PCC Structurals, Inc.

July 26, 2024

Heather Kuoppamaki
Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232
Re: Response to DEQ letter dated April 25, 2024

Heather:

PCC Structurals, Inc. (PCC) received your letter dated April 25, 2024 (the letter), relating to the Cleaner Air Oregon (CAO) Large Parts Campus Emissions Inventory submitted by PCC on October 10, 2020 and subsequent responses to requests for information, including the source test reports Mostardi Platt submitted to the Oregon Department of Environmental Quality (DEQ) on December 21, 2023. Upon receiving the Letter, PCC requested an extension to July 26, 2024, to respond to item 1 and committed to respond to items 2 through 10 by the initial response deadline June 24, 2024. An extension was granted by the DEQ on June 3, 2024 for the due date of the response to item 1. PCC submitted responses to items 2 through 10 of the letter on June 24, 2024. PCC and Maul Foster & Alongi, Inc. (MFA), have prepared the following timely responses to item 1 of the letter.

Activities performed as part of the investment casting process at PCC are somewhat unique when compared to other metal foundries. PCC's intricate wax molds and investing process are engineered to produce castings that are close to a finished state, thereby minimizing the processing needed by the customer. Customer specifications dictate the composition of alloys used and the methods of casting and finishing. The variable complexity of the molds impacts casting and cleaning processes. Finishing activities are performed on an as-needed basis for each cast part, imperfections identified in the cast part must be corrected before a part is complete. As a result, publicly available emission factor data is not adequately representative.

We acknowledge the challenges with developing the emissions inventory for PCC's operations and hope that the DEQ agrees that care should be taken to ensure that calculated emissions are sufficiently representative without being unrealistically conservative. We believe the baghouse dust catch method of calculating emissions is the most representative method for estimating emissions from the wide variety of baghouses used at PCC, and that this method should not be rejected by the DEQ based on the June 2023 source testing.

In the following response to item 1 of the letter, DEQ comments are shown in bold followed by our response.

**1. Proposal for revising emission estimates from baghouse and filter-controlled activities. Given that the June 2023 source testing demonstrated significant decreases in control efficiencies from those reported in the Inventory, submit a proposal for revising the Inventory for all TEUs that exhaust to a baghouse. Estimates should be based on the best available data which should include the June 2023 source testing. The following are some items for consideration when developing this proposal:**

- **The current control efficiencies in the Inventory, based on manufacturer data for control of Particulate Matter (PM) reported at 99.9% or greater, are not acceptable for individual TACs and are not approvable for the purposes of this Risk Assessment.**

  The control efficiencies shown in the source test reports should not be viewed as representing the overall particulate control efficiency. Small sample catch amounts over eight-hour sample runs and inconsistency within the suite of results make the control efficiencies from the June 2023 source testing

unreliable for use in emission calculations and should not preclude the use of a more accurate control efficiency value moving forward.

- **DEQ recommends using the outlet mass emission rates from the June 2023 source test data as opposed to control efficiencies for estimating TAC emissions. PCC may consider methods to apply this data to baghouses with similar processes as those included in the source test if applicable.**

  Baghouse 9203 and Baghouse 9256, and their respective source test results, are not representative of any other TEUs at PCC. Baghouse 9203 controls emissions from the removal of gating by hot cutting activities. Baghouse 9256 controls emissions from air casting activities. The outlet emission factors from the letter, which are based on the source test reports for these baghouses, can be applied to the emissions inventory with the following exceptions.

  For metals that were below detection limits in all inlet and outlet samples, no emissions will be estimated.

  For metals that were below detection limits on the outlet samples, emission factors will be calculated based on the updated alloy content data being developed as part of the emissions inventory revision. The nickel emission factor developed from the source test will be multiplied by the ratio of alloy contents for the given metal species to nickel. Nickel is chosen as it is a predominant metal species in most alloys poured at PCC, and each test run had measurable nickel on both the inlet and outlet samples.

  The emission factors for aluminum and phosphorus are not representative due to elevated concentrations of these metals in the sample filters. These results are biased high because of the blank correction requirements of Method 29, which biases the resulting control efficiency low.

  Baghouse 8901 is potentially representative of other baghouses managing grinding emissions at LPC. However, as noted in the source test reports and the letter, there were significant issues with Run 1, and additional concerns with data quality for Run 2. As a result, PCC is proposing to re-test Baghouse 8901. The proposed testing will include those methods performed during the June 2023 source testing, and also include testing for total particulate matter to verify the overall control efficiency. Testing total particulate matter will give a more accurate representation of the control efficiency provided by Baghouse 8901 and will provide a basis of comparison for the metals sampling.

  PCC intends to assess the control efficiencies of Baghouse 9203 and Baghouse 9256 at a later date, if needed, to refine the dataset. Using the baghouse catch data and speciation still represents the most effective method available for estimating emissions from all baghouses at PCC. The tests for baghouses 9203 and 9256 were extremely labor-intensive and costly, and produced results that appear inconsistent with reasonably expected levels of performance. However, in the interest of moving the CAO process forward, PCC agrees to utilize the test data as described above in the facility TAC emissions inventory for Baghouse 9203 and Baghouse 9256.

- **DEQ may consider allowing the use of the following approach provided that it includes appropriately conservative assumptions:**
  - **Emissions based on baghouse catch data or available, preferred activity-specific PM emission factors (e.g., RTI International), coupled with a percent composition for TACs and that use TAC-specific control efficiencies based on June 2023 source testing.**

  Use of baghouse catch data represents the most straightforward means of capturing the variability in both production and alloy composition among the various baghouses in use at PCC. We disagree with the option of applying “TAC-specific control efficiencies”. Many metal species were below the detection limit for one or more samples on the inlet or outlet of the testing campaign, and others had exceedingly

small collection amounts (on the order of micrograms over eight hours) that could have been contaminated during sample handling activities. Any amount of contamination would have a significant impact on the resulting emission factors and calculated control efficiencies.

A review of the source test data shows that the control efficiencies for metal species with inlet sample collection amounts below 1 milligram are highly variable and inconsistent. Control efficiencies for metal species with inlet sample collection amounts above 1 milligram are consistently greater than 98%, and the control efficiencies for the highest sample collection amounts (from Run 1 of Baghouse 8901) exceed 99.9%. There are exceptions to this trend such as for aluminum, which as mentioned previously is not representative due to elevated aluminum in the sample filters that was not blank-corrected due to limitations imposed by Method 29. Data from Table B-7 of the RTI International document show a similar trend of higher control efficiencies for higher sample collection rates, and with increased variability in control efficiencies for lower sample collection rates.

The exhaust temperature for the sampled sources are either ambient, or slightly elevated above ambient, with Baghouse 9256 having the highest tested exhaust temperature at 100°F. All metals, except mercury, are expected to be in a solid form at these temperatures, and there should not be an expectation that different metals will have appreciably different control efficiencies. Section 6.2.2 of the RTI International document referenced in the letter states that "it is assumed that there are no condensable PM emissions" for finishing and cutting operations (e.g. grinding). While melting activities may produce condensable emissions, data from Table 3-3 of the RTI International document indicates condensable PM emissions from an electric induction furnace would be up to 3.33% of total filterable PM emissions.

The RTI International document discusses a proposed hierarchy to emission calculation methods. A methodology whereby emissions calculated based on baghouse catch data is ranked higher than a methodology using the "default factors" presented therein. The RTI International document makes no mention of assessing control efficiencies for individual metal species, and instead focuses on control efficiencies based on the type of control device used. Section 6.3.3 of the RTI International document also states "when available, baghouse dust analyses should be used to determine the metal HAP content of the filterable PM". This is consistent with how emissions are estimated for the other TEUs controlled by baghouses at the facility.

A basic comparison of the Baghouse 8901 testing to the "default factors" in the RTI International document reinforces the inadequacy of the activity-specific PM emission factor methodology for PCC's operations. Baghouse 8901 captures grinding and cutting emissions from the Alloy Service Center, which processes ingots. The total metal emission factor Run 2 of the inlet testing of Baghouse 8901 (including values below detection limit) is 0.026 lb metal emissions per ton metal processed. Previous baghouse dust analyses from material collected by Baghouse 8901 show the material collected is primarily metal. Table E-1 of the RTI International document referenced in the letter lists a median grinding emission factor of 16.2 lb PM per ton metal processed. This is-three orders of magnitude larger than the tested emission factor for Baghouse 8901.

- **In all cases, detailed references and justification must be provided for any proposed emission estimates.**
- **PCC must use the corrected data provided in the attached spreadsheets for the June 2023 source test data.**

  PCC will use the corrected data from the letter, with the adjustments to values below detection limits applied as described previously.
- **Consider additional source testing to enhance the data set.**

Baghouse 8901 is the only baghouse of the three tested that is potentially representative of other TEUs. However, sample results from Run 1 were contaminated by material that had built up within the ductwork and was subsequently disturbed when the duct had to be rotated to fit the sample probes. This left Run 2 from the testing of Baghouse 8901 as the only potentially representative test run.

After additional review of the testing data, we believe that the measured flowrates may be biased high due to the sample probe effectively reducing the cross-sectional area of the 12 inch duct at the point where velocity pressure measurements were taken. The sample probe represents an obstruction around which the air will speed up, resulting in artificially high velocities at the point of measurement. Higher velocities result in higher airflows for a given duct diameter. This adds additional uncertainty to application the Baghouse 8901 test data.

Therefore, we propose to test Baghouse 8901 again, and add on the total particulate analysis to determine the overall particulate control efficiency.

For TEUs not represented by Baghouse 8901, PCC proposes to continue using the baghouse catch data and baghouse dust analysis data as the basis for estimating TAC emissions. The results of the Baghouse 8901 particulate testing may be representative of the control efficiency for other baghouses with HEPA after-filters. PCC may consider identifying a conventional baghouse (without after-filters) for testing to determine the control efficiency for conventional baghouses. Regardless, this method is being proposed consistent with the baghouse catch calculation methodology presented in the RTI International document.

We believe that with this submittal, we have responded to items 1 through 10 of the letter. Please let us know if you have any questions or would like to set up a meeting to discuss this proposal.

Sincerely,

PCC Structurals, Inc.

Brandon Hadzinsky

Brandon Hadzinsky
Division Environmental Engineer

cc: Bryan McCampbell
Tom Wood (Stoel Rives)
Brian Eagle (MFA)