Compliance Assurance Monitoring Plan (S-ENV-4464_Rev. A)

Compliance Assurance Monitoring Plan
East Jordan Foundry, LLC
Elmira, Michigan

By
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For
East Jordan Foundry, LLC
2675 N US 131
Elmira, Michigan

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Revisions to CAM Plan

Date	Description
November 04, 2019, Rev. A	Initial issuance of plan.

List of Acronyms

CAM	Compliance assurance monitoring
CD	Control Device
CFR	Code of Federal Regulations
CMS	Continuous monitoring system
CO	Carbon Monoxide
DRE	Destruction efficiency
EJ Foundry	East Jordan Foundry
EU	Emission Unit
FR	Federal Register
HAP	Hazardous Air Pollutant
IA	Insignificant Activity
Inches w. g.	Inches of Water, Gauge Pressure
MACT	Maximum Achievable Control Technology
MPAP	Malfunction, Prevention and Abatement Plan
NSPS	New Source Performance Standards
PM	Particulate Matter
PPMVd	Parts per million, by volume, on a dry basis
PPMVw	Parts per million, by volume, on a wet basis
PS	Performance Specification
PSEU	Pollutant-specific emission unit
QA/QC	Quality Assurance/Quality Control
QIP	Quality Improvement Plan
SCFM	Standard cubic feet per minute
SV	Stack / Vent
TEA	Triethylamine
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound

1.0 Introduction

East Jordan Foundry, LLC (EJF) located in Elmira, Michigan operates a gray iron foundry and is subject to the requirements identified in Air Permit to Install (PTI) 185-16A. Emission units identified within the PTI are described in the Tables.

EJF is a "major source" subject to the requirement to obtain a Part 70 permit. Per 40 CFR 64.2(a), a facility subject to Part 70 air permitting requirements is subject to Compliance Assurance Monitoring (CAM) requirements if certain criteria as will be discussed in Section 2.0 are met.

This Compliance Assurance Monitoring (CAM) Plan addresses the requirements of 40 CFR Part 64 and satisfies the CAM requirements for EJF.

2.0 CAM Applicability

Per 40 CFR 64.2(a), the CAM requirement applies to each pollutant-specific emission unit (PSEU) at a major source that is required to obtain a part 70 permit if the unit satisfies all of the following criteria [and is not exempted by the rule or have emissions limitations or standards not exempted by the rule]:

- The unit is subject to an emissions limitation or standard for the applicable regulated air pollutant;
- The unit uses a control device to achieve compliance with any such emission limitation or standard; and
- The unit has "potential pre-control device emissions" of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

Potential Pre-Control Device Emissions

Of special importance to the above, is the definition of "potential pre-control device emissions." Per Part 64, this shall have the same meaning as "potential to emit" as defined in Title V regulations except the emission reduction achieved by the applicable control device shall not be taken into account.

Potential to emit is defined in Part 70, the Title V regulations, as "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation is enforceable by the Administrator."

Potential Pre-Control Device emissions are provided in Appendix B.

CAA Section 112 Exemption

Part 64 CAM exemptions are related to rules or emissions limitations and not to specific equipment. The exemptions are available based on monitoring requirements in those rules or emissions limitations being inherently sufficient to provide assurance of compliance without the additional burden of CAM requirements. A specific exemption is provided for those PSEUs that are subject to Clean Air Act Section 111 or 112 standards promulgated after 11/15/1990 since those standards have been and will be designed with monitoring that provides a reasonable assurance of compliance.

The EJF facility is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Iron and Steel Foundries (40 CFR Part 63 Subpart ZZZZZ) which is also referred to as the Foundry Area Source Rule. The Foundry Area Source Rule was promulgated on January 2, 2008 and provides emission limits for metal hazardous air pollutants (HAP) or alternatively total particulate matter as a surrogate for total metal HAP for foundry melting operations. The Foundry Area Source Rule was a rule developed under CAA Section 112 following 11/15/1990 and any source regulated under that rule would be exempt from CAM.

Electric Induction Melting Furnaces operating under EGMELTING, consisting of EUEIF1, EUEIF2, EUEIF3, and EUEIF4, are exempted from the CAM requirements as these furnaces are subject to specific emission limits contained in the Foundry Area Source Rule since the standard have been designed with monitoring that provides a reasonable assurance of compliance. This exemption is somewhat of a moot point as shown by the calculations provided in Appendix B as the uncontrolled emissions from these furnaces are such that the potential pre-control emissions are less than 100 percent of the amount required for the furnaces to be classified as a major source.

Table 1 provided in Appendix A yields an emission unit by emission unit evaluation of CAM applicability. This evaluation is supported by the Potential Pre-Control Device Emissions quantified in Appendix B.

The results of the evaluation identified the following emission units as subject to CAM:

- EUDUCTINOC
- EULMLSO
- EU1230SO
- EUSHMM
- EUBLAST
- EUGRIND

3.0 CAM Plans

The CAM Plans for the emission units identified in Section 2.0 are provided in Tables 2 through 7 included in Appendix A.

Appendix A
Tables

TABLE 1

CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Flexible Group ID	Subject to an Emissions Limitation or Standard for the Applicable Regulated Air Pollutant (Y/N)?	Uses a Control Device to Achieve Compliance with any such Emission Limitation or Standard (Y/N)?	"Potential Pre-Control Device Emissions" of the Applicable Regulated Air Pollutant that are Equal to or Greater than 100 Percent of the Amount (in TPY), Required for a Source to be Classified as a Major Source (Y/N)?	CAM Applicable (Y/N)?
EUCHRGHAND	Charge Handling - The handling and storage of furnace charge material include internal returns (e.g. sprue, scrap), incoming scrap metal, alloy materials, inoculants, fluxes, etc.	FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUEIF1	Electric Induction Furnace Melting - Electric Induction Furnace (EIF) to melt and process charge material. Design holding capacity 11 tons	FGMELTING FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUEIF2	Electric Induction Furnace Melting - Electric Induction Furnace (EIF) to melt and process charge material. Design holding capacity 11 tons	FGMELTING FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUEIF3	Electric Induction Furnace Melting - Electric Induction Furnace (EIF) to melt and process charge material. Design holding capacity 11 tons	FGMELTING FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUEIF4	Electric Induction Furnace Melting - Electric Induction Furnace (EIF) to melt and process charge material. Design holding capacity 11 tons	FGMELTING FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUDUCTINOC	Ductile Inoculation - An addition of magnesium-based material to strengthen the metal when cast.	FGFACILITY FGMACTZZZZZ	Y	Y	Y	Y
EUMLTXFER	Hot Metal Transfer - The transfer of hot metal in a ladle (transfer ladle) from the electric induction furnaces to the pouring operations.	FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EULMLPC	Large Mold Line Pouring and Cooling - The pouring and subsequent cooling of molten metal cast in a sand mold on the Large Mold Line. The mold and casting is subsequently transferred to the LML Shakeout.	FGPOURCOOL FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EULMLSO	Large Mold Line Shakeout - The separation of mold and core sand from the casting. Sprue is subsequently transferred to Charge Handling, while mold and core sand is discharged to conveyors that are part of Sand Handling and Moldmaking.	FGSHAKEOUT FGFACILITY FGMACTZZZZZ	Y	Y	Y	Y
EU1230PC	1230 Line Pouring and Cooling -The pouring and subsequent cooling of molten metal cast in a sand mold on the 1230 Line. The mold and casting is subsequently transferred to 1230 Line Shakeout.	FGPOURCOOL FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EU1230SO	1230 Line Shakeout - The separation of mold and core sand from the casting. Sprue is subsequently transferred to Charge Handling, while mold and core sand is discharged to conveyors that are part of Sand Handling and Moldmaking.	FGSHAKEOUT FGFACILITY FGMACTZZZZZ	Y	Y	Y	Y
EUSHMM	Sand Handling and Moldmaking - Includes Moldmaking and application of mold release.	FGFACILITY FGMACTZZZZZ	Y	Y	Y	Y
EUBLAST	Shotblasting - Enclosed process for the removal of excess sand and metal from casting surface.	FGFACILITY FGMACTZZZZZ	Y	Y	Y	Y
EUGRIND	Grinding - Remove of unwanted metal at the mold parting lines and elsewhere.	FGFACILITY FGMACTZZZZZ	Y	Y	Y	Y
EUDIPTANK	Asphaltic Dip Tank - The application of a low-VOC coating to finished castings.	FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUPUNBCM	Phenolic Urethane No Bake (PUNB) Coremaking - After sand is heated to promote the reaction, a two-part resin system and a single liquid catalyst is mixed with the sand. After mixing the sand is distributed to the pattern. A release agent to promote core removal may be applied to the pattern prior to forming the core.	FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUSHELLCM	Shell Coremaking - Resin coated sand is fed to a pattern that is preheated and coated with a release agent. Heat from the pattern cures the sand mix into the desired shape.	FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUCOREWASH	Core Washing - The application of a VOC-containing refractory material (slurry) to the core. The core is subsequently ignited (i.e. lightoff) to dry and partially destroy the VOCs.	FGCORECHEM FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUCORERELEASE	Core Release - The application on an "as needed basis" of a material to promote the release of the core from the pattern.	FGCORECHEM FGFACILITY FGMACTZZZZZ	Y	N	N	N
EULDLREPAIR	Ladle Repair - The removal and replacement of ladle refractory used to protect the ladle from the heat of the molten metal.	FGFACILITY FGMACTZZZZZ	Y	Y	N	N
EUWASTESAND	Waste Sand Dust Handling - The removal and disposition of spent sand from the system.	FGFACILITY FGMACTZZZZZ	Y	N	N	N

Emission Unit ID	Emission Unit Description (Process Equipment & Control Devices)	Flexible Group ID	Subject to an Emissions Limitation or Standard for the Applicable Regulated Air Pollutant (Y/N)?	Uses a Control Device to Achieve Compliance with any such Emission Limitation or Standard (Y/N)?	"Potential Pre-Control Device Emissions" of the Applicable Regulated Air Pollutant that are Equal to or Greater than 100 Percent of the Amount (in TPY), Required for a Source to be Classified as a Major Source (Y/N)?	CAM Applicable (Y/N)?
EUMUAGEN	Makeup Air Units - Nine (9) natural-gas fired makeup air units with maximum rating of 10.4328 MMBtu/hr each. Two (2) natural gas fired makeup air units with maximum rating of 7.8246 MMBtu/hr each.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUHTRFDRYOFF	Foundry Office Heaters - Four (4) natural-gas fired units to provide heat to foundry offices with a maximum total rating of 0.600 MMBtu/hr.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUHTRSUPPOFF	Support Office Heaters - Natural-gas fired units to provide heat to shipping office, maintenance office, grinding office, melt lab, scale office, mold office, CMM, control room, sand lab and (2) local bathroom with a maximum total rating of 0.700 MMBtu/hr.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUHTROILBLD	Oil Building Heater - Natural-gas fired unit to provide heat to oil storage building with a maximum total rating of 0.350 MMBtu/hr.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUINFARED	Infrared heaters - Seven (7) infrared natural-gas heaters to provide heat to the building rated at 0.130 MMBtu/hr each.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUBOILERS	Hot Water Boilers - Four (4) natural-gas hot water heaters total. Two (2) heaters rated at a maximum of 1.0 MMBtu/hr and two (2) heaters rated at a maximum of 0.096 MMBtu/hr. All to provide hot water to showers, restrooms, kitchen, etc.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUFNCHEAT	Furnace Heaters - Four (4) natural-gas fired furnace heaters rated up to 2.0 MMBtu/hr to maintain environment when furnaces are not in use or as necessary.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EULDLHEAT	Ladle Preheaters - Three (3) natural-gas fired pedestal ladle heaters rated up to 1.5 MMBtu/hr each.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EULDLREPAIRHTR	Ladle Repair Torches - Eight (8) natural-gas fired ladle repair curing torches rated up to 2.0 MMBtu/hr each.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUDUCTHTRS	Baghouse Duct Heaters - Five (5) natural-gas duct heaters for LML Mold Cooling, 1230 Mold Cooling, Sand Cooling, Hot Sand Screen, Cool Sand Screen rated at up to 0.50 MMBtu/hr each	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUDIPTANKHTR	Dip Tank Heater - One (1) natural-gas dip tank heater rated up to 0.140 MMBtu/hr to maintain coating at appropriate temperature.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUDIPCUREOVEN	Dip Cure Oven - One (1) natural-gas dip curing oven heater rated up to 3.5 MMBtu/hr	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUPUNBBOILER	PUNB Core Sand Heater - One (1) natural-gas boiler to heat sand prior to mixing rated at 0.15 MMBtu/hr	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUSCALEPITBOILE R	Scale Pit Boiler - One (1) natural-gas boiler to supply heat for scale pit rated at 0.096 MMBtu/hr.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUSHELLHEATERS	Shell Core Heaters - Four (4) natural-gas heaters to heat shell core boxes. Two (2) rated at 1.0 MMBtu/hr and two (2) rated at 0.50 MMBtu/hr.	FGNATGASUNITS FGFACILITY FGMACTZZZZZ	Y	N	N	N
EUEG1	300 KW Natural Gas-Fired Emergency Generator - The emergency generator will be used to supply emergency power sufficient to remove any metal left in the furnaces should a power outage occur.	FGEG FGFACILITY	Y	N	N	N
EUEG2	300 KW Natural Gas-Fired Emergency Generator - The emergency generator will be used to supply emergency power sufficient to remove any metal left in the furnaces should a power outage occur.	FGEG FGFACILITY	Y	N	N	N
EUROADS	Roadways and Parking Areas - Paved roads and parking areas used for receipt and shipping of goods as well as employee and visitor parking.	FGFACILITY	N	N	N	N

TABLE 2:DUCTILE INOCULATION			
I	**Background**		
	A.	Emissions Unit Information:	
		Description	The addition of magnesium-based material to strengthen the metal when cast.
		Identification	EUDUCTINOC
	B.	Applicable Regulation, Emission Limit, and Monitoring Requirements:	
		Regulation Numbers	R 336.1331(1)(c) – Condition of a PTI R 336.2803 – Ambient Air Increments R 336.2804 – Ambient Air Ceilings R 336.2810 – Control Technology Review
		Emissions Limits	
		Particulates	Baghouse A and B shall not exceed 0.002 gr/dscf and 2.726 pph
		Monitoring Requirements	Continuously measure and record daily differential pressure measured in inches of water across the baghouse filtration media.
	C.	Control Technology:	
		Baghouses A and B (Fabric Filters)	
II	**Monitoring Approach**		
	The key elements of the monitoring approach are presented below:		
	A.	Indicator:	Differential pressure will be used as the indicator.
	B.	Measurement Approach:	Differential pressure across the baghouse filtration media will be continuously monitored.
	C.	Indicator Range:	The differential pressure will be maintained in the differential pressure range identified in the facility's PMP.
	D.	QIP Threshold:	None identified.

III	**Performance Criteria**		
	A.	Data Representativeness:	Measurements are being made directly at the control device across the filtration media.
	B.	Verification of Operational Status:	Differential pressure will be monitored continuously and recorded once per shift during operation to verify operational status.
	C.	QA/QC Practices and Criteria:	The pressure instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations.
	D.	Monitoring Frequency and Data Collection Procedure:	Differential pressure will be monitored continuously.
	E.	Data Collection Procedure:	Differential pressure will be recorded once per shift, as identified in the PMP.
	F.	Averaging Period:	None identified.
IV	**Justification**		
	A.	Background:	
		EJF utilizes a baghouse to control the emission of particulate matter from the identified operations.	
	B.	Rationale for Selection of Performance Indicator:	
		Differential pressure was selected as the performance indicator because it indicates that the baghouse is operating properly. Monitoring pressure drop provides a means of detecting a change in operation that can lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the airflow has increased. A decrease in pressure drop may indicate broken or loose bags. Pressure drop across the baghouse also serves to indicate that there is airflow through the control device.	
	C.	Rationale for Selection of Performance Indicator Level:	
		Particulate emissions from the baghouse exhaust vary within a normal range dependent on process variables. So long as the differential pressure remains within this normal range, the baghouse is performing as expected. If the differential pressure is out of the allowable operating range, then baghouse performance is abnormal and corrective action will be initiated to return the baghouse performance to normal, as described in the PMP for the facility.	
	D.	Performance Test:	
		A performance test was performed on the baghouse in 2019. This testing was performed under conditions of maximum emissions potential under anticipated operating conditions. The performance test has been submitted to EGLE.	

TABLE 3: LARGE MOLD LINE SHAKEOUT			
I	**Background**		
	A.	Emissions Unit Information:	
		Description	The separation of mold and core sand from the casting. Sprue is subsequently transferred to Charge Handling, while mold and core sand is discharged to conveyors that are part of Sand Handling and Moldmaking.
		Identification	EULMLSO
	B.	Applicable Regulation, Emission Limit, and Monitoring Requirements:	
		Regulation Numbers	R 336.1331(1)(c) – Condition of a PTI R 336.2803 – Ambient Air Increments R 336.2804 – Ambient Air Ceilings R 336.2810 – Control Technology Review
		Emissions Limits	
		Particulates	Baghouse C, D and E shall not exceed 0.0015 gr/dscf and 1.278 pph, 0.002 gr/dscf and 1.363 pph, and 0.002 gr/dscf and 1.038 pph, respectively.
		Monitoring Requirements	Continuously measure and record daily differential pressure measured in inches of water across the baghouse filtration media.
	C.	Control Technology:	
		Baghouses C, D and E (Fabric Filters)	
II	**Monitoring Approach**		
	The key elements of the monitoring approach are presented below:		
	A.	Indicator:	Differential pressure will be used as the indicator.
	B.	Measurement Approach:	Differential pressure across the baghouse filtration media will be continuously monitored.
	C.	Indicator Range:	The differential pressure will be maintained in the differential pressure range identified in the facility's PMP.
	D.	QIP Threshold:	None identified.

III	**Performance Criteria**		
	A.	Data Representativeness:	Measurements are being made directly at the control device across the filtration media.
	B.	Verification of Operational Status:	Differential pressure will be monitored continuously and recorded once per shift during operation to verify operational status.
	C.	QA/QC Practices and Criteria:	The pressure instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations.
	D.	Monitoring Frequency and Data Collection Procedure:	Differential pressure will be monitored continuously.
	E.	Data Collection Procedure:	Differential pressure will be recorded once per shift, as identified in the PMP.
	F.	Averaging Period:	None identified.
IV	**Justification**		
	A.	Background:	
		EJF utilizes a baghouse to control the emission of particulate matter from the identified operations.	
	B.	Rationale for Selection of Performance Indicator:	
		Differential pressure was selected as the performance indicator because it indicates that the baghouse is operating properly. Monitoring pressure drop provides a means of detecting a change in operation that can lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the airflow has increased. A decrease in pressure drop may indicate broken or loose bags. Pressure drop across the baghouse also serves to indicate that there is airflow through the control device.	
	C.	Rationale for Selection of Performance Indicator Level:	
		Particulate emissions from the baghouse exhaust vary within a normal range dependent on process variables. So long as the differential pressure remains within this normal range, the baghouse is performing as expected. If the differential pressure is out of the allowable operating range, then baghouse performance is abnormal and corrective action will be initiated to return the baghouse performance to normal, as described in the PMP for the facility.	
	D.	Performance Test:	
		A performance test was performed on the baghouse in 2019. This testing was performed under conditions of maximum emissions potential under anticipated operating conditions. The performance test has been submitted to EGLE.	

TABLE 4: 1230 LINE SHAKEOUT			
I	**Background**		
	A.	Emissions Unit Information:	
		Description	The separation of mold and core sand from the casting. Sprue is subsequently transferred to Charge Handling, while mold and core sand is discharged to conveyors that are part of Sand Handling and Moldmaking.
		Identification	EU1230SO
	B.	Applicable Regulation, Emission Limit, and Monitoring Requirements:	
		Regulation Numbers	R 336.1331(1)(c) – Condition of a PTI R 336.2803 – Ambient Air Increments R 336.2804 – Ambient Air Ceilings R 336.2810 – Control Technology Review
		Emissions Limits	
		Particulates	Baghouse C, D and E shall not exceed 0.0015 gr/dscf and 1.278 pph, 0.002 gr/dscf and 1.363 pph, and 0.002 gr/dscf and 1.038 pph, respectively.
		Monitoring Requirements	Continuously measure and record daily differential pressure measured in inches of water across the baghouse filtration media.
	C.	Control Technology:	
		Baghouses C, D and E (Fabric Filters)	
II	**Monitoring Approach**		
	The key elements of the monitoring approach are presented below:		
	A.	Indicator:	Differential pressure will be used as the indicator.
	B.	Measurement Approach:	Differential pressure across the baghouse filtration media will be continuously monitored.
	C.	Indicator Range:	The differential pressure will be maintained in the differential pressure range identified in the facility's PMP.
	D.	QIP Threshold:	None identified.

III	**Performance Criteria**		
	A.	Data Representativeness:	Measurements are being made directly at the control device across the filtration media.
	B.	Verification of Operational Status:	Differential pressure will be monitored continuously and recorded once per shift during operation to verify operational status.
	C.	QA/QC Practices and Criteria:	The pressure instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations.
	D.	Monitoring Frequency and Data Collection Procedure:	Differential pressure will be monitored continuously.
	E.	Data Collection Procedure:	Differential pressure will be recorded once per shift, as identified in the PMP.
	F.	Averaging Period:	None identified.
IV	**Justification**		
	A.	Background:	
		EJF utilizes a baghouse to control the emission of particulate matter from the identified operations.	
	B.	Rationale for Selection of Performance Indicator:	
		Differential pressure was selected as the performance indicator because it indicates that the baghouse is operating properly. Monitoring pressure drop provides a means of detecting a change in operation that can lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the airflow has increased. A decrease in pressure drop may indicate broken or loose bags. Pressure drop across the baghouse also serves to indicate that there is airflow through the control device.	
	C.	Rationale for Selection of Performance Indicator Level:	
		Particulate emissions from the baghouse exhaust vary within a normal range dependent on process variables. So long as the differential pressure remains within this normal range, the baghouse is performing as expected. If the differential pressure is out of the allowable operating range, then baghouse performance is abnormal and corrective action will be initiated to return the baghouse performance to normal, as described in the PMP for the facility.	
	D.	Performance Test:	
		A performance test was performed on the baghouse in 2019. This testing was performed under conditions of maximum emissions potential under anticipated operating conditions. The performance test has been submitted to EGLE.	

TABLE 5: SAND HANDLING AND MOLDMAKING			
I	**Background**		
	A.	Emissions Unit Information:	
		Description	Belts, elevators, bins, screen(s), and muller. Unit also Includes Moldmaking and application of mold release.
		Identification	EUSHMM
	B.	Applicable Regulation, Emission Limit, and Monitoring Requirements:	
		Regulation Numbers	R 336.1331(1)(c) – Condition of a PTI R 336.2803 – Ambient Air Increments R 336.2804 – Ambient Air Ceilings R 336.2810 – Control Technology Review
		Emissions Limits	
		Particulates	Baghouse A, B, E, F and G shall not exceed 0.002 gr/dscf and 2.726 pph, 0.002 gr/dscf and 2.726 pph, 0.002 gr/dscf and 1.038 pph, 0.002 gr/dscf and 1.038 pph, and 0.002 gr/dscf and 0.681 pph, respectively
		Monitoring Requirements	Continuously measure and record daily differential pressure measured in inches of water across the baghouse filtration media.
	C.	Control Technology:	
		Baghouses A, B, E, F and G (Fabric Filters)	
II	**Monitoring Approach**		
	The key elements of the monitoring approach are presented below:		
	A.	Indicator:	Differential pressure will be used as the indicator.
	B.	Measurement Approach:	Differential pressure across the baghouse filtration media will be continuously monitored.
	C.	Indicator Range:	The differential pressure will be maintained in the differential pressure range identified in the facility's PMP.
	D.	QIP Threshold:	None identified.

III	**Performance Criteria**		
	A.	Data Representativeness:	Measurements are being made directly at the control device across the filtration media.
	B.	Verification of Operational Status:	Differential pressure will be monitored continuously and recorded once per shift during operation to verify operational status.
	C.	QA/QC Practices and Criteria:	The pressure instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations.
	D.	Monitoring Frequency and Data Collection Procedure:	Differential pressure will be monitored continuously.
	E.	Data Collection Procedure:	Differential pressure will be recorded once per shift, as identified in the PMP.
	F.	Averaging Period:	None identified.
IV	**Justification**		
	A.	Background:	
		EJF utilizes a baghouse to control the emission of particulate matter from the identified operations.	
	B.	Rationale for Selection of Performance Indicator:	
		Differential pressure was selected as the performance indicator because it indicates that the baghouse is operating properly. Monitoring pressure drop provides a means of detecting a change in operation that can lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the airflow has increased. A decrease in pressure drop may indicate broken or loose bags. Pressure drop across the baghouse also serves to indicate that there is airflow through the control device.	
	C.	Rationale for Selection of Performance Indicator Level:	
		Particulate emissions from the baghouse exhaust vary within a normal range dependent on process variables. So long as the differential pressure remains within this normal range, the baghouse is performing as expected. If the differential pressure is out of the allowable operating range, then baghouse performance is abnormal and corrective action will be initiated to return the baghouse performance to normal, as described in the PMP for the facility.	
	D.	Performance Test:	
		A performance test was performed on the baghouse in 2019. This testing was performed under conditions of maximum emissions potential under anticipated operating conditions. The performance test has been submitted to EGLE.	

TABLE 6: SHOTBLASTING			
I	**Background**		
	A.	Emissions Unit Information:	
		Description	Enclosed process for the removal of excess sand and metal from casting surface.
		Identification	EUBLAST
	B.	Applicable Regulation, Emission Limit, and Monitoring Requirements:	
		Regulation Numbers	R 336.1331(1)(c) – Condition of a PTI R 336.2803 – Ambient Air Increments R 336.2804 – Ambient Air Ceilings R 336.2810 – Control Technology Review
		Emissions Limits	
		Particulates	Baghouse H and J shall not exceed 0.001 gr/dscf and 1.704 pph.
		Monitoring Requirements	Continuously measure and record daily differential pressure measured in inches of water across the baghouse filtration media.
	C.	Control Technology:	
		Baghouses H and J (Fabric Filters)	
II	**Monitoring Approach**		
	The key elements of the monitoring approach are presented below:		
	A.	Indicator:	Differential pressure will be used as the indicator.
	B.	Measurement Approach:	Differential pressure across the baghouse filtration media will be continuously monitored.
	C.	Indicator Range:	The differential pressure will be maintained in the differential pressure range identified in the facility's PMP.
	D.	QIP Threshold:	None identified.

III	**Performance Criteria**		
	A.	Data Representativeness:	Measurements are being made directly at the control device across the filtration media.
	B.	Verification of Operational Status:	Differential pressure will be monitored continuously and recorded once per shift during operation to verify operational status.
	C.	QA/QC Practices and Criteria:	The pressure instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations.
	D.	Monitoring Frequency and Data Collection Procedure:	Differential pressure will be monitored continuously.
	E.	Data Collection Procedure:	Differential pressure will be recorded once per shift, as identified in the PMP.
	F.	Averaging Period:	None identified.
IV	**Justification**		
	A.	Background:	
		EJF utilizes a baghouse to control the emission of particulate matter from the identified operations.	
	B.	Rationale for Selection of Performance Indicator:	
		Differential pressure was selected as the performance indicator because it indicates that the baghouse is operating properly. Monitoring pressure drop provides a means of detecting a change in operation that can lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the airflow has increased. A decrease in pressure drop may indicate broken or loose bags. Pressure drop across the baghouse also serves to indicate that there is airflow through the control device.	
	C.	Rationale for Selection of Performance Indicator Level:	
		Particulate emissions from the baghouse exhaust vary within a normal range dependent on process variables. So long as the differential pressure remains within this normal range, the baghouse is performing as expected. If the differential pressure is out of the allowable operating range, then baghouse performance is abnormal and corrective action will be initiated to return the baghouse performance to normal, as described in the PMP for the facility.	
	D.	Performance Test:	
		A performance test was performed on the baghouse in 2019. This testing was performed under conditions of maximum emissions potential under anticipated operating conditions. The performance test has been submitted to EGLE.	

TABLE 7: GRINDING			
I	**Background**		
	A.	Emissions Unit Information:	
		Description	Remove of unwanted metal at the mold parting lines and elsewhere.
		Identification	EUGRIND
	B.	Applicable Regulation, Emission Limit, and Monitoring Requirements:	
		Regulation Numbers	R 336.1331(1)(c) – Condition of a PTI R 336.2803 – Ambient Air Increments R 336.2804 – Ambient Air Ceilings R 336.2810 – Control Technology Review
		Emissions Limits	
		Particulates	Baghouse H and J shall not exceed 0.001 gr/dscf and 1.704 pph.
		Monitoring Requirements	Continuously measure and record daily differential pressure measured in inches of water across the baghouse filtration media.
	C.	Control Technology:	
		Baghouses H and J (Fabric Filters)	
II	**Monitoring Approach**		
	The key elements of the monitoring approach are presented below:		
	A.	Indicator:	Differential pressure will be used as the indicator.
	B.	Measurement Approach:	Differential pressure across the baghouse filtration media will be continuously monitored.
	C.	Indicator Range:	The differential pressure will be maintained in the differential pressure range identified in the facility's PMP.
	D.	QIP Threshold:	None identified.

III	**Performance Criteria**		
	A.	Data Representativeness:	Measurements are being made directly at the control device across the filtration media.
	B.	Verification of Operational Status:	Differential pressure will be monitored continuously and recorded once per shift during operation to verify operational status.
	C.	QA/QC Practices and Criteria:	The pressure instrumentation will be maintained based on the plant's standard procedures, which have been established in part from the manufacturer's recommendations.
	D.	Monitoring Frequency and Data Collection Procedure:	Differential pressure will be monitored continuously.
	E.	Data Collection Procedure:	Differential pressure will be recorded once per shift, as identified in the PMP.
	F.	Averaging Period:	None identified.
IV	**Justification**		
	A.	Background:	
		EJF utilizes a baghouse to control the emission of particulate matter from the identified operations.	
	B.	Rationale for Selection of Performance Indicator:	
		Differential pressure was selected as the performance indicator because it indicates that the baghouse is operating properly. Monitoring pressure drop provides a means of detecting a change in operation that can lead to an increase in emissions. An increase in pressure drop can indicate that the cleaning cycle is not frequent enough, cleaning equipment is damaged, the bags are becoming inefficient, or the airflow has increased. A decrease in pressure drop may indicate broken or loose bags. Pressure drop across the baghouse also serves to indicate that there is airflow through the control device.	
	C.	Rationale for Selection of Performance Indicator Level:	
		Particulate emissions from the baghouse exhaust vary within a normal range dependent on process variables. So long as the differential pressure remains within this normal range, the baghouse is performing as expected. If the differential pressure is out of the allowable operating range, then baghouse performance is abnormal and corrective action will be initiated to return the baghouse performance to normal, as described in the PMP for the facility.	
	D.	Performance Test:	
		A performance test was performed on the baghouse in 2019. This testing was performed under conditions of maximum emissions potential under anticipated operating conditions. The performance test has been submitted to EGLE.	

Appendix B
Potential Pre-Control Device Emissions Calculations

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
Charge Handling

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Charge Handling
Control Device: Baghouses A/B, E, H/J, K
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

The sprue return conveyors (1530) and alloy delivery system are included in the charge handling system.

Facility Process Name:		Criteria Pollutants								
Charge Handling										
Emission Factor Basis:		**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:		0.07	0.07	0.06						
(source)		Note 1	Note 1	Note 3						
Capture Efficiencies:										
Maximum Stack Emission Rate:										
Hourly (lb/hr)										
Annual (TPY)										
Maximum Fugitive Emission Rate:										
Hourly (lb/hr)		1.960	1.960	1.680						
Annual (TPY)		4.480	4.480	3.840						
Total Emission Rate:										
Hourly (lb/hr)		1.960	1.960	1.680						
Annual (TPY)		4.480	4.480	3.840						

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Gutow Article, Modern Casting; January 1972; PM emissions from Raw material handling (0.04 lbs/ton) and charge makeup (0.03 lbs/ton) released to the atmosphere. All PM emission were conservatively assumed to be PM-10 emissions.

Note 2: The Gutow article was supplement with an Ohio EPA RACM document to account for the ventilation at the sprue conveyor and inoculant addition system. Ohio EPA RACM guide indicates that the emissions generated from incoming scrap are of particle size 30 -1000 microns. Therefore the only source of emissions of PM/PM10 from raw material handling is from handling of foundry returns. Sprue return ventilation system would capture 80% of the emissions generated from foundry returns.

Note 3: Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor.

EXAMPLE CALCULATIONS:
Maximum Emission Rate (lb/hr) {building exhausts} = (Emission Factor lb/ton) x (Maximum Hourly Rate tph) x (% returns/100 for PM10 only) x (1- %fugitive rate/100)
Maximum Emission Rate (lb/hr) {fugitive} = (Emission Factor lb/ton) x (Maximum Hourly Rate tph) x (%returns for PM10 only) x (% fugitive emissions rate/100)
Annual (TPY) Emission Rates = (lb/hr emission rate) x (Maximum Annual Melt Rate) / (Maximum Hourly Melt Rate) / (2000 lbs/ton)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
EIF Melting

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
EIF Melting

Control Device:	Baghouses A/B
SCC Code:	
Control Device Outlet:	0.0020 gr/dscf
Airflow:	57,000 acfm
Stack Gas Temperature:	°F

Facility Process Name:		Criteria Pollutants								
EIF Melting										
Emission Factor Basis:		PM	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	CO_2e
Emission Factors:	lb/ton	0.90	0.86	0.85			0.03	0.33		24.32
(source)		Note 1	Note 1	Note 6			Note 2	Note 4	Note 3	Note 5
	Capture Efficiency									
	Control Efficiency									
	Building Capt. Eff									
Maximum Stack Emission Rate:										
	Hourly (lb/hr)									
	Annual (TPY)									
Maximum Fugitive Emission Rate:										
	Hourly (lb/hr)	25.200	24.080	23.688			0.840	9.240		680.877
	Annual (TPY)	57.600	55.040	54.144			1.920	21.120		1556.291
Total Emission Rate:										
	Hourly (lb/hr)	25.200	24.080	23.698			0.840	9.240		680.877
	Annual (TPY)	57.600	55.040	54.144			1.920	21.120		1556.291

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from FIRE 6.25 SCC 3-04-003-03
Note 2. From Stack testing at Wheland Foundry in Tennessee
Note 3 See below HAPs calculations
Note 4 EJIW Foundry Stack Testing (Oct 2010). Results used with Wheland and Technikon information to distribute between melting, pouring, cooling and shakeout
Note 5 EJIW Stack Testing (July 2010). Average rate calculated between MS-01 & MS-02. Methane and Nitrous Oxide emissions are not known. Background concentration of CO2 was not considered
Note 6 Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) (PM & PM-10)=(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Stack Emission Rate (lb/hr) (Lead)=(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)*(Lead EF/PM EF)
Maximum Annual (Ton/yr) Stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

East Jordan Foundry, LLC
HAP Emission Calculations
EIF Melting

HAPs	CAS #	Emission Factor %wt PM (Note 10)	Emissions lbs/hr	Emissions tons/yr	
Antimony (Sb)	7440-36-0				
Arsenic (As)	7440-38-2				
Beryllium (Be)	7440-41-7				
Cadmium (Cd)	7440-43-9				
Chromium (Cr)	7440-47-3	0.30	0.0761	0.1804	Note 8
Cobalt (Co)	7440-48-4				
Lead (Pb)	7439-92-1	0.13	0.0339	0.0782	Note 9
Manganese (Mn)	7439-96-5	0.70	0.1823	0.4210	Note 8
Mercury (Hg)	7439-97-6				
Nickel (Ni)	7440-02-0	0.10	0.0260	0.0601	Note 8
Selenium (Se)	7782-49-2				
Acetaldehyde	75-07-0				
Dimethylnaphthalenes	28804-88-8				
Cresol	1319-77-3				
Methylnaphthalenes	90-12-0				
Propionaldehyde	123-38-6				
Methylene diphenyl diisocyanate (MDI)	101-68-8				
4,4-methylenedianiline (MBA)	101-77-9				
Formaldehyde	50-00-0				
Cumene	98-82-8				
Benzene	71-43-2				
O-Xylene	95-47-6				
M-Xylene	108-38-3				
Phenol	108-95-2				
Naphthalene	91-20-3				
Ethyl Benzene	100-41-4				
Hydrogen Flouride	7664-39-3				
Toluene	108-88-3				
P-Xylene	106-42-3				
Hexane	110-54-3				
Xylenes	1330-20-7				
o-Cresol	95-48-7				
Styrene	100-42-5				
Acetophenone	98-86-2				
Dibenzofurans	132-64-9				
Nitrobenzene	98-95-3				
Total HAPs			3.20E-01	7.40E-01	

Note 8 Emission factors are taken from design range of Gray & Ductile Iron. Emissions were estimated using the highest end of the concentration range of either metal type.
Note 9. Emission factor developed using the average composite lead content of baghouse dust
Note 10 %wt of PM EF multiplied fugitive and stack emissions. Stack emissions derived from air volume allocated to EIFs and gr loading of BH

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
Ductile Inoculation

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Ductile Inoculation
Control Device: Baghouses A/B
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:		Criteria Pollutants								
Ductile Inoculation										
Emission Factor Basis:		**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:	lb/ton	3.00	3.00	1.89			0.005			
(source)		Note 2	Note 2	Note 3			Note 1			
Capture Efficiency										
Note 4 Process Design Reduction Eff.										
Building Capt. Eff										
Maximum Stack Emission Rate:										
	Hourly (lb/hr)									
	Annual (TPY)									
Maximum Fugitive Emission Rate:										
	Hourly (lb/hr)	84.000	84.000	52.920			0.140			
	Annual (TPY)	192.000	192.000	120.960			0.320			
Total Emission Rate:										
	Hourly (lb/hr)	84.000	84.000	52.920			0.140			
	Annual (TPY)	192.000	192.000	120.960			0.320			

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from FIRE 6.25 SCC 3-04-003-10
Note 2: Emission factor from FIRE 6.25 SCC 3-04-003-22
Note 3: Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor.
Note 4: The inoculation ladle and method of inoculation "Tundish Ladle" that has been chosen is designed to minimize emissions to the atmosphere from this process. The manufacturer advertises a reduction in emissions of 98%.

EXAMPLE CALCULATIONS:
Maximum Fugitive Emission Rate (lb/hr) = (Emission Factor) x (process weight rate (ton/hr)) x (1-(Settling Factor)/100)
Annual (TPY) Emission Rates = (lb/hr emission rate) x (1/ Maximum Hourly Process Rate (tons/hr)) x (Annual process weight rate (tons/yr))x (ton/2000)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
Hot Metal Transfer

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Hot Metal Transfer
Control Device: Baghouses A/B
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:	Criteria Pollutants								
Hot Metal Transfer									
Emission Factor Basis:	**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:	0.056	0.052	0.046						
(source)	Note 1	Note 2	Note 3						
Capture Efficiency									
Control Efficiency									
Building Capt. Eff									
Maximum Stack Emission Rate:									
Hourly (lb/hr)									
Annual (TPY)									
Maximum Fugitive Emission Rate:									
Hourly (lb/hr)	1.568	1.443	1.286						
Annual (TPY)	3.584	3.297	2.939						
Total Emission Rate:									
Hourly (lb/hr)	1.568	1.443	1.286						
Annual (TPY)	3.584	3.297	2.939						

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Hot metal transfer at building monitor. AP-42, Ch. 12-5, Table 12.5-1
Note 2: Emission factor based on USEPA PM Calculator PM/PM10/PM2.5 ratio and uncontrolled PM emission factor for SCC 30400320

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Annual (Ton/yr) stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
200 Tons/Year

Flow Diagram Designation
Ladle Repair

Maximum Hourly Capacity
1.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Ladle Repair
Control Device: Baghouse K
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:		Criteria Pollutants								
Ladle Repair										
Emission Factor Basis:		PM	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	CO_2e
Emission Factors:	lb/ton	1.00	1.00	1.00						
(source)		Note 1	Note 2	Note 3						
	Capture Efficiency									
	Control Efficiency									
	Building Capt. Eff									
Maximum Stack Emission Rate:										
	Hourly (lb/hr)									
	Annual (TPY)									
Maximum Fugitive Emission Rate:										
	Hourly (lb/hr)	1.000	1.000	1.000						
	Annual (TPY)	0.100	0.100	0.100						
Total Emission Rate:										
	Hourly (lb/hr)	1.000	1.000	1.000						
	Annual (TPY)	0.100	0.100	0.100						

PROPOSED OPERATING SCHEDULE
22 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from Ohio EPA RACM Table 2.18-1, p2-378 (Primary Crushing)
Note 2: Assumes PM10 is equal to PM
Note 3: Assumes PM2.5 is equal to PM10

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Annual (Ton/yr) stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)

Flow Diagram Designation
In-Duct Burners

Process Description:
In-Duct Burners
Control Device:

Natural Gas Combustion

Inputs	
1.5	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
1470.6	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
6000	= Maximum Operation (hours/year)
8.823529412	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor (lb/10^6 scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	See BH Emissions for each Stk	
NOx	n/a	100.0	0.15	0.44
CO	n/a	84.0	0.12	0.37
Lead	n/a	0.0005	7.35E-07	2.21E-06
SO2	n/a	0.6	0.001	0.003
VOC	n/a	5.5	0.01	0.02
CO_2e	n/a	120,000	176.47	529.41
Arsenic (As)	7440-38-2	2.00E-04	2.94E-07	8.82E-07
Beryllium (Be)	7440-41-7	1.20E-05	1.76E-08	5.29E-08
Cadmium (Cd)	7440-43-9	1.10E-03	1.62E-06	4.85E-06
Chromium (Cr)	7440-47-3	1.40E-03	2.06E-06	6.18E-06
Cobalt (Co)	7440-48-4	8.40E-05	1.24E-07	3.71E-07
Manganese (Mn)	7439-96-5	3.80E-04	5.59E-07	1.68E-06
Mercury (Hg)	7439-97-6	2.60E-04	3.82E-07	1.15E-06
Nickel (Ni)	7440-02-0	2.10E-03	3.09E-06	9.26E-06
Selenium (Se)	7782-49-2	2.40E-05	3.53E-08	1.06E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	3.53E-08	1.06E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	2.65E-09	7.94E-09
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	2.35E-08	7.06E-08
POM/Acenaphthene	83-32-9	1.80E-06	2.65E-09	7.94E-09
POM/Acenaphthylene	203-96-8	1.80E-06	2.65E-09	7.94E-09
POM/Anthracene	120-12-7	2.40E-06	3.53E-09	1.06E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	2.65E-09	7.94E-09
Benzene	71-43-2	2.10E-03	3.09E-06	9.26E-06
POM/Benzo(a)pyrene	50-32-8	1.20E-06	1.76E-09	5.29E-09
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	1.76E-09	5.29E-09
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	1.76E-09	5.29E-09
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	2.65E-09	7.94E-09
POM/Chrysene	218-01-9	1.80E-06	2.65E-09	7.94E-09
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	1.76E-09	5.29E-09
Dichlorobenzene	25321-22-6	1.20E-03	1.76E-06	5.29E-06
POM/Fluoranthene	206-44-0	3.00E-06	4.41E-09	1.32E-08
POM/Fluorene	86-73-7	2.80E-06	4.12E-09	1.24E-08
Formaldehyde	50-00-0	7.50E-02	1.10E-04	3.31E-04
Hexane	110-54-3	1.80E+00	2.65E-03	7.94E-03
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	2.65E-09	7.94E-09
Naphthalene	91-20-3	6.10E-04	8.97E-07	2.69E-06
POM/Phenanathrene	85-01-8	1.70E-05	2.50E-08	7.50E-08
POM/Pyrene	129-00-0	5.00E-06	7.35E-09	2.21E-08
Toluene	108-88-3	3.40E-03	5.00E-06	1.50E-05
Total POM			1.29E-07	3.86E-07
Total HAPs			2.78E-03	8.33E-03

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
Ladle Heaters

Process Description:
Ladle Heaters
Control Device:

Natural Gas Combustion

Inputs

28.5	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
27941.2	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
6000	= Maximum Operation (hours/year)
167.6470588	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.21	0.64
NOx	n/a	100.0	2.79	8.38
CO	n/a	84.0	2.35	7.04
Lead	n/a	0.0005	1.40E-05	4.19E-05
SO2	n/a	0.6	0.017	0.050
VOC	n/a	5.5	0.15	0.46
CO_2e	n/a	120,000	3352.94	10058.82
Arsenic (As)	7440-38-2	2.00E-04	5.59E-06	1.68E-05
Beryllium (Be)	7440-41-7	1.20E-05	3.35E-07	1.01E-06
Cadmium (Cd)	7440-43-9	1.10E-03	3.07E-05	9.22E-05
Chromium (Cr)	7440-47-3	1.40E-03	3.91E-05	1.17E-04
Cobalt (Co)	7440-48-4	8.40E-05	2.35E-06	7.04E-06
Manganese (Mn)	7439-96-5	3.80E-04	1.06E-05	3.19E-05
Mercury (Hg)	7439-97-6	2.60E-04	7.26E-06	2.18E-05
Nickel (Ni)	7440-02-0	2.10E-03	5.87E-05	1.76E-04
Selenium (Se)	7782-49-2	2.40E-05	6.71E-07	2.01E-06
POM/2-Methylnaphthalene	91-57-6	2.40E-05	6.71E-07	2.01E-06
POM/3-Methylchloranthrene	56-49-5	1.80E-06	5.03E-08	1.51E-07
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	4.47E-07	1.34E-06
POM/Acenaphthene	83-32-9	1.80E-06	5.03E-08	1.51E-07
POM/Acenaphthylene	203-96-8	1.80E-06	5.03E-08	1.51E-07
POM/Anthracene	120-12-7	2.40E-06	6.71E-08	2.01E-07
POM/Benz(a)anthracene	56-55-3	1.80E-06	5.03E-08	1.51E-07
Benzene	71-43-2	2.10E-03	5.87E-05	1.76E-04
POM/Benzo(a)pyrene	50-32-8	1.20E-06	3.35E-08	1.01E-07
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	3.35E-08	1.01E-07
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	3.35E-08	1.01E-07
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	5.03E-08	1.51E-07
POM/Chrysene	218-01-9	1.80E-06	5.03E-08	1.51E-07
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	3.35E-08	1.01E-07
Dichlorobenzene	25321-22-6	1.20E-03	3.35E-05	1.01E-04
POM/Fluoranthene	206-44-0	3.00E-06	8.38E-08	2.51E-07
POM/Fluorene	86-73-7	2.80E-06	7.82E-08	2.35E-07
Formaldehyde	50-00-0	7.50E-02	2.10E-03	6.29E-03
Hexane	110-54-3	1.80E+00	5.03E-02	1.51E-01
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	5.03E-08	1.51E-07
Naphthalene	91-20-3	6.10E-04	1.70E-05	5.11E-05
POM/Phenanathrene	85-01-8	1.70E-05	4.75E-07	1.43E-06
POM/Pyrene	129-00-0	5.00E-06	1.40E-07	4.19E-07
Toluene	108-88-3	3.40E-03	9.50E-05	2.85E-04
Total POM			2.45E-06	7.34E-06
Total HAPs			5.28E-02	1.58E-01

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
LML Pouring & Cooling

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
LML Pouring & Cooling
Control Device: Baghouses A/B, D
SCC Code:
Control Device Outlet: 0.0020 gr/dscf gr/dscf
Airflow: 129,000 acfm acfm
Stack Gas Temperature: °F

Facility Process Name: LML Pouring & Cooling		Criteria Pollutants								
Emission Factor Basis:		**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:	lb/ton	0.410	0.410	0.336	0.260	0.068	1.241	6.523	0.00048	24.654
(source)		Note 1	Note 1	Note 8	Note 2	Note 6	Note 5	Note 4	Note 3	Note 7
Capture Efficiency										
Control Efficiency										
Building Capt. Eff										
Maximum Stack Emission Rate:										
	Hourly (lb/hr)								2.98E-03	
	Annual (TPY)								4.47E-06	
Maximum Fugitive Emission Rate:										
	Hourly (lb/hr)	11.480	11.480	9.414	7.280	1.917	34.748	182.655	1.34E-02	690.305
	Annual (TPY)	26.240	26.240	21.517	16.640	4.381	79.424	417.497	3.07E-02	1577.840
Total Emission Rate:										
	Hourly (lb/hr)	11.480	11.480	9.414	7.280	1.917	34.748	182.655	1.64E-02	690.305
	Annual (TPY)	26.240	26.240	21.517	16.640	4.381	79.424	417.497	3.07E-02	1577.840

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Stack test at Quality Castings, Orrville, OH.
Note 2: 2019 Compliance Test plus 20% allowance for testing and measurement variability each.
Note 3: From Stack testing at Foundry in Mexico (CERP data)
Note 4: EJIW Foundry Stack Testing (Oct 2010). Results used with Wheland and Techniken information to distribute between melting, pouring, cooling and shakeout
Note 5: EJIW Stack testing (March 2002) and Techniken #1410-117 FU
Note 6: EJIW Stack Testing (March 2002, July 2010)
Note 7: EJIW-Ardmore Foundry Stack Testing (July 2010). Average rate calculated between SS-01 & SS-03. Methane and Nitrous Oxide emissions are not known. Background concentration of CO_2 was not considered
Note 8: Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor.
Note 9: This shows maximum emissions from this line. Combined group limit on Pouring and Cooling of 28 tph, 128,000 tpy throughput due to max melt rate upstream
Note 10: Compliance with gaseous criteria pollutants to be demonstrated by summing emissions across all applicable stacks.

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Stack Emission Rate (lb/hr) {Lead} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr) x (EF for Lead/EF for PM-10)
Maximum Stack Emissions Rate (lb/hr) {SOx,NOx, VOC, CO} =(Max. Rated Capacity ton/hr) x (EF in lb/ton) x (Capture Eff./100)
Maximum Annual (Ton/yr) PM, PM10 and lead stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Annual (ton/yr) SOx NOx, VOC and CO stack emissions= (Hourly stack emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

<u>Maximum Yearly Capacity</u>
128,000 Tons/Year

<u>Flow Diagram Designation</u>
1230 Pouring & Cooling

<u>Maximum Hourly Capacity</u>
28.00 Tons/Hour

<u>Process Description:</u>

East Jordan Foundry, LLC		
1230 Pouring & Cooling		
Control Device:	Baghouses A/B, D	
SCC Code:		
Control Device Outlet:	0.0020 gr/dscf	gr/dscf
Airflow:	129,000 acfm	acfm
Stack Gas Temperature:	°F	

Facility Process Name:		Criteria Pollutants								
1230 Pouring & Cooling										
Emission Factor Basis:		PM	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	CO_2e
Emission Factors:	lb/ton	0.410	0.410	0.336	0.260	0.068	1.241	6.523	0.00048	24.654
(source)		Note 1	Note 1	Note 8	Note 2	Note 6	Note 5	Note 4	Note 3	Note 7
	Capture Efficiency									
	Control Efficiency									
	Building Capt. Eff									
Maximum Stack Emission Rate:										
Hourly (lb/hr)										
Annual (TPY)										
Maximum Fugitive Emission Rate:										
Hourly (lb/hr)		11.480	11.480	9.414	7.280	1.917	34.748	182.655	1.34E-02	690.305
Annual (TPY)		26.240	26.240	21.517	16.640	4.381	79.424	417.497	3.07E-02	1577.840
Total Emission Rate:										
Hourly (lb/hr)		11.480	11.480	9.414	7.280	1.917	34.748	182.655	1.34E-02	690.305
Annual (TPY)		26.240	26.240	21.517	16.640	4.381	79.424	417.497	3.07E-02	1577.840

<u>PROPOSED OPERATING SCHEDULE</u>
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Stack test at Quality Castings, Orrville, OH.
Note 2: 2019 Compliance Test plus 20% allowance for testing and measurement variability each.
Note 3: From Stack testing at Foundry in Mexico (CERP data)
Note 4: EJIW Foundry Stack Testing (Oct 2010). Results used with Wheland and Techniken information to distribute between melting, pouring, cooling and shakeout.
Note 5: EJIW Stack testing (March 2002) and Techniken #1410-117 FU. Includes Mold Making emissions.
Note 6: EJIW Stack Testing (March 2002, July 2010)
Note 7. EJIW-Ardmore Foundry Stack Testing (July 2010). Average rate calculated between SS-01 & SS-03. Methane and Nitrous Oxide emissions are not known. Background concentration of CO_2 was not considered.
Note 8. Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor.
Note 9: This shows maximum emissions from this line. Combined group limit on Pouring and Cooling of 28 tph, 128,000 tpy throughout due to max melt rate upstream.
Note 10: Compliance with gaseous criteria pollutants to be demonstrated by summing emissions across all applicable stacks.

<u>EXAMPLE CALCULATIONS:</u>
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Stack Emission Rate (lb/hr) {Lead} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr) x (EF for Lead/EF for PM-10)
Maximum Stack Emissions Rate (lb/hr) {SOx,NOx, VOC, CO} =(Max. Rated Capacity ton/hr) x (EF in lb/ton) x (Capture Eff./100)
Maximum Annual (Ton/yr) PM, PM10 and lead stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Annual (ton/yr) SOx NOx, VOC and CO stack emissions= (Hourly stack emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
LML Shakeout

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
LML Shakeout
Control Device: Baghouses C, D, E
SCC Code:
Control Device Outlet: gr/dscf gr/dscf
Airflow: acfm acfm
Stack Gas Temperature: °F

Facility Process Name:		Criteria Pollutants								
LML Shakeout										
Emission Factor Basis:		**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO2e**
Emission Factors:	lb/ton	3.20	2.24	1.34		0.002	0.528	1.592	1.26E-04	
(source)		Note 1	Note 6	Note 6		Note 5	Note 4	Note 2	Note 3	Note 4
	Capture Efficiency									
	Control Efficiency									
	Building Capt. Eff									
Maximum Stack Emission Rate:										
Hourly (lb/hr)										
Annual (TPY)										
Maximum Fugitive Emission Rate:										
Hourly (lb/hr)		89.600	62.720	37.524		0.056	14.784	44.574	3.53E-03	
Annual (TPY)		204.800	143.360	85.770		0.128	33.792	101.883	8.06E-03	
Total Emission Rate:										
Hourly (lb/hr)		89.600	62.720	37.524		0.056	14.784	44.574	3.53E-03	
Annual (TPY)		204.800	143.360	85.770		0.128	33.792	101.883	8.06E-03	

PROPOSED OPERATING SCHEDULE
22 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from FIRE 6.25 SCC 3-04-003-31
Note 2: EJW-Ardmore Foundry Stack Testing (Oct 2010). Results used with Wheland and Techniken information to distribute between melting, pouring, cooling and shakeout.
Note 3: Factors' Baseline Emissions from Automotive Foundries in Mexico"
Note 4: C02e emissions included in Pouring & Mold Cooling Tab
Note 5: Emission factor from EJW stack test (July 2010)
Note 6: Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor.
Note 7: Max emissions from this line. Combined group limit on Shakeout of 28 tph, 128,000 tpy throughput due to max melt rate upstream

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Stack Emission Rate (lb/hr) {Lead} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr) x (EF for Lead/EF for PM-10)
Maximum Stack Emissions Rate (lb/hr) {VOC, CO} =(Max. Rated Capacity ton/hr) x (EF in lb/ton) x (Capture Eff./100)
Maximum Annual (Ton/yr) PM, PM10 and lead stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Annual (ton/yr) VOC and CO stack emissions= (Hourly stack emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
1230 Shakeout

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
1230 Shakeout
Control Device: Baghouses C, D, E
SCC Code:
Control Device Outlet: gr/dscf gr/dscf
Airflow: acfm acfm
Stack Gas Temperature: °F

Facility Process Name:		PM	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	CO_2e
1230 Shakeout		Criteria Pollutants								
Emission Factor Basis:										
Emission Factors:	lb/ton	3.20	2.24	1.34		0.002	0.528	1.592	1.26E-04	
(source)		Note 1	Note 6	Note 6		Note 5	Note 4	Note 2	Note 3	Note 4
	Capture Efficiency									
	Control Efficiency									
	Building Capt. Eff									
Maximum Stack Emission Rate:										
Hourly (lb/hr)										
Annual (TPY)										
Maximum Fugitive Emission Rate:										
Hourly (lb/hr)		89.600	62.720	37.524		0.056	14.784	44.574	3.53E-03	
Annual (TPY)		204.800	143.360	85.770		0.128	33.792	101.883	8.06E-03	
Total Emission Rate:										
Hourly (lb/hr)		89.600	62.720	37.524		0.056	14.784	44.574	3.53E-03	
Annual (TPY)		204.800	143.360	85.770		0.128	33.792	101.883	8.06E-03	

PROPOSED OPERATING SCHEDULE
22 HRS/DAY
6,000 HRS/YEAR

Note 1 Emission factor from FIRE 6.25 SCC 3-04-003-31
Note 2: EJIW-Ardmore Foundry Stack Testing (Oct 2010). Results used with Wheland and Technikon information to distribute between melting, pouring, cooling and shakeout.
Note 3. Factors: Baseline Emissions from Automotive Foundries in Mexico"
Note 4: C02e emissions included in Pouring & Mold Cooling Tab
Note 5: Emission factor from EJIW stack test (July 2010)
Note 6: Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor
Note 7 Max emissions from this line Combined group limit on Shakeout of 25 tph, 128,000 tpy throughput due to max melt rate upstream

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Stack Emission Rate (lb/hr) {Lead} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr) x (EF for Lead/EF for PM-10)
Maximum Stack Emissions Rate (lb/hr) {VOC, CO} =(Max. Rated Capacity ton/hr) x (EF in lb/ton) x (Capture Eff./100)
Maximum Annual (Ton/yr) PM, PM10 and lead stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Annual (ton/yr) VOC and CO stack emissions= (Hourly stack emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
Shotblast

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Shotblast
Control Device: Baghouses H/J
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:		Criteria Pollutants								
Shotblast										
Emission Factor Basis:		PM	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	CO_2e
Emission Factors:	lb/ton	15.50	1.70	1.70						
(source)		Note 1	Note 2	Note 3						
Capture Efficiency										
Control Efficiency										
Building Capt. Eff										
Maximum Stack Emission Rate:										
Hourly (lb/hr)										
Annual (TPY)										
Maximum Fugitive Emission Rate:										
Hourly (lb/hr)		434.000	47.600	47.600						
Annual (TPY)		992.000	108.800	108.800						
Total Emission Rate:										
Hourly (lb/hr)		434.000	47.600	47.600						
Annual (TPY)		992.000	108.800	108.800						

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from Bernard S. Gutow article
Note 2: Emission factor from FIRE 6.25 SCC 3-04-003-40
Note 3: Assumes $PM^{2.5}$ is equal to PM_{10}

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Annual (Ton/yr) stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
128,000 Tons/Year

Flow Diagram Designation
Grinding

Maximum Hourly Capacity
28.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Grinding
Control Device: Baghouses H/J
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:			Criteria Pollutants								
	Grinding										
Emission Factor Basis:			**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:		lb/ton	1.60	0.005	0.005						
(source)			Note 1	Note 2	Note 3						
		Capture Efficiency									
		Control Efficiency									
		Building Capt. Eff									
Maximum Stack Emission Rate:											
	Hourly (lb/hr)										
	Annual (TPY)										
Maximum Fugitive Emission Rate:											
	Hourly (lb/hr)		44.800	0.126	0.126						
	Annual (TPY)		102.400	0.288	0.288						
Total Emission Rate:											
	Hourly (lb/hr)		44.800	0.126	0.126						
	Annual (TPY)		102.400	0.288	0.288						

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from Bernard S. Gutow article
Note 2: Emission factor from FIRE 6.25 SCC 3-04-003-60
Note 3: Assumes PM2.5 is equal to PM10

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Annual (Ton/yr) stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
1,920,000 Tons/Year

Flow Diagram Designation
Sand Handling & Storage (H&S)

Maximum Hourly Capacity
390.00 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Sand Handling & Storage (H&S)
Control Device: Baghouse E, F, G, H/J
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:		Criteria Pollutants								
Sand Handling & Storage (H&S)										
Emission Factor Basis:		PM	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	CO_2e
Emission Factors:	lb/ton	3.60	0.54	0.54						
(source)		Note 1,3	Note 1,3	Note 2,3			Note 4			
	Capture Efficiency									
	Control Efficiency									
	Building Capt. Eff									
Maximum Stack Emission Rate:										
Hourly (lb/hr)										
Annual (TPY)										
Maximum Fugitive Emission Rate:										
Hourly (lb/hr)		1404.000	210.600	210.600						
Annual (TPY)		3456.000	518.400	518.400						
Total Emission Rate:										
Hourly (lb/hr)		1404.000	210.600	210.600						
Annual (TPY)		3456.000	518.400	518.400						

PROPOSED OPERATING SCHEDULE
22 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from FIRE 6.25 SCC 3-04-003-50
Note 2: Assumes PM2.5 is equal to PM10
Note 3: Includes mold making PM emissions.
Note 4: Mold making VOC emissions included with Pouring & Cooling VOC EF.

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Annual (Ton/yr) stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)) x (8760 hrs/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

Maximum Yearly Capacity
1,500 Tons/Year

Flow Diagram Designation
Shell Coremaking

Maximum Hourly Capacity
0.48 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Shell Coremaking
Control Device: Baghouse L
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:		Criteria Pollutants								
	Shell Coremaking									
Emission Factor Basis:		**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:	lb/ton	0.35	0.35	0.11			0.2%			
(source)		Note 1	Note 1	Note 2			Note 3			
	Capture Efficiency									
	Control Efficiency									
	Building Capt. Eff									
Maximum Stack Emission Rate:										
	Hourly (lb/hr)									
	Annual (TPY)									
Maximum Fugitive Emission Rate:										
	Hourly (lb/hr)	0.168	0.168	0.050			1.824			
	Annual (TPY)	0.263	0.263	0.079			2.850			
Total Emission Rate:										
	Hourly (lb/hr)	0.168	0.168	0.050			1.824			
	Annual (TPY)	0.263	0.263	0.079			2.850			

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1 Ohio RACM Guide, Page 2-219, Table 2.7-1, Emission Factor #15 gives uncontrolled emission factors of 0.3 lb/ton of sand mixed for mixing and 0.35 lb/ton of cores made from making the cores. No mixing will be conducted, the shell sand will be input directly into the machines. Therefore an emission factor of 0.35 lb/ton of cores made will be utilized.
Note 2 Emission factor based on USEPA PM Calculator (March 2012) PM to PM2.5 ratio and uncontrolled PM emission factor
Note 3 %wt - Discussions w/Borden rep. Regarding Super F E19E19 MSDS

EXAMPLE CALCULATIONS:
Maximum Fugitive Emission Rate (lb/hr) = (Emission Factor) x (process weight rate (ton/hr)) x (1-(Settling Factor)/100)
Annual (TPY) Emission Rates = (lb/hr emission rate) x (1/ Maximum Hourly Process Rate (tons/hr)) x (Annual process weight rate (tons/yr))x (ton/2000)

East Jordan Foundry, LLC
HAP Emission Calculations
Shell Coremaking

HAPs	CAS #	Emission Factor %wt	Emissions lbs/hr	Emissions tons/yr	
Antimony (Sb)	7440-36-0				
Arsenic (As)	7440-38-2				
Beryllium (Be)	7440-41-7				
Cadmium (Cd)	7440-43-9				
Chromium (Cr)	7440-47-3				
Cobalt (Co)	7440-48-4				
Lead (Pb)	7439-92-1				
Manganese (Mn)	7439-96-5				
Mercury (Hg)	7439-97-6				
Nickel (Ni)	7440-02-0				
Selenium (Se)	7782-49-2				
Acetaldehyde	75-07-0				
Dimethylnaphthalenes	28804-88-8				
Cresol	1319-77-3				
Methylnaphthalenes	90-12-0				
Propionaldehyde	123-38-6				
Methylene diphenyl diisocyanate (MDI)	101-68-8				
4,4-methylenedianiline (MBA)	101-77-9				
Formaldehyde	50-00-0	0.02%	0.19	0.30	Note 3
Cumene	98-82-8				
Benzene	71-43-2				
O-Xylene	95-47-6				
M-Xylene	108-38-3				
Phenol	108-95-2	0.08%	0.77	1.20	Note 3
Naphthalene	91-20-3				
Ethyl Benzene	100-41-4				
Hydrogen Flouride	7664-39-3				
Toluene	108-88-3				
P-Xylene	106-42-3				
Hexane	110-54-3				
Xylenes	1330-20-7				
o-Cresol	95-48-7				
Styrene	100-42-5				
Acetophenone	98-86-2				
Dibenzofurans	132-64-9				
Nitrobenzene	98-95-3				
Total HAPs			9.60E-01	1.50E+00	

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
Shell Core NG

Process Description:
Shell Core NG
Control Device: None

Natural Gas Combustion

Inputs		
3	= Max. Hourly Heat Input Rate (MMBtu/hr)	Note 1
1020	= MMBtu/MMscf	
2941.2	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)	
6000	= Maximum Operation (hours/year)	
17.64706	= Maximum Annual Fuel Usage (MMscf)	

POLLUTANT	CAS #	Note 2 Emission Factor (lb/10^6 scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.02	6.71E-02
NOx	n/a	100.0	0.29	8.82E-01
CO	n/a	84.0	0.25	7.41E-01
Lead	n/a	0.0005	1.47E-06	4.41E-06
SO2	n/a	0.6	0.002	5.29E-03
VOC	n/a	5.5	0.02	4.85E-02
CO_2e	n/a	120,000	352.94	1.06E+03
Arsenic (As)	7440-38-2	2.00E-04	5.88E-07	1.76E-06
Beryllium (Be)	7440-41-7	1.20E-05	3.53E-08	1.06E-07
Cadmium (Cd)	7440-43-9	1.10E-03	3.24E-06	9.71E-06
Chromium (Cr)	7440-47-3	1.40E-03	4.12E-06	1.24E-05
Cobalt (Co)	7440-48-4	8.40E-05	2.47E-07	7.41E-07
Manganese (Mn)	7439-96-5	3.80E-04	1.12E-06	3.35E-06
Mercury (Hg)	7439-97-6	2.60E-04	7.65E-07	2.29E-06
Nickel (Ni)	7440-02-0	2.10E-03	6.18E-06	1.85E-05
Selenium (Se)	7782-49-2	2.40E-05	7.06E-08	2.12E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	7.06E-08	2.12E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	5.29E-09	1.59E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	4.71E-08	1.41E-07
POM/Acenaphthene	83-32-9	1.80E-06	5.29E-09	1.59E-08
POM/Acenaphthylene	203-96-8	1.80E-06	5.29E-09	1.59E-08
POM/Anthracene	120-12-7	2.40E-06	7.06E-09	2.12E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	5.29E-09	1.59E-08
Benzene	71-43-2	2.10E-03	6.18E-06	1.85E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	3.53E-09	1.06E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	3.53E-09	1.06E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	3.53E-09	1.06E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	5.29E-09	1.59E-08
POM/Chrysene	218-01-9	1.80E-06	5.29E-09	1.59E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	3.53E-09	1.06E-08
Dichlorobenzene	25321-22-6	1.20E-03	3.53E-06	1.06E-05
POM/Fluoranthene	206-44-0	3.00E-06	8.82E-09	2.65E-08
POM/Fluorene	86-73-7	2.80E-06	8.24E-09	2.47E-08
Formaldehyde	50-00-0	7.50E-02	2.21E-04	6.62E-04
Hexane	110-54-3	1.80E+00	5.29E-03	1.59E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	5.29E-09	1.59E-08
Naphthalene	91-20-3	6.10E-04	1.79E-06	5.38E-06
POM/Phenanathrene	85-01-8	1.70E-05	5.00E-08	1.50E-07
POM/Pyrene	129-00-0	5.00E-06	1.47E-08	4.41E-08
Toluene	108-88-3	3.40E-03	1.00E-05	3.00E-05
Total POM			2.58E-07	7.73E-07
Total HAPs			5.55E-03	1.67E-02

Note 1: Two (2) machines - 0.5 MMBTU/HR each
Note 2: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
3,000 Tons/Year

Flow Diagram Designation
PUCB Coremaking

Maximum Hourly Capacity
12.77 Tons/Hour

Process Description:
East Jordan Foundry, LLC
PUCB Coremaking
Control Device: Baghouse L
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:	Criteria Pollutants								
PUCB Coremaking									
Emission Factor Basis:	**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:	0.65	0.65	0.65						
(source)	Note 1	Note 1	Note 1						
Capture Efficiency									
Control Efficiency									
Building Capt. Eff									
Maximum Stack Emission Rate:									
Hourly (lb/hr)	See Controlling BH(s) for Stk Emissions								
Annual (TPY)	See Controlling BH(s) for Stk Emissions								
Maximum Fugitive Emission Rate:									
Hourly (lb/hr)	8.301	8.301	8.301						
Annual (TPY)	0.975	0.975	0.975						
Total Emission Rate:									
Hourly (lb/hr)	8.301	8.301	8.301						
Annual (TPY)	0.975	0.975	0.975						

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Ohio RACM Guide, Page 2-219, Table 2.7-1

EXAMPLE CALCULATIONS:
Maximum Fugitive Emission Rate (lb/hr) = (Emission Factor) x (process weight rate (ton/hr)) x (1-(Settling Factor)/100)
Annual (TPY) Emission Rates = (lb/hr emission rate) x (1/ Maximum Hourly Process Rate (tons/hr)) x (Annual process weight rate (tons/yr))x (ton/2000)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
Mold & Core Room Chemicals
East Jordan Foundry, LLC
VOC & HAP Emission Estimates from Mold & Core Room chemicals

Maximum Yearly Capacity
Tons/Year

Maximum Hourly Capacity
Tons/Hour

	Material/TAC	CAS Number	Maximum Usage lbs/hr	Maximum Usage lbs/yr	VOC/TAC Content (% by wt)	VOC Control Efficiency (% Reduction)	Factor Basis	Emissions lb/hr	Emissions tons/yr
	Core Wash - Low VOC		5	25000	1%	0%	Material Balance	0.05	0.13
	VELVAPLASTTM TGW 053 COATING								
Note 1	Methanol	67-56-1			0.01%	0%	Material Balance	0.001	0.001
Note 1	Diethylene Glycol	111-46-6			0.01%	0%	Material Balance	0.001	0.001
Note 3	Hydrotreated light silicon	64742-47-8			1.00%	0%	Material Balance	0.05	0.13
	VELVALITE GA 2								
	No TACs emitted								
	Core Wash - Alcohol Based								
	VELVALITETM ZGA 065 Coating		5	20000	25%	70%	Material Balance	0.38	0.75
Note 2	Isopropyl Alcohol	67-63-0			25%	70%	Material Balance	0.38	0.75
	IPA Thinning Solvent		2.5	11000	100%	70%	Material Balance	0.75	1.65
Note 2	Isopropyl Alcohol	67-63-0			100%	70%	Material Balance	0.75	1.65
	Core Release - Shell Core								
	Nix Stix HCLVOC		0.1	150	50%	0%	Material Balance	0.05	0.04
Note 2	Acetaldehyde	75-07-0			0.1%	0%		0.0001	0.0001
	Core Release - No Bake								
	Zip Slip 125H		0.1	150	0.79%	0%	Material Balance	0.001	0.001
Note 2	High molecular wt. silicon	63148-62-9			100%	0%		0.10	0.08
							TOTAL	1.23	2.56

Note 1. Per ASK email, the maximum concentration of either TAC is less than 0.01%. Added 07/2019.
Note 2: Maximum SDS % by weight per SDS. Added 09/2019.

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
64,620 Gal/Year Note 1

Flow Diagram Designation
Asphaltic Dip Coating

Maximum Hourly Capacity
17.23 Gal/Hour Note 1

Process Description:
East Jordan Foundry, LLC
Asphaltic Dip Coating
Control Device: None
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:			Criteria Pollutants								
	Asphaltic Dip Coating										
Emission Factor Basis:			PM	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	CO_2e
Emission Factors:		lb/gal						0.47			
(source)								Note 2			
		Capture Efficiency									
		Control Efficiency									
		Building Capt. Eff									
Maximum Stack Emission Rate:											
	Hourly (lb/hr)										
	Annual (TPY)										
Maximum Fugitive Emission Rate:											
	Hourly (lb/hr)							8.099			
	Annual (TPY)							15.186			
Total Emission Rate:											
	Hourly (lb/hr)							8.099			
	Annual (TPY)							15.186			

PROPOSED OPERATING SCHEDULE
22 HRS/DAY
6,000 HRS/YEAR

Note 1: Throughput rate based on 1.077 gal coating per ton melted at maximum melting rate and assuming coating is applied to 50% of total melted thoughput
Note 2: Vulcan MC4 VOC content from EPA Method 24 analysis, no HAPs exist in this substance

EXAMPLE CALCULATIONS:
Maximum Fugitive Emission Rate (lb/hr) = (Maximum Hourly Production gal/hr) x (VOC content lb/gal)
Maximum Annual Fugitive Emissions (ton/yr)= (Maximum Annual Production gal/yr) x (VOC content lb/gal) / (2000 lb/ton)

Flow Diagram Designation
Asphaltic Dip Tank Post Heater

Process Description:
Asphaltic Dip Tank Post Heater
Control Device: None

Natural Gas Combustion

Inputs

3.64	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
3568.6	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
6000	= Maximum Operation (hours/year)
21.41176	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.03	8.14E-02
NOx	n/a	100.0	0.36	1.07E+00
CO	n/a	84.0	0.30	8.99E-01
Lead	n/a	0.0005	1.78E-06	5.35E-06
SO2	n/a	0.6	0.002	6.42E-03
VOC	n/a	5.5	0.02	5.89E-02
CO_2e	n/a	120,000	428.24	1.28E+03
Arsenic (As)	7440-38-2	2.00E-04	7.14E-07	2.14E-06
Beryllium (Be)	7440-41-7	1.20E-05	4.28E-08	1.28E-07
Cadmium (Cd)	7440-43-9	1.10E-03	3.93E-06	1.18E-05
Chromium (Cr)	7440-47-3	1.40E-03	5.00E-06	1.50E-05
Cobalt (Co)	7440-48-4	8.40E-05	3.00E-07	8.99E-07
Manganese (Mn)	7439-96-5	3.80E-04	1.36E-06	4.07E-06
Mercury (Hg)	7439-97-6	2.60E-04	9.28E-07	2.78E-06
Nickel (Ni)	7440-02-0	2.10E-03	7.49E-06	2.25E-05
Selenium (Se)	7782-49-2	2.40E-05	8.56E-08	2.57E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	8.56E-08	2.57E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	6.42E-09	1.93E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	5.71E-08	1.71E-07
POM/Acenaphthene	83-32-9	1.80E-06	6.42E-09	1.93E-08
POM/Acenaphthylene	203-96-8	1.80E-06	6.42E-09	1.93E-08
POM/Anthracene	120-12-7	2.40E-06	8.56E-09	2.57E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	6.42E-09	1.93E-08
Benzene	71-43-2	2.10E-03	7.49E-06	2.25E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	4.28E-09	1.28E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	4.28E-09	1.28E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	4.28E-09	1.28E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	6.42E-09	1.93E-08
POM/Chrysene	218-01-9	1.80E-06	6.42E-09	1.93E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	4.28E-09	1.28E-08
Dichlorobenzene	25321-22-6	1.20E-03	4.28E-06	1.28E-05
POM/Fluoranthene	206-44-0	3.00E-06	1.07E-08	3.21E-08
POM/Fluorene	86-73-7	2.80E-06	9.99E-09	3.00E-08
Formaldehyde	50-00-0	7.50E-02	2.68E-04	8.03E-04
Hexane	110-54-3	1.80E+00	6.42E-03	1.93E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	6.42E-09	1.93E-08
Naphthalene	91-20-3	6.10E-04	2.18E-06	6.53E-06
POM/Phenanathrene	85-01-8	1.70E-05	6.07E-08	1.82E-07
POM/Pyrene	129-00-0	5.00E-06	1.78E-08	5.35E-08
Toluene	108-88-3	3.40E-03	1.21E-05	3.64E-05
Total POM			3.13E-07	9.38E-07
Total HAPs			6.74E-03	2.02E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
MUA-1

Process Description:
MUA-1
Control Device: None

Natural Gas Combustion

Inputs	
7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
MUA-2

Process Description:
MUA-2
Control Device: None

Natural Gas Combustion

Inputs

7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4, 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
MUA-3

Process Description:
MUA-3
Control Device: None

Natural Gas Combustion

Inputs

7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor (lb/10^6 scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3,44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
MUA-4

Process Description:
MUA-4
Control Device: None

Natural Gas Combustion

Inputs

7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
MUA-5

Process Description:
MUA-5
Control Device: None

Natural Gas Combustion

Inputs	
7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
MUA-6

Process Description:
MUA-6
Control Device: None

Natural Gas Combustion

Inputs

7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
MUA-7

Process Description:
MUA-7
Control Device: None

Natural Gas Combustion

Inputs

7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor (lb/10^6 scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
MUA-8

Process Description:
MUA-8
Control Device: None

Natural Gas Combustion

Inputs

7.30296 = Max. Hourly Heat Input Rate (MMBtu/hr)
1020 = MMBtu/MMscf
7159.8 = Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000 = Maximum Operation (hours/year)
28.63906 = Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
MUA-9

Process Description:
MUA-9
Control Device: None

Natural Gas Combustion

Inputs	
7.30296	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
7159.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
28.63906	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	0.05	1.09E-01
NOx	n/a	100.0	0.72	1.43E+00
CO	n/a	84.0	0.60	1.20E+00
Lead	n/a	0.0005	3.58E-06	7.16E-06
SO2	n/a	0.6	0.004	8.59E-03
VOC	n/a	5.5	0.04	7.88E-02
CO_2e	n/a	120,000	859.17	1.72E+03
Arsenic (As)	7440-38-2	2.00E-04	1.43E-06	2.86E-06
Beryllium (Be)	7440-41-7	1.20E-05	8.59E-08	1.72E-07
Cadmium (Cd)	7440-43-9	1.10E-03	7.88E-06	1.58E-05
Chromium (Cr)	7440-47-3	1.40E-03	1.00E-05	2.00E-05
Cobalt (Co)	7440-48-4	8.40E-05	6.01E-07	1.20E-06
Manganese (Mn)	7439-96-5	3.80E-04	2.72E-06	5.44E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.86E-06	3.72E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.50E-05	3.01E-05
Selenium (Se)	7782-49-2	2.40E-05	1.72E-07	3.44E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.72E-07	3.44E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	1.29E-08	2.58E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	1.15E-07	2.29E-07
POM/Acenaphthene	83-32-9	1.80E-06	1.29E-08	2.58E-08
POM/Acenaphthylene	203-96-8	1.80E-06	1.29E-08	2.58E-08
POM/Anthracene	120-12-7	2.40E-06	1.72E-08	3.44E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	1.29E-08	2.58E-08
Benzene	71-43-2	2.10E-03	1.50E-05	3.01E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	8.59E-09	1.72E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	1.29E-08	2.58E-08
POM/Chrysene	218-01-9	1.80E-06	1.29E-08	2.58E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	8.59E-09	1.72E-08
Dichlorobenzene	25321-22-6	1.20E-03	8.59E-06	1.72E-05
POM/Fluoranthene	206-44-0	3.00E-06	2.15E-08	4.30E-08
POM/Fluorene	86-73-7	2.80E-06	2.00E-08	4.01E-08
Formaldehyde	50-00-0	7.50E-02	5.37E-04	1.07E-03
Hexane	110-54-3	1.80E+00	1.29E-02	2.58E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	1.29E-08	2.58E-08
Naphthalene	91-20-3	6.10E-04	4.37E-06	8.73E-06
POM/Phenanathrene	85-01-8	1.70E-05	1.22E-07	2.43E-07
POM/Pyrene	129-00-0	5.00E-06	3.58E-08	7.16E-08
Toluene	108-88-3	3.40E-03	2.43E-05	4.87E-05
Total POM			6.27E-07	1.25E-06
Total HAPs			1.35E-02	2.70E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
MUA-10

Process Description:
MUA-10
Control Device: None

Natural Gas Combustion

Inputs

5.47722	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
5369.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
21.47929	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	(tpy)
PM/PM10/PM2.5	n/a	7.6	0.04	8.16E-02
NOx	n/a	100.0	0.54	1.07E+00
CO	n/a	84.0	0.45	9.02E-01
Lead	n/a	0.0005	2.68E-06	5.37E-06
SO2	n/a	0.6	0.003	6.44E-03
VOC	n/a	5.5	0.03	5.91E-02
CO_2e	n/a	120,000	644.38	1.29E+03
Arsenic (As)	7440-38-2	2.00E-04	1.07E-06	2.15E-06
Beryllium (Be)	7440-41-7	1.20E-05	6.44E-08	1.29E-07
Cadmium (Cd)	7440-43-9	1.10E-03	5.91E-06	1.18E-05
Chromium (Cr)	7440-47-3	1.40E-03	7.52E-06	1.50E-05
Cobalt (Co)	7440-48-4	8.40E-05	4.51E-07	9.02E-07
Manganese (Mn)	7439-96-5	3.80E-04	2.04E-06	4.08E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.40E-06	2.79E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.13E-05	2.26E-05
Selenium (Se)	7782-49-2	2.40E-05	1.29E-07	2.58E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.29E-07	2.58E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	9.67E-09	1.93E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	8.59E-08	1.72E-07
POM/Acenaphthene	83-32-9	1.80E-06	9.67E-09	1.93E-08
POM/Acenaphthylene	203-96-8	1.80E-06	9.67E-09	1.93E-08
POM/Anthracene	120-12-7	2.40E-06	1.29E-08	2.58E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	9.67E-09	1.93E-08
Benzene	71-43-2	2.10E-03	1.13E-05	2.26E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	6.44E-09	1.29E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	6.44E-09	1.29E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	6.44E-09	1.29E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	9.67E-09	1.93E-08
POM/Chrysene	218-01-9	1.80E-06	9.67E-09	1.93E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	6.44E-09	1.29E-08
Dichlorobenzene	25321-22-6	1.20E-03	6.44E-06	1.29E-05
POM/Fluoranthene	206-44-0	3.00E-06	1.61E-08	3.22E-08
POM/Fluorene	86-73-7	2.80E-06	1.50E-08	3.01E-08
Formaldehyde	50-00-0	7.50E-02	4.03E-04	8.05E-04
Hexane	110-54-3	1.80E+00	9.67E-03	1.93E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	9.67E-09	1.93E-08
Naphthalene	91-20-3	6.10E-04	3.28E-06	6.55E-06
POM/Phenanathrene	85-01-8	1.70E-05	9.13E-08	1.83E-07
POM/Pyrene	129-00-0	5.00E-06	2.68E-08	5.37E-08
Toluene	108-88-3	3.40E-03	1.83E-05	3.65E-05
Total POM			4.70E-07	9.41E-07
Total HAPs			1.01E-02	2.03E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
MUA-11

Process Description:
MUA-11
Control Device: None

Natural Gas Combustion

Inputs

5.47722	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
5369.8	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
4000	= Maximum Operation (hours/year)
21.47929	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.04	8.16E-02
NOx	n/a	100.0	0.54	1.07E+00
CO	n/a	84.0	0.45	9.02E-01
Lead	n/a	0.0005	2.68E-06	5.37E-06
SO2	n/a	0.6	0.003	6.44E-03
VOC	n/a	5.5	0.03	5.91E-02
CO_2e	n/a	120,000	644.38	1.29E+03
Arsenic (As)	7440-38-2	2.00E-04	1.07E-06	2.15E-06
Beryllium (Be)	7440-41-7	1.20E-05	6.44E-08	1.29E-07
Cadmium (Cd)	7440-43-9	1.10E-03	5.91E-06	1.18E-05
Chromium (Cr)	7440-47-3	1.40E-03	7.52E-06	1.50E-05
Cobalt (Co)	7440-48-4	8.40E-05	4.51E-07	9.02E-07
Manganese (Mn)	7439-96-5	3.80E-04	2.04E-06	4.08E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.40E-06	2.79E-06
Nickel (Ni)	7440-02-0	2.10E-03	1.13E-05	2.26E-05
Selenium (Se)	7782-49-2	2.40E-05	1.29E-07	2.58E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.29E-07	2.58E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	9.67E-09	1.93E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	8.59E-08	1.72E-07
POM/Acenaphthene	83-32-9	1.80E-06	9.67E-09	1.93E-08
POM/Acenaphthylene	203-96-8	1.80E-06	9.67E-09	1.93E-08
POM/Anthracene	120-12-7	2.40E-06	1.29E-08	2.58E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	9.67E-09	1.93E-08
Benzene	71-43-2	2.10E-03	1.13E-05	2.26E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	6.44E-09	1.29E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	6.44E-09	1.29E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	6.44E-09	1.29E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	9.67E-09	1.93E-08
POM/Chrysene	218-01-9	1.80E-06	9.67E-09	1.93E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	6.44E-09	1.29E-08
Dichlorobenzene	25321-22-6	1.20E-03	6.44E-06	1.29E-05
POM/Fluoranthene	206-44-0	3.00E-06	1.61E-08	3.22E-08
POM/Fluorene	86-73-7	2.80E-06	1.50E-08	3.01E-08
Formaldehyde	50-00-0	7.50E-02	4.03E-04	8.05E-04
Hexane	110-54-3	1.80E+00	9.67E-03	1.93E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	9.67E-09	1.93E-08
Naphthalene	91-20-3	6.10E-04	3.28E-06	6.55E-06
POM/Phenanathrene	85-01-8	1.70E-05	9.13E-08	1.83E-07
POM/Pyrene	129-00-0	5.00E-06	2.68E-08	5.37E-08
Toluene	108-88-3	3.40E-03	1.83E-05	3.65E-05
Total POM			4.70E-07	9.41E-07
Total HAPs			1.01E-02	2.03E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
Various NG Sources

Process Description:
Various NG Sources
Control Device: None

Natural Gas Combustion

Inputs

4.656	= Max. Hourly Heat Input Rate (MMBtu/hr)
1020	= MMBtu/MMscf
4564.7	= Max. Hourly Fuel Usage Rate (standard cubic feet hour)
6000	= Maximum Operation (hours/year)
27.38824	= Maximum Annual Fuel Usage (MMscf)

POLLUTANT	CAS #	Note 1 Emission Factor ($lb/10^6$ scf)	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM/PM10/PM2.5	n/a	7.6	0.03	1.04E-01
NOx	n/a	100.0	0.46	1.37E+00
CO	n/a	84.0	0.38	1.15E+00
Lead	n/a	0.0005	2.28E-06	6.85E-06
SO2	n/a	0.6	0.003	8.22E-03
VOC	n/a	5.5	0.03	7.53E-02
CO_2e	n/a	120,000	547.76	1.64E+03
Arsenic (As)	7440-38-2	2.00E-04	9.13E-07	2.74E-06
Beryllium (Be)	7440-41-7	1.20E-05	5.48E-08	1.64E-07
Cadmium (Cd)	7440-43-9	1.10E-03	5.02E-06	1.51E-05
Chromium (Cr)	7440-47-3	1.40E-03	6.39E-06	1.92E-05
Cobalt (Co)	7440-48-4	8.40E-05	3.83E-07	1.15E-06
Manganese (Mn)	7439-96-5	3.80E-04	1.73E-06	5.20E-06
Mercury (Hg)	7439-97-6	2.60E-04	1.19E-06	3.56E-06
Nickel (Ni)	7440-02-0	2.10E-03	9.59E-06	2.88E-05
Selenium (Se)	7782-49-2	2.40E-05	1.10E-07	3.29E-07
POM/2-Methylnaphthalene	91-57-6	2.40E-05	1.10E-07	3.29E-07
POM/3-Methylchloranthrene	56-49-5	1.80E-06	8.22E-09	2.46E-08
POM/7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	7.30E-08	2.19E-07
POM/Acenaphthene	83-32-9	1.80E-06	8.22E-09	2.46E-08
POM/Acenaphthylene	203-96-8	1.80E-06	8.22E-09	2.46E-08
POM/Anthracene	120-12-7	2.40E-06	1.10E-08	3.29E-08
POM/Benz(a)anthracene	56-55-3	1.80E-06	8.22E-09	2.46E-08
Benzene	71-43-2	2.10E-03	9.59E-06	2.88E-05
POM/Benzo(a)pyrene	50-32-8	1.20E-06	5.48E-09	1.64E-08
POM/Benzo(b)fluoranthene	205-99-2	1.20E-06	5.48E-09	1.64E-08
POM/Benzo(g,h,i)perylene	191-24-2	1.20E-06	5.48E-09	1.64E-08
POM/Benzo(k)fluoranthene	205-82-3	1.80E-06	8.22E-09	2.46E-08
POM/Chrysene	218-01-9	1.80E-06	8.22E-09	2.46E-08
POM/Dibenzo(a,h)anthracene	53-70-3	1.20E-06	5.48E-09	1.64E-08
Dichlorobenzene	25321-22-6	1.20E-03	5.48E-06	1.64E-05
POM/Fluoranthene	206-44-0	3.00E-06	1.37E-08	4.11E-08
POM/Fluorene	86-73-7	2.80E-06	1.28E-08	3.83E-08
Formaldehyde	50-00-0	7.50E-02	3.42E-04	1.03E-03
Hexane	110-54-3	1.80E+00	8.22E-03	2.46E-02
POM/Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	8.22E-09	2.46E-08
Naphthalene	91-20-3	6.10E-04	2.78E-06	8.35E-06
POM/Phenanathrene	85-01-8	1.70E-05	7.76E-08	2.33E-07
POM/Pyrene	129-00-0	5.00E-06	2.28E-08	6.85E-08
Toluene	108-88-3	3.40E-03	1.55E-05	4.66E-05
Total POM			4.00E-07	1.20E-06
Total HAPs			8.62E-03	2.59E-02

Note 1: FROM AP-42 Fifth Edition, Supplement D, TABLE 1.4-2&3&4. 7/98 External Combustion Sources 1.4-9. Many emission factors < than specific value. In this case, specific value used to error on conservative side

EXAMPLE CALCULATIONS:
Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
EG-1

Process Description:
EG-1
Control Device:

Natural Gas Combustion

	Inputs	
Note 2	459.0	= Rating of Generator (hp)
	300.0	= Rating of Generator (KW)
	7000	= Brake Specific Fuel Consumption Btu/hp-hr (AP-42 Table 3.3-1, footnote a)
	3.2130	= Max. Hourly Heat Input Rate (MMBtu/hr)
	150.0	= Maximum Operation (hours/year)

POLLUTANT	CAS #	Note 1 Emission Factor (lb/MMBtu) Fuel Input	Maximum Emissions (lbs/hr)	Maximum Emissions (tpy)
PM	n/a	0.0099	0.032	0.002
PM10/PM2.5	n/a	0.0095	0.031	0.002
NOx	n/a	2.27	7.294	0.547
CO	n/a	3.72	11.952	0.896
Lead	n/a			
SO2	n/a	0.0006	0.002	0.000
VOC	n/a	0.0296	0.095	0.007
CO_2	n/a	110	353.43	26.51
N_2O	n/a			
Methane	n/a	0.23	0.74	0.06
CO_2e	n/a	115.75	371.9	27.89
1,1,2-Trichloroethane	79-00-5	ND	ND	ND
1,3-Butadiene	106-99-0	6.63E-04	2.13E-03	1.60E-04
1,3-Dichloropropene	542-75-6	ND	ND	ND
Acetaldehyde	75-07-0	2.79E-03	8.96E-03	6.72E-04
Acrolein	107-02-8	2.63E-03	8.45E-03	6.34E-04
Benzene	71-43-2	1.58E-03	5.08E-03	3.81E-04
Carbon Tetrachloride	56-23-5	ND	ND	ND
Chlorobenzene	108-90-7	ND	ND	ND
Chloroform	67-66-3	ND	ND	ND
Ethylbenzene	100-41-4	ND	ND	ND
Ethylene Dibromide (Dibromoethane)	106-93-4	ND	ND	ND
Ethylene Dichloride (1,2-Dichloroethane)	107-06-2	ND	ND	ND
Ethylidene Dichloride (1,1-Dichloroethane)	75-34-3	ND	ND	ND
Formaldehyde	50-00-0	2.05E-02	6.59E-02	4.94E-03
Methanol	67-56-1	3.06E-03	9.83E-03	7.37E-04
Methyl Chloride (Chloromethane)	74-87-3	4.12E-05	1.32E-04	9.93E-06
Naphthalene	91-20-3	9.71E-05	3.12E-04	2.34E-05
PAH	n/a	1.41E-04	4.53E-04	3.40E-05
Propylene Dichloride (1,2-Dichloropropane)	78-87-5	ND	ND	ND
Styrene	100-42-5	1.19E-05	3.82E-05	2.87E-06
Toluene	108-88-3	5.58E-04	1.79E-03	1.34E-04
Vinyl Chloride	75-01-4	ND	ND	ND
Xylenes (isomers and mixture)	1330-20-7	1.95E-04	6.27E-04	4.70E-05
Total HAPs			1.04E-01	7.78E-03

Note 1: FROM AP-42 Fifth Edition, Supplement F, Ch. 3.2 TABLE 3.2-3, 8/2000. Many emission factors < than detectable value, these emission factors are represented as undetectable (ND).
Note 2: Manufacturer spec sheet

Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Flow Diagram Designation
EG-2

Process Description:
EG-2
Control Device:

Natural Gas Combustion

	Inputs	
Note 2	459.0	= Rating of Generator (hp)
	300.0	= Rating of Generator (KW)
	7000	= Brake Specific Fuel Consumption Btu/hp-hr (AP-42 Table 3.3-1, footnote a)
	3.2130	= Max. Hourly Heat Input Rate (MMBtu/hr)
	150.0	= Maximum Operation (hours/year)

POLLUTANT	CAS #	Note 1 Emission Factor (lb/MMBtu) Fuel Input	Maximum Emissions (lbs/hr)	(tpy)
PM	n/a	0.0099	0.032	0.002
PM10/PM2.5	n/a	0.0095	0.031	0.002
NOx	n/a	2.27	7.294	0.547
CO	n/a	3.72	11.952	0.896
Lead	n/a			
SO2	n/a	0.0006	0.002	0.000
VOC	n/a	0.0296	0.095	0.007
CO_2	n/a	110	353.43	26.51
N_2O	n/a			
Methane	n/a	0.23	0.74	0.06
CO_2e	n/a	115.75	371.9	27.89
1,1,2-Trichloroethane	79-00-5	ND	ND	ND
1,3-Butadiene	106-99-0	6.63E-04	2.13E-03	1.60E-04
1,3-Dichloropropene	542-75-6	ND	ND	ND
Acetaldehyde	75-07-0	2.79E-03	8.96E-03	6.72E-04
Acrolein	107-02-8	2.63E-03	8.45E-03	6.34E-04
Benzene	71-43-2	1.58E-03	5.08E-03	3.81E-04
Carbon Tetrachloride	56-23-5	ND	ND	ND
Chlorobenzene	108-90-7	ND	ND	ND
Chloroform	67-66-3	ND	ND	ND
Ethylbenzene	100-41-4	ND	ND	ND
Ethylene Dibromide (Dibromoethane)	106-93-4	ND	ND	ND
Ethylene Dichloride (1,2-Dichloroethane)	107-06-2	ND	ND	ND
Ethylidene Dichloride (1,1-Dichloroethane)	75-34-3	ND	ND	ND
Formaldehyde	50-00-0	2.05E-02	6.59E-02	4.94E-03
Methanol	67-56-1	3.06E-03	9.83E-03	7.37E-04
Methyl Chloride (Chloromethane)	74-87-3	4.12E-05	1.32E-04	9.93E-06
Naphthalene	91-20-3	9.71E-05	3.12E-04	2.34E-05
PAH	n/a	1.41E-04	4.53E-04	3.40E-05
Propylene Dichloride (1,2-Dichloropropane)	78-87-5	ND	ND	ND
Styrene	100-42-5	1.19E-05	3.82E-05	2.87E-06
Toluene	108-88-3	5.58E-04	1.79E-03	1.34E-04
Vinyl Chloride	75-01-4	ND	ND	ND
Xylenes (isomers and mixture)	1330-20-7	1.95E-04	6.27E-04	4.70E-05
Total HAPs			1.04E-01	7.78E-03

Note 1: FROM AP-42 Fifth Edition, Supplement F, Ch. 3.2 TABLE 3.2-3, 8/2000. Many emission factors < than detectable value, these emission factors are represented as undetectable (ND).
Note 2: Manufacturer spec sheet

Maximum Hourly Emission = Max.hourly Fuel Usage rate (standard cubic feet hour) x (Pollutant E.F.)
Maximum Yearly Emission = Max.Hourly Emission Rate (lb/hr) x (Maximum Hours of Operation)

Flow Diagram Designation
Road Fug. Dust
East Jordan Foundry, LLC
Paved Road Calculation - Projected

AP-42 (1/11 Version) Ch. 13.2.1
Paved Road Calculation - Projected   E = k * (sL/2)^0.65 * (W/3)^1.5

E = PM-10 emissions factor (lb/VMT)
k = Base emission factor (lb/VMT) - PM-10
sL = Silt loading (g/m²)
W = Mean vehicle weight (tons)

0.4 Round trip distance per vehicle (mi)

Paved Roadways	Number of Round Trips/day	k lb/VMT	sL g/m²	W tons	E lb/VMT	Control Efficiency	Miles Traveled Projected Miles/Year	Emissions (TPY) PM	Emissions (TPY) PM10	Emissions (TPY) PM2.5 [f]	Emissions (lb/hr) PM	Emissions (lb/hr) PM10	Emissions (lb/hr) PM2.5
	Note 2	Note 1				Note 4	Note 3				Note 5	Note 5	Note 5,6
Employee Parking Lot -Cars PM	300	0.082	9.7	2.5	0.17	75	120.0	0.003			0.001		
Employee Parking Lot Cars PM-10	300	0.016	9.7	2.5	0.03	75	120.0		0.001			0.000	
Employee Parking Lot Cars PM-2.5	300	0.016	9.7	2.5	0.03	75	120.0			0.001			0.000
Shipping Castings-PM	26	0.082	9.7	40	11.14	75	10.4	0.014			0.003		
Shipping Castings-PM-10	26	0.016	9.7	40	2.17	75	10.4		0.003			0.001	
Shipping Castings-PM-2.5	26	0.016	9.7	40	2.17	75	10.4			0.003			0.001
Receiving Scrap Metal- PM	26	0.082	9.7	40	11.14	75	10.4	0.014			0.003		
Receiving Scrap Metal PM-10	26	0.016	9.7	40	2.17	75	10.4		0.003			0.001	
Receiving Scrap Metal PM-2.5	26	0.016	9.7	40	2.17	75	10.4			0.003			0.001
Receiving Sand- PM	7	0.082	9.7	40	11.14	75	2.8	0.004			0.001		
Receiving Sand- PM-10	7	0.016	9.7	40	2.17	75	2.8		0.001			0.000	
Receiving Sand- PM-2.5	7	0.016	9.7	40	2.17	75	2.8			0.001			0.000
Receiving Other Materials- PM	5	0.082	9.7	40	11.14	75	2.0	0.003			0.001		
Receiving Other Materials- PM-10	5	0.016	9.7	40	2.17	75	2.0		0.001			0.000	
Receiving Other Materials- PM-2.5	5	0.016	9.7	40	2.17	75	2.0			0.001			0.000
Removing Sand Pit Waste -PM	2	0.082	9.7	30	7.24	75	0.8	0.001			0.000		
Removing Sand Pit Waste -PM-10	2	0.016	9.7	30	1.41	75	0.8		0.000			0.000	
Removing Sand Pit Waste -PM-2.5	2	0.016	9.7	30	1.41	75	0.8			0.000			0.000
							TOTAL:	0.039	0.008	0.008	0.009	0.002	0.002

Note 1: Numbers from AP-42 (Version 1/11) Ch.13.2.1 Table 13.2.1-1
Note 2: Emissions estimate based on figures provided by EJIW and on Maximum production levels. Estimate high to be conservative.
Note 3: Emissions based on potential metal poured of 180,000 tpy
Note 4: Control efficiency of 75% for street sweeping from RACM, Tabe 2.1.1-3 Ohio EPA
Note 5: Lb/hr emission rate calculated by multiplying the tpy emission rate by 2000 lbs/ton and dividing by number of Maximum operating rate hours/yr.
Note 6: Assumed PM2.5 is equal to PM10

PROPOSED OPERATING SCHEDULE
24 hours/day
8,760 hours/year

Uncontrolled Emission Calculations
CAM Applicability
East Jordan Foundry, LLC
Elmira, Michigan

Maximum Yearly Capacity
19,200 Tons/Year

Flow Diagram Designation
Waste Sand Dust Handling

Maximum Hourly Capacity
3.90 Tons/Hour

Process Description:
East Jordan Foundry, LLC
Waste Sand Dust Handling
Control Device: Baghouse H/J
SCC Code:
Control Device Outlet: gr/dscf
Airflow: acfm
Stack Gas Temperature: °F

Facility Process Name:	Criteria Pollutants								
Waste Sand Dust Handling									
Emission Factor Basis:	**PM**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**CO**	**Lead**	**CO_2e**
Emission Factors:	0.65	0.54	0.54						
(source)	Note 1	Note 2	Note 3						
Capture Efficiency									
Control Efficiency									
Building Capt. Eff									
Maximum Stack Emission Rate:									
Hourly (lb/hr)									
Annual (TPY)									
Maximum Fugitive Emission Rate:									
Hourly (lb/hr)	2.535	2.106	2.106						
Annual (TPY)	6.240	5.184	5.184						
Total Emission Rate:									
Hourly (lb/hr)	2.535	2.106	2.106						
Annual (TPY)	6.240	5.184	5.184						

PROPOSED OPERATING SCHEDULE
24 HRS/DAY
6,000 HRS/YEAR

Note 1: Emission factor from EPA Document No. 450/4-90-003, March 1990
Note 2: Emission factor from FIRE 6.25 SCC 3-04-003-50
Note 3: Assumes PM2.5 is equal to PM10

EXAMPLE CALCULATIONS:
Maximum Stack Emission Rate (lb/hr) {PM,PM-10} =(gr/acfm) x (acfm) x (1 lb / 7000 grains) x (60 min / 1 hr)
Maximum Annual (Ton/yr) stack Emission Rates = (lb/hr emission rate) x (hours of operation per year at max. rate) x (ton/2000 lbs)
Maximum Fugitive Emission Rate (lb/hr) = ((1 - Capture Efficiency/100) x (Emission Factor) x (Melt ton/hr) x (1-(Settling Factor)/100)
Maximum Annual Fugitive Emissions (ton/yr)= (Hourly fugitive emissions (lb/hr)/ hourly Process rate (ton/hr) x (Annual process rate (tons/yr) x (ton/2000 lbs)
Total Emission Rate (lb/hr) = (Maximum Stack Emission Rate lb/hr) + (Maximum Fugitive Emission Rate lb/hr)
Total Emission Rates Annual (TPY)= (annual stack emissions (ton/yr)) + (annual fugitive emissions (ton/yr))

EGLE

RENEWABLE OPERATING PERMIT APPLICATION
AI-001: ADDITIONAL INFORMATION

This information is required by Article II, Chapter 1, Part 55 (Air Pollution Control) of P.A. 451 of 1994, as amended, and the Federal Clean Air Act of 1990. Failure to obtain a permit required by Part 55 may result in penalties and/or imprisonment. Please type or print clearly. Refer to instructions for additional information to complete this form.

	SRN: N6052	Section Number (if applicable):
1. Additional Information ID **AI-**S-003(11)		

Additional Information

2. Is This Information Confidential? ☐ Yes ☒ No

11. Does the source have any required plans such as a malfunction abatement plan, fugitive dust plan, operatoin/maintenance plan, startup/shutdown plans or any other monitoring plan? If Yes, then the plan(s) must be submitted with this application on an AI-001 Form.

Yes. Please find the attached plans specific to EJF including:

Scrap Selection and Inspection Plan
Malfunction Abatement Plan

A Fugitive Dust Plan is included as Appendix A in the attached PTI.

Scrap Selection and Inspection Plan (S-ENV-1546, Rev. B)

Scrap Selection and Inspection Plan
East Jordan Foundry, LLC (EJF)
2675 N. US 131
Elmira, Michigan

As required by
40 CFR 63 Subpart ZZZZZ, National Emission Standards for Hazardous Air Pollutants for Iron and Steel Foundries Area Sources

May 2019

Table of Contents

Plan Revision and Updates

Date	Section(s)	Description
October 2018, Rev. A	All	Initial issuance of plan
May 2019, Rev. B	All	Revised prior to submittal to EPA/EGLE (MDEQ)

1.0 Introduction

On January 2, 2008, the Environmental Protection Agency (EPA) promulgated the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Iron and Steel Foundries Area Sources (Subpart ZZZZZ). These standards implement section 112 (d)(5) of the Clean Air Act (CAA) by requiring all sources to meet hazardous air pollutant (HAP) emission standards reflecting application of generally available control technology (GACT). The East Jordan Foundry located in Elmira, Michigan is currently considered an area source of HAP's.
Further East Jordan Foundry is a "new" affected source per §63.10880 (b)(2) as construction was started after September 17, 2007. Per §63.10885(g), as a "new" affected source, East Jordan Foundry is required to determine initial applicability based on the facility's annual metal melting capacity and has determined the facility must meet the requirements of a "large" foundry.

Subpart ZZZZZ establishes "large" foundry requirements for demonstrating initial and continuous compliance with pollution prevention management practices, work practice standards, operational and maintenance requirements, monitoring requirements, performance testing requirements, and recordkeeping and reporting requirements. One of the pollution prevention management practices of this subpart, is the management practice for metallic scrap and mercury switches. Section §63.10885(a) describes the Metallic Scrap Management Program requirements, while section §63.10885(b) describes the Mercury Requirements.

Per §63.10881(c) as a "new" affected source, the East Jordan Foundry has achieved compliance with the applicable provisions of Subpart ZZZZZ upon startup.

<u>Section §63.10885(a) Metallic Scrap Management Program requirements:</u>

§63.10885(a) provides requirements for metallic scrap requirement programs for "restricted metallic scrap" and "general iron and steel scrap." For each segregated metallic scrap storage area, bin or pile, East Jordan Foundry, LLC (EJF) must comply with the materials acquisition requirements of §63.10885(a)(1) for "restricted metallic scrap" or (2) for "general iron and steel scrap.". EJF must keep a copy of the material specifications onsite and readily available to all personnel with material acquisition duties and provide a copy to each of your scrap providers.

EJF may have certain scrap subject to either §63.10885 (a)(1) or (2) and will ensure provided the metallic scrap remains segregated until charge make-up should that be the case.

As required by §63.10885(a)(1) for "restricted metallic scrap". (Purchasing Specification)
EJF will prepare and operate at all times according to written material specifications for the purchase and use of only metal ingots, pig iron, slitter, or other materials that do not include post-consumer automotive body scrap, post-consumer engine blocks, post-consumer oil filters, oily turnings, lead components, chlorinated plastics, or free liquids. "Free liquids" is defined as material that fails the paint filter liquids test by EPA Method 9095B (see Appendix D). The requirements for no free liquids do not apply if the owner or operator can demonstrate that the free liquid is water that resulted from scrap exposure to natural precipitation (rain, snow, sleet, etc.).

Per section §63.10885(a)(2) for "general iron and steel scrap". (Inspection Procedures)

EJF will prepare and operate at all times according to written material specifications for the purchase and use of only iron and steel scrap that has been depleted (to the extent practicable) of organics and HAP metals in the charge materials used by the iron and steel foundry. At a minimum the material specification must include: that for metallic scrap materials charged to a metal melting furnace must be depleted (to the extent practicable) of the presence of used oil filters, chlorinated plastic parts, accessible lead-containing components (such as batteries and wheel weights), and to ensure the scrap materials are drained of free liquids.

Section §63.10885(b) Mercury requirements:

As defined in §63.10906. "Motor vehicle scrap means vehicle or automobile bodies, including automobile body hulks, that have been processed through a shredder. Motor vehicle scrap does not include automobile manufacturing bundles, or miscellaneous vehicle parts, such as wheels, bumpers, or other components that do not contain mercury switches." EJF does not intend to procure scrap containing motor vehicle scrap and therefore per §63.10885(b)(4) EJF will certify in the notification of compliance status and maintain records of documentation that the scrap does not contain motor vehicle scrap.

1.1 Purpose

This Scrap Selection and Inspection Plan has been created to fulfill the pollution prevention management practice of Subpart ZZZZZ. The purpose of the plan is as follows:

To eliminate or minimize, to the extent practicable, the amount of potentially polluting materials in the charge material used by East Jordan Foundry, LLC in its foundry operations.

1.2 Scope

The Scrap Selection and Inspection Plan includes instructions to ensure the plan fulfills the following basic functions.

- Establishment of written procedures to include:
  - The purchase and use of only metal ingots, pig iron, slitter, or other materials that do not include post-consumer automotive body scrap, post-consumer engine blocks, post-consumer oil filters, oily turnings, lead components, chlorinated plastics, or free liquids.
  - The purchase and use of only iron and steel scrap that has been depleted (to the extent practicable) of organics and HAP metals.
  - Prohibiting the purchase or use of motor vehicle scrap.
- Establishment of written procedures for scrap inspection and maintains records documenting inspections, including how iron and steel scrap must be depleted (to the extent practicable) of the presence of used oil filters, chlorinated plastic parts, accessible lead-containing components (such as batteries and wheel weights) and drained of free liquids.

2.0 Scrap Selection and Inspection

East Jordan Foundry, LLC (EJF) is a gray and ductile iron foundry. As a part of our operation, scrap is purchased and then charged to four (4) Electric Induction Furnaces (EIF) to produce molten metal that is used in the manufacture of our products.

As stated above, this scrap selection and inspection plan has been developed such that scrap is purchased that is free of plastic, lead components, batteries, and liquid organics (to the extent practicable). The components of the scrap selection and inspection plan, including recordkeeping forms, have been prepared in an ISO format and are included in Appendix A-D with the material specification and work instructions.

2.1 Material Acquisition

EJF scrap and raw material purchases are included in the following specifications:

- Electric Melting Metallic Scrap and Raw Material Specification, SPEC-0100
- External Electric Melting Metallics Inspection Specification, SPEC-0101

These materials and their specifications are included in Appendix A. Additional material categories may be added or deleted in the future and such changes will be documented. These specifications document and describe unacceptable material scrap loads containing plastic and free liquids, mercury switches, lead components, etc. EJF will not purchase or use motor vehicle scrap, as defined in §63.10906

2.2 Visual Inspection Procedures

The procedure requires the visual inspection of a representative portion but not less than 10% of all incoming scrap to ensure the scrap material meets specifications. EJF will inspect a minimum of 10% of all incoming scrap.

The inspection procedures include the following:

- identify the locations where scrap inspections are to be performed and the location (s) must provide a reasonable vantage point, considering worker safety
- include record keeping requirements that document each visual inspection
- include provisions for rejecting or returning shipments not meeting specifications
- limit purchases from vendors whose shipments fail to meet specifications more than three (3) times in one calendar year

The scrap inspection procedures are contained in the work instructions, Electric Melt Scrap Inspection, F0290-0277, Receiving Procedures 0700-0135, and fulfill all these requirements.

3.0 Plan Distribution and Vendor Notification

A copy of the Scrap Selection and Inspection Plan is kept onsite and maintained with the Environmental and Safety Manager. This plan is readily available to all plant personnel involved with the materials acquisition or inspection of scrap materials.

Material specifications will be supplied to all East Jordan Foundry, LLC scrap vendors. The letter sent to all current scrap vendors is found in Appendix C. The approved vendor list is maintained in the Corporate QSI Supplier Management Database. It will be updated periodically, and new vendors will be sent material specifications.

4.0 Document Control

The documents presented in Appendix A-C are the current documents when this plan was issued. The QSI Document Control System contains the most current version of the documents.

Appendix A - External Specifications

See latest revision of: Electric Melting Metallic Scrap and Raw Material Specification, SPEC-0100

See latest revision of: External Electric Melting Metallics Inspection Specification, SPEC-0101

Appendix B - Internal Procedures

See latest revision of: Electric Melt Scrap Inspection, F0290-0277

See latest revision of: Receiving Procedures, 0700-0135

Appendix C - Vendor Notification Letter (Example Letter)

October X, 20XX

Dear Scrap Vendor,

Re: External Electric Melting Metallics Inspection Specification, SPEC-0101

Please find the enclosed specification, External Electric Melting Metallics Inspection Specification, SPEC-0101, which is a portion of our program relating to compliance with the MACT Standards. The new specification becomes effective at East Jordan Foundry, LLC, immediately upon startup of the foundry SPEC-0101 replaces all previous melt specifications that may have been provided to you in the past.

The new specifications zero in on some specific items that MACT Standards require you to minimize/eliminate from our scrap material flows, i.e. lead, mercury switches, plastic, and free liquids. Listed below are the grades of scrap we will be purchasing:

Item Number	Description
7281951E	#1 Shredded Scrap
7281951E	Plate & Structural
7281951E	Flashings
7281951E	OTM
7281951E	Rail Crop
7291923E	Busheling
7291923E	#1 Shredded Clip
7269807E	Clean Auto Cast
7176257	Pig Iron, Basic

East Jordan Foundry, LLC will not be purchasing scrap containing motor vehicle scrap, as defined in §63.10906. "Motor vehicle scrap means vehicle or automobile bodies, including automobile body hulks, that have been processed through a shredder. Motor vehicle scrap does not include automobile manufacturing bundles, or miscellaneous vehicle parts, such as wheels, bumpers, or other components that do not contain mercury switches." If your foundry steel or shredded contains motor vehicle scrap, it will be returned to your facility at your cost.

Another part of this Standard that will impact all suppliers is that the Purchase Order number and Item Number must be written on all shippers (and bill of lading) to cover loads delivered to East Jordan Foundry, LLC. If a load is received that does not have this information on the shipper/bill of lading, it may not be accepted.

Please let me know if you have any questions pertaining to Electric Melting Metallics Inspection Specification. We will make every attempt to work with all of our suppliers to help them comply with these rules and regulations imposed on the foundry industry.

Sincerely,

Tony A. Pitts
Environmental Services Manager

Appendix D - Paint Filter Liquids Test

See latest revision of: SW-846 Test Method 9095B: Paint Filter Liquids Test, may be found at https://www.epa.gov/hw-sw846