

Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

JAN 27 2020

Mr. Glen Kelley
Environmental Specialist
Bodine Aluminum, Inc.
100 Cherry Blossom Way
Troy, MO 63379

RE: New Source Review Permit - Project Number: 2019-08-083

Dear Mr. Kelley:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your amended operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: <http://dnr.mo.gov/regions/>. The online CAV request can be found at <http://dnr.mo.gov/cav/compliance.htm>.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.



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Mr. Glen Kelley
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If you have any questions regarding this permit, please do not hesitate to contact Dakota Fox at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



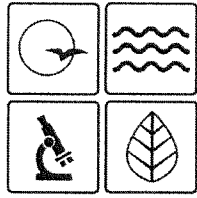
Susan Heckenkamp
New Source Review Unit Chief

SH:dfa

Enclosures

c: St. Louis Regional Office
PAMS File: 2019-08-083

Permit Number: **012020-017**



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **012020-017**

Project Number: 2019-08-083
Installation Number: 113-0029

Parent Company: Toyota Motor Engineering & Manufacturing North America, Inc.

Parent Company Address: 151 Engineering Way, Georgetown, KY 40324

Installation Name: Bodine Aluminum, Inc.

Installation Address: 100 Cherry Blossom Way, Troy, MO 63379

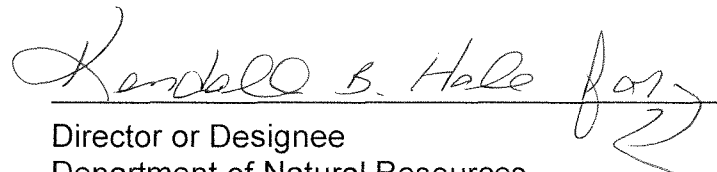
Location Information: Lincoln County, S38, T36N, R7W

Application for Authority to Construct was made for:

The replacement of non-refillable hand-held aerosol cans with a bulk spray gun. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

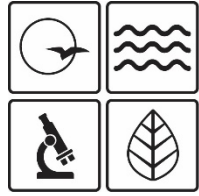
Standard Conditions (on reverse) and Special Conditions are applicable to this permit.



Director or Designee
Department of Natural Resources

JAN 27 2020

Effective Date



MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

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Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

Director or Designee
Department of Natural Resources

Effective Date

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Enforcement and Compliance Section of the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department's regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
<http://dnr.mo.gov/regions/>

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted to the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (3)(E). "Conditions required by permitting authority."

Bodine Aluminum, Inc.
 Lincoln County, S38, T36N, R7W

1. **Superseding Condition**
 The conditions of this permit supersede Special Condition 3 found in the previously issued construction permit 092019-009 issued by the Air Pollution Control Program.

2. **Synthetic Minor Source PM Limitation**
 - A. Bodine Aluminum, Inc. shall emit less than 250 tons of PM in any consecutive 12-month period from the entire installation as listed in Table 1.

Table 1: Installation-wide List of PM Emission Sources

Emission Source	Description
C01	Plantwide Natural Gas External Combustion ^(See Attachment C)
C02	80 kW Natural Gas Emergency Generator, Kohler 80REZGD
G1	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shakeout
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cooling
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Finishing
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shot Blasting
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR TIG Welding
O2	Lines GR-Kai #1 and #2 Casting Machines
O5	Line GR-Kai #1 Core Molding Machines
O2	Line GR-Kai #3 Casting Machines
O5	Lines GR-Kai #2 and #3 Core Molding Machines
O2	Lines AR #3 and #4 and UR Casting Machines
O5	Lines AR #3 and #4 and UR Core Molding Machines
O2	Line ZR Casting Machines
O5	Line ZR Core Molding Machines
P01	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Used Sand Crushing
P02	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Used Sand Sieving

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
P03	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Aluminum/Sand Separation
P04	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Final Sand Crushing
P05	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #1
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Reclamation Furnace #2
P06	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Separation
P07	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Storage
P08	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Weighing
P09	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Sand Dryer
P10	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Heated Sand Storage
P11	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Coating
P12	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Resin Holding, Bin Charging
P13	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Storage
P14	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Crushing
P15	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Sieving
P16	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Coated Sand Storage
P34	Paved Haul Roads
P35	3,230 HP Diesel Emergency Generator
P36	435 HP Diesel Emergency Fire Pump
P37	Electric Aluminum Holding Furnaces - Fluxing
P41	500 KW Emergency Diesel Generator
P42	500 KW Emergency Diesel Generator
P43	500 KW Emergency Diesel Generator
P44	500 KW Emergency Diesel Generator
P45	500 KW Emergency Diesel Generator
P46	500 KW Emergency Diesel Generator
I01b	Line I01 Sand Polisher
I01c	Line I01 Sand Classifier

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
I01d	Line I01 Sand Classifier
I01f	Line I01 (5) Core Molding Machines
I01/I02e	Lines I01 and I02 (2) Sand Crushers
I01/I02g	Lines I01 and I02 (2) Transfer Devices
I01/I02h	Lines I01 and I02 (2) Heaters
I01/I02i	Lines I01 and I02 (2) Sand Coolers
I01/I02j	Lines I01 and I02 Vibra Mill Crusher
I01k	Line I01 Buffer Tank
I01l	Line I01 (3) Casting Machines
I01m	Line I01 Metal Cooling
I01/I02/I04a	Lines I01, I02, and I04 Shakeout and Finishing
I02b	Line I02 Sand Polisher
I02c	Line I02 Sand Classifier
I02d	Line I02 Sand Classifier
I02f	Line I02 (5) Core Molding Machines
I02k	Line I02 (3) Casting Machines
I02l	Line I02 Metal Cooling
I02m	Line I02 Buffer Tank
I03a	Line I03 Vibra Mill Crusher
I03b	Line I03 Sand Polisher
I03c	Line I03 Sand Classifier
I03d	Line I03 Sand Classifier
I03e	Line I03 Sand Sub Vacuum
I03f	Line I03 (5) Core Molding Machines
I03g	Line I03 Sand Sub Vacuum Transfer Unit
I03h	Line I03 Shakeout and Finishing
I03i	Line I03 Heater
I03j	Line I03 Buffer Tank
I03k	Line I03 Sand Cooler
I03l	Line I03 (3) Casting Machines
I03m	Line I03 Metal Cooling
I04b	Line I04 Sand Polisher
I04c	Line I04 Sand Classifier
I04d	Line I04 Sand Crusher
I04e	Line I04 (2) Core Molding Machines
I04f	Line I04 Heater
I04g	Line I04 Sand Cooler
I04h	Line I04 Transfer Device
I04i	Line I04 (1) Casting Machine
I04j	Line I04 Buffer Tank
I04k	Line I04 Metal Cooling
Q01b	Line Q01 Sand Polisher

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
Q01c	Line Q01 Sand Classifier
Q01d	Line Q01 Sand Classifier
Q01f	Line Q01 (5) Core Molding Machines
Q01/Q02h	Lines Q01 and Q02 (2) Transfer Devices
Q01/Q02e	Lines Q01 and Q02 Vibra Mill Crusher
Q01/Q02i	Lines Q01 and Q02 (2) Heaters
Q01/Q02g	Lines Q01 and Q02 (2) Sand Coolers
Q01/Q02a	Lines Q01 and Q02 Shakeout and Finishing
Q01j	Line Q01 Buffer Tank
Q01k	Line Q01 (3) Casting Machines
Q01l	Line Q01 Metal Cooling
Q02b	Line Q02 Sand Polisher
Q02c	Line Q02 Sand Classifier
Q02d	Line Q02 Sand Classifier
Q02f	Line Q02 (5) Core Molding Machines
Q02j	Line Q02 Buffer Tank
Q02k	Line Q02 (3) Casting Machines
Q02l	Line Q02 Metal Cooling
Q03a	Line Q03 Sand Polisher
Q03b	Line Q03 Sand Classifier
Q03c	Line Q03 Sand Classifier
Q03/Q04d	Lines Q03 and Q04 Vibra Mill Crusher
Q03/Q04e	Lines Q03 and Q04 Shakeout and Finishing
Q03/Q04f	Lines Q03 and Q04 (2) Transfer Devices
Q03/Q04g	Lines Q03 and Q04 (2) Heaters
Q03h	Line Q03 Sand Polisher
Q03/Q04i	Lines Q03 and Q04 (2) Sand Coolers
Q03j	Line Q03 Buffer Tank
Q03k	Line Q03 (5) Core Molding Machines
Q03l	Line Q03 Pre-Classifier
Q03m	Line Q03 (3) Casting Machines
Q03n	Line Q03 Metal Cooling
Q04a	Line Q04 Sand Polisher
Q04c	Line Q04 Sand Classifier
Q04b	Line Q04 Sand Classifier
Q04h	Line Q04 Sand Polisher
Q04j	Line Q04 Buffer Tank
Q04k	Line Q04 (5) Core Molding Machines
Q04l	Line Q04 Pre-Classifier
Q04m	Line Q04 (3) Casting Machines
Q04n	Line Q04 Metal Cooling
Q05/Q06a	Lines Q05 and Q06 (2) Vibra Mill Crushers

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Emission Source	Description
Q05b	Line Q05 Pre-Classifier
Q05/Q06c	Lines Q05 and Q06 (2) Transfer Devices
Q05d	Line Q05 Sand Classifier
Q05e	Line Q05 Sand Polisher
Q05/Q06f	Lines Q05 and Q06 (2) Heaters
Q05/Q06g	Lines Q05 and Q06 (2) Sand Coolers
Q05h	Line Q05 Sand Polisher
Q05i	Line Q05 Sand Classifier
Q05j	Line Q05 Buffer Tank
Q05k	Line Q05 (5) Core Molding Machines
Q05l	Line Q05 Metal Cooling
Q05/Q06m	Lines Q05 and Q06 Shakeout and Finishing
Q05n	Line Q05 (3) Casting Machines
Q06b	Line Q06 Pre-Classifier
Q06d	Line Q06 Sand Classifier
Q06e	Line Q06 Sand Polisher
Q06h	Line Q06 Sand Polisher
Q06i	Line Q06 Sand Classifier
Q06j	Line Q06 Buffer Tank
Q06k	Line Q06 (5) Core Molding Machines
Q06l	Line Q06 Metal Cooling
Q06n	Line Q06 (3) Casting Machines
Q07a	Line Q07 Vibra Mill Crusher
Q07b	Line Q07 Pre-Classifier
Q07c	Line Q07 Transfer Device
Q07d	Line Q07 Sand Classifier
Q07e	Line Q07 Sand Polisher
Q07f	Line Q07 Heater
Q07g	Line Q07 Sand Cooler
Q07h	Line Q07 Sand Polisher
Q07i	Line Q07 Sand Classifier
Q07j	Line Q07 Buffer Tank
Q07k	Line Q07 (5) Core Molding Machines
Q07m	Line Q07 Shakeout and Finishing
Q07n	Line Q07 (3) Casting Machines
Q07l	Line Q07 Metal Cooling
QC001	Paint Gun Spray Booth

- B. Attachment B or an equivalent form, such as an electronic form, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 2.A.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

3. Spray Limitation

- A. Bodine Aluminum, Inc. shall limit their paint booth spray (QC001) usage to 100 gallons in any consecutive 12-month period.
- B. Bodine Aluminum, Inc. shall record the amount of material sprayed each month and shall also calculate the 12-month rolling total number of gallons sprayed each month using Attachment A or another equivalent form.

4. Capture Device Requirement – Ventilation Hood

- A. Bodine Aluminum, Inc. shall use hoods to capture emissions from emission point QC001. A hood is a shaped inlet to a pollution control system that does not totally surround an emissions unit.
- B. Bodine Aluminum, Inc. shall design and construct each hood according to the most current version of the industrial ventilation manual entitled, “Industrial Ventilation – A Manual of Recommended Practice, American Conference of Governmental Industrial Hygienists.”
- C. Bodine Aluminum, Inc. shall demonstrate that each hood was constructed according to Special Condition 4.B. by keeping a record of the following design parameters for each hood:
 - 1) The cross-sectional area of the hood inlet
 - 2) The distance from the hood inlet to the emission source
 - 3) The minimum recommended volumetric airflow
 - 4) The minimum recommended hood face velocity
- D. At least once per calendar year (no less than nine calendar month and no more than 15 calendar months following the previous measurement), Bodine Aluminum, Inc. shall verify the proper operation of each hood by:
 - 1) Recording the actual face velocity or the actual volumetric airflow of each capture hood.
 - 2) Performing a visual smoke puff test at each emission source.
- E. Bodine Aluminum, Inc. shall minimize cross drafts by locating the emissions source and the hood inside a building with four (4) sides and a roof.
- F. Bodine Aluminum, Inc. shall maintain an operating and maintenance log for the hoods, which shall include the following:
 - 1) Incidents of malfunction with impact on emissions, duration of event, probable cause, and corrective actions
 - 2) Maintenance activities with inspection schedule, repair actions, replacements, etc.
 - 3) Dates of all above incidents, activities, actions, etc.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

5. Capture Device Requirement – Booth
 - A. Bodine Aluminum, Inc. shall capture emissions from the bulk spray guns using a booth (QC001) with not more than one inlet face opening (e.g. 3-sided or totally enclosed booth).
 - B. All coatings shall be applied inside the booth and sprayed in a direction away from the inlet face opening.
 - C. The inlet face opening shall be equipped with a visual indicator, such as streamers, that show air flow into the booth whenever surface coating is applied.
 - D. Inward air velocity shall be maintained at at least 100 fpm at all points across the inlet face opening.
 - 1) Air velocity shall be monitored and recorded at initial startup with an anemometer.
 - 2) Air velocity shall be monitored and recorded once per calendar quarter following initial startup.
 - 3) Each monitoring event shall be conducted immediately prior to filter replacement and with substrate located inside the booth.
 - E. Bodine Aluminum, Inc. shall maintain an operating and maintenance log for the booths which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
6. Control Device Requirement- Carbon Filters
 - A. The booth shall be equipped with carbon filters (as specified in the permit application) to control emissions from the bulk spray gun (QC001).
 - B. Bodine Aluminum, Inc. shall regenerate/replace the filters before breakthrough.
 - C. The filters shall be operated and maintained in accordance with the manufacturer's specifications. Bodine Aluminum, Inc. shall develop and implement a written filter regeneration/replacement plan, which shall be kept on site. The plan shall include a method to evaluate filter performance in order to determine when the filters shall be regenerated/replaced.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- D. Replacement filters shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - E. Bodine Aluminum, Inc. shall maintain a copy of the filter manufacturer's performance warranty on site.
 - F. Bodine Aluminum, Inc. shall maintain an operating and maintenance log for the filters which shall include the following:
 - 1) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
7. Control Device Requirement – HEPA Filter
- A. Bodine Aluminum, Inc. shall control particulate emissions from the spray booth (QC001) using a HEPA filter in addition to the hood required by Special Condition 4.
 - B. The HEPA filters shall be equipped with a gauge or meter which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.
 - C. Bodine Aluminum, Inc. shall monitor and record the operating pressure drop across the HEPA filters once every 24 hours while the equipment is in operation. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - D. Bodine Aluminum, Inc. shall maintain a copy of the HEPA filter's performance warranty on site.
 - E. Bodine Aluminum, Inc. shall perform semiannual inspections and maintenance to ensure proper performance of the HEPA filter. This includes structural and filter integrity. Bodine Aluminum, Inc. shall record the results of these inspections.
 - F. Replacement HEPA filters shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

- G. Bodine Aluminum, Inc. shall maintain an operating and maintenance log for the filters which shall include the following:
 - 1) Incidents of malfunction with impact on emissions duration of event, probable cause, and corrective action; and
 - 2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

- 8. Alternative Materials
 - A. Bodine Aluminum, Inc. is allowed to use alternative materials for the bulk spray guns (QC001) that are different from the materials listed in the Application for Authority to Construct.

 - B. The limits established by Special Conditions 2 and 3 shall include the use of any alternative materials.

 - C. Bodine Aluminum, Inc. shall maintain a list of any alternative materials used and the date they are either first purchased or used.

 - D. For alternative materials, if any HAPs with a SMAL less than 0.25 tpy are present, then Bodine Aluminum, Inc. shall seek approval from the Air Pollution Control Program before the use of the alternative material. If no HAPs with a SMAL less than 0.25 tpy are present, Bodine Aluminum, Inc. shall retain documentation of the material components on site and make them available upon request.

- 9. Record Keeping and Reporting Requirements
 - A. Bodine Aluminum, Inc. shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include SDS for all materials used.

 - B. Bodine Aluminum, Inc. shall report to the Air Pollution Control Program's Compliance/Enforcement Section, by mail at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (5) REVIEW

Project Number: 2019-08-083
Installation ID Number: 113-0029
Permit Number:

Installation Address:

Bodine Aluminum, Inc.
100 Cherry Blossom Way
Troy, MO 63379

Parent Company:

Toyota Motor Engineering and
Manufacturing North America, Inc.
151 Engineering Way
Georgetown, KY 40324

Lincoln County, S38, T36N, R7W

REVIEW SUMMARY

- Bodine Aluminum, Inc. has applied for authority to replace non-refillable hand-held aerosol cans with a bulk spray gun.
- The application was deemed complete on August 30, 2019.
- No HAP emissions are expected from the proposed equipment.
- None of the New Source Performance Standards (NSPS) apply to the installation.
 - 40 CFR 60 Subpart MM, "Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations" does not apply to the equipment, as the sprays being used are penetrants and developers used to check for defects and not prime coats, guide coats, or topcoats. Alternative coatings shall be evaluated for NSPS MM applicability.
- None of the NESHAPs apply to this installation. None of the currently promulgated MACT regulations apply to the proposed equipment.
- A Carbon Filter is being used to control the VOC emissions from the equipment in this permit. A HEPA filter is being used to control PM emissions from the equipment in this permit.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of VOC are conditioned below de minimis levels.
- This installation is located in Lincoln County, an attainment/unclassifiable area for all criteria pollutants.

- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2.
- Ambient air quality modeling was not performed since potential emissions of the application are conditioned below de minimis levels.
- Emissions testing is not required for the equipment as a part of this permit. Testing may be required as part of other state, federal or applicable rules
- Approval of this permit is recommended with special conditions.
- The installation is required to amend their Part 70 Operating Permit renewal application (Project# 2015-05-043) no later than one year after startup of QC001.

INSTALLATION DESCRIPTION

Bodine Aluminum, Inc. is an aluminum die casting installation located in Lincoln County. The installation has been in operation since 1992. Bodine Aluminum, Inc. produces cylinder heads to support Toyota's North American vehicle manufacturing operations.

The installation receives molten aluminum from MOST, Inc. (113-0046). The Air Pollution Control Program has determined that MOST, Inc. and Bodine Aluminum, Inc. are separate installations. For additional information, see Applicability Determination Project 2019-04-027. The molten aluminum is stored in electric aluminum holding furnaces until it is needed. A small amount of flux is added to the holding furnaces.

The installation uses sand cores to make internal voids in their casted cylinder heads. Sand cores are made by mixing sand with binders and molding the sand into a core. Used sand from shakeout is recycled and cleaned to remove any buildup. The sand is screened and reused to make new molds. Some green sand is added to replace sand that is lost during processing.

The molten aluminum floods the dies containing the sand cores on one of the installation's 18 casting lines. After the aluminum casting has cooled, the sand core is shaken out. The cast aluminum cylinder head then undergoes finishing operations, which remove any burrs, risers, or gates. After finishing, the cylinder head undergoes heat treatment.

The installation operates seven older casting lines: Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR. The sand operations associated with these older casting lines are shared. These older casting lines are subject to a combined annual sand processing limit of 58,500 tons and a combined annual metal production limit of 78,000 tons by Construction Permit 062014-002 Special Condition 3. These older casting lines use a phenolic resin binder in their sand core molding operations, which produces VOC and HAP emissions.

The installation operates eleven newer casting lines: Lines I01-I04 and Q01-Q07. These casting lines each have their own sand processing operations. These newer casting lines are not subject to the sand and metal limits of Construction Permit 062014-002 Special Condition 3. These newer casting lines use water-based sand binders, which produce very little VOC and no HAP emissions.

Bodine Aluminum, Inc. currently operates under Part 70 Operating Permit OP2012-122, which expired November 18, 2015. A Part 70 operating permit renewal application, Project 2015-05-043, was submitted on May 14, 2015. As the installation's renewal application was timely and complete, OP2012-122 remains effective until the operating permit renewal is issued.

The Air Pollution Control Program has issued the following New Source Review permits to Bodine Aluminum, Inc.:

Table 2: Permit History

Permit Number	Description
0591-003	Original permit for the installation of the plant
0593-008	Installation of a natural gas oven to dry recycled aluminum prior to melting
1193-006	Addition of six machining centers and a washing station to produce engine brackets
0194-014	Addition of a shot blaster to rework surface areas
0995-005	Increase production by 1,825 tons of poured aluminum
0196-019	Addition of new building and increased production
0996-011	Addition of natural gas fired die heating oven, 2 MMBtu/hr
1299-009 & 1299-009A	Addition of casting machines
112004-005	Replace casting and machine equipment
032006-004	New casting line
112008-006	Modify product mix
032012-006, 032012-006A, & 032012-006B	Increase coolant to 5,000 gal/yr, reduce sand production to 58,500 tpy, install DC-10 furnace, startup four idle high pressure die casting machines
062014-002 & 062014-002A	Install casting machines, core machines, and a natural gas-fired heat treat furnace
102014-009	Removal of RTO from reclamation furnaces—modification of sand reclaim furnaces
102015-005	Install Lines I01-I04
012017-008	Install Lines Q01 and Q02
052019-001	Install Lines Q03 and Q04
072019-011	Install Lines Q05-Q07
092019-009	Install Generators

PROJECT DESCRIPTION

Bodine Aluminum, Inc. has had a spray booth that they have operated in accordance with 10 CSR 10-6.061, *Construction Permit Exemptions*, which uses solely non-refillable hand-held aerosol cans. This spray booth utilizes a fan while operating to draw exhaust air through a HEPA filter and a charcoal filter prior to exhausting back into the building. At this booth, penetrant and developer are sprayed onto parts to check for defects in the Quality Control Department. Due to cost savings, Bodine Aluminum, Inc. is requesting to replace the use of aerosol cans with a bulk spray gun (QC001).

There are four coatings that will be sprayed by the new bulk spray gun (QC001): YNA0119212, YNA0282023, YNA0119211, and YNA011052. The chemical solutions attributed to each coating are as follows: YNA0119212 contains SKL-WP2, YNA0282023 and YNA0119211 contain SKD-2, and YNA011052 contains ZP-95. The bulk spray gun will be able to spray an individual coating at a rate of up to 5.8 standard cubic feet per minute (SCFM).

The new bulk spray gun is a Binks Trophy Series Gravity Feed LVMP Touch-up spray gun will be limited to a spray rate of 100 gallons per year of all sprays combined. This limit is a conservative limit chosen by Bodine Aluminum, as a maximum hourly dosage rate could not be obtained. The gun is used within a 3-sided paint booth that uses a hood to capture emissions. The booth and hood were given a combined capture efficiency of 90%. The Charcoal filter being used to control VOC emissions was given a 95% control efficiency for an overall efficiency of 85.5%. The HEPA (High Efficiency Particulate Air) filter being used to control all sizes of PM was given a 99.9% control efficiency. PM for this booth was also given a 75% transfer efficiency and for an overall efficiency of 98.7% [75-80% transfer efficiency is considered standard for powder coating using HVLP spray guns, as described in chapter 5 of the EPA training document Sources and Control of Volatile Organic Air Pollutants (November 2002)].

Alternative material sprays are allowed as part of this project. Any material that does not contain a HAP with a SMAL less than 0.25 tpy is allowed without the need to first seek approval from the Air Pollution Control Program. This value was determined by calculating the maximum HAP concentration a material could possess and still not exceed 0.5 lb/hr of HAP emissions (the insignificant HAP level in 10 CSR 10-6.061). A conservatively low spray rate of 0.1 gallons per hour and a total usage of 100 gallons of material sprayed in a given year were used in the calculations. Alternative material sprays do not have to be limited on VOC content, as no reasonable maximum VOC content will cause an emission of VOCs above the de minimis limit with the 100 gallon per year limit.

EMISSIONS/CONTROLS EVALUATION

The VOC and PM content used in this analysis were obtained from the SDS for each mixture used in the four different sprays.

Emissions from the spray booth QC001 are being drawn through exhaust hoods and vented through a carbon filter. These hoods were assigned a 90% capture efficiency in accordance with Special Condition 4.

The carbon filters were assigned 95% VOC and volatile HAP control efficiency according to the EPA document, *Carbon Adsorption for Control of VOC Emissions: Theory and Full Scale System Performance*, June 1988.

The DOP (Dispersed Oil Particulate) HEPA filters were assigned a 99.9% PM, PM₁₀, and PM_{2.5} control efficiency, as is the standard control efficiency for HEPA level control.

Special Condition 7 allows the use of alternative materials not evaluated for this project, some of which may contain significantly higher VOC and PM contents; however, even with the use of 100% VOC and 100% PM sprays at 100 gallons per year and densities of 7 lb/gal, with an overall control factor of 90.25% for VOC emissions and 94.9% for PM emissions, it is not possible for the VOC or PM emissions of the project to exceed the de minimis level. No HAP emissions are allowed as a result of the use of any alternative materials, as none of the materials evaluated as part of this project contain any HAP content.

The following table provides an emissions summary for this project. Existing potential emissions were taken from Construction Permit 092019-009. Existing actual emissions were taken from the installation's 2018 EIQ. Potential emissions of the project represent the potential of the modified equipment, assuming continuous operation (8760 hours per year). Conditioned Potential emissions of the project represent the potential of the modified equipment at 100 gallons per year of usage at a density of 7 lb/gal.

Table 3: Emissions Summary (tpy)

Pollutant	Regulatory De Minimis Levels / SMAL ^a	Existing Potential Emissions ^b	Existing Actual Emissions (2018 EIQ)	Potential Emissions of the Project	Conditioned Potential Emissions of the Project ^c	New Installation Conditioned Potential
PM	25.0	<250.0	N/A	N/D	1.1 x 10 ⁻³	<250.0
PM ₁₀	15.0	171.60	21.18	N/D	1.1 x 10 ⁻³	N/A
PM _{2.5}	10.0	109.38	20.80	N/D	1.1 x 10 ⁻³	N/A
SOx	40.0	2.97	0.95	N/A	N/A	N/A
NOx	40.0	<250.0	80.22	N/A	N/A	<250.0
VOC	40.0	56.70	19.51	> 40.00	0.04	N/A
CO	100.0	125.62	21.50	N/A	N/A	N/A
Total HAPs	10.0/25.0	<25.0	2.67	N/A	N/A	<25.0
Acetaldehyde	9	8.95	N/A	N/A	N/A	N/A
Acrolein	0.04	0.01	N/A	N/A	N/A	N/A
Benzene	2	2.97	N/A	N/A	N/A	N/A
Toluene	10	2.19	N/A	N/A	N/A	N/A
Formaldehyde	2	1.60	N/A	N/A	N/A	N/A
Napthalene	10	0.64	N/A	N/A	N/A	N/A
Xylenes	10	1.54	N/A	N/A	N/A	N/A

N/A = Not Applicable; N/D = Not Determined

^a SMAL of all individual HAPs

^b Other pollutants can be indirectly limited by the limits on PM, NOx, and total HAPs. However, the values listed do not take into account any indirect limitations in the potential emissions.

^c PM, PM₁₀ and PM_{2.5} are assumed to be equivalent

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of VOC are conditioned below de minimis levels.

APPLICABLE REQUIREMENTS

Bodine Aluminum, Inc. shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit

GENERAL REQUIREMENTS

- *Start-Up, Shutdown, and Malfunction Conditions*, 10 CSR 10-6.050

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
 - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required every year for Part 70 installations.

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220

- *Restriction of Emission of Odors*, 10 CSR 10-6.165

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 29, 2019, received August 30, 2019, designating Toyota Motor Engineering and Manufacturing North America, Inc. as the owner and operator of the installation.

Attachment B - PM Compliance Worksheet

Bodine Aluminum, Inc.
 Lincoln County, S36, T36, R7W
 Project Number: 2019-08-083
 Installation ID Number: 113-0029
 Permit Number:

This sheet covers the period from _____ to _____.
 (month, year) (month, year)

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
C01	Plantwide Natural Gas External Combustion	MMscf	1.9 lb/MMscf ²	
C02	Natural Gas Emergency Generator	Hours ³¹	9.59 x 10 ⁻⁵ lb/hr ³	
G1	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shakeout	tons metal	0.53 lb/ton ^{Error!} Bookmark not defined. ⁴	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cooling	tons metal	0.46 lb/ton ⁴	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Finishing	tons metal	0.58 lb/ton ⁵	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Shot Blasting	tons blast media	54 lb/ton ⁶	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Welding	tons welding rod	20 lb/ton ⁷	
P01	Used Sand Crushing – Controlled by DC1B Dust Collector	tons sand	0.40 lb/ton ⁸	
	Used Sand Crushing – SSM emissions	tons sand	4.02 lb/ton ⁷	
P02	Used Sand Sieving – Controlled by DC1B Dust Collector	tons sand	0.23 lb/ton ⁸	
	Used Sand Sieving – SSM emissions	tons sand	2.25 lb/ton ⁷	

¹ Monthly PM Emissions (tons) = Monthly Usage x PM Emission Factor x 0.0005 (ton/lb).

² Obtained from AP-42 Section 1.4 "Natural Gas Combustion" (July 1998).

³ A PM emission factor of 7.71 x 10⁻⁵ lb/MMBtu was obtained from AP-42 Section 3.2 "Natural Gas-fired Reciprocating Engines" (August 2000) Table 3.2-1 and a natural gas heat content of 1,050 MMBtu/MMscf obtained from AP-42 Appendix A "Miscellaneous Data and Conversion Factors" (September 1985). The engine combusts 1,185 scf/hr at full load.

⁴ Obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999).

⁵ Obtained from Toyota Design Data.

⁶ Obtained from AP-42 Section 13.2.6 "Abrasive Blasting" (October 1997)

⁷ Obtained from the General District-ARB-Nassco GMAW emission estimation procedure (August 1999)

⁸ Assumes 90% overall capture and control for the use of a dust collector/baghouse

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
P03	Aluminum/Sand Separation – Controlled by DC1B Dust Collector	tons sand	0.19 lb/ton ⁸	
	Aluminum/Sand Separation – SSM emissions	tons sand	1.9 lb/ton ⁷	
O2	Lines GR-Kai #1 and #2 Cylinder Head Casting – controlled by OD3 Wet Scrubber	tons metal	0.17 lb/ton ⁹	
	Line GR-Kai #3 Cylinder Head Casting – controlled by OD4 Wet Scrubber	tons metal	0.17 lb/ton ⁹	
	Lines AR #3 and #4 and UR Cylinder Head Casting – controlled by OD5 Wet Scrubber	tons metal	0.17 lb/ton ⁹	
	Line ZR Cylinder Head Casting – controlled by OD6 Wet Scrubber	tons metal	0.17 lb/ton ⁹	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Cylinder Head Casting – SSM emissions	tons metal	0.58 lb/ton ¹⁰	
O5	Line GR-Kai #1 Core Molding – Controlled by OD3 Wet Scrubber	tons sand	0.01 lb/ton ⁹	
	Lines GR-Kai #2 and #3 Core Molding – Controlled by OD4 Wet Scrubber	tons sand	0.01 lb/ton ⁹	
	Lines AR #3 and #4 and UR Core Molding – Controlled by OD5 Wet Scrubber	tons sand	0.01 lb/ton ⁹	
	Line ZR Core Molding – Controlled by OD6 Wet Scrubber	tons sand	0.01 lb/ton ⁹	
	Lines GR-Kai #1, #2, and #3; AR #3 and #4; UR; and ZR Core Molding – SSM emissions	tons sand	1.1 lb/ton ¹¹	
P04	Final Sand Crushing – Controlled by DC1B Dust Collector	tons sand	0.17 lb/ton ⁸	
	Final Sand Crushing – SSM emissions	tons sand	1.68 lb/ton ⁷	
P05	Sand Reclamation Furnace #1 – controlled by DC2 Baghouse	tons sand	0.02 lb/ton ¹²	
	Sand Reclamation Furnace #2 – controlled by DC16 Baghouse	tons sand	0.02 lb/ton ¹²	
	Sand Reclamation Furnaces #1 and #2 – SSM emissions	tons sand	2 lb/ton ¹³	
P06	Sand Separation – Controlled by DC1B Dust Collector	tons sand	0.17 lb/ton ⁸	
	Sand Separation – SSM emissions	tons sand	1.68 lb/ton ⁷	

⁹ Obtained from January 2016 stack test.

¹⁰ Emission factor obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999).

¹¹ Obtained from AP-42 Section 12.10 "Gray Iron Foundries" (May 2003).

¹² Obtained from December 2014 RTO inlet/baghouse outlet stack test results

¹³ Obtained from AP-42 Section 11.19.1 "Sand & Gravel Processing" (November 1995).

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
P07	Sand Storage – Controlled by DC1B Dust Collector	tons sand	0.04 lb/ton ⁸	
	Sand Storage – SSM emissions	tons sand	0.42 lb/ton ⁷	
P08	Sand Weighing – Controlled by DC1A Baghouse	tons sand	0.04 lb/ton ⁸	
	Sand Weighing – SSM emissions	tons sand	0.42 lb/ton ⁷	
P09	Sand Dryer – Controlled by DC1A Baghouse	tons sand	0.04 lb/ton ⁸	
	Sand Dryer – SSM emissions	tons sand	0.42 lb/ton ⁷	
P10	Heated Sand Storage – Controlled by DC1A Baghouse	tons sand	0.04 lb/ton ⁸	
	Heated Sand Storage – SSM emissions	tons sand	0.42 lb/ton ⁷	
P11	Resin Coating – Controlled by OD1 RTO and DC3 Dust Collector	tons sand	0.01 lb/ton ¹⁴	
	Resin Coating – SSM emissions	tons sand	1.75 lb/ton ¹⁵	
P12	Resin Holding, Bin Charging – Controlled by DC1A Baghouse	tons sand	2.9 x 10 ⁻³ lb/ton ⁸	
	Resin Holding, Bin Charging – SSM emissions	tons sand	0.03 lb/ton ¹⁶	
P13	Coated Sand Cooling – Controlled by DC1A Baghouse	tons sand	0.38 lb/ton ⁸	
	Coated Sand Cooling – SSM emissions	tons sand	3.8 lb/ton ⁷	
P14	Coated Sand Crushing – Controlled by DC1A Baghouse	tons sand	0.17 lb/ton ⁸	
	Coated Sand Crushing – SSM emissions	tons sand	1.68 lb/ton ⁷	
P15	Coated Sand Sieving – Controlled by P15 Dust Collector	tons sand	0.23 lb/ton ⁸	
	Coated Sand Sieving – SSM emissions	tons sand	2.25 lb/ton ⁷	
P16	Coated Sand Storage – Controlled by DC1A Baghouse	tons sand	0.42 lb/ton ⁸	

¹⁴ Obtained from December 2014 RTO outlet stack test results.

¹⁵ Obtained from December 2014 RTO inlet/baghouse outlet stack test results and assuming a 99% combined capture and control efficiency for the dust collector.

¹⁶ Obtained from WebFIRE for Process SCC 30502503.

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
	Coated Sand Storage – SSM emissions	tons sand	4.22 lb/ton ⁷	
P34	Paved Haul Roads	VMT	2.03 lb/VMT ¹⁷	
P35	3,230 HP Diesel Emergency Generator	hours ³¹	2.38 lb/hr ¹⁸	
P36	435 HP Diesel Emergency Fire Pump	hours ³¹	1.00 lb/hr ¹⁹	
P37	Electric Aluminum Holding Furnaces Flux Usage	tons flux	963 lb/ton ²⁰	
P41	500 KW Emergency Diesel Generator	hours ¹¹	0.22 lb/hr ²¹	
P42	500 KW Emergency Diesel Generator	hours ¹¹	0.22 lb/hr ²¹	
P43	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ²¹	
P44	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ²¹	
P45	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ²¹	
P46	500 KW Emergency Diesel Generator	hours ¹⁰	0.22 lb/hr ²¹	
I01/I02j	Lines I01 and I02 Vibra Mill Crusher – Controlled by BH4 Dust Collector	tons sand	0.40 lb/ton ⁸	
I03a	Line I03 Vibra Mill Crusher – Controlled by BH13A Dust Collector	tons sand	0.40 lb/ton ⁸	
Q01/Q02e	Lines Q01 and Q02 Vibra Mill Crusher – Controlled by BH18 Dust Collector	tons sand	0.40 lb/ton ⁸	
Q03/Q04d	Lines Q03 and Q04 Vibra Mill Crusher – Controlled by BH45 Dust Collector	tons sand	0.40 lb/ton ⁸	
Q05/Q06a	Lines Q05 and Q06 (2) Vibra Mill Crushers – Controlled by BH50 Dust Collector	tons sand	0.40 lb/ton ⁸	
Q07a	Line Q07 Vibra Mill Crusher – Controlled by BH79 Dust Collector	tons sand	0.40 lb/ton ⁸	

¹⁷ Obtained from AP-42 Section 13.2.1 “Paved Haul Roads” (January 2011).

¹⁸ An emission factor in lb/1,000 gal was obtained from WebFIRE for Process SCC 20200401. The engine combusts 173.92 gal/hr at full load.

¹⁹ An emission factor in lb/1,000 gal was obtained from WebFIRE for Process SCC 20200102. The engine combusts 23.423 gal/hr at full load.

²⁰ Obtained from WebFIRE for Process SCC 30400104, includes 3.7% control for being located in a building.

²¹ Obtained from 40 CFR §89.112, *Oxides of nitrogen, carbon monoxide, hydrocarbon, and particulate matter exhaust emission standards*

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
I01/I02j, 103a, Q01/Q02e, Q03/Q04d, Q05/Q06a, & Q07a	Lines I01-I03 and Q01-Q07 Vibra Mill Crushers – SSM emissions	tons sand	4.02 lb/ton ⁷	
Q03l	Line Q03 Pre-Classifier – Controlled by BH35 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q04l	Line Q04 Pre-Classifier – Controlled by BH36 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q05b	Line Q05 Pre-Classifier – Controlled by BH55 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q06b	Line Q06 Pre-Classifier – Controlled by BH70 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q07b	Line Q07 Pre-Classifier – Controlled by BH74 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q03l, Q04l, Q05b, Q06b, & Q07b	Lines Q03-Q07 Pre-Classifiers – SSM emissions	tons sand	2.25 lb/ton ⁷	
I04d	Line I04 Sand Crusher – Controlled by BH1 Dust Collector	tons sand	0.40 lb/ton ⁸	
	Line I04 Sand Crusher – SSM emissions	tons sand	4.02 lb/ton ⁷	
I01e	Line I01 Sand Crusher – Controlled by BH4 Dust Collector	tons sand	0.17 lb/ton ⁸	
I02e	Line I02 Sand Crusher – Controlled by BH4 Dust Collector	tons sand	0.17 lb/ton ⁸	
I01e & I02e	Lines I01 and I02 Sand Crushers – SSM emissions	tons sand	1.68 lb/ton ⁷	
I03e	Line I03 Sand Sub Vacuum – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ⁸	
	Line I03 Sand Sub Vacuum – SSM emissions	tons sand	0.42 lb/ton ⁵	
I01/I02g	Lines I01 and I02 (2) Transfer Devices – Controlled by BH4 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q01/Q02h	Lines Q01 and Q02 (2) Transfer Devices – Controlled by BH18 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q03/Q04f	Lines Q03 and Q04 (2) Transfer Devices – Controlled by BH40 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q05/Q06c	Lines Q05 and Q06 (2) Transfer Devices – Controlled by BH59 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q07c	Line Q07 Transfer Device – Controlled by BH80 Dust Collector	tons sand	0.04 lb/ton ⁸	

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
I01/I02g, Q01h, Q02h, Q03/Q04f, Q05/Q06c, & Q07c	Lines I01, I02, and Q01-Q07 Transfer Devices – SSM emissions	tons sand	0.42 lb/ton ⁷	
I03g	Line I03 Sand Sub Vacuum Transfer Unit – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ⁸	
	Line I03 Sand Sub Vacuum Transfer Unit – SSM emissions	tons sand	0.42 lb/ton ⁷	
I04h	Line I04 Transfer Device	tons sand	0.40 lb/ton ²²	
I01d	Line I01 Sand Classifier – Controlled by BH11 Dust Collector	tons sand	0.23 lb/ton ⁸	
I02d	Line I02 Sand Classifier – Controlled by BH7 Dust Collector	tons sand	0.23 lb/ton ⁸	
I03d	Line I03 Sand Classifier – Controlled by BH15 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q01d	Line Q01 Sand Classifier – Controlled by BH31 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q02d	Line Q02 Sand Classifier – Controlled by BH27 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q03c	Line Q03 Sand Classifier – Controlled by BH41 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q04c	Line Q04 Sand Classifier – Controlled by BH46 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q05d	Line Q05 Sand Classifier – Controlled by BH58 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q06d	Line Q06 Sand Classifier – Controlled by BH72 Dust Collector	tons sand	0.23 lb/ton ⁸	
Q07d	Line Q07 Sand Classifier – Controlled by BH73 Dust Collector	tons sand	0.23 lb/ton ⁸	
I01d, I02d, I03d, Q01d, Q02d, Q03c, Q04c, Q05d, Q06d, & Q07d	Lines I01-I03 and Q01-Q07 Sand Classifiers – SSM emissions	tons sand	2.25 lb/ton ⁷	
I01/I02h	Lines I01 and I02 (2) Heaters – Controlled by BH4 Dust Collector	tons sand	0.04 lb/ton ⁸	
I03i	Line I03 Heater – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ⁸	
I04f	Line I04 Heater – Controlled by BH1 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q01/Q02i	Lines Q01 and Q02 (2) Heaters – Controlled by BH18 Dust Collector	tons sand	0.04 lb/ton ⁸	

²² Obtained from Toyota Design Data. Includes 3.7% overall capture and control for being located within a building.

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
Q03/Q04g	Lines Q03 and Q04 (2) Heaters – Controlled by BH40 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q05/Q06f	Lines Q05 and Q06 (2) Heaters – Controlled by BH59 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q07f	Line Q07 Heater – Controlled by BH80 Dust Collector	tons sand	0.04 lb/ton ⁸	
I01/I02h, I03i, I04f, Q01/Q02i, Q03/Q04g, Q05/Q06f, & Q07f	Lines I01-I04 and Q01-Q07 Heaters – SSM emissions	tons sand	0.42 lb/ton ⁷	
I01/I02i	Lines I01 and I02 (2) Sand Coolers – Controlled by BH4 Dust Collector	tons sand	0.04 lb/ton ⁸	
I03k	Line I03 Sand Cooler – Controlled by BH19 Dust Collector	tons sand	0.04 lb/ton ⁸	
I04g	Line I04 Sand Cooler – Controlled by BH1 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q01/Q02g	Lines Q01 and Q02 (2) Sand Coolers – Controlled by BH18 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q03/Q04i	Lines Q03 and Q04 (2) Sand Coolers – Controlled by BH40 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q05/Q06g	Lines Q05 and Q06 (2) Sand Coolers – Controlled by BH59 Dust Collector	tons sand	0.04 lb/ton ⁸	
Q07g	Line Q07 Sand Cooler – Controlled by BH80 Dust Collector	tons sand	0.04 lb/ton ⁸	
I01/I02i, I03k, I04g, Q01/Q02g, Q03/Q04i, Q05/Q06g, & Q07g	Lines I01-I04 and Q01-Q07 Sand Coolers – SSM emissions	tons sand	0.42 lb/ton ⁷	
I01b	Line I01 Sand Polisher – Controlled by BH8 Dust Collector	tons sand	0.17 lb/ton ⁸	
I02b	Line I02 Sand Polisher – Controlled by BH5 Dust Collector	tons sand	0.17 lb/ton ⁸	
I03b	Line I03 Sand Polisher – Controlled by BH13 Dust Collector	tons sand	0.17 lb/ton ⁸	
I04b	Line I04 Sand Polisher – Controlled by BH2 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q01b	Line Q01 Sand Polisher – Controlled by BH23 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q02b	Line Q02 Sand Polisher – Controlled by BH25 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q03a	Line Q03 Sand Polisher – Controlled by BH42 Dust Collector	tons sand	0.17 lb/ton ⁸	

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
Q03h	Line Q03 Sand Polisher – Controlled by BH33 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q04a	Line Q04 Sand Polisher – Controlled by BH47 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q04h	Line Q04 Sand Polisher – Controlled by BH34 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q05e	Line Q05 Sand Polisher – Controlled by BH81 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q05h	Line Q05 Sand Polisher – Controlled by BH56 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q06e	Line Q06 Sand Polisher – Controlled by BH71 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q06h	Line Q06 Sand Polisher – Controlled by BH52 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q07e	Line Q07 Sand Polisher – Controlled by BH75 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q07h	Line Q07 Sand Polisher – Controlled by BH76 Dust Collector	tons sand	0.17 lb/ton ⁸	
I01b, I02b, I03b, I04b, Q01b, Q02b, Q03a, Q03h, Q04a, Q04h, Q05e, Q05h, Q06e, Q06h, Q07e, & Q07h	Lines I01-I04 and Q01-Q04 Sand Polishers – SSM emissions	tons sand	1.68 lb/ton ⁷	
I01c	Line I01 Sand Classifier – Controlled by BH9 Dust Collector	tons sand	0.17 lb/ton ⁸	
I02c	Line I02 Sand Classifier – Controlled by BH6 Dust Collector	tons sand	0.17 lb/ton ⁸	
I03c	Line I03 Sand Classifier – Controlled by BH14 Dust Collector	tons sand	0.17 lb/ton ⁸	
I04c	Line I04 Sand Classifier – Controlled by BH3 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q01c	Line Q01 Sand Classifier – Controlled by BH24 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q02c	Line Q02 Sand Classifier – Controlled by BH26 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q03b	Line Q03 Sand Classifier – Controlled by BH43 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q04b	Line Q04 Sand Classifier – Controlled by BH48 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q05i	Line Q05 Sand Classifier – Controlled by BH57 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q06i	Line Q06 Sand Classifier – Controlled by BH53 Dust Collector	tons sand	0.17 lb/ton ⁸	
Q07i	Line Q07 Sand Classifier – Controlled by BH77 Dust Collector	tons sand	0.17 lb/ton ⁸	

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
I01c, I02c, I03c, I04c, Q01c, Q02c, Q03b, Q04b, Q05i, Q06i, & Q07i	Lines I01-I04 and Q01-Q07 Sand Classifiers – SSM emissions	tons sand	1.68 lb/ton ⁷	
I01k	Line I01 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
I02m	Line I02 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
I03j	Line I03 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
I04j	Line I04 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
Q01j	Line Q01 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
Q02j	Line Q02 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
Q03j	Line Q03 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
Q04j	Line Q04 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
Q05j	Line Q05 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
Q06j	Line Q06 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
Q07j	Line Q07 Buffer Tank – Controlled by Sock Filters	tons sand	0.21 lb/ton ²³	
I01k, I02m, I03j, I04j, Q01j, Q02j, Q03j, Q04j, Q05j, Q06j, & Q07j	Lines I01-I04 and Q01-Q07 Buffer Tanks – SSM emissions	tons sand	0.42 lb/ton ⁷	
I01f, I02f, I03f, I04e, Q01f, Q02f, Q03k, Q04k, Q05k, Q06k, Q07k	Lines I01-I04 and Q01-Q07 Core Molding Machines	tons sand	1.06 lb/ton ²⁴	
I01i, I02k, I03l, I04i, Q01k, Q02k, Q03m, Q04m, Q05n, Q06n, & Q07n	Lines I01-I04 and Q01-Q07 Casting Machines	tons metal	0.56 lb/ton ²⁵	
I01m, I02l, I03m, I04k, Q01l, Q02l,	Lines I01-I04 and Q01-Q07 Metal Cooling	tons metal	0.47 lb/ton ²⁵	

²³ Assumes 50% overall capture and control for the use of sock filters.

²⁴ Obtained from AP-42 Section 12.10 "Gray Iron Foundries" (May 2003). Includes 3.7% overall capture and control for being located within a building.

²⁵ Obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999). Includes 3.7% overall capture and control for being located within a building.

Emission Source	Description	Monthly Usage	PM Emission Factor	Monthly PM Emissions ¹ (tons)
Q03n, Q04n, Q05l, Q06l, & Q07l				
I01/I02/I04a	Lines I01, I02, and I04 Shakeout and Finishing – Controlled by BH16 Dust Collector	tons metal	0.11 lb/ton ⁸	
I03h	Line I03 Shakeout and Finishing – Controlled by BH20 Dust Collector	tons metal	0.11 lb/ton ⁸	
Q01/Q02a	Lines Q01 and Q02 Shakeout and Finishing – Controlled by BH18 Dust Collector	tons metal	0.11 lb/ton ⁸	
Q03/Q04e	Lines Q03 and Q04 Shakeout and Finishing – Controlled by BH45 Dust Collector	tons metal	0.11 lb/ton ⁸	
Q05/Q06m	Lines Q05 and Q06 Shakeout and Finishing – Controlled by BH50 Dust Collector	tons metal	0.11 lb/ton ⁸	
Q07m	Line Q07 Shakeout and Finishing – Controlled by BH79 Dust Collector	tons metal	0.11 lb/ton ⁸	
I01/I02/I04a, I03h, Q01/Q02a, Q03/Q04e, Q05/Q06m, & Q07m	Lines I01-I04 and Q01-Q07 Shakeout and Finishing – SSM emissions	tons metal	1.11 lb/ton ²⁶	
QC001	Spray Booth – Controlled by HEPA Filter and Ventilation Hoods	gal spray	0.17 lb/gal ²⁷	
	Spray Booth – SSM emissions	gal spray	7 lb/gal ²⁸	
Installation Monthly PM Emissions²⁹ (tons):				
Installation 12-Month Rolling Total PM Emissions³⁰ (tons):				

²⁶ Shakeout emission factor obtained from Emissions Measurement Team Casting Emission Reduction Program's "Foundry Process Emission Factors: Baseline Emissions from Automotive Foundries in Mexico" (January 1999). Finishing emission factor obtained from Toyota Design Data.

²⁷ Assumes 95% capture and 99.9% control for the use of HEPA filters

²⁸ Based on a worst-case material with a density of 7 lb/gal and 100% solids composition

²⁹ Installation Monthly PM Emissions (tons) = the sum of each emission source's Monthly PM Emissions (tons).

³⁰ Installation 12-Month Rolling Total PM Emissions (tons) = the sum of the most recent 12 months' Installation Monthly PM Emissions (tons). **Installation 12-Month Rolling Total PM Emissions of less than 250.0 tons indicates compliance with Special Condition 2.A.**

³¹ Obtained from the non-resettable meter on the engine. Monthly usage = This month's meter reading (hours) – previous month's meter reading (hours).

Attachment C – C01 Plantwide Natural Gas External
Combustion includes all of the following equipment:

Bodine Aluminum, Inc.
Lincoln County, S36, T36, R7W
Project Number: 2019-08-083
Installation ID Number: 113-0029
Permit Number:

Description	Total MHDR (MMBtu/hr)	Process Emissions are reported under...
Sand Reclamation Furnace #1	4.8	P05
Sand Reclamation Furnace #2	4.8	
(1) Resin Coating/Muller Pre-heater	4	P11
(1) Regenerative Thermal Oxidizer	8.9	
(53) Low Pressure Die Casting Die Heaters	24.91	N/A
(9) Toyota New Global Architecture (TNGA) Die Heaters	0.234	N/A
(31) HVAC Units	135.98	N/A
(4) Conventional Heat Treatment Furnaces: (4) natural gas aging burners at 1.76 MMBtu/hr each and (4) electric solution burners	7.04	OA7
(6) Simple Slim Heat Treatment Furnaces: (6) solution burners at 2.34 MMBtu/hr each and (6) aging burners at 2.374 MMBtu/hr each	28.284	
(6) TNGA Heat Treatment Furnaces: (4) solution burners at 2.374 MMBtu/hr each, (4) aging burners at 1.187 MMBtu/hr each, and (2) aging burners at 2.374 MMBtu/hr each	23.67	
(1) Simple Slim Heat Treatment Furnace	1.586	
Line GR Kai #1 Die Heaters	5.64	N/A
Line GR Kai #2 Die Heaters	4.7	N/A
Line GR Kai #3 Die Heaters	3.76	N/A
Line UR Die Heaters	4.7	N/A
Line I03 Die Heaters	1.41	N/A
Line ZR Die Heaters	1.88	N/A
Lines I01 and I02 Die Heaters	2.82	N/A
Sand Dryer	0.03948	N/A
Lines Q01-Q07 Die Heaters	9.87	N/A
Boiler Room A Water Heater	0.2	N/A
Boiler Room B Water Heater	0.2	N/A
Kitchen Water Heater	0.13	N/A
SW Restrooms Water Heater	0.04	N/A
Lines I01-I04 and Q01-Q07 Heat Treatment Furnaces	26.18	N/A

APPENDIX A

Abbreviations and Acronyms

% percent	Mgal 1,000 gallons
°F degrees Fahrenheit	MWmegawatt
acfm actual cubic feet per minute	MHDRmaximum hourly design rate
BACT Best Available Control Technology	MMBtuMillion British thermal units
BMPs Best Management Practices	MMCFmillion cubic feet
Btu British thermal unit	MSDSMaterial Safety Data Sheet
CAM Compliance Assurance Monitoring	NAAQSNational Ambient Air Quality Standards
CAS Chemical Abstracts Service	NESHAPs National Emissions Standards for Hazardous Air Pollutants
CEMS Continuous Emission Monitor System	NO_xnitrogen oxides
CFR Code of Federal Regulations	NSPSNew Source Performance Standards
CO carbon monoxide	NSRNew Source Review
CO₂ carbon dioxide	PMparticulate matter
CO_{2e} carbon dioxide equivalent	PM_{2.5}particulate matter less than 2.5 microns in aerodynamic diameter
COMS Continuous Opacity Monitoring System	PM₁₀particulate matter less than 10 microns in aerodynamic diameter
CSR Code of State Regulations	ppmparts per million
dscf dry standard cubic feet	PSDPrevention of Significant Deterioration
EQ Emission Inventory Questionnaire	PTEpotential to emit
EP Emission Point	RACTReasonable Available Control Technology
EPA Environmental Protection Agency	RAL Risk Assessment Level
EU Emission Unit	SCCSource Classification Code
fps feet per second	scfmstandard cubic feet per minute
ft feet	SDS Safety Data Sheet
GACT Generally Available Control Technology	SICStandard Industrial Classification
GHG Greenhouse Gas	SIPState Implementation Plan
gpm gallons per minute	SMAL Screening Model Action Levels
gr grains	SO_xsulfur oxides
GWP Global Warming Potential	SO₂sulfur dioxide
HAP Hazardous Air Pollutant	SSM Startup, Shutdown & Malfunction
hr hour	tph tons per hour
hp horsepower	tpy tons per year
lb pound	VMT vehicle miles traveled
lbs/hr pounds per hour	VOC Volatile Organic Compound
MACT Maximum Achievable Control Technology	
µg/m³ micrograms per cubic meter	
m/s meters per second	