

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>		<i>Responsible Department</i>
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	PM Maximum Emission Limit	0.87 pph	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	PM 10 Maximum Emission Limit	0.23 pph	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	PM-2.5 Maximum Emission Limit	0.23 pph	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	VOC Maximum Emission Limit	0.08 pph	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Nox Maximum Emission Limit	1.47 pph	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Nox Maximum Emission Limit	3.90 tpy	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	CO Maximum Emission Limit	1.24 pph	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	MAP shall address bag house, pressure drop, cartridge replacement, etc		Environmental / Maintenance
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Approved MAP		Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Sand Processing not to exceed	73,339 tons	Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Shall not exceed	15 MMBtu/hr	Precision Sand / Maintenance
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Shall not operate equipment under EUPSANDPROCESS unless respective air pollution control equipment is installed and operating properly in accordance with the MAP		Precision Sand / Maintenance Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Shall record – new and recovered sand throughput rate		Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Shall record – PM, PM10, & PM2.5 emissions in pph		Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Shall record – NOx emissions in tpy calculated using AP-42 factors for natural gas combustion		Environmental
EUPSANDPROCESS	SV-Z02-BH-01, SV-Z02-BH-02	Shall record – natural gas usage rate		Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and DMIPA usage or other amine and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

In the Precision Sand Process area, there are two Thermal Sand Reclaim Units (TSRs) The TSRs are interlocked with their associated process so that if the temperature in the TSR falls below operational ranges the reclaim system will not process sand.

INTERLOCK**Assessing Compliance with the Air Permit**

The air permit requires that GM assess the emissions for Precision Sand. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

Precision Sand Processing

Emissions of PM and VOC from the precision sand process depend on the quantity of sand that is processed or throughput rates and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the baghouses. VOC emissions depend largely on the proper operation of the TSR's. Temperature, pressure drop, and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant's Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant's Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant's Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant's Environmental Engineer shall notify the site's Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

Precision Sand - Baghouse Monitoring

Continuously **

<u>Monitoring Parameter</u>	<u>Monitoring Frequency</u>	<u>General Range</u>
Differential Pressure**	Daily	0.5-10 inches WC
Temperature **	Daily	>1200°F (676°C hood temp)
Bag Condition/Interior Insp.	Semi-Annually	Check for sand on clean side of BH; Structural integrity

Note: * ±40 hours for the shift responsible for the task, and hours will be collector hours during production
 Note **: GM will observe the magnitude of the gauge reading only on production days

Dust Collector

Equipment No.	Guideline Delta Pressure (inches)***
SV-Z02-BH-1	0.5-10
SV-Z02-BH-2	0.5-10

Note: *** The minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced or other reason acceptable to the AQD.

Stack Opacity Checks

Precision Sand Process TSR's Baghouse	3 times/week	Limit: 10%
Precision Sand Process Bin Vent	1 time/year	Limit: 0%

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a "significant" visible plume, they will call for the site's Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the baghouses will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra bags, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

CAM Plan Does NOT apply

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>		<i>Responsible Department</i>
EUPSANDCOREROOM	SV-Z03-CC-02	PM Maximum Emission Limit	1.35 pph	Environmental
EUPSANDCOREROOM	SV-Z03-CC-02	PM 10 Maximum Emission Limit	1.35 pph	Environmental
EUPSANDCOREROOM	SV-Z03-CC-02	PM-2.5 Maximum Emission Limit	1.35 pph	Environmental
EUPSANDCOREROOM	SV-Z03-CC-02	VOC Maximum Emission Limit	1.35 pph	Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01	PM Maximum Emission Limit of exhaust gas on a dry gas basis	0.56 pph	Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01	PM 10 Maximum Emission Limit	0.56 pph	Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01	PM-2.5 Maximum Emission Limit	0.56 pph	Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01	VOC Maximum Emission Limit	8.10 pph	Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01	VOC Average 12- month rolling	22.00 tpy	Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01	MAP shall address bag house, pressure drop, cartridge replacement, etc		Environmental / Maintenance
EUPSANDCOREROOM	SV-Z03-CC-02 SV-Z03-ISO-01	Approved MAP		Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01	Shall not exceed DMIPA use based on 12-month rolling average	481 tpy	Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01 SV-Z03-CC-02	Shall not operate equipment under EUPSANDCOREROOM unless respective air pollution control equipment is installed and operating properly in accordance with the MAP		Precision Sand Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01 SV-Z03-CC-02	Shall monitor and record PM, PM10, and PM2.5 emissions in pph		Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01 SV-Z03-CC-02	Shall record DMIPA and Core Sand throughput rates monthly and (12-month rolling average)		Environmental
EUPSANDCOREROOM	SV-Z03-ISO-01 SV-Z03-CC-02	Shall record VOC emissions in tpy monthly and (12-month rolling average)		Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and DMIPA usage or other amine and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the Precision Sand Core room area, the core machines will be interlocked to the acid scrubber and to the cartridge collector. Should either piece of equipment fail in key parameters such as flow or pH, the core machines will no longer be able to process cores.

INTERLOCK

Assessing Compliance with the Air Permit

The air permit requires that GM assess the emissions for Precision Sand. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

Precision Sand Coreroom

Emissions of PM and VOC from the precision sand core room depends on the number cores that are processed through the core machines and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the cartridge collector. VOC emissions depend largely on the proper operation of the acid scrubber. Flow, pressure drop, pH and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag or media change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant’s Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant’s Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant’s Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant’s Environmental Engineer shall notify the site’s Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

Cartridge Collectors Monitoring

Continuously **

Monitored Parameter

Monitoring Frequency

Comments/Ranges

Static pressure drop**
 Mechanical Inspection
 Electrical Inspection
 Change out Filters

Daily
 744 hours ±40 hours*
 744 hours ±40 hours*
 As Needed

See Cartridge Collector General Ranges
 Check ductwork, drains, bearings, etc.
 Check fans, amps, belts, sheaves, etc.
 If static pressure drop raises too high
 and cannot be reduced by blow down
 cleaning air

Acid Scrubbers Monitoring

Continuously **

Monitored Parameter

Monitoring Frequency

Comments/Ranges

Acid scrubber weekly audit

Monthly

Check pH & water level probes; acid
 pump & ex. fan; control panel;

Acid scrubber Inspection

2880 hours ±40 hours*

Inspect mist collection system, Mist
 Collector cleaning, replace pad if required
 Inspect liquid reservoir and 2ndary
 containment, remove any residue/debris
 See Acid Scrubber General Ranges (below)
 Change tower packing(if required)/clean
 (verify durometer of media)

Annual Cleaning

5760 hours ±40 hours

Flow**

Record every 15mins
 for an hourly average

See Acid Scrubber General Ranges

Differential Pressure**

Record every 15mins
 for an hourly average

See Acid Scrubber General Ranges

pH **

Record every 15mins
 for an hourly average

See Acid Scrubber General Ranges

Note: * ±40 hours for the shift responsible for the task, and hours will be collector hours during production
 Note **: GM will observe the magnitude of the gauge reading only on production days

Cartridge Collector General Ranges

	Guideline Range (inches)
Z03-CC-02	0.1-10.0

Acid Scrubber General Ranges

Equipment No.	Guideline Delta Pressure (inches)	Guideline Water Pressure (GPM)	Actual pH*
PSAND-ISO-01	0.1-6	>190	<4.5

*Note: Two pH Probes

CAM Plan Applies
 to VOC controlled
 by scrubber

Stack Opacity Checks

<u>Process Activity</u>	<u>Frequency of Observations</u>	<u>Comments</u>
Precision Sand Coreroom	3 times/week	Limit: 10%

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the cartridge collector and acid scrubber will be available in order to conduct rapid repairs, if needed. Typical spare parts include flow meters, extra cartridges, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

Title 40: Protection of Environment

PART 64—COMPLIANCE ASSURANCE MONITORING.

A CAM Plan or Compliance Assurance Monitoring Plan is required for all units that require abatement for Volatile Organic Carbons (VOC’s). This plan includes MAP requirements for monitoring, measuring and operations of the equipment.

CAM Plan Applies to
VOC controlled by
scrubber

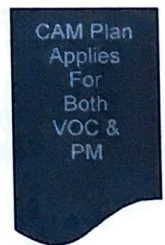
Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>	<i>Responsible Department</i>
EUPSANDCASTLINE	SV-Z02-RTO-03	PM Maximum Emission Limit 2.85 pph	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	PM 10 Maximum Emission Limit 5.55 pph	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	PM-2.5 Maximum Emission Limit 5.55 pph	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	VOC Maximum Emission Limit 4.07 pph	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	NOx Maximum Emission Limit 4.46 pph	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	NOx Maximum Emission Limit 15.21 tpy	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	MAP shall address bag house, pressure drop, bag or media replacement, etc	Environmental / Maintenance
EUPSANDCASTLINE	SV-Z02-RTO-03	Approved MAP	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	Total Aluminum pour Limit (12 month rolling average) 17,490 tpy	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	Shall record aluminum through put rate monthly & (12 month rolling average)	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	Shall not exceed 10 MMBtu/hr during operation of RTO	Precision Sand / Maintenance
EUPSANDCASTLINE	SV-Z02-RTO-03	Shall not exceed 10 MMBtu/hr during operation of RTO Duct Burner	Precision Sand / Maintenance
EUPSANDCASTLINE	SV-Z02-RTO-03	Shall not operate equipment under EUPSANDCASTLINE unless respective air pollution control equipment is installed and operating properly in accordance with the MAP	Precision Sand / Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	Shall record – natural gas usage rate	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	Shall record – NOx emission in tpy calculated using recent test data	Environmental
EUPSANDCASTLINE	SV-Z02-RTO-03	Shall record – PM, PM10, & PM2.5 emissions in pph	Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity



Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and DMIPA usage or other amine gas or SO₂, and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the Precision Sand area, one regenerative thermal oxidizer (RTO) serves as abatement equipment for VOC's from the pouring/cooling/shakeout processes. The RTO is interlocked with the cast line so that if the temperature in the RTO falls below 1400°F, the cast line can no longer pour any additional castings.

Assessing Compliance with the Air Permit

INTERLOCK

The air permit requires that GM assess the emissions for Precision Sand. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

Precision Sand Castline

Emissions of PM and VOC from the precision sand castline depend on the number of castings poured and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the cartridge collectors and the baghouses. VOC emissions depend largely on the proper operation of the RTO. Temperature, pressure drop, and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag or cartridge change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant’s Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant’s Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant’s Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant’s Environmental Engineer shall notify the site’s Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

Regenerative Thermal Oxidizer (RTO) Monitoring

CAM Plan Applies

Continuously**

<u>Monitored Parameter</u>	<u>Monitoring Frequency</u>	<u>General Range</u>
Temperature**	Daily	>1400°F
Natural Gas Usage	744 hours ±40 hours*	Calculate avg. MM Btu/hr
Damper valve	5760 hours ±40 hours*	Inspect the seal
Burner air/fuel ratio	5760 hours ±40 hours*	Inspection of all burners
Thermocouple accuracy	5760 hours ±40 hours*	+/- 5% of design

Cartridge Collectors Monitoring

Continuously

<u>Monitored Parameter</u>	<u>Monitoring Frequency</u>	<u>Comments/Ranges</u>
Differential Pressure**	Daily	0.1 – 8.0
Mechanical Inspection	744 hours ±40 hours*	Check ductwork, bearings, etc.
Electrical Inspection	744 hours ±40 hours*	Check fans, amps, belts, sheaves, etc.
Change out Filters	As Needed	If static pressure drop raises too high and cannot be reduced by blow down cleaning air

Precision Sand - Baghouse Monitoring

CAM Plan Applies

Continuously

<u>Monitoring Parameter</u>	<u>Monitoring Frequency</u>	<u>General Range</u>
Differential Pressure**	Daily	1.0-7.0 inches WC***
Bag Condition/Interior Insp.	2880 hours ±40 hours*	Check for sand on clean side of BH; Structural integrity

Note: * ±40 hours for the shift responsible for the task, and hours will be collector hours during production

Note: **: GM will observe the magnitude of the gauge reading only on production days

Note: *** The minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced or other reason acceptable to the AQD.

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the baghouses and cartridge collectors will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra bags, extra cartridges, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

Title 40: Protection of Environment

PART 64—COMPLIANCE ASSURANCE MONITORING. A CAM Plan or Compliance Assurance Monitoring Plan is required for all units that require abatement for Volatile Organic Carbons (VOC’s) or Particulate Matter

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

(PM). This plan includes MAP requirements for monitoring, measuring and operations of the equipment.

CAM Plan Applies
for both VOC & PM

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>	<i>Responsible Department</i>
EUPSANDSCCSH	SV-Z02-BH-06	PM Maximum Emission Limit	2.36 pph Environmental
EUPSANDSCCSH	SV-Z02-BH-06	PM 10 Maximum Emission Limit	4.73 pph Environmental
EUPSANDSCCSH	SV-Z02-BH-06	PM-2.5 Maximum Emission Limit	4.73 pph Environmental
EUPSANDSCCSH	SV-Z02-BH-06	VOC Maximum Emission Limit	3.99 pph Environmental
EUPSANDSCCSH	SV-Z02-BH-06	MAP shall address bag house, pressure drop, cartridge replacement, etc	Environmental / Maintenance
EUPSANDSCCSH	SV-Z02-BH-06	Approved MAP	Environmental
EUPSANDSCCSH	SV-Z02-BH-06	Shall not operate the rotary drum for more than (12 month rolling average)	5,300 hours Precision Sand / Environmental
EUPSANDSCCSH	SV-Z02-BH-06	Shall not operate equipment under EUPSANDSCCSH unless respective air pollution control equipment is installed and operating properly in accordance with the MAP	Precision Sand / Environmental
EUPSANDSCCSH	SV-Z02-BH-06	Shall record hours of operation rotary drum-sand throughput	Precision Sand / Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and DMIPA usage or other amine gas or SO₂, and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the Precision Sand area, one baghouse serves as particulate abatement equipment from the cooler and sand handling processes. The collector is interlocked with the cast line so that if there is a malfunction in the collector the cast line can no longer process any additional castings.

INTERLOCK

Assessing Compliance with the Air Permit

The air permit requires that GM assess the emissions for Precision Sand. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

Precision Sand Cooling Conveyor Sand Handling

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Emissions of PM and VOC from the precision sand cooling conveyor and sand handling depends on the number of castings poured and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the baghouse. Pressure drop, and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant’s Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant’s Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant’s Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant’s Environmental Engineer shall notify the site’s Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

CAM Plan
Applies to PM

PSANDSCCSH - Baghouse Monitoring

<u>Continuously Monitoring Parameter</u>	<u>Monitoring Frequency</u>	<u>General Range</u>
Differential Pressure**	Record every 15 mins for an hourly average	1.0-10.0 inches WC***
Bag Condition/Interior Insp.	2880 hours ±40 hours*	Check for sand on clean side of BH; Structural integrity

Note: * ±40 hours for the shift responsible for the task, and hours will be collector hours during production

Note: **: GM will observe the magnitude of the gauge reading only on production days

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Note: *** The minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced or other reason acceptable to the AQD.

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the baghouse will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra bags, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

Title 40: Protection of Environment

PART 64—COMPLIANCE ASSURANCE MONITORING.

A CAM Plan or Compliance Assurance Monitoring Plan is required for all units that require abatement for Particulate Matter (PM). This plan includes MAP requirements for monitoring, measuring and operations of the equipment.

CAM Plan Applies
to PM

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>		<i>Responsible Department</i>
EU-FINISH	SV-Z05 CC 01	PM Maximum Emission Limit	0.86 pph	Environmental
EU-FINISH	SV-Z05 CC 01	PM 10 Maximum Emission Limit	0.86 pph	Environmental
EU-FINISH	SV-Z05 CC 01	PM-2.5 Maximum Emission Limit	0.86 pph	Environmental
EU-FINISH	SV-Z05 CC 01	VOC Maximum Emission Limit	1.53 pph	Environmental
EU-FINISH	SV-Z03 CC 01	PM Maximum Emission Limit	0.20 pph	Environmental
EU-FINISH	SV-Z03 CC 01	PM 10 Maximum Emission Limit	0.20 pph	Environmental
EU-FINISH	SV-Z03 CC 01	PM-2.5 Maximum Emission Limit	0.20 pph	Environmental
EU-FINISH	SV-Z03 CC 01 SV-Z05 CC 01	MAP shall address, pressure drop, cartridge replacement, etc		Environmental / Maintenance
EU-FINISH	SV-Z03 CC 01 SV-Z05 CC 01	Approved MAP		Environmental
EU-FINISH	SV-Z03 CC 01 SV-Z05 CC 01	PM,PM10, AND PM2.5 Emissions in pph		Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and DMIPA usage or other amine gas or SO₂, and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the Precision Sand and Semi-Permanent Mold Finish area, there are two cartridge collectors that serve as abatement equipment for particulate from the finishing processes. These are interlocked with the finish line so that if abatement systems are not on the finishing line may not process additional castings.

INTERLOCK

Assessing Compliance with the Air Permit

The air permit requires that GM assess the emissions for Precision Sand. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

Finishing

Emissions of PM from the precision sand and SPM finishing depends on the number of castings poured and thus presented for finishing operations and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the cartridge. Pressure drop, and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for cartridge change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant’s Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant’s Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant’s Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant’s Environmental Engineer shall notify the site’s Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

<u>Cartridge Collectors Monitoring</u>		
<u>Continuously ** Monitored Parameter</u>	<u>Monitoring Frequency</u>	<u>Comments/Ranges</u>
Pressure drop**	Weekly	See Cartridge Collector General Ranges
Mechanical Inspection	744 hours ±40 hours*	Check ductwork, drains, bearings, etc.
Electrical Inspection	744 hours ±40 hours*	Check fans, amps, belts, sheaves, etc.
Change out Filters	As Needed	If static pressure drop raises too high and cannot be reduced by blow down cleaning air

Note: * ±40 hours for the shift responsible for the task, and hours will be collector hours during production
 Note: ** GM will observe the magnitude of the gauge reading only on production days.

Cartridge Collector General Ranges

Equipment No.	Guideline Range (inches)
SV-Z03-CC-01	0.1-10.0
SV-Z05-CC-01	0.1-10.0

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the cartridge collectors will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra cartridges, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>		<i>Responsible Department</i>
EUSPMPROCESSAND	SV-Z02-BH-04	PM Maximum Emission Limit	0.19 pph	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	PM 10 Maximum Emission Limit	0.05 pph	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	PM-2.5 Maximum Emission Limit	0.05 pph	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	VOC Maximum Emission Limit	0.02 pph	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	NOx Maximum Emission Limit	0.39 pph	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	NOx Maximum Emission Limit (12-month rolling average)	1.18 tpy	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	CO Maximum Emission Limit	0.33 pph	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	MAP shall address bag house, pressure drop, cartridge replacement, etc		Environmental / Maintenance
EUSPMPROCESSAND	SV-Z02-BH-04	Approved MAP		Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	Sand Processing not to exceed	27,891 tons	Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	Shall not exceed	4MMBtu/hr	SPM / Maintenance
EUSPMPROCESSAND	SV-Z02-BH-04	Shall not operate equipment under EUSPMPROCESSAND unless respective air pollution control equipment is installed and operating properly in accordance with the MAP		SPM /Maintenance Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	Shall record – new and recovered sand throughput rate		Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	Shall record – PM, PM10, & PM2.5 emissions in pph		Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	Shall record – NOx emissions in tpy calculated using AP-42 factors for natural gas combustion		Environmental
EUSPMPROCESSAND	SV-Z02-BH-04	Shall record – natural gas usage rate		Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and SO₂ usage, and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the SPM Process area, there is a Thermal Sand Reclaim Units (TSR). The TSR is interlocked with their associated process so that if the temperature in the TSR falls below operational ranges the reclaim system will not process sand.

INTERLOCK

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements**Assessing Compliance with the Air Permit**

The air permit requires that GM assess the emissions for SPM. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

SPM Processing

Emissions of PM and VOC from the SPM process depend on the quantity of sand that is processed or throughput rates and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the baghouses. VOC emissions depend largely on the proper operation of the TSR. Temperature, pressure drop, and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant's Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant's Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant's Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant's Environmental Engineer shall notify the site's Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

SPM - Baghouse Monitoring

Continuously **

<u>Monitoring Parameter</u>	<u>Monitoring Frequency</u>	<u>General Range</u>
Differential Pressure**	Daily	0.5-10 inches WC (See Note A)
Temperature**	Daily	>1250°F (676°C)(Hood Temp)
Bag Condition/Interior Insp.	2880 hours ±40 hours*	Check for sand on clean side of BH; Structural integrity

Note: * ±40 hours for the shift responsible for the task, and hours will be collector hours during production
 Note **: GM will observe the magnitude of the gauge reading only on production days.

Dust Collector

<u>Equipment No.</u>	<u>Guideline Delta Pressure (inches)***</u>
SV-Z02-BH-04	0.5-10

Note: *** The minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced or other reason acceptable to the AQD.

Stack Opacity Checks

SPM Process TSR’s Baghouse	3 times/week	Limit: 10%
SPM Process Bin Vent	1 time/year	Limit: 0%

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the baghouses will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra bags, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

CAM Plan Does NOT apply

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>		<i>Responsible Department</i>
EUSPMCOREROOM	SV-Z05-CC-2	PM Maximum Emission Limit	0.34 pph	Environmental
EUSPMCOREROOM	SV-Z05-CC-2	PM 10 Maximum Emission Limit	0.34 pph	Environmental
EUSPMCOREROOM	SV-Z05-CC-2	PM-2.5 Maximum Emission Limit	0.34 pph	Environmental
EUSPMCOREROOM	SV-Z05-CC-2	VOC Maximum Emission Limit	0.41 pph	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2	PM Maximum Emission Limit	0.45 pph	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2	PM 10 Maximum Emission Limit	0.45 pph	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2	PM-2.5 Maximum Emission Limit	0.45 pph	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2	VOC Maximum Emission Limit	1.23 pph	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2	SO2 Maximum Emission Limit	5.49 pph	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2	VOC Average 12-month rolling	3.72 pph	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2 SV-Z05-CC-2	MAP shall address bag house, pressure drop, pH, media and cartridge replacement, etc		Environmental / Maintenance
EUSPMCOREROOM	SV-Z05-ISO-2 SV-Z05-CC-2	Approved MAP		Environmental
EUSPMCOREROOM	SV-Z05-ISO-2	Shall not exceed SO ₂ use based on (12-month rolling average)	307 tpy	Environmental
EUSPMCOREROOM	SV-Z05-ISO-2 SV-Z05-CC-2	Shall not operate equipment under EUSPMCOREROOM unless respective air pollution control equipment is installed and operating properly in accordance with the MAP		SPM Environmental
EUSPMCOREROOM	SV-Z05-ISO-2 SV-Z05-CC-2	Shall monitor and record PM, PM10, and PM2.5 emissions in pph		Environmental
EUSPMCOREROOM	SV-Z05-ISO-2 SV-Z05-CC-2	Shall record SO ₂ and Core Sand throughput rates monthly and (12-month rolling average)		Environmental
EUSPMCOREROOM	SV-Z05-ISO-2 SV-Z05-CC-2	Shall record VOC emissions in tpy monthly and (12-month rolling average)		Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and SO₂ and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the SPM Coreroom area, the core machines will be interlocked to the caustic scrubber and to the cartridge collector. Should either piece of equipment fail in key parameters the core machines or should the differential between the 2 pH probes fail the caustic scrubber will no longer be able to process cores.

INTERLOCK
Last Revised: March 2020

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements**Assessing Compliance with the Air Permit**

The air permit requires that GM assess the emissions for Semi-Permanent Mold. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

SPM Coreroom

Emissions of PM and VOC from the SPM coreroom depends on the number cores that are processed through the coremachines and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the cartridge collector. VOC emissions depend largely on the proper operation of the caustic scrubber. Flow, pressure drop, pH and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag or media change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant's Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant's Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant's Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant's Environmental Engineer shall notify the site's Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Cartridge Collector Monitoring

Continuously **

<u>Monitored Parameter</u>	<u>Monitoring Frequency</u>	<u>Comments/Ranges</u>
Static pressure drop**	Weekly	See: Cartridge Collector General Ranges
Mechanical Inspection etc.	744 hours ±40 hours*	Check ductwork, drains, bearings,
Electrical Inspection etc.	744 hours ±40 hours*	Check fans, amps, belts, sheaves, interlock
Change out Filters	As Needed	If static pressure drop raises too high and cannot be reduced by blow down cleaning air

Caustic Scrubber Monitoring

CAM Plan Applies to SO2 controlled by scrubber

Continuously **

<u>Monitored Parameter</u>	<u>Monitoring Frequency</u>	<u>Comments/Ranges</u>
Caustic scrubber audit	Monthly	Check pH & water level probes; caustic Inspect pump & ex. fan; control panel; nozzle and liquid coverage
Caustic scrubber Inspection	2880 hours ±40 hours*	See: Caustic Scrubber General Ranges Inspect mist collection system, Mist Collector cleaning, replace pad if required. Inspect liquid reservoir and 2ndary containment, remove any residue/debris.
Annual Cleaning	5760 hours ±40 hours*	Verify durometer of media, change tower packing (if required)/clean
Flow**	Record every 15mins for an hourly average	See Caustic Scrubber General Ranges
Differential Pressure** for an hourly average	Record every 15mins See Caustic Scrubber General Ranges	
pH **	Record every 15mins for an hourly average	See Caustic Scrubber General Ranges

Note: * ±40 hours for the shift responsible for the task, and hours will be collector hours during production

Note **: GM will observe the magnitude of the gauge reading only on production days.

Cartridge Collector General Ranges

Equipment No.	Guideline Range (inches)
Z05-CC-2	0.1-10.0

Caustic Scrubber General Ranges

Equipment No.	Guideline Delta Pressure (inches)	Guideline Water Pressure (GPM)	Actual pH Control Range	pH Process Range
Z05-ISO-2	0.1-12	>390	>8.0-10.5	7.5-14

*Note: Two pH Probes

Stack Opacity Checks

<u>Process Activity</u>	<u>Frequency of Observations</u>	<u>Comments</u>
Semi-Permanent Mold Coreroom	3 times/week	Limit: 10%

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the cartridge collector and caustic scrubber will be available in order to conduct rapid repairs, if needed. Typical spare parts include magnehelics, flow meters, extra cartridges, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

Title 40: Protection of Environment

PART 64—COMPLIANCE ASSURANCE MONITORING.

A CAM Plan or Compliance Assurance Monitoring Plan is required for SO2 emissions. This plan includes MAP requirements for monitoring, measuring and operations of the equipment.

CAM Plan Applies to SO2 controlled by scrubber

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>		<i>Responsible Department</i>
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	PM Maximum Emission Limit combined	7.07 pph	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	PM 10 Maximum Emission Limit combined	7.07 pph	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	PM-2.5 Maximum Emission Limit combined	7.07 pph	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	VOC Maximum Emission Limit combined	10.81 pph	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	NOx Maximum Emission Limit combined	1.9 pph	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	NOx Maximum Emission Limit combined	1.41 tpy	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	CO Maximum Emission Limit Combined	12.47 pph	Environmental
EUSPMCASTLINE	SV-Z05-CC-4	PM Maximum Emission Limit Mold coating	0.88 pph	Environmental
EUSPMCASTLINE	SV-Z05-CC-4	PM 10 Maximum Emission Limit Mold coating	0.88 pph	Environmental
EUSPMCASTLINE	SV-Z05-CC-4	PM-2.5 Maximum Emission Limit Mold Coating	0.88 pph	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3, SV-Z05-CC-4	MAP shall address bag house, pressure drop, bag or media replacement, etc...		Environmental / Maintenance
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3, SV-Z05-CC-4	Approved MAP		Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	Total Aluminum pour Limit (12 month rolling average)	19,412 tpy	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	Shall record aluminum through put rate monthly & (12 month rolling average)		SPM Maintenance Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	Shall not operate SPMCAST for more than (12 month rolling average)	6,032 hours	Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	Shall not operate equipment under SPMCASTLINE unless respective air pollution control equipment is installed and operating properly in accordance with the MAP		SPM Maintenance Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3, SV-Z05-CC-4	Shall record – natural gas usage rate		Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	Shall record – NOx emission in tpy calculated using most recent stack test		Environmental
EUSPMCASTLINE	SV-Z05-BH-1, SV-Z05-BH-2 SV-Z05-BH-3	Shall record – PM, PM10, PM2.5 & CO emissions in pph		Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and SO₂, and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the SPM area, three baghouses and one cartridge collector will serve as abatement equipment for particulate from the pouring/cooling/shakeout processes. The baghouses are interlocked with the castline so that if there are malfunctions with the collectors that the castline can no longer pour any additional castings.

Assessing Compliance with the Air Permit

INTERLOCK

The air permit requires that GM assess the emissions for SPM. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

SPM Castlines

Emissions of PM from SPM castlines depend on the number of castings poured and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the cartridge collectors and the baghouses. Pressure drop, and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag, media or cartridge change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant's Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant's Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant's Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant’s Environmental Engineer shall notify the site’s Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

SPM - Baghouse /Cartridge Collector Monitoring

Continuously **

<u>Monitoring Parameter</u>	<u>Monitoring Frequency</u>	<u>General Range</u>
Bag Condition/Interior Insp.	2880±40 hours*	Check for sand on clean side of BH; Structural integrity
Differential Pressure**	Daily	0.5-10 inches WC **

CAM Plan Applies to PM controlled by the Baghouses

Note: ** GM will observe the magnitude of the gauge reading only on production days.
 Note: * ±40 hours for the shift responsible for the task

Dust Collector

<u>Equipment No.</u>	<u>Guideline Delta Pressure (inches)</u>
Z05-BH-1	0.5-10***
Z05-BH-2	0.5-10***
Z05-BH-3	0.5-10***
Z05-CC-4	0.5-10

***The minimum pressure drop shall not be less than 1 inch, water gauge, except when a large number of filter bags have been replaced or other reason acceptable to the AQD.

Stack Opacity Checks

<u>Process Activity</u>	<u>Frequency of Observations</u>	<u>Comments</u>
Semi-Permanent Mold Cast Lines	3 times/week	Limit: 10%

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Some replacement parts for the baghouses, and cartridge collectors will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra bags, extra cartridges, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

CAM Plan Applies to PM controlled by the Baghouses.

Title 40: Protection of Environment

PART 64—COMPLIANCE ASSURANCE MONITORING. A CAM Plan or Compliance Assurance Monitoring Plan is required for the PM emissions controlled by the baghouses. CAM is not applicable to the PM controlled by the cartridge collector. This plan includes MAP requirements for monitoring, measuring and operations of the equipment.

Air Permit, Malfunction Abatement Plan, and Preventive Maintenance Plan Requirements

Permit Requirements

<i>Emission Source</i>	<i>Process Description</i>	<i>Permit Requirement</i>		<i>Responsible Department</i>
EUSPMCASTLINE4	SV-Z02-BH-5	PM Maximum Emission Limit Cast Line Section 1 & 2 including mold preheating	6.02 pph	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	PM 10 Maximum Emission Limit Cast Line Section 1 & 2 including mold preheating	3.63 pph	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	PM-2.5 Maximum Emission Limit Cast Line Section 1 & 2 including mold preheating	3.63 pph	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	VOC Maximum Emission Limit Cast Line Section 1 & 2 including mold preheating	9.19 pph	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	NOx Maximum Emission Limit Cast Line Section 1 & 2 including mold preheating	2.59 pph	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	NOx Maximum Emission Limit Cast Line Section 1 & 2 including mold preheating	1.41 tpy	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	CO Maximum Emission Limit Cast Line Section 1 & 2 including mold preheating	10.77 pph	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	MAP shall address bag house, pressure drop, bag or media replacement, etc...		Environmental / Maintenance
EUSPMCASTLINE4	SV-Z02-BH-5	Approved MAP		Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	Total Aluminum pour Limit (12 month rolling average)	12,288 tpy	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	Shall record aluminum through put rate monthly & (12 month rolling average)		SPM Maintenance Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	Shall not operate SPMCAST for more than (12 month rolling average)	6,032 hours	Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	Shall not operate equipment under SPMCASTLINE4 unless respective air pollution control equipment is installed and operating properly in accordance with the MAP		SPM Maintenance Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	Shall record – NOx emission in tpy calculated using test data		Environmental
EUSPMCASTLINE4	SV-Z02-BH-5	Shall record – PM, PM10, & PM2.5 emissions in pph		Environmental

Malfunction Abatement Plan (MAP) Requirements

The permit governs air emissions by limiting the materials processed by the mold lines and requiring proper operation of the abatement equipment. The MAP will focus on the following key elements.

- Employee training
- Process monitoring
- Interlock of abatement equipment and process
- Preventive Maintenance (PM) of abatement equipment
- Monitoring of Process Opacity

Certain employees will be trained to understand the permit conditions before the final permit is issued.

The process activity will be monitored to ensure compliance with permit criteria. Process activity such as tons of aluminum melted, tons of aluminum poured, core resin and SO₂, and aluminum furnace flux usage will be logged either manually or into a computerized system.

Several interlock systems will be employed so that production equipment is shut down safely in the event of a failure of an abatement system. Descriptions of these interlock systems follow.

In the SPMCastline4 area, two baghouses will serve as abatement equipment for particulate from the pouring/cooling/shakeout processes. The baghouses are interlocked with the castline so that if there are malfunctions with the collectors that the castline can no longer pour any additional castings.

Assessing Compliance with the Air Permit**INTERLOCK**

The air permit requires that GM assess the emissions for SPMCASTLINE4. Generally, methods and emission factors listed in the permit application provided to the EGLE will be employed to assess emissions. For each of these operations, discussions are provided below on how GM will determine emissions and comply with permit conditions.

SPM Castline4

Emissions of PM on SPMCASTLINE4 depend on the number of castings poured and the proper operation of the abatement equipment. Particulate emissions depend largely on the proper operation of the baghouses. Pressure drop, and other checks will help to ensure that the abatement equipment is working properly. The inspection and monitoring process will dictate the frequency for bag change out. This can be conducted through visual inspection of the unit(s) or through the monitoring of the equipment data ranges.

Actions associated with a Malfunction

Emissions in excess of a permit limit can result from a malfunction of the process or associated air pollution control equipment. In the event of a malfunction resulting in emissions in excess of a permit limit, GM will implement the following procedures.

Step 1 – The plant’s Environmental Engineer will be notified and will verify that an actual exceedance of the permit is occurring. If the problem has already occurred, the Environmental Coordinator shall ensure that the problem has been resolved or that the process has been shut down. In this case, go to Step 5.

Step 2 - The plant’s Environmental Engineer will consult with the Maintenance or Process Supervisor to determine the severity of the problem and the estimated time to repair.

Step 3 - If repairs to the abatement equipment or process controls can be made within one hour to re-establish compliance, the process shall continue to be operated while repairs are made.

Step 4 - If excessive emissions are projected to continue for more than one hour, the plant’s Environmental Engineer shall notify the Process Supervisor to shut down as rapidly and safely as possible.

Step 5 - The plant’s Environmental Engineer shall notify the site’s Senior Environmental Engineer who will contact the EGLE and report the situation, as required, in accordance with Rule 912, which governs the reporting of excessive emissions resulting from equipment failures or malfunctions.

Monitoring Parameters and Frequency

The monitoring parameters define exactly what components of the control system are to be inspected and assessed for proper operation. In general, GM will follow the PM program recommended by the equipment manufacturer. If a maintenance check finds that a parameter is out of range, a corrective action shall be performed as soon as possible and documented on the inspection form. A parameter out of range does not necessarily indicate that an emissions limitation is being exceeded. GM will observe opacity of the respective stack, as noted below, for any parameter that is out of range. The monitoring parameters are listed below.

CAM Plan Applies to PM controlled by the Baghouses

SPMCASTLINE4- Baghouse Monitoring

Contiuously **

<u>Monitoring Parameter</u>	<u>Monitoring Frequency</u>	<u>General Range</u>
Bag Condition/Interior Insp.	2880±40 hours*	Check for sand on clean side of BH; Structural integrity
Differential Pressure**	Daily	0.1-10 inches WC **

Note: * ±40 hours for the shift responsible for the task

Note: ** GM will observe the magnitude of the gauge reading only on production days.

Dust Collector

<u>Equipment No.</u>	<u>Guideline Delta Pressure (inches)</u>
Z02-BH-5 East	0.1-10***
Z02-BH-5 West	0.1-10***

***The minimum pressure drop shall not be less than 0.1 inch, water gauge, except when a large number of filter bags have been replaced or other reason acceptable to the AQD.

Stack Opacity Checks

<u>Process Activity</u>	<u>Frequency of Observations</u>	<u>Comments</u> Action Level
SPMCASTLINE4 (Z02-BH-5)	3 times/week	10%

Plume opacity will be periodically checked as noted above on production days. If plant personnel observe a “significant” visible plume, they will call for the site’s Environmental Engineer to observe the plume using an EPA Method 9 test procedure. It should be noted that water vapor is not considered as opacity. Significant plume opacity is defined as opacity greater than 5 %, which is the assumed threshold for opacity. The plant personnel who conduct opacity observations will be trained on opacity observations.

Spare or Replacement Parts

Some replacement parts for the baghouses will be available in order to conduct rapid repairs, if needed. Typical spare parts include extra bags, fan belts, and static pressure gauges. If a serious problem is discovered, parts suppliers shall be contacted and equipment will be obtained as quickly as possible.

CAM Plan Applies to PM controlled by the Baghouses

Title 40: Protection of Environment

PART 64—COMPLIANCE ASSURANCE MONITORING. A CAM Plan or Compliance Assurance Monitoring Plan is required for the PM emissions controlled by the baghouses. This plan includes MAP requirements for monitoring, measuring and operations of the equipment.