



February 23, 2018

Mr. Eric Grinstern
Air Quality Division
Michigan Department of Environmental Quality
350 Ottawa Avenue, NW
Unit 10
Grand Rapids, MI 49503

Subject: Barber Steel Foundry Corporation (SRN B1961)
Response to Violation Notice, dated February 5, 2018

Dear Mr. Grinstern:

On January 25, 2018, the Department of Environmental Quality (DEQ), Air Quality Division (AQD) met with representatives of Barber Steel Foundry Corporation (BSF) to discuss emissions from the facility's foundry operations. BSF operates a steel foundry located at 2625 West Winston Road, Rothbury, Oceana County, Michigan. The facility operates under MDEQ-AQD Permit To Install (PTI) 12-14C issued on October 13, 2018. During the meeting, BSF shared information regarding engineering stack test data indicating elevated emissions of volatile organic compounds (VOC) and VOC-related pollutants from the pouring, cooling, and shakeout (PCS) processes at BSF. In a Violation Notice (VN), dated February 5, 2018, MDEQ-AQD requested that BSF provide information related to the elevated emissions data, as well as a plan to achieve and maintain compliance with all relevant permit limits. BSF is submitting this letter as a timely response to the VN.

This letter addresses three main topics. First, a discussion of the information that prompted the January 25th meeting and issues identified related to that data. Second, the actions BSF is currently taking at the plant to achieve compliance with conditions of PTI 12-14C. Finally, a long-term compliance plan of proposed action items to ensure compliance with AQD rules and policies is included in this letter.

Summary of Issues Identified during Engineering Stack Tests

On September 26-28, 2017, BSF conducted engineering stack tests to determine emission rates from emission units at the facility with limits under PTI 12-14C. Engineering testing was conducted in anticipation of compliance testing to be conducted on January 11, 2018 pursuant to PTI 12-14C. The results of the engineering tests revealed higher than anticipated VOC, VOC HAP, and other VOC



pollutant emissions from Pouring, Cooling, and Shakeout (PCS) processes at the plant. In light of the unanticipated results from the engineering stack tests, on November 16, 2017, BSF retained a different testing company to perform a second round of confirmation engineering testing limited to emission points associated with PCS focused on VOC and VOC HAP emission rates only. This test resulted in very similar results as the testing conducted in September 2017. In response to the sampling results, BSF began pursuing solutions to reduce organic compound related emissions from PCS and contacted MDEQ-AQD to discuss the challenges identified during the engineering testing.

As a result of those discussions, MDEQ-AQD identified alleged violations of PTI 12-14C that can be considered in two groups:

1. Violations of the requirement to conduct testing on the timeline outlined in PTI 12-14C for EUINDUCFURNEIF6, EUSHAKEOUT, and FGPOURCOOL;
2. Violations of pound per hour emission limits outlined in PTI 12-14C for each of the emission units identified above.

BSF has identified a series of short and long term action items to achieve and maintain compliance with PTI 12-14C and MDEQ-AQD regulations. These action items are summarized here.

Short Term Action Items

As discussed above, BSF immediately began pursuing options to emit less VOC and VOC related compounds when stack test data identified excess VOC emissions as an area of concern. It became apparent that a change in the current process may be necessary to achieve a meaningful reduction in emissions of this type. Therefore, BSF has been proactively evaluating options for reducing VOC and VOC HAP emissions from the PCS areas through process changes.

The evaluation of process changes was narrowed down to evaluation of changing the binder system currently in use after in-depth discussion with available vendors. At this time, BSF has selected a new binder system that is currently being implemented in the facility. On February 1, 2018, BSF shared with MDEQ a memo outlining the change in binder systems and its exemption from the PTI processes under MDEQ rules. Selection of this new system included extensive discussion with vendors and conducting lab tests on potential solutions prior to identifying the most viable candidate. Much of the information collected during the lab testing and evaluation phases was shared with MDEQ-AQD at the meeting on January 25, 2018. The implementation of the new binder system is anticipated to reduce VOC and VOC related emissions from the facility significantly.

BSF has contracted Alliance Source Testing to conduct compliance stack tests for particulate and visible emissions on the EUINDUCFURNEIF6 and FGPOURCOOL sources to meet the requirements



of PTI 12-14C for those pollutants as soon as possible. Testing will be conducted from February 26, 2018 through February 28, 2018.

Long Term Action Items

At this time, BSF has identified and began to implement a new binder system at the Rothbury, Michigan plant. As discussed above, a significant reduction in VOC and VOC related emissions is anticipated as a result of full implementation of the new system. However, PTI 12-14C will continue to be inconsistent with the process in use at BSF. This inconsistency can be traced to the anticipated and actual operation of the plant with respect to binder on sand ratio. During the application process BSF developed VOC and VOC HAP emissions factors based on documented emissions from foundry processes utilizing roughly 1% binder on sand for molds on the pouring floor. This percentage of binder is considered to be the industry standard as many binder systems, including those in use at BSF, require that level of binder in the process sand to work effectively. This ratio was relied upon in BSF's Amended Permit to Install Application and was consistent with vendor recommendations and documented emissions factors, including the Casting Emission Reduction Program (CERP) study. However, neither the CERP study nor other documents used in the development of emissions factors accounted for residual binder in molds on the pouring floor. The actual plant operating conditions result in up to approximately 4% binder on sand for molds on the pouring floor, including up to 3% residual binder in reused sand and roughly 1% new binder addition. This additional binder, even when accounting for emission reductions anticipated from the new binder system, will require BSF to pursue a new permit. Similarly, the emissions of several pollutants including carbon monoxide and particulate matter will need to be rebalanced between FGPOURCOOL and EUSHAKEOUT to be more consistent with operation of the facility as observed during the engineering testing. These changes would also result in the need to update PTI 12-14C.

Therefore, as long term action items BSF is proposing to submit to MDEQ-AQD an application to update PTI 12-14C to accurately reflect operation of the facility with the new binder system. Once emissions limits are updated appropriately, BSF will work with MDEQ-AQD to schedule compliance stack tests for all compounds outstanding aside from those tested during February, 2018. This will result in a full set of compliance testing for all required units in the facility.

Note, BSF is moving very quickly to solve a very complex issue. The solution chosen has been vetted as thoroughly as possible by BSF to ensure success of the plan outlined here. However, as with any complex system, changes to integral parts of the process, as binder systems are, can have unintended consequences. BSF is committed to maintaining an open line of communication with MDEQ-AQD during this process. In the unlikely event that the new binder system cannot be implemented fully at the facility due to technical constraints, BSF will promptly contact MDEQ-AQD to discuss alternative paths forward.



Conclusion

BSF has identified short and long term action items to respond to the VN issued by MDEQ-AQD on February 5, 2018. These actions include:

- Implementation of a new binder system;
- Immediate compliance stack tests for particulate and visible emissions from EUINDUCFURNEIF6 and FGPOURCOOL;
- Permit modification to be consistent with BSF operation; and
- Full compliance testing shortly after permit modification.

BSF has worked hard to develop and implement viable solutions to unexpected challenges discovered very recently. Additionally, BSF appreciates MDEQ-AQD's understanding and participation in the process of identifying an acceptable path forward within the framework of MDEQ-AQD rules and regulations. If you have any questions or comments related to the information provided in this response, please feel free to contact me.

Sincerely,

Bruce A. Milligan, P.E.
Director, Operations