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May 18, 2020

Louise C. Gross
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VIA EMAIL: gross.louise@epa.gov

RE: Response to April 13, 2020 information request

Dear Ms. Gross:

The purpose of this letter is to submit the information that you requested from Green Bay Metropolitan Sewerage District (GBMSD) via email on April 13, 2020. Your requested items are listed below, along with GBMSD's description of each. Supplemental documentation is attached.

1) **The results from the granulated activated carbon (GAC) sulfur weight percent measurements required by the August 1, 2018 Alternative Monitoring Plan (AMP) approval letter from EPA Region 5.**
   a) **The AMP required monthly measurements for the first three months following fluidized bed incinerator (FBI) startup, followed by measurements every six months thereafter. The FBI began operating on May 8, 2018 and the GAC failure occurred on November 7, 2019. So, the FBI/GAC operated for 18 months prior to GAC failure, which should result in at least four total analyzed carbon samples.**

Response
Periodic monitoring of carbon for remaining available sulfur indicates how long the carbon is expected to be effective at removing mercury from incinerator air emissions.

Carbon analysis to determine baseline available sulfur in new (unused) carbon was conducted upon initial fill in May 2018, using laboratory methods approved by the GAC system designer.

After bringing the incineration system online with new carbon in the GAC, the GAC system designer recommends conducting carbon analysis once per month for three months to establish saturation behavior of the carbon bed, then every six months after that.

Soon after sludge was combusted for the first time in May 2018, a series of equipment failures led to extended periods of the incinerator being offline for repairs. These equipment failures were detailed in the Request to Extend Initial Beryllium and Mercury Performance Test Deadline for New Incinerator submitted to US EPA by GBMSD on June 29, 2018. Additional equipment failures that occurred during June, July and August were documented in the Request to Extend Initial Performance Test Deadline submitted to US EPA by GBMSD on August 31, 2018. In these letters, GBMSD demonstrated that a *force majeure* had occurred which prevented the operation of the incinerator.

US EPA concurred with these two requests and granted the extensions in letters dated August 1, 2018 and September 24, 2018.

Repairs and commissioning were completed so that the incinerator was operating in a typical fashion by late 2018. To establish the saturation behavior of the carbon and evaluate the mercury removal capacity of the GAC once the system was fully operational, carbon samples were analyzed in December 2018, January 2019, February 2019, March 2019, and May 2019. The next carbon sample was scheduled for late 2019 after the incinerator was shut down for maintenance.

For each sampling event, samples were taken from the top and bottom of each of the three vertical carbon layers. Laboratory reports can be found in Files 01-05.

Remaining available sulfur was determined using the equation developed by the GAC system designer (and with their assistance). Remaining available sulfur can be found in File 06. Note that the GAC system manufacturer, CPPE, reviewed the results from the January 2019 and February 2019 sampling and determined the results were likely erroneous. They had not seen such a significant reduction in available sulfur in any previous application. The correct analytical method was used, but CPPE believed that there was an error in the sulfur concentration reported in January 2019 and February 2019. Based on data from previous sampling events and their expertise, CPPE estimated that in January 2019 and February 2019, the available sulfur was between 10 and 13%. Since February 2019, carbon has been analyzed by SGS Laboratory, with results that are believable and useful.

2) GAC differential temperature and differential pressure measurements for the six-month period of FBI/GAC operation prior to the GAC system failure.

Response
The incinerator system was shut down on October 19, 2019 for annual scheduled inspection and maintenance. Data for scrubber pressure differential across the carbon in the GAC and temperature differential between the scrubber outlet and the GAC inlet for the six months preceding the scheduled shutdown can be found in File 07.

3) The annual temperature and differential pressure sensor/transmitter calibration reports from 2018 and 2019.

Response
Temperature elements TE/TIT-0517 and TE/TIT-0666 are used to monitor temperature differential between the scrubber outlet and the GAC inlet. (Note that the instrument that measures temperature in the scrubber outlet, TIT-0517, was incorrectly identified in the 2018 Petition for Alternative Monitoring as TIT-0606). All of these were initially calibrated by the supplier prior to installation and startup of the system (File 08). After installation, the temperature elements were not calibrated in a traditional sense, rather they were checked periodically for a verification of accuracy. This is done by comparing the temperature that is displayed at the thermocouple panel with the temperature recorded by the SCADA monitoring system. While GBMSD has written confirmation of this temperature verification for -0666 and -0606 (see File 09), it does not have such confirmatory records for the verification conducted at -0517. Also, GBMSD recently discovered that the TIT instruments (transmitters) were not calibrated after installation during the requested time period. Since conducting the review required by this information request, GBMSD has taken the necessary action to ensure that such verification and calibration for the TE and TIT elements, respectively, are occurring at the -0517 and -0666 locations.

PDIT-0700 is used to monitor pressure differential across the carbon beds in the GAC. It was initially calibrated by the supplier prior to startup of the unit and was scheduled to be calibrated in 2019 after the incinerator was shut down for maintenance on October 19, 2019. It was calibrated again in January 2020 along with functional testing of the system interlocks, prior to the GAC going online on February 13, 2020. Due to the malfunction that occurred in the GAC and the subsequent repairs and carbon replacement, some of the annual maintenance tasks, including the calibration of PDIT-0700, were completed at the end of the shutdown, in early 2020.

4) **The scrubber liquid pH and flow rate readings for the six-month period of FBI operation prior to the GAC system failure.**

Response
The incinerator system was shut down on October 19, 2019 for annual scheduled inspection and maintenance. Data for scrubber liquid flow rate and scrubber liquid pH for the six months preceding the scheduled shutdown can be found in File 10.

Please feel free to contact me by email (tsigmund@newwater.us) or phone (920-438-1095) with any questions or concerns you may have.

Sincerely,

GREEN BAY METROPOLITAN SEWERAGE DISTRICT

Thomas W. Sigmund

Thomas W. Sigmund, P.E.
Executive Director

Appendices
1) Files 01-05: Laboratory reports from carbon analysis
2) File 06: Remaining available sulfur of carbon
3) File 07: Monitoring data for GAC temperature differential and pressure differential 4/19/19-10/19/19
4) File 08: Initial calibration reports
5) File 09: Calibration and verification records
6) File 10: Monitoring data for scrubber liquid flow rate and pH 4/19/19-10/19/19

cc via email:
Mr. Dan Schaufelberger, US EPA
Mr. James Bonar Bridges, Wisconsin DNR
Ms. Tania Taff, Wisconsin DNR