated and weighed to a constant weight. The sum of the net gains of the two components was used to calculate a filterable PM concentration.

5.6 Visible emissions – VE's were determined following Method 9 procedures. A certified VE observer monitored and recorded the visible emissions during each test period. There were no VE's during any test period. VE data is located in Appendix C.

6.0 Discussion of Test Results and Critique of Test.

The third test run was terminated prematurely due to the inadvertent shut down of the Hammermill. The timing was such that the unit could not be re-started before the facility's mandatory time for operation cessation. Mr. Hege was contacted and he agreed to consider the third test run as valid provided it did not vary significantly from the first two test runs.

No other unusual events occurred during the performance of the tests. Accordingly the data presented in this report are considered to be true representations of the emission characteristics of the Hammermill with the WIS operated by Capitol City Metals, LLC at their Indianapolis facility.

Table 1 Summary of Particulate Matter Emissions for Shredder

Run #	Production Rate (tph)[a]	Concentration (gr/dscf)[b]	(lb/dscf)[c]	Emission Rate (lb/hr)[d]
1	67.9	0.004	5.97E-07	0.12
2	69.2	0.006	8.71E-07	0.18
3	65.5	0.007	1.03E-06	0.20
Average	**67.5**	**0.006**	**8.33E-07**	**0.16**

[a] Production rate in tons per hour

[b] Concentration in grains per dry standard cubic foot

[c] Concentration in pounds per dry standard cubic foot

[d] Emission rate in pounds per hour

EF in Lbs/Ton

$\frac{0.16}{67.5}$ = 0.00237 lb/ton

Table 2 Summary of Stack Gas Conditions for Shredder

Run #	Date/Time	Vs (fps)[a]	Flow Rate (acfm)[b]	(dscfm)[c]	T_S °F	H_2O %	O_2 %	CO_2 %
1	2/08/2005 1117-1240	26.2	3,494	3,226	85	2.9	21.0	0.0
2	2/08/2005 1301-1516	27.6	3,679	3,360	85	3.9	21.0	0.0
3	2/08/2005 1536-1705	26.0	3,472	3,182	83	3.9	21.0	0.0
Average		**26.6**	**3,548**	**3,256**	**84**	**3.6**	**21.0**	**0.0**

[a] Velocity in feet per second

[b] Actual cubic feet per minute

[c] Dry standard cubic feet per minute

Versar INC.

Title V Applicability

Workbook

Prepared for:

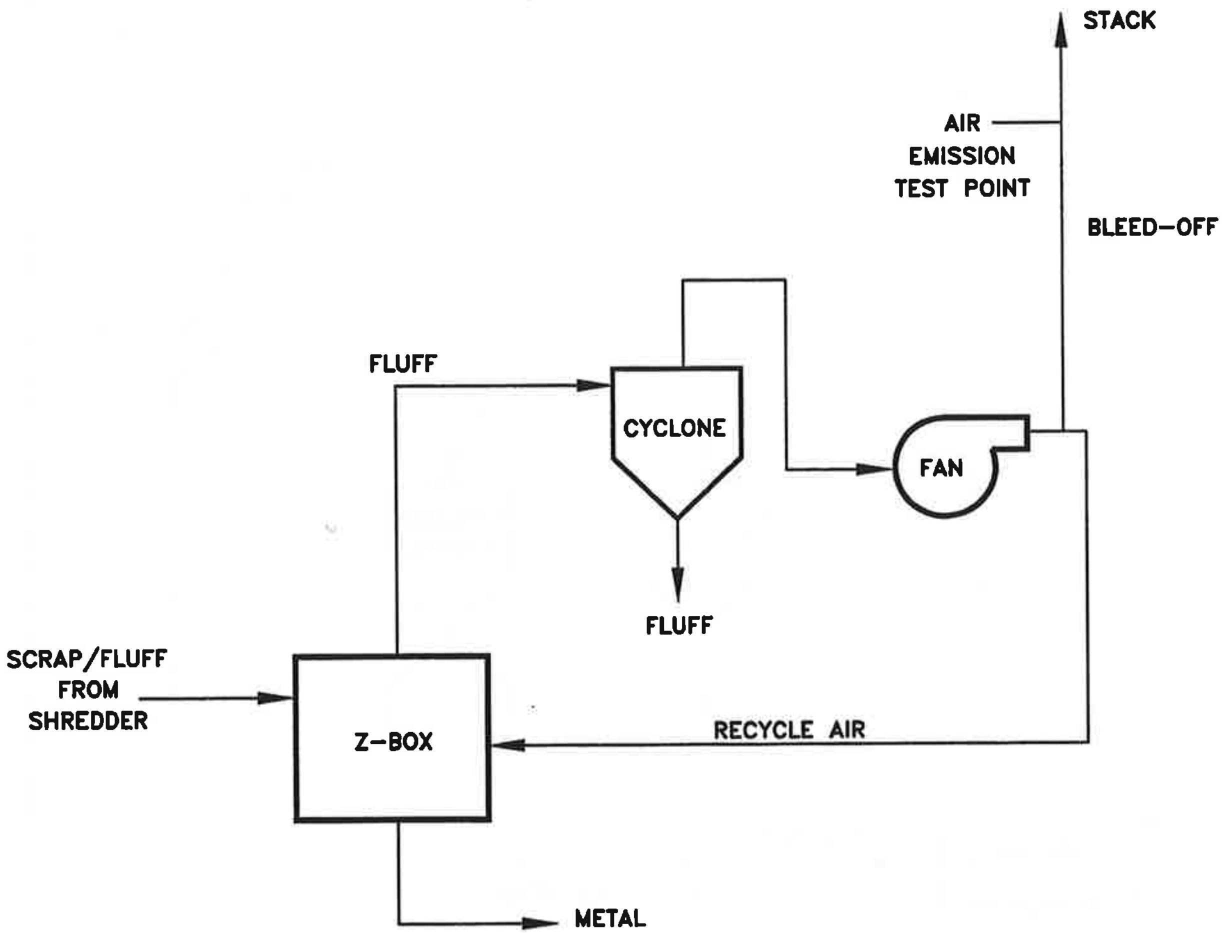
INSTITUTE OF SCRAP RECYCLING INDUSTRIES, INC.
1325 G Street, NW
Washington, DC 20005-3104
(202) 737-1770

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



FEED MIX	MILL TYPE	HORSE POWER	FEED RATE	PM lbs/hr	PM lbs/TON
100% AUTO BODIES *	DAMP	4,000	185 TPH **	1.06	0.00571

* ALL AUTO BODIES HAVE BATTERIES, GAS TANKS, AND TIRES REMOVED. 95% OF AUTO BODIES FLATTENED, WITH THE MAJORITY OF FLUIDS DRAINED OUT. ALSO, 80% OF ENGINES ARE REMOVED WITH THE RADIATOR AND TRANSMISSION AS WELL.

** SAMPLING FOR THIS TEST (TABLE D-11.A) AND UP STREAM TEST (TABLE D-10.A) WERE DONE AT DIFFERENT TIMES WITH DIFFERENT FEED RATES.

TABLE D-11.A
EMISSION TEST FOR:
Z-BOX SEPARATOR W/CYCLONE & BLEED-OFF

CAD FILE: G:\......\30071C.DWG

EPA-452/F-03-005

Air Pollution Control Technology
Fact Sheet

Name of Technology: Cyclones

This type of technology is a part of the group of air pollution controls collectively referred to as "precleaners," because they are oftentimes used to reduce the inlet loading of particulate matter (PM) to downstream collection devices by removing larger, abrasive particles. Cyclones are also referred to as cyclone collectors, cyclone separators, centrifugal separators, and inertial separators. In applications where many small cyclones are operating in parallel, the entire system is called a multiple tube cyclone, multicyclone, or multiclone.

Type of Technology: Removal of PM by centrifugal and inertial forces, induced by forcing particulate-laden gas to change direction.

Applicable Pollutants:

Cyclones are used to control PM, and primarily PM greater than 10 micrometers (μm) in aerodynamic diameter. However, there are high efficiency cyclones designed to be effective for PM less than or equal to 10 μm and less than or equal to 2.5 μm in aerodynamic diameter (PM_{10} and $PM_{2.5}$). Although cyclones may be used to collect particles larger than 200 μm, gravity settling chambers or simple momentum separators are usually satisfactory and less subject to abrasion (Wark, 1981; Perry, 1984).

Achievable Emission Limits/Reductions:

The collection efficiency of cyclones varies as a function of particle size and cyclone design. Cyclone efficiency generally <u>increases</u> with (1) particle size and/or density, (2) inlet duct velocity, (3) cyclone body length, (4) number of gas revolutions in the cyclone, (5) ratio of cyclone body diameter to gas exit diameter, (6) dust loading, and (7) smoothness of the cyclone inner wall. Cyclone efficiency will <u>decrease</u> with increases in (1) gas viscosity, (2) body diameter, (3) gas exit diameter, (4) gas inlet duct area, and (5) gas density. A common factor contributing to decreased control efficiencies in cyclones is leakage of air into the dust outlet (EPA, 1998).

Control efficiency ranges for single cyclones are often based on three classifications of cyclone, i.e., conventional, high-efficiency, and high-throughput. The control efficiency range for conventional single cyclones is estimated to be 70 to 90 percent for PM, 30 to 90 percent for PM_{10}, and 0 to 40 percent for $PM_{2.5}$.

High efficiency single cyclones are designed to achieve higher control of smaller particles than conventional cyclones. According to Cooper (1994), high efficiency single cyclones can remove 5 μm particles at up to 90 percent efficiency, with higher efficiencies achievable for larger particles. The control efficiency ranges for high efficiency single cyclones are 80 to 99 percent for PM, 60 to 95 percent for PM_{10}, and 20 to 70 percent for $PM_{2.5}$. Higher efficiency cyclones come with higher pressure drops, which require higher energy costs to move the waste gas through the cyclone. Cyclone design is generally driven by a specified pressure-drop limitation, rather than by meeting a specified control efficiency (Andriola, 1999; Perry, 1994).

According to Vatavuk (1990), high throughput cyclones are only guaranteed to remove particles greater than 20 μm, although collection of smaller particles does occur to some extent. The control efficiency ranges for high-throughput cyclones are 80 to 99 percent for PM, 10 to 40 percent for PM_{10}, and 0 to 10 percent for $PM_{2.5}$.

Multicyclones are reported to achieve from 80 to 95 percent collection efficiency for 5 μm particles (EPA, 1998).

Applicable Source Type: Point

Typical Industrial Applications:

Cyclones are designed for many applications. Cyclones themselves are generally not adequate to meet stringent air pollution regulations, but they serve an important purpose as precleaners for more expensive final control devices such as fabric filters or electrostatic precipitators (ESPs). In addition to use for pollution control work, cyclones are used in many process applications, for example, they are used for recovering and recycling food products and process materials such as catalysts (Cooper, 1994).

Cyclones are used extensively after spray drying operations in the food and chemical industries, and after crushing, grinding and calcining operations in the mineral and chemical industries to collect salable or useful material. In the ferrous and nonferrous metallurgical industries, cyclones are often used as a first stage in the control of PM emissions from sinter plants, roasters, kilns, and furnaces. PM from the fluid-cracking process are removed by cyclones to facilitate catalyst recycling. Fossil-fuel and wood-waste fired industrial and commercial fuel combustion units commonly use multiple cyclones (generally upstream of a wet scrubber, ESP, or fabric filter) which collect fine PM (< 2.5 μm) with greater efficiency than a single cyclone. In some cases, collected fly ash is reinjected into the combustion unit to improve PM control efficiency (AWMA, 1992; Avallone, 1996; STAPPA/ALAPCO, 1996; EPA, 1998).

Emission Stream Characteristics:

a. **Air Flow:** Typical gas flow rates for a single cyclone unit are 0.5 to 12 standard cubic meters per second (sm^3/sec) (1,060 to 25,400 standard cubic feet per minute (scfm)). Flows at the high end of this range and higher (up to approximately 50 sm^3/sec or 106,000 scfm) use multiple cyclones in parallel (Cooper, 1994). There are single cyclone units employed for specialized applications which have flow rates of up to approximately 30 sm^3/sec (63,500 scfm) and as low as 0.0005 sm^3/sec (1.1 scfm) (Wark, 1981; Andriola, 1999).

b. **Temperature:** Inlet gas temperatures are only limited by the materials of construction of the cyclone, and have been operated at temperatures as high as 540°C (1000°F) (Wark, 1981; Perry, 1994).

c. **Pollutant Loading:** Waste gas pollutant loadings typically range from 2.3 to 230 grams per standard cubic meter (g/sm^3) (1.0 to 100 grains per standard cubic foot (gr/scf)) (Wark, 1981). For specialized applications, loadings can be as high as 16,000 g/sm^3 (7,000 gr/scf), and as low as l g/sm^3 (0.44 gr/scf) (Avallone, 1996; Andriola, 1999).

d. **Other Considerations:** Cyclones perform more efficiently with higher pollutant loadings, provided that the device does not become choked. Higher pollutant loadings are generally associated with higher flow designs (Andriola, 1999).

Emission Stream Pretreatment Requirements:

No pretreatment is necessary for cyclones.

Cost Information:

The following are cost ranges (expressed in 2002 dollars) for a single conventional cyclone under typical operating conditions, developed using an EPA cost-estimating spreadsheet (EPA, 1996), and referenced to the volumetric flow rate of the waste stream treated. Flow rates higher than approximately 10 sm^3/sec (21,200 scfm) usually employ multiple cyclones operating in parallel. For purposes of calculating the example cost effectiveness, flow rates are assumed to be between 0.5 and 50 sm^3/sec (1,060 and 106,000 scfm), the PM inlet loading is assumed to be approximately 2.3 and 230 g/sm^3 (1.0 to 100 gr/scf) and the control efficiency is assumed to be 90 percent. The costs do not include costs for disposal or transport of collected material. Capital costs can be higher than in the ranges shown for applications which require expensive materials. As a rule, smaller units controlling a waste stream with a low PM concentration will be more expensive (per unit volumetric flow rate and per quantity of pollutant controlled) than a large unit controlling a waste stream with a high PM concentration.

- **a.** **Capital Cost:** $4,600 to $7,400 per sm^3/sec ($2.20 to $3.50 per scfm)
- **b.** **O & M Cost:** $1,500 to $18,000 per sm^3/sec ($0.70 to $8.50 per scfm), annually
- **c.** **Annualized Cost:** $2,800 to $29,000 per sm^3/sec ($1.30 to $13.50 per scfm), annually
- **d.** **Cost Effectiveness:** $0.47 to $440 per metric ton ($0.43 to $400 per short ton), annualized cost per ton per year of pollutant controlled

Flow rates higher than approximately 10 sm^3/sec (21,200 scfm), and up to approximately 50 sm^3/sec (106,000 scfm), usually employ multiple cyclones operating in parallel. Assuming the same range of pollutant loading and an efficiency of 90 percent, the following cost ranges (expressed in third quarter 1995 dollars) were developed for multiple cyclones, using an EPA cost-estimating spreadsheet (EPA, 1996), and referenced to the volumetric flow rate of the waste stream treated.

Theory of Operation:

Cyclones use inertia to remove particles from the gas stream. The cyclone imparts centrifugal force on the gas stream, usually within a conical shaped chamber. Cyclones operate by creating a double vortex inside the cyclone body. The incoming gas is forced into circular motion down the cyclone near the inner surface of the cyclone tube. At the bottom of the cyclone, the gas turns and spirals up through the center of the tube and out of the top of the cyclone (AWMA, 1992).

Particles in the gas stream are forced toward the cyclone walls by the centrifugal force of the spinning gas but are opposed by the fluid drag force of the gas traveling through and out of the cyclone. For large particles, inertial momentum overcomes the fluid drag force so that the particles reach the cyclone walls and are collected. For small particles, the fluid drag force overwhelms the inertial momentum and causes these particles to leave the cyclone with the exiting gas. Gravity also causes the larger particles that reach the cyclone walls to travel down into a bottom hopper. While they rely on the same separation mechanism as momentum separators, cyclones are more effective because they have a more complex gas flow pattern (AWMA, 1992).

Cyclones are generally classified into four types, depending on how the gas stream is introduced into the device and how the collected dust is discharged. The four types include tangential inlet, axial discharge; axial inlet, axial discharge; tangential inlet, peripheral discharge; and axial inlet, peripheral discharge. The first two types are the most common (AWMA, 1992).

Pressure drop is an important parameter because it relates directly to operating costs and control efficiency. Higher control efficiencies for a given cyclone can be obtained by higher inlet velocities, but this also increases the pressure drop. In general, 18.3 meters per second (60 feet per second) is considered the best operating velocity. Common ranges of pressure drops for cyclones are 0.5 to 1 kilopascals (kPa) (2 to 4 in. H_2O) for low-efficiency units (high throughput), 1 to 1.5 kPa (4 to 6 in. H_2O) for medium-efficiency units (conventional), and 2 to 2.5 kPa (8 to 10 in. H_2O) for high-efficiency units (AWMA, 1992).

When high-efficiency (which requires small cyclone diameter) and large throughput are both desired, a number of cyclones can be operated in parallel. In a multiple tube cyclone, the housing contains a large number of tubes that have a common gas inlet and outlet in the chamber. The gas enters the tubes through axial inlet vanes which impart a circular motion (AWMA, 1992). Another high-efficiency unit, the wet cyclonic separator, uses a combination of centrifugal force and water spray to enhance control efficiency.

Advantages:

Advantages of cyclones include (AWMA, 1992; Cooper, 1994; and EPA, 1998):

1. Low capital cost;
2. No moving parts, therefore, few maintenance requirements and low operating costs;
3. Relatively low pressure drop (2 to 6 inches water column), compared to amount of PM removed;
4. Temperature and pressure limitations are only dependent on the materials of construction;
5. Dry collection and disposal; and
6. Relatively small space requirements.

Disadvantages:

Disadvantages of cyclones include (AWMA, 1992; Cooper, 1994; and EPA, 1998):

1. Relatively low PM collection efficiencies, particularly for PM less than 10 μm in size;
2. Unable to handle sticky or tacky materials; and
3. High efficiency units may experience high pressure drops.

Other Considerations:

Using multiple cyclones, either in parallel or in series, to treat a large volume of gas results in higher efficiencies, but at the cost of a significant increase in pressure drop. Higher pressure drops translate to higher energy usage and operating costs. Several designs should be considered to achieve the optimum combination of collection efficiency and pressure drop (Cooper, 1994).

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Table 11.19.2-2 (English Units). EMISSION FACTORS FOR CRUSHED STONE PROCESSING OPERATIONS (lb/Ton)[a]

Source [b]	Total Particulate Matter [r,s]	EMISSION FACTOR RATING	Total PM-10	EMISSION FACTOR RATING	Total PM-2.5	EMISSION FACTOR RATING
Primary Crushing (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Primary Crushing (controlled) (SCC 3-05-020-01)	ND		ND[n]		ND[n]	
Secondary Crushing (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Secondary Crushing (controlled) (SCC 3-05-020-02)	ND		ND[n]		ND[n]	
Tertiary Crushing (SCC 3-050030-03)	0.0054[d]	E	0.0024[o]	C	ND[n]	
Tertiary Crushing (controlled) (SCC 3-05-020-03)	0.0012[d]	E	0.00054[p]	C	0.00010[q]	E
Fines Crushing (SCC 3-05-020-05)	0.0390[e]	E	0.0150[e]	E	ND	
Fines Crushing (controlled) (SCC 3-05-020-05)	0.0030[f]	E	0.0012[f]	E	0.000070[q]	E
Screening (SCC 3-05-020-02, 03)	0.025[c]	E	0.0087[l]	C	ND	
Screening (controlled) (SCC 3-05-020-02, 03)	0.0022[d]	E	0.00074[m]	C	0.000050[q]	E
Fines Screening (SCC 3-05-020-21)	0.30[g]	E	0.072[g]	E	ND	
Fines Screening (controlled) (SCC 3-05-020-21)	0.0036[g]	E	0.0022[g]	E	ND	
Conveyor Transfer Point (SCC 3-05-020-06)	0.0030[h]	E	0.00110[h]	D	ND	
Conveyor Transfer Point (controlled) (SCC 3-05-020-06)	0.00014[i]	E	4.6×10^{-5}[i]	D	1.3×10^{-5}[q]	E
Wet Drilling - Unfragmented Stone (SCC 3-05-020-10)	ND		8.0×10^{-5}[j]	E	ND	
Truck Unloading -Fragmented Stone (SCC 3-05-020-31)	ND		1.6×10^{-5}[j]	E	ND	
Truck Loading - Conveyor, crushed stone (SCC 3-05-020-32)	ND		0.00010[k]	E	ND	

a. Emission factors represent uncontrolled emissions unless noted. Emission factors in lb/Ton of material of throughput. SCC = Source Classification Code. ND = No data.

b. Controlled sources (with wet suppression) are those that are part of the processing plant that employs current wet suppression technology similar to the study group. The moisture content of the study group without wet suppression systems operating (uncontrolled) ranged from 0.21 to 1.3 percent, and the same facilities operating wet suppression systems (controlled) ranged from 0.55 to 2.88 percent. Due to carry over of the small amount of moisture required, it has been shown that each source, with the exception of crushers, does not need to employ direct water sprays. Although the moisture content was the only variable measured, other process features may have as much influence on emissions from a given source. Visual observations from each source under normal operating conditions are probably the best indicator of which emission factor is most appropriate. Plants that employ substandard control measures as indicated by visual observations should use the uncontrolled factor with an appropriate control efficiency that best reflects the effectiveness of the controls employed.

c. References 1, 3, 7, and 8

d. References 3, 7, and 8

VEHICLE EMISSION FACTOR FROM GENERAL PERMIT APPLICATION

HOT MIX ASPHALT PLANT, DATED 3/30/2010, AS SUBMITTED TO AZ DEQ

(USED FOR FUGITIVE DUST E.F. FOR VEHICLE MILEAGE)

Table 7 – Controlled Fugitive Emissions Due To Vehicular Traffic

Table 7 is for calculating fugitive emissions caused by vehicular traffic. Number of Vehicle Miles Traveled/hour (VMT/hr) (n) is multiplied by PM and PM_{10} emission factors (b) and (c). VMT should include any traffic on access roads that do not have public access.

Emission source	VMT[1] per hour	Emission Factor		Emissions	
		PM	PM_{10}	PM	PM_{10}
		Pounds per VMT	Pounds per VMT	Pounds per hour	
	N	b	c	D2 = n x b	E2 = n x c
Vehicular traffic		0.66	0.17		

[1] VMT – Vehicle Miles Traveled

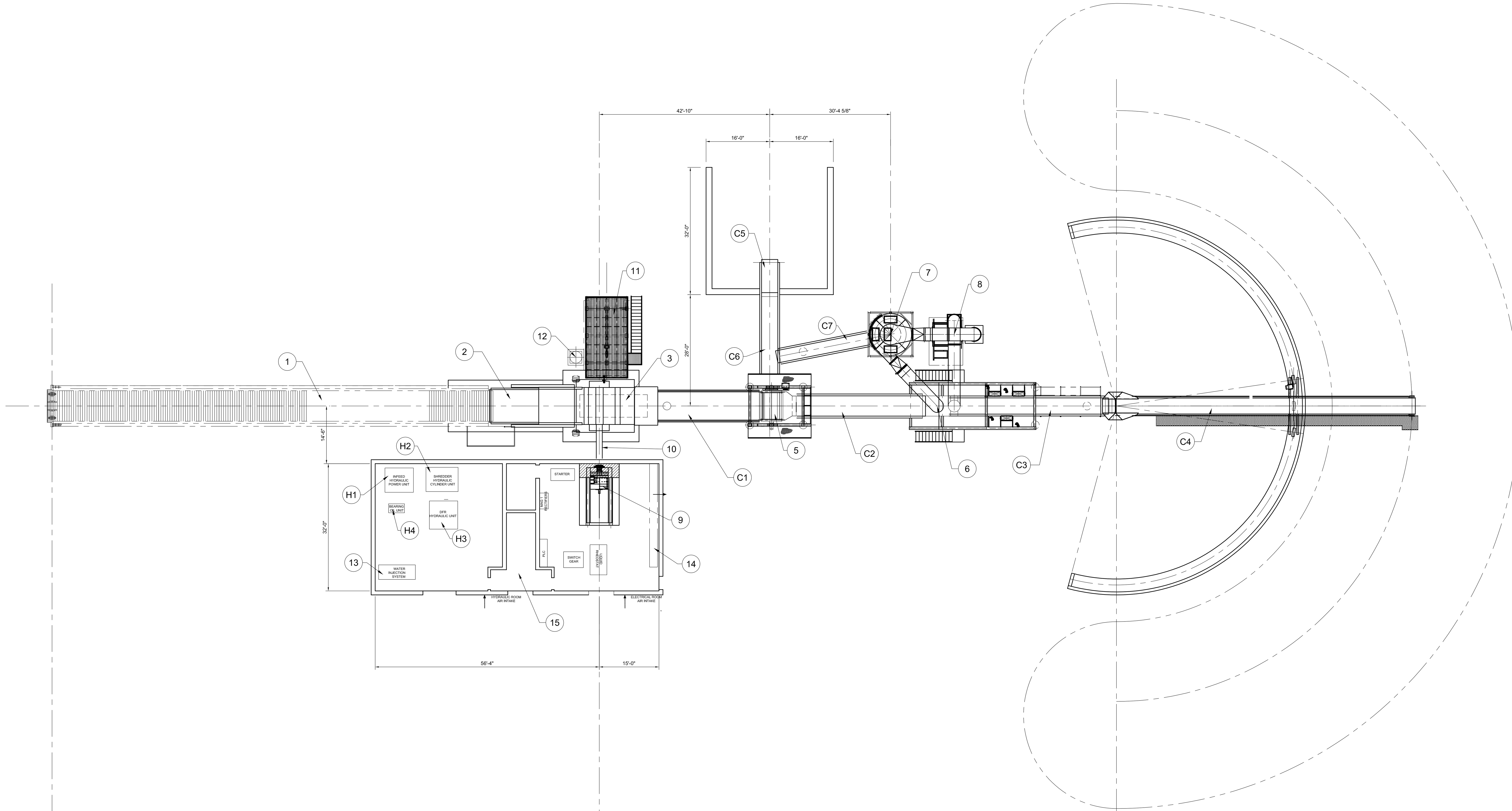
Table 8 - Controlled Fugitive Emissions from Storage Piles

Table 8 is for calculating fugitive emissions due to storage piles. Number of storage piles is multiplied by PM and PM_{10} emission factors (b) and (c).

Emission source	Number of piles	Emission Factor		Emissions	
		PM	PM_{10}	PM	PM_{10}
		Pounds per pile per hour	Pounds per pile per hour	Pounds per hour	
	N	b	c	D3 = n x b	E3 = n x c
Wind Erosion from Aggregate Storage Piles		0.0001	0.00005		

Attachment 6

Manufacturer Plan Sheets



LEGEND

	ITEM	DESCRIPTION	HP1	HP2	HP3	POWER
	1	INFEED CONVEYOR 99 X 115'-7" W/ HYD. DRIVE				
	2	FEEDING DEVICE - DOUBLE FEEDROLL w/ HYD. DRIVE				
	3	METSO 98 X 104 HEAVY-DUTY SHREDDER (4" HOUSING)				
	4	SHREDDER SUB-FRAM W/ SPRINGS				
	5	60"Ø X 84"W DRUM MAGNET (WITH SOFT START) & (MAG RECTIFIER 14 KW)	20			
	6	60" SUPER Z-BOX				
	7	10'-6"Ø Z-BOX - CYCLONE	7.5			
	8	Z-BOX CYCLONE FAN - 712 CW UP BLAT	250			
	9	4000-HP MAIN MOTOR				
	10	440 - DRIVE SHAFT AND GUARD				
	11	PIN PULLER				
OPTIONAL	12	HYDRAULICS JIB-HOIST				
	13	WATER INJECTION SYSTEM	10	10		
	14	MOTOR CONTROL CENTER				
	15	MOTOR HOUSE AND CONTROL TOWER				

TOTAL HP 297.5

BELT CONVEYORS

ITEM	DESCRIPTION	WIDTH	LENGTH	HP1	HP2	FPM
C1	1ST TRANSFER CONVEYOR	84	30	20		250
C2	2ND TRANSFER CONVEYOR	60	35	20		350
C3	FERROUS SORTING CONVEYOR	54	46	15		200
C4	STACKING CONVEYOR	48	80	20	2	300
C5	NONFERROUS CONVEYOR	48	40	10		250
C6	FERROUS RECOVERY CONVEYOR	48	27'-6"	7.5		250
C7	CYCLONE CONVEYOR	36	32	7.5		150

TOTAL HP 102

VIBRATORY CONVEYORS

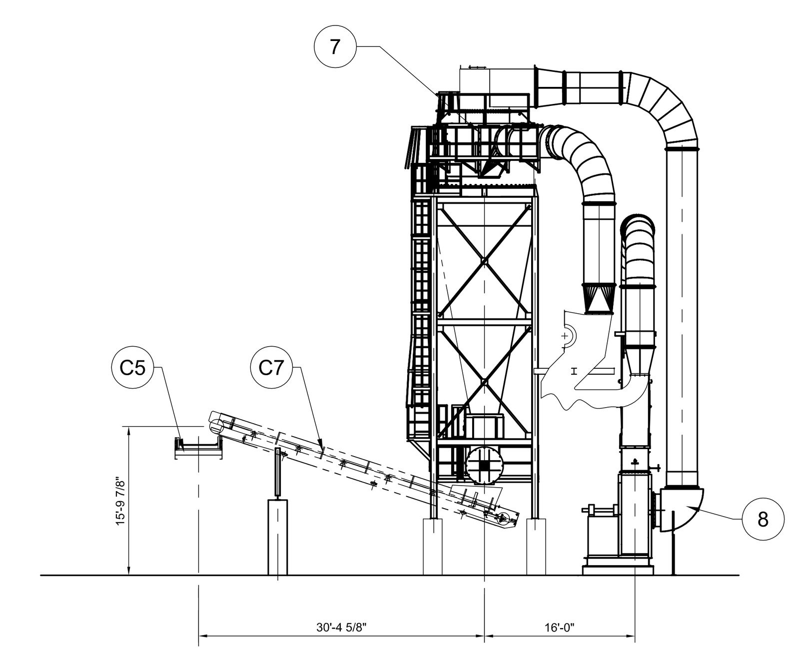
ITEM	DESCRIPTION	WIDTH	LENGTH	HP1	HP2
V1	UNDERMILL	69	17'	10	10

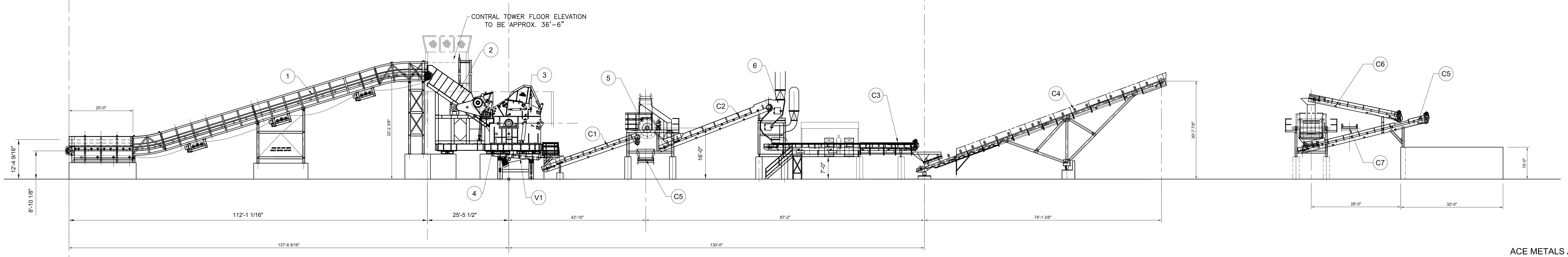
TOTAL HP 20

HYDRAULIC POWER UNITS

ITEM	DESCRIPTION	HP1	HP2
H1	INFEED CONVEYOR HYD. UNIT (AIR COOL)	75	2
H2	MILL POWER UNIT (AIR COOL)	75	2
H3	DOUBLE FEED ROLL HYD. UNIT (AIR COOL)	150	2
H4	OIL RECIRCULALING UNITS (2 EA.)	2	2

TOTAL HP 310





ACE METALS ALBUQUERQUE, NM.

NO.	REVISION	DATE	BY
-	-	-	-

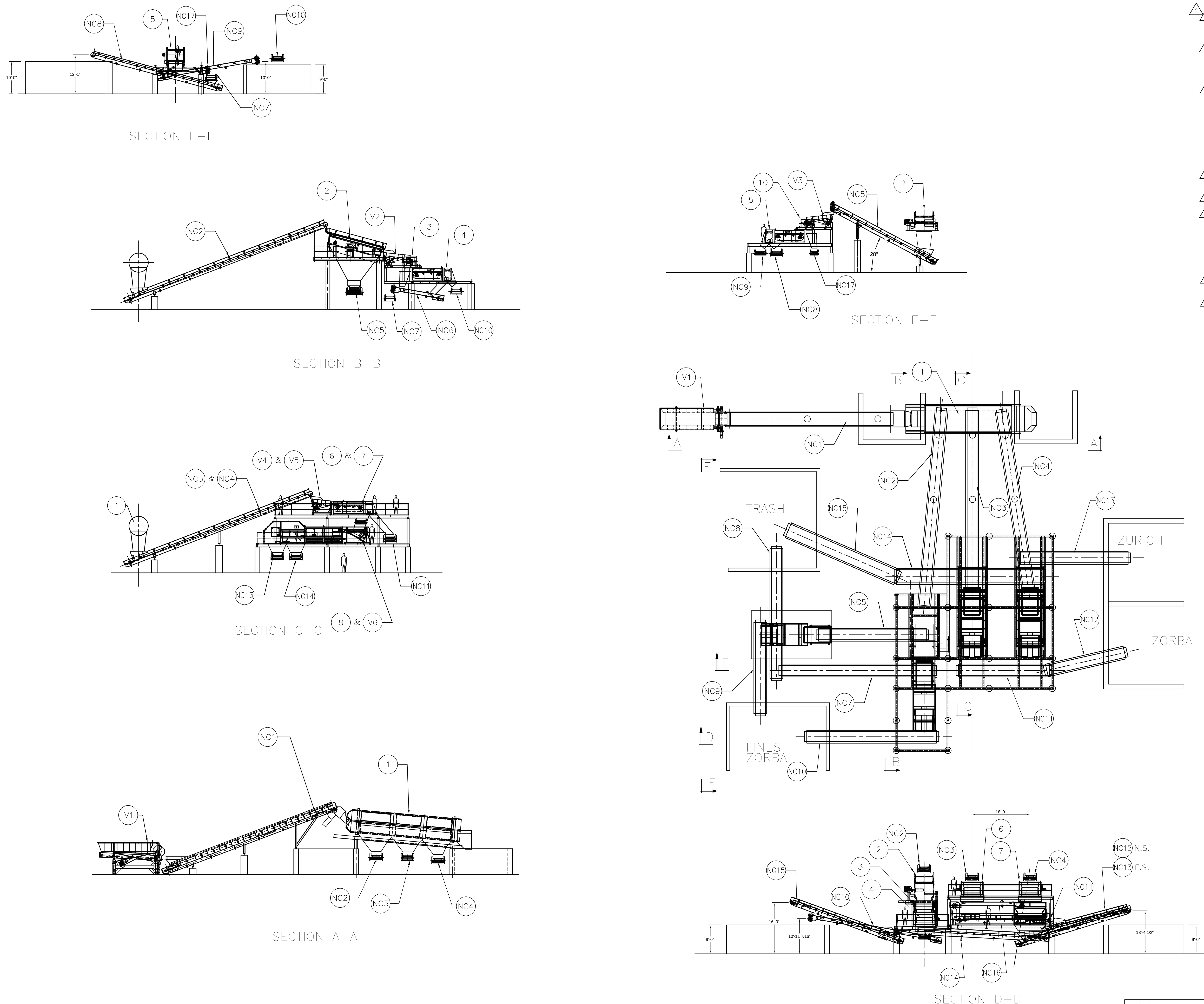
metso
METSO MINERALS INDUSTRIES, INC.
11451 JONES MALTSBERGER
SAN ANTONIO, TEXAS 78216

TITLE
98X104 SHREDDER
PLANT LAYOUT

DATE	SCALE	DRAWN BY:
8-13-10	1/16" = 1'-0"	CES

SHEET	TEXAS SHREDDER DRAWING NO	REV
1 OF 1	SAT004885-000	-

AUTOCAD



LEGEND

	ITEM	DESCRIPTION	HP1	HP2
	1	TSI TROMMEL 60" HEX X 36'	30	
4, 2	2	BIVI-TEC SCREEN (1.5M X 5M) – BY CUSTOMER	15	
	3	SGM TMP PRE-MAGNET 1.5M		
	4	SMALL FRACTION FINES ECS 1.5M	60 AMP	
4, 3	5	FINES FRACTION FINES ECS 42" – BY CUSTOMER	40 AMP	
	6	MEDIUM FRACTION ECS 1.5M	60 AMP	
	7	LARGE FRACTION ECS 1.5M	60 AMP	
	8	LARGE FRACTION ISS 2.4M	60 AMP	
	9	AIR COMPRESSOR	150	
5	10	SGM TMP PRE-MAGNET 42"		

BELT CONVEYORS

	ITEM	DESCRIPTION	WIDTH	LENGTH	HP1	SPEED
2	NC1	TROMMEL FEED CONVEYOR W/ MAG HEAD PULLEY	48	65	15	250
	NC2	SMALL FRACTION ECS FEED CONVEYOR	36	65	10	250
	NC3	MEDIUM FRACTION ECS FEED CONVEYOR	36	60	10	250
	NC4	LARGE FRACTION ECS FEED CONVEYOR	36	60	10	250
	NC5	FINES FRACTION ECS FEED CONVEYOR	30	35	7.5	250
	NC6	FINES FLUFF FIRST TRANSFER CONVEYOR	24	15	3	250
	NC7	FINES FLUFF SECOND TRANSFER CONVEYOR	30	45	7.5	250
	NC8	FINES FLUFF STACKING CONVEYOR	36	40	7.5	250
	NC9	FINES ECS PRODUCT CONVEYOR	30	30	5	250
	NC10	SMALL FRACTION ECS PRODUCT CONVEYOR	30	40	7.5	250
	NC11	ECS FIRST PRODUCT CONVEYOR	36	28	7.5	250
3	NC12	ECS SECOND PRODUCT CONVEYOR	36	25	7.5	250
	NC13	ISS PRODUCT CONVEYOR	36	35	7.5	250
	NC14	ISS FIRST TRASH CONVEYOR	48	46	7.5	250
4	NC15	ISS SECOND TRASH CONVEYOR	48	40	7.5	250
	NC16	ISS FEED CONVEYOR	48	21	7.5	250
5	NC17	FINES TMP WASTE CONVEYOR	24	15	3	250

VIBRATORY CONVEYORS

	ITEM	DESCRIPTION	WIDTH	LENGTH	HP1	HP2
	V1	BATCH FEEDER	48	244"	6	6
	V2	SMALL FRACTION ECS FEED	53	96"	3	3
4	V3	FINES FRACTION ECS FEED – BY CUSTOMER	43	96"	2	2
	V4	MEDIUM FRACTION ECS FEED	56	96"	3	3
	V5	LARGE FRACTION ECS FEED	56	96"	3	3
4	V6	ISS FEED	90	96"	5	5

ACE METALS – ALBUQUERQUE, NM

NO.	REVISION	DATE	BY
01	RELEASE FOR PROPOSAL	06/02/10	JA
02	HP WAS 10, ECS WAS 2M	06/14/10	JA
03	ECS UNITS WERE 80", ADDED NC12	09/20/10	JA
04	ADDED BIVI-TEC & FINES ECS, RECONFIGURED PLANT	10/04/10	JA
05	ADDED TMP, INCREASED HEIGHT OF NC 15	10/04/10	JA

EST WEIGHT: – lbs

TOLERANCES UNLESS OTHERWISE SPECIFIED

THIRD ANGLE PROJECTION

ALL DIMENSIONS IN INCHES

Fractional =±1/16
Fract. Mach'd =±1/64
Angle =±1°
.X = .020
.XX = .010
.XXX = .005
√ = RMS MICROINCHES

metso

METSO MINERALS INDUSTRIES, INC.
TEXAS SHREDDER
11451 JONES MALTSBERGER
SAN ANTONIO, TEXAS 78216

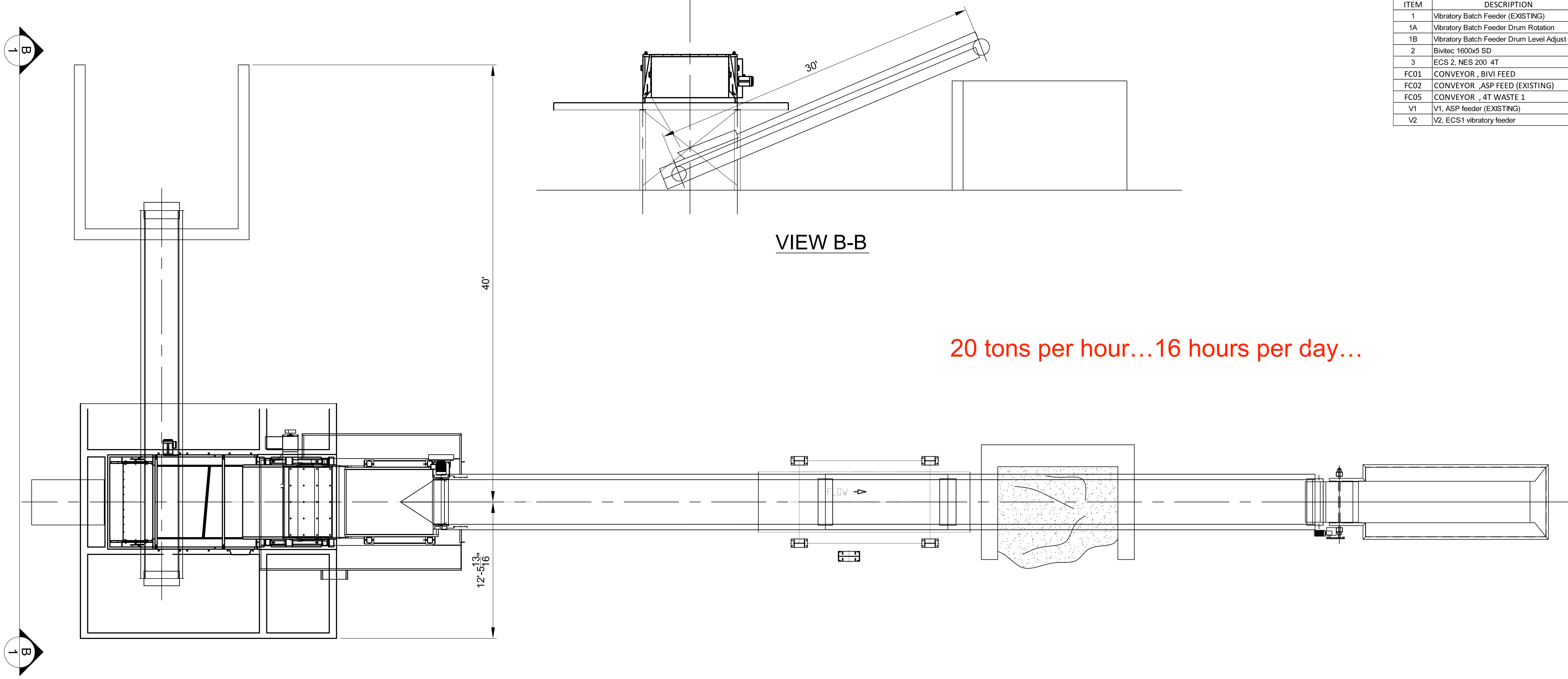
TITLE
NON FERROUS PLANT LAYOUT
TRIPLE ECS, DUAL SENSOR SORTER

DATE	SCALE	DRAWN BY:
06/01/2010	1/16" = 1'-0"	JA

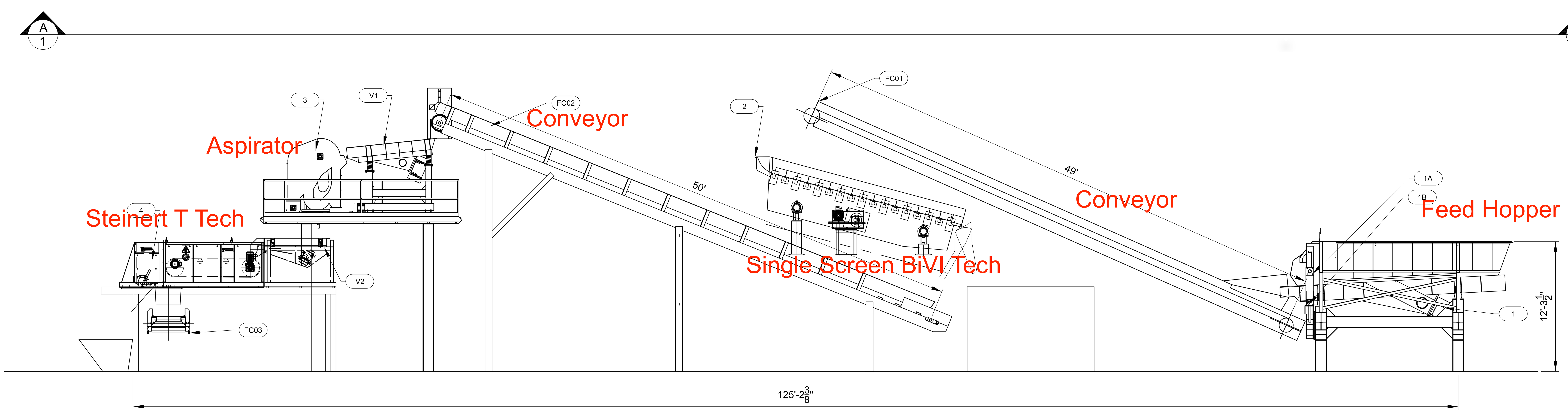
SHEET	DRAWING NO.	REV.
1 of 1	MR0001649-000	05

AUTOCAD D+

ITEM	DESCRIPTION	W	L	HP1	HP2	HP3	NOTES
1	Vibratory Batch Feeder (EXISTING)			4.0	4.0		VFD for feed rate control
1A	Vibratory Batch Feeder Drum Rotation			1.0			
1B	Vibratory Batch Feeder Drum Level Adjust			0.5			
2	Bivitec 1600x5 SD			15.0			7/16 HOLES
3	ECS 2, NES 200 4T						50 AMP FEED
FC01	CONVEYOR , BIVI FEED	48	49	7.5			
FC02	CONVEYOR ,ASP FEED (EXISTING)	48	50	7.5			
FC05	CONVEYOR , 4T WASTE 1	30	30	5.0			
V1	V1, ASP feeder (EXISTING)			2.0	2.0		
V2	V2, ECS1 vibratory feeder						Included in item 5 panel



VIEW B-B



VIEW A-A

REVISIONS		
Date	Description	Approved

FINES ECS PROCESS LINE PLANT LAYOUT	Designed 2016/01/30 Drawn - Checked -	Project ALBUQUERQUE METALS ALBUQUERQUE, NM
THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION THAT CANNOT BE REPRODUCED OR DIVULGED, IN WHOLE OR IN PART, WITHOUT WRITTEN AUTHORIZATION	Scale AS NOTED Sheet 1 of 1	Drawing No. 10383 Rev 01

Attachment 7

Shredder Specifications from Manufacturer

Metso Minerals Industries, Inc. - Texas Shredder
is pleased to present

ALBUQUERQUE METALS RECYCLING, INC.

Albuquerque, NM

With the following proposal

98/104 Damp Shredding Plant and Ferrous Downstream

EQUIPMENT SPECIFICATIONS

PART 1: INFEED CONVEYOR – 115 FT.

The Texas Shredder Infeed Conveyor is a heavy-duty steel track conveyor. The conveyor is built using wide flange beams, I-Beams, rectangular tubing, heavy channel, heavy angle and ½ inch plate skirting. Two load-impact rails run the full length of the conveyor. The conveyor has a 20-foot horizontal loading section at the base of the conveyor and a 10-foot horizontal section at the head of the conveyor. The under carriage is constructed with Heavy Duty Caterpillar D4 components or their equivalent. The conveyor will be powered by one (1) Hagglund's CA210 Hydrostatic drive. The height of the sides of the conveyor is approx. 37 inches above the moving flights.

Technical Specifications

Head shaft height	Approx. 31 feet
Tail shaft height	Approx. 10 feet
Length	Approx. 115 feet
Working width	93 inches
Hydraulic motors	(1) Hagglunds CA210
Power unit	75 hp, with oil cooler
Under carriage	Caterpillar D4 or equivalent rollers
Roller	5 inch oversize
Tracks	1/2 inch Triple grouser, straight
Chain	D-4 Heavy Duty
Paint color	Metso Recycle Blue (standard)
Total weight	Approx. 90 tons

NOTE: Press-tool for connecting chain sections is included on a loaner basis.

PART 2: 98/104 HEAVY SERVICE DUAL DISCHARGE SHREDDER/FEED CHUTE

This Shredder is designed to process a wide variety of materials in an efficient manner. The shredder will process whole or flattened cars complete without gas tanks, miscellaneous loose appliances and a wide range of #2 and light #1 scrap with a maximum thickness of ½ inch.

ITEM 2.1: Feed Chute/Double Feedroll with Hydraulic System

The infeed chute is constructed of heavy service I-beam for the vertical columns, heavy wall square tubing for most of the horizontal beams, and large reinforced I-beams for the base. The 35 degree chute surface is made of 1 inch and 2 inch plate. A wear resistant plate is supplied below the feed rollers. The re-enforced sides include a removable safety curtain.

Technical Specifications

Overall width	130 inches
Working width	98 inches
Paint color	Metso Recycle Blue (standard)
Weight (chute only w/guards)	Approx. 24 tons

The double feedroll yoke is constructed of ½ inch and 1 inch box-section plate with internal ribs. The pivot pins fit into pivot boxes, located on the feed chute, with lubricated bushings. The 36 inch diameter drums are made of 2 inch steel with two internal gussets plus the outside plates. The alloy shafts (4140) have 7 3/16 inch journals with flanged roller bearings. The sprockets are held in place with B-Locs and use heavy-duty double #200 chain (one side only). Both rollers have staggered bars and end flanges.

The rollers are driven by two Hagglund's CA210 hydraulic motors that are powered by a Denison Gold Cup power unit with an automatic or manually controlled variable speed.

Technical Specifications

Upper roll	36 inch diameter
Lower roll	36 inch diameter
Weight	Approx. 23 tons with motors & shields
Motor	(2 ea.) Hagglund's CA210
Power unit	with oil cooler
Reservoir capacity	100 gallons
Motor	150 HP
Pump	Denison Gold Cup (P14P)
Speed Variable to approx. 15 RPM	
Dimensions 69" wide x 85" long x 63" high	
Operating pressures	5000 psi (max)
Paint color	Metso Recycle Blue (standard)

NOTE 1: Roller shafts between ends of rollers and bearings to be protected with ½ inch stainless steel.

NOTE 2: Chain guard for the #200 chain drive included.

ITEM 2.2: Base Section with New Generation Grate Design

The base section is constructed primarily from 4 inch A36 plate, with the anvil seat being 6 inches. All areas subject to high wear or subject to great stress are reinforced to withstand the rigors of processing a wide range of feedstock. All internal wear areas are lined with either cast bolt-in manganese liners or with plug welded wear resistant AR liners, as is appropriate. All castings for Base Section are included and shipped loose.

Technical Specifications

Paint color	Metso Recycle Blue (standard)
Weight	Approx. 54 tons without castings

ITEM 2.3: Mid-Section With "Drop-In" Front Wall

The mid-section is constructed primarily from 4-inch A36 MS plate. All areas subject to high wear or subject to great stress are reinforced to withstand the rigors of processing a wide range of feedstock. The front wall design utilizes "drop-in" castings which are hung from shafts supported on both ends by the sidewall. All castings are included and shipped loose.

Technical Specifications

Paint color	Metso Recycle Blue (standard)
Weight	Approx. 27 tons without castings

ITEM 2.4: Deflector Box

The deflector box is constructed from 1½ inch A36 MS plate. The wear surfaces are lined with cast manganese bolt-in liners. The structure is reinforced to resist distortions resulting from normal operations as well as extraordinary occurrences such as explosions. All castings for Deflector Box are included.

Technical Specifications

Paint color	Metso Recycle Blue (standard)
Weight	Approx. 12.5 tons without castings

ITEM 2.5: Discharge Hopper

The discharge hopper is made of 1 inch A36 steel and is lined with 1 1/2 inch thick bolt-in manganese liners. The side mounting plates are welded to the shredder subframe for ease of installation of the shredder base. Rubber skirting around the sides ensures a good fit to the discharge vibrator. The discharge end has heavy duty weighted rubber flaps for safety.

Technical Specifications

Paint color	Metso Recycle Blue (standard)
Weight	Approx. 3.5 tons without castings

(This unit is shipped disassembled.)

ITEM 2.6: Rotor Assembly – "No Weld"

The Texas Shredder rotors are made with a quality forging electric furnace 4340 shaft, which is certified as to soundness, chemistry and hardness. The discs will be made from T1 alloy plate exclusively for Texas Shredder. The center discs are 4 inches thick; the end discs are 4¾ inches thick and are capped.

Technical Specifications

Rotor type	DISC (2) end discs and 8 center discs
Hammer swing	98 inches
Rotating weight	Approx. 42 tons
Pin Shafts	(6 ea.) 4⅞ inch dia. x 101 inch
Shaft	4340 alloy steel forging
Hammers	Approx. 465 lbs. each
Pin protectors	Approx. 363 lbs. each
Bearing type	Spherical self-aligning tapered bore
Bearing size	380 mm SKF
Bearing housing	Cast steel
Bearing recirculation unit	with oil cooler
Capacity	60 gallons
pump (2 ea.)	Gear flow rate variable (max 1.0 gallons/minute)
motor (2 ea.)	1 hp

ITEM 2.7: Vibration Suppression System and Sub-Frame

The vibration suppression system consists of a sub-frame mount for both the feed chute and the mill and Metso vibration dampening “spring” assemblies. The system allows the mill to absorb virtually all the vibration while controlling the movement of the shredder (nominally under 1 inch). The spring units are easily positioned and kept in place with welded "keeper bars".

Technical Specifications

Total weight (sub-frame & springs)	Approx. 31 tons

ITEM 2.8: Primary Hydraulic System

The Primary Hydraulic System is designed to operate the hydraulic cylinders on the shredder as well as the hydraulic pin puller cylinder. Included in the system are the hydraulic cylinders for the reject door (2 ea.) mill tilt (2 ea.), feedroll lift (2 ea.) and pin puller (1 ea.), and deflector box (2 ea.).

Technical Specifications

Reservoir	150 gallons with oil cooler
Electric Motor	75 hp
Reject door cylinder	6 x 18 inches
Mill tilt cylinder	10 x 45 inches
Feedroll lift cylinder	7 x 42 inches
Pin puller cylinder	7 x 110 inches
Operating pressures	2000-3000 psi (max)
Deflector Box Lift Cylinder	6 x 28 inches

ITEM 2.9: Driveshaft

The rotor and the electric motor are coupled by means of a driveshaft. The driveshaft provided is the proper speed for the motor. It is a flange unit with constant velocity universal joints at each end and a splined joint mid section. Rotor coupling and drive shaft guard are also provided.

Technical Specifications

Mid-spline length	98 inches
Weight	Approx. 1.8 tons

ITEM 2.10: Mill Discharge Vibrator

The mill discharge vibrator carries the shredded scrap from beneath the shredder to the Primary Transfer Conveyor. This vibrator is of extra heavy-duty construction. A mill discharge hood is provided. See optional equipment for drive side catwalk.

Technical Specifications

Length	Approx. 17 feet
Width	Approx. 69 inches
Capacity	200 tph
Drive	2 x 10 hp
Paint color	Metso Recycle Blue (standard)
Weight	Approx. 12 tons

ITEM 2.11: Pin Puller/Platform

The hydraulic pin puller is designed to facilitate the removal and changing of hammer pin shafts, hammers, and pin protectors. Included are the support structure, walkways and stairway. Hydraulic manipulations are achieved through remote valves on the pin puller platform.

Technical Specifications

Length	Approx. 15 feet
Width	Approx.12 feet
Weight	Total approx. 4.5 tons
Height	Shipped disassembled
Paint color	Metso Recycle Blue (standard)

ITEM 2.12: Mill Water Injection System

The mill water injection system works to control dust, smoke and fire in the shredder by injection a known volume of water (average approx. 5 gallons per ton) into the rotor chamber, which will effect good distribution along with good evaporation so that the minimum amount required is delivered.

The basic system is PLC controlled and the injection/fire pump operate only on the receipt of a healthy signal from the shredder. The flow of water will be dependent on the loadings of the main drive motor and preset limits. There is one pump, which In the event of a fire, will be brought up to full speed.

PART 3: FERROUS CONVEYING AND CLEANING SYSTEM

The conveying and cleaning systems' function is to transport the shredded materials away from the shredder and process, clean, and separate the aggregate product into its various component parts. This particular conveying and cleaning system is designed to process an average output flow of 100-150 net tons per hour. To be effective it is necessary that the system be able to handle surges of up to 200 tons per hour. The previously stated rates of production refer to finished ferrous product.

ITEM 3.1: First Transfer Conveyor

The First Transfer Conveyor is a heavy-duty semi-flat conveyor, which transports the shredded material from the undermill vibrator (included) to the First Ferrous Separation Unit. The conveyor is of a heavy channel construction and includes a feed hopper, supports, and a stainless steel head pulley. The conveyor uses a semi-flat picking idler which has pre-lubricated bearings, and includes all guards, motors, gear reducers, etc. The conveyor is preassembled in the factory with all components and then disassembled, if required, to facilitate shipment.

Technical Specifications

Conveyor Type	Semi-flat
Length	Approx. 40 feet
Width	72 inches
Belt	HD 3 ply
Electric motor	20 hp
Belt speed	Approx. 220 FPM
Head pulley	Stainless
Paint color	Metso Recycle Blue (standard)

ITEM 3.2: Ferrous Separation Unit with SGM 6084 Drum Magnet

This unit consists of a heavy-duty support structure for the drum magnet and both ferrous and non-ferrous (residue plus fluff) fractions. There are walkways with handrails and stairways on both sides.

The magnet is a high-powered electro drum magnet, which picks up the ferrous (frag) material and throws it over to the second transfer conveyor. The non-ferrous fraction goes under the magnet to the primary non-ferrous conveyor. It is driven by chain from a gearbox with a v-belt-coupled electric motor.

Technical Specification

Diameter	60 inches
Width	84 inches
Rectifier	Approx. 14 KW
Drive	20 hp

ITEM 3.3: Second Transfer Ferrous Conveyor (60 inches)

The Z-Box conveyor receives the material from the magnet and transfers it to the Z-Box. The conveyor is of a heavy channel construction and includes all necessary hoppers, walkways, inspection/service platforms and stairs and/or ladders. The conveyor idlers have lubricated bearings, the conveyor includes all guards, motors, gear reducers, etc. The conveyor is pre-assembled in the factory with all components and then disassembled only to facilitate shipment.

Technical Specifications

Type	Semi-flat
Length	55 feet
Width	60 inches
Belt	3 ply
Electric motor	20 hp
Belt speed	Approx. 380 FPM
Paint color	Metso Recycle Blue (standard)

ITEM 3.4: Model 60 Z-Box

The Z-Box separates light debris from the ferrous material that is still entangled in the metal stream. The material drops through the Z-box which is supplied with an air stream to remove the light debris and carry it to the customer provided cyclone separator. The Z-box has replaceable liners is high wear areas. The ducting required to connect the Z-box to the customer's cyclone is supplied with this proposal.

Technical Specifications

Paint color	Metso Recycle Blue (standard)

ITEM 3.5: Sorting Conveyor with Platform

The ferrous sorting conveyor is a heavy-duty semi-flat conveyor that transports the ferrous portion of the shredded material from the magnets to the ferrous stacking conveyor. On this conveyor there are picking stations (weather protection by client) where any miscellaneous trash and unwanted metallics (principally copper bearing materials) are retrieved. The conveyor is of a heavy channel construction and includes a feed hopper and supports. The conveyor idlers have pre-lubricated bearings and include all guards, motors, gear reducers, etc. The conveyor is pre-assembled in the factory with all components and then disassembled, if required, to facilitate shipment.

Technical Specifications

Type	Semi-flat with picking stations
Length	40 feet
Width	54 inches
Belt	HD 3 ply
Electric motor	20 hp
Belt speed	125 FPM
Paint color	Metso Recycle Blue (standard)

ITEM 3.6: Ferrous Radial Stacking Conveyor

The Ferrous Radial Stacking Conveyor is a heavy duty troughing conveyor, which transports the ferrous portion of the shredded material from the Stacker Shuttle Conveyor to the ferrous finished product stockpile. The conveyor is of a heavy channel construction and includes a feed hopper and supports. The conveyor uses 35 degree troughing idlers, which have pre-lubricated bearings, the conveyor includes all guards, motors, gear reducers, etc. The conveyor is supplied with a walkway on one side and is preassembled in the factory with all components and then disassembled, if required, to facilitate shipment.

Technical Specifications

Type	Radial stacking 35 degree troughing
Length	80 feet
Width	48 inches
Belt	HD 3 ply
Electric motor	20 hp
Belt speed	Approx. 350 FPM
Carriage drive	2 hp
Paint color	Metso Recycle Blue (standard)

ITEM 3.7: First Non-Ferrous Conveyor & Positioned Chute

The Primary Non-Ferrous Conveyor is a heavy-duty semi-flat conveyor that transports the non-ferrous portion of the shredded material from the magnet and to the non-ferrous stockpile via a positioned chute. The conveyor is of a heavy channel construction and includes a feed hopper and supports. The conveyor uses picking idlers, which have pre-lubricated bearings, and includes all guards, motors, gear reducers, etc. The conveyor is preassembled in the factory with all components and then disassembled, if required, to facilitate shipment. Impact bars are installed in the feed hopper area.

Technical Specifications

Type	Semi-flat
Length	Approx. 40 feet
Width	48 inches
Belt	3 ply
Electric motor	10 hp
Belt speed	Approx. 250 FPM
Paint color	Metso Recycle Blue (standard)

ITEM 3.8: Ferrous Recovery Conveyor

The Ferrous Recovery Conveyor is designed to recover tramp ferrous pieces not collected by the drum magnets. The conveyor is positioned in line and above the primary non-ferrous belt where a magnetic tail pulley catches the ferrous material and returns it to the ferrous product stream. The idlers have pre-lubricated sealed bearings. The conveyor is of a heavy channel construction and includes drive, guards, etc.

Technical Specifications

Type	Semi-flat
Length	26½ feet
Width	48 inches
Belt	HD 3 ply
Electric motor	7.5 hp
Belt speed	Approx. 250 FPM
Tail pulley	24 inch dia. permanent magnet
Paint color	Metso Recycle Blue (standard)

PART 4: SHREDDER ELECTRICAL & CONTROL SYSTEMS

The scope of this project is to be limited to power and controls engineering for the shredder plant to including the following:

ITEM 4.1: Engineering and Design

The following engineering and design drawings will be provided:

1. PLC I/O layout and Schematics.
2. Low-voltage power one-line diagrams.
3. Ferrous Motor Control Center
4. Hydraulic Motor Control Center.
5. Main shredder PLC control panel.
6. Operator chair control.
7. As-built drawings as required for items listed above.

ITEM 4.2: PLC Programming and HMI Development

The following programming services for this project will be provided:

1. PLC programming to control motors per this proposal. Program will provide for automatic startup/shutdown sequencing and manual control.
2. HMI development for the Control Chair.

ITEM 4.3: Ferrous/Hydraulic Motor Control Center

One ferrous motor control center will be fabricated. General specifications include 480V, 3 Phase, 60 Hertz, with an Interrupting Capacity of 65Ka, NEMA 12 Rating, and shall have a UL845 listing.

ITEM 4.4: Main Shredder PLC Control Panel

The Main PLC control panel is to utilize all UL listed components and be constructed within a NEMA 12 steel enclosure, and shall have a UL508a listing.

ITEM 4.5: Operator Chair and Control Panel

The operator control chair is to provide easily accessible controls for the operation of the shredder installation. The chair will be provided with height and rake adjustment, having a side pod mounted to either side of the operator as well as an adjustable arm for holding the operator touch screen, and will incorporate a Heavy duty gated joystick with top mounted pushbutton. At a minimum, the following controls and meters will be provided on the chair:

1. Infeed conveyor forward
2. Infeed conveyor reverse
3. Reject door open
4. Reject door close
5. Infeed conveyor jog
6. DFR forward
7. DFR reverse
8. Yoke raise
9. Yoke lower
10. Yoke squash enable
11. Main motor AMP meter (provided by others)
12. Main motor RPM meter (provided by others)
13. Shredder mode selector switch

ITEM 4.6: Remote Maintenance Control Panels

ITEM 3 .6.1: Engineering and Design

The following engineering and design drawings will be provided:

1. Magnet stand operator panel drawings with detailed BOM.
2. Picking station operator panel drawings with detailed BOM.
3. As-built drawings as required for items listed above.

ITEM 4.6.2: Magnet Stand Operator Panel

The Magnet Stand control panel utilizes all UL listed components and is constructed within a steel enclosure. The Magnet Stand control panel does require a Flex I/O rack with Ethernet communications. Remote control for conveyors in the magnet stand area for maintenance and off-line operation.

ITEM 4.6.3: Picking Station Operator Panel

The Picking Station control panel includes all UL listed components and is constructed within a steel enclosure. The Picking Station control panel includes one Flex I/O rack with Ethernet communications. Remote control for conveyors in the picking area for maintenance and off-line operation.

ITEM 4.7: Documentation

The Operation and Maintenance Manual (OM&M) includes the following items:

1. Sequence of operations.
2. Annotated program listings.
3. Complete set of drawings.

ITEM 4.8: Control House

The control house is 8 feet deep, 10 feet wide (viewing toward the shredder) and 7 feet tall with all dimensions being approximate. The control house is a packaged unit which is set in place on an existing power building, supplied by the customer. The control house should be elevated to a point that material going into the shredder is visible through the front window. The loading area should also be visible through one side window and the downstream through the other. The unit is supplied with two lifting eyes for mounting purposes. One door is supplied on the control house and is located on the back side of the building. The heating, ventilation and air conditioning unit (HVAC) is also located on the back wall of the unit and will require fresh air for heat exchange and air intake. The control house is pre-wired for HVAC, lighting and wall sockets. It is primed and painted. The customer is responsible for mounting the control house to the power building.

Technical Specifications

Height	8 feet, nominal
Width	10 feet, nominal
Depth	8 feet, nominal
Lift eyes	2 supplied
Floor	Diamond plate steel, painted
Windows	1/2" thick, tinted Lexan with inside crossbar
Door	one with locking hardware
Walls	1" thick black vinyl covered sound suppression material
Lights	2 overhead fluorescents, wrapped lenses

<u>Attachment 8</u>

Operations and Maintenance (O&M) Plan for Cyclone

ALBUQUERQUE METALS RECYCLING, INC.

OPERATION AND MAINTENANCE (O&M) PLAN

For Cyclone / Z-Box

Revised: July 15, 2015

I) GENERAL INFORMATION

Business Name: Albuquerque Metals Recycling, Inc.

Business Address: 3339 Second Street SW
Albuquerque, NM 87105

Permit Number: 1529 – M2 (modification pending)

Date of Preparation/ Revision: July 15, 2015

General description of overall facility operations:

Albuquerque Metals Recycling (AMR) operates a metal shredding facility which accepts scrap metal from local businesses and the general public. The scrap metal is sorted on site and then shredded and compacted for resale.

Description of process(es) ducted to control device(s) including pollutants controlled:

The shredder equipment includes a Z-box/cyclone separator system to control dust emissions during high velocity air sorting of ferrous metal.

The general flow of the material occurs as follows:

1. Material is treated with water as it passes through the shredder.
2. After shredding, a primary magnetic separator divides the relatively clean ferrous stream from the non-magnetic fraction (non-ferrous metals such as aluminum, copper, brass, zinc, etc.) and not-metallic shredder fluff (wood, plastic, rubber, foam, fabric, dirt, etc.).
3. The ferrous fraction passes through a closed loop air classifying system (Z-Box / Cyclone), which separates the heavy fraction (metal) from the light fraction (fabric, entangled carpet, and rubber). The closed loop air classifying system in the Z-Box/Cyclone is the only ducted control device in the shredding process, and includes a small bleed-off duct to maintain negative pressure within the system.

Operation Summary:

Unclean shredded ferrous residue is transported on belt conveyor to required elevation at cascade inlet.

Residue passes through balanced air in-feed gate and into the "double cut" cascade cleaning chamber (i.e., Z-Box). The material's path causes a reverse air stream to intersect the material two times in the chamber. The light fraction of residue (paper, wood, plastic, dirt, etc.) is lifted out of the top of the cascade cleaning chamber, while the heavy fraction (metals) is discharged to the AMR's downstream conveyor for further manual separation.

The light waste fraction is pneumatically conveyed through abrasive resistant steel ducting to a high efficiency cyclone which discharges almost all material through a rotary airlock to AMR's waste handling equipment (conveyor, tote bin, stockpile, etc.).

A small amount of dust remaining in the air stream is then conveyed from cyclone through standard ducting to inlet of fan. Air is then discharged from fan to lower entry area of cascade cleaning chamber, thus completing "closed loop" circuit (and taking any remaining dust back into material flow for additional separation by agglomeration).

Any leakage in or out of the cascade cleaning chamber is balanced out by allowing the same percentage of air to be bled off through a discharge stack to atmosphere (typically, 5% of total volume). The bleed off gate is positioned in a "quiet zone" just after the fan discharge. The fan centrifugal force causes any particulate present in the air stream to be transported away from the gate. This results in a very low amount of particulate escaping to atmosphere.

Velocity through cascade cleaning chamber and, in turn, "cut point" of heavy vs. light fraction adjusted by small "closed loop" bypass duct with flow control valve.

With typical process material, you can expect ferrous quality, after magnetic separation, to be + 99% by weight.

Complete description of control device(s) covered by the O&M plan:

Control Device	Manufacturer	Model	Capacity	Quantity
Cyclone / Z-Box system	Metso	10'6"	60,000 CFM	1

II) OPERATING PLAN

Operating parameters for control devices are to be monitored as follows:

Device	Operating Parameter	Unit of Measure	Operating Limit	Recording Frequency	Record Method	Instrument Type	Display Range
Cyclone / Z-Box	Visible Emissions (VE)	N/A	N/A	Weekly	VE Observation or EPA Method 22	Visual	N/A
	Opacity	%	0-20	Once Per Year	EPA Method 9	Visual	N/A

IV) MAINTENANCE PLAN

Maintenance procedures (inspections, cleanings, lubrications, adjustments, replacements, instrumentation calibrations, etc.) shall be performed on a routine basis to ensure the equipment remains in peak operating condition. A summary of maintenance requirements are included below. Actual maintenance checklists and forms are included in Appendix A of this O&M plan.

Device	Procedure	Frequency
Cyclone / Z-Box	Inspect for exterior damage – repair as necessary	Weekly
	Inspect fan and fan motor – clean as required	Weekly
	Inspect inlet ductwork for blockage – clear as required	Weekly
	Inspect rotary air lock – clean as required	Weekly
	Inspect Z-box for blockage – clear as required	Weekly
	Inspect exterior for dust build-up – clean as required	Weekly
	Inspect center tube for build-up – clean as required	monthly
	Inspect all ductwork for build-up	monthly
	Inspect Z-box for build-up – clean as required	monthly
	Inspect valves / dampers for build-up – clean as required	monthly
	Inspect fan belts – adjust and replace as necessary	monthly
	Pressure wash duct work	annually

IV) ADDITIONAL INFORMATION

Air Quality training will be provided, as needed.

APPENDIX A

Business Name: Albuquerque Metals Recycling, Inc.
Equipment Identification: O & M Plan Shredder Plant
Revision Date: July 2015

CYCLONE VISIBLE EMISSIONS
WEEKLY OPERATIONS LOG SHEET

MONTH ________________________

PARAMETER	LIMITS	READINGS						
		______	______	______	______	______	______	______
Visible emissions present at outlet?	Y / N	______	______	______	______	______	______	______
Other visible emissions?	Y / N	______	______	______	______	______	______	______
Date		______	______	______	______	______	______	______
Time		______	______	______	______	______	______	______
Operator		______	______	______	______	______	______	______

COMMENTS (INCLUDING CORRECTIVE ACTION TAKEN): ____

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Business Name: Albuquerque Metals Recycling, Inc.
Equipment Identification: O & M Plan Shredder Plant
Revision Date: July 2015

CYCLONE
WEEKLY PREVENTATIVE MAINTENANCE CHECKLIST

DATE: ____________________ **TECHNICIAN:** ____________________________

WEEKLY PROCEDURES:	RESULTS	ACTION TAKEN
Inspect for exterior damage		
Inspect fan / fan motor		
Inspect inlet ductwork for blockage		
Inspect rotary air lock for blockage		
Inspect Z-Box for blockage		
Inspect exterior for dust build-up		

COMMENTS: ____

CYCLONE
MONTHLY PREVENTATIVE MAINTENANCE CHECKLIST

DATE: ____________________ **TECHNICIAN:** ____________________

MONTHLY PROCEDURES:	RESULTS	ACTION TAKEN
Inspect center tube for build-up		
Inspect all ductwork for build-up		
Inspect Z-Box for build-up		
Inspect valves / dampers for build-up		
Inspect Fan Belts		

COMMENTS: ____________________

Business Name: Albuquerque Metals Recycling, Inc.
Equipment Identification: O & M Plan Shredder Plant
Revision Date: July 2015

FUGITIVE OR SMOKE EMISSION INSPECTION (EPA METHOD 22)

Date	Company	Location
Company Rep.	Observer/Affiliation	
Sky Conditions Precipitation	Wind Direction Wind Speed	Industry Process Unit

Sketch process unit: indicate observer position relative to source; indicate potential emission points and/or actual emission points.

Observations:	CLOCK TIME	Observation period duration, min:sec	Accumulated Emission time, min:sec
BEGIN OBSERVATION			
END OBSERVATION			

Attachment 9

EPA TANKS 4.0.9d
Emission Loss Calculations for a Gasoline Tank

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification	
User Identification:	ABQ Metals - Horizontal Tank
City:	Albuquerque
State:	New Mexico
Company:	Albuquerque Metals
Type of Tank:	Horizontal Tank
Description:	
Tank Dimensions	
Shell Length (ft):	5.00
Diameter (ft):	3.42
Volume (gallons):	308.59
Turnovers:	12.00
Net Throughput(gal/yr):	3,703.08
Is Tank Heated (y/n):	N
Is Tank Underground (y/n):	N
Paint Characteristics	
Shell Color/Shade:	White/White
Shell Condition	Good
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.03

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

ABQ Metals - Horizontal Tank - Horizontal Tank
Albuquerque, New Mexico

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 10)	All	58.54	51.41	65.66	56.17	5.0402	4.3776	5.7809	66.0000			92.00	Option 4: RVP=10, ASTM Slope=3

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

ABQ Metals - Horizontal Tank - Horizontal Tank
Albuquerque, New Mexico

Annual Emission Calcaulations	
Standing Losses (lb):	106.9564
Vapor Space Volume (cu ft):	29.2558
Vapor Density (lb/cu ft):	0.0598
Vapor Space Expansion Factor:	0.2439
Vented Vapor Saturation Factor:	0.6864
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	29.2558
Tank Diameter (ft):	3.4200
Effective Diameter (ft):	4.6673
Vapor Space Outage (ft):	1.7100
Tank Shell Length (ft):	5.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0598
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.0402
Daily Avg. Liquid Surface Temp. (deg. R):	518.2062
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	515.8442
Tank Paint Solar Absorptance (Shell):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.2439
Daily Vapor Temperature Range (deg. R):	28.5089
Daily Vapor Pressure Range (psia):	1.4033
Breather Vent Press. Setting Range(psia):	0.0600
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.0402
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.3776
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.7809
Daily Avg. Liquid Surface Temp. (deg R):	518.2062
Daily Min. Liquid Surface Temp. (deg R):	511.0790
Daily Max. Liquid Surface Temp. (deg R):	525.3334
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.6864
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	5.0402
Vapor Space Outage (ft):	1.7100
Working Losses (lb):	29.3295
Vapor Molecular Weight (lb/lb-mole):	66.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.0402
Annual Net Throughput (gal/yr.):	3,703.0800
Annual Turnovers:	12.0000
Turnover Factor:	1.0000
Tank Diameter (ft):	3.4200
Working Loss Product Factor:	1.0000
Total Losses (lb):	136.2858

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

ABQ Metals - Horizontal Tank - Horizontal Tank
Albuquerque, New Mexico

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gasoline (RVP 10)	29.33	106.96	136.29