Executive Director
Thomas W. Sigmund, P.E.
Commissioners
Kathryn Hasselblad, President
James Blumreich, Secretary
Thomas P. Maintz, Vice President
Mark D. Tumpach, Vice President
Lee D. Hoffmann, Vice President

NEW Water
The brand of the Green Bay Metropolitan Sewerage District

December 31, 2019

VIA CERTIFIED MAIL AND
EMAIL TO WHEELER.ANDREW@EPA.GOV AND MOONEY.JOHN@EPA.GOV
Mr. Andrew Wheeler
EPA Administrator
U.S. Environmental Protection
Agency Mail Code 1101A
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Mr. John Mooney
U.S. Environmental Protection Agency
Mail Code A-187
77 West Jackson Boulevard
Chicago, IL 60604-3507

RE: 40 CFR § 60.4861(b) Written Report
NEW Water Fluidized Bed Incinerator
Operation Permit No. 405004600-P30
WPDES Permit No. WI-0065251-01-1

Dear Messrs. Wheeler and Mooney:

This letter serves as the written report referenced in 40 CFR § 60.4861(b) and demonstrates that the Green Bay Metropolitan Sewerage District ("NEW Water") has met the affirmative defense requirements set forth in 40 CFR § 60.4861(a). Since November 12, 2019, NEW Water has had numerous discussions with U.S. Environmental Protection Agency ("EPA") Region 5 attorneys and staff (including Ms. Louise Gross, Mr. Daniel Schaufelberger, Mr. John Mooney, and Mr. Ethan Chatfield) and with Wisconsin Department of Natural Resources ("DNR") attorneys and staff (including Mr. James Bonar-Bridges, Ms. Kristin Hart, Ms. Maria Hill, and Ms. Tania Taff), regarding a malfunction in connection with NEW Water's Granular Activated Carbon ("GAC") equipment used to control mercury emissions from its fluid bed incinerator ("FBI") and related events. As you are aware, on November 22, 2019, NEW Water provided notice via telephone in accordance with 40 CFR § 60.4861(b) to Mr. John Mooney, Acting Director of EPA Region 5 Air and Radiation Division, of a potential exceedance of its mercury emissions limit on November 21, 2019 during the malfunction. NEW Water also provided a follow-up email regarding the notice to Mr. Mooney and Ms. Louise Gross (see Appendix B).

As discussed in further detail below, NEW Water has made extensive efforts to avoid operating its FBI without the GAC during the malfunction while continuing to provide necessary sewerage treatment services for the public in the metropolitan Green Bay area, a service vital to the basic sanitation needs of area residences and businesses.

This report is intended to meet the requirement to file a written report within 45 days of the initial exceedance on November 21, 2019 in accordance with 40 CFR § 60.4861(b).

ED_012958_00010453-00001

While operating the FBI without the GAC might exceed a mercury emission limit, it does not pose a significant risk to the public. NEW Water conducted an air dispersion modeling evaluation using an estimate of the mercury emission rate from the FBI without the GAC. The evaluation demonstrates that the impacts from the emission rate are well within state health-based standards.

Background

NEW Water operates an FBI at its plant located in Green Bay, Wisconsin. The FBI processes biosolids generated at the Green Bay plant as well as the De Pere, Wisconsin plant, which is located about seven miles from the Green Bay plant and is connected with a pipeline. NEW Water commissioned the new, state-of-the-art FBI and the air pollution control system (including the GAC) in May 2018. The FBI, which replaced two old multi-hearth incinerators, was part of a complete solids processing upgrade project that cost more than $170,000,000. NEW Water planned for its first annual maintenance shutdown of the FBI in fall 2019. The shutdown started on October 19, 2019 and was to conclude with all systems back in operation starting on November 7, 2019.

The FBI is subject to the Standards of Performance for New Sewage Sludge Incineration Units under 40 CFR 60 Subpart LLLL ("Subpart LLLL.") Subpart LLLL contains an emission limitation for mercury, 0.0010 milligrams per cubic dry meter (mg/dm^3) corrected to seven percent oxygen (see Table 1 to Subpart LLLL). In addition, NEW Water holds a construction permit (Permit No. 14-JJW-051-R1) and an operation permit (Permit No. 405004600-P30) for the FBI and the emission control systems that include the Subpart LLLL requirements.

In order to meet the Subpart LLLL mercury standard, NEW Water petitioned the EPA to allow the installation of the GAC, which the EPA approved. The GAC uses a specially-formulated activated carbon designed to remove mercury from the FBI exhaust stream. During the initial and subsequent compliance emission tests required under Subpart LLLL, NEW Water has established acceptable operating parameter metrics for the GAC and the other emission control processes on the FBI, including metrics for the applicable mercury limitation.

NEW Water treatment staff observed abnormal temperature and carbon monoxide readings in the GAC during the warm up of the FBI on November 7, 2019. After discovering these abnormal readings, NEW Water staff had extensive communication with Carbon Process & Plant Engineering, S.A. ("CPPE"), the manufacturer of the GAC, about the appropriate action NEW Water should take as part of the startup process. Based upon the GAC manufacturer's recommendations and NEW Water's concern about the potential for a fire in the GAC, NEW Water manually initiated a water quench of the GAC vessel. A subsequent visual inspection revealed damage to internal components of the GAC. NEW Water subsequently began the process of evacuating the GAC of all carbon and performing a full internal inspection. The FBI remained down during the GAC evacuation process.

NEW Water took all appropriate action to order new carbon for the unit as well as replacement grids from the manufacturer and other suppliers. After removal of the carbon, NEW Water discovered extensive damage to the GAC grid units and walls. Upon discovery of the extensive damage and after consultation with the manufacturer, NEW Water ordered additional grid parts.

In addition, NEW Water has made arrangements with a qualified contractor to repair the damaged walls of the GAC. NEW Water is in the process of engaging a qualified expert to undertake a root cause analysis of the malfunction of the GAC.

For the reasons set forth below, NEW Water has been intermittently operating the FBI without the GAC since November 21, 2019. NEW Water currently anticipates that the GAC will be repaired and available for use by mid-January 2020, provided the root cause analysis does not identify any additional actions required to prevent reoccurrence of a malfunction.

Affirmative Defense Pursuant to 40 CFR § 60.4861(a)

(1) The excess emissions:

(i) Were caused by a sudden, infrequent, and unavoidable failure of air pollution control and monitoring equipment, process equipment, or a process to operate in a normal or usual manner

Response:

The excess emissions were caused by a sudden, infrequent, and unavoidable failure of the GAC during the startup of the FBI after a scheduled annual shutdown for inspection and maintenance, which was expected to occur between October 19, 2019 and November 7, 2019.

During the shutdown, NEW Water personnel worked with the designer and manufacturer of the GAC, CPPE, to troubleshoot and resolve an increase in differential pressure observed by NEW Water staff across the carbon bed beginning in late August 2019. NEW Water continuously monitors differential pressure across the carbon bed, which contains three vertical layers. NEW Water's limit for maximum differential pressure across the bed is 11 inches of water. The limit was never exceeded, but the rate of increase indicated that changes were occurring within the unit and further action was warranted in response to the observed change in differential pressure.

Based upon NEW Water's follow-up inspections of the GAC unit during the scheduled shutdown and communication between NEW Water and CPPE, CPPE concluded that sulfur salts had likely built up in at least one of the three carbon layers and recommended that the carbon be washed with water to remove the material to allow air to flow through more freely. NEW Water personnel followed CPPE's written procedure for conducting the carbon wash and communicated closely with CPPE for clarification and guidance throughout the washing.

When the wash was complete, the carbon was wet and required drying before the unit could be put into service, per CPPE's instructions. NEW Water followed CPPE's written procedure for initiating the drying process from October 29 until November 1, 2019.

After NEW Water completed the washing and drying process for the carbon, on November 7, NEW Water treatment personnel commenced the process of the startup of the GAC without sludge in the FBI and observed increasing temperature and carbon monoxide concentrations inside the GAC. After sharing these observations with CPPE, CPPE agreed on November 7 that NEW Water personnel should initiate the built-in quench system to cool the carbon and to attempt to reduce any combustion.

Once the carbon appeared to be controlled (the temperature dropped to the expected level), the GAC was isolated to prevent additional combustion. Inlet and outlet isolation dampers were closed and the GAC was taken out of service. NEW Water continued to flush the adsorber until carbon removal began on November 19.

(ii) Could not have been prevented through careful planning, proper design, or better operation and maintenance practices

Response:

Based on currently available information, NEW Water could not have prevented the excess emissions through careful planning, proper design, or better operation and maintenance practices.

NEW Water made and has continued to make extensive efforts to avoid operating the FBI without the GAC during the malfunction, which efforts are described in more detail in the response to Section 60.4861(a)(3) and Appendix A.

At the time of the startup of the GAC after the washing and drying process was completed, the carbon was well within its recommended useful life range, as discussed in more detail in the response to Section 60.4861(a)(1)(iii), below.

NEW Water closely followed CPPE's recommendations when it washed and dried the carbon and then commenced startup, as discussed in more detail in the response to Section 60.4861(a)(1)(i), above.

NEW Water is in the process of engaging a qualified expert to undertake a root cause analysis of the incident. NEW Water is working with the system manufacturer, designers, vendors, and an independent consultant to review the incident. NEW Water will share the findings of the investigation with the EPA as soon as the findings are available.

Once the cause of the incident is better understood, NEW Water may implement modifications to the system as well as to the operating procedures if the findings support such action.

(iii) Did not stem from any activity or event that could have been foreseen and avoided, or planned for

Response:

Based on information currently available to NEW Water, NEW Water could not have foreseen and avoided, or planned for the excess emissions resulting from the malfunction.

The malfunction occurred while the FBI was being brought online after a scheduled shutdown for inspection and maintenance. The carbon in the unit had been washed and dried according to the manufacturer's written instructions, as described in more detail in the response to Section 60.4861(a)(1)(i), above.

In accordance with information provided by CPPE, NEW Water expected to need replacement of the carbon at the earliest after two to three years of operation. NEW Water's air permit requires site-specific parametric monitoring in accordance with Subpart LLLL. NEW Water followed manufacturer recommendations to establish two methods of parametric monitoring to assess the actual remaining life of the carbon on an ongoing basis, as described in its site specific monitoring plan.

The first parameter is the differential pressure across the adsorber. The upper differential pressure limit, 11 inches of water, was set by the manufacturer based on the maximum gas flow rate through the carbon. The differential pressure is an indication of the buildup of dust, moisture or precipitates, which normally increases slowly over time. NEW Water continuously monitored this parameter when the incinerator combusted sewage sludge, and the differential pressure did not indicate that the carbon was expended.

The second parameter is mercury removal capacity. The manufacturer recommends replacing carbon when the available sulfur content reaches 20% or less of the original sulfur content of the carbon. The total sulfur content of the activated carbon is determined by a certified laboratory. In accordance with the schedule recommended by the manufacturer, the mercury removal capacity for NEW Water's activated carbon was monitored monthly for the first three months to establish saturation behavior of the carbon bed, then every six months. The most recent sampling event took place in May 2019, the results of which showed sulfur content at 77% to 84%, well in excess of CPPE's recommendations for carbon replacement. Samples of the carbon were taken from each of the three vertical carbon layers within the GAC. Thus, the analytical results indicated that the carbon could be used to control mercury emissions for several years.

(iv) Were not part of a recurring pattern indicative of inadequate design, operation, or maintenance

Response:

Based on information currently available to NEW Water, the excess emissions resulting from the malfunction are not part of a recurring pattern indicative of inadequate design, operation, or maintenance.

NEW Water is not aware of any thermal excursions in NEW Water's GAC prior to the November 7 incident.

NEW Water became aware of one isolated incident of a thermal excursion at another FBI installation in Connecticut during construction of the NEW Water FBI. NEW Water installed systems recommended by the manufacturer designed to mitigate such excursions and relied on assurances from the manufacturer that such systems would mitigate such excursions.

(2) Repairs were made as expeditiously as possible when the applicable emission limits were being exceeded. Off-shift and overtime labor were used, to the extent practicable to make these repairs

NEW Water has diligently endeavored to obtain replacement parts and schedule repairs as expeditiously as possible. Such efforts have included contacting multiple suppliers of carbon and contractors to perform the repairs, as described in more detail below. NEW Water has conducted a GAC vessel assessment and developed repair plans to return the GAC to an operable state as soon as possible. Contractors and NEW Water staff have been working and will continue to work extended hours to accommodate repairs.

NEW Water has undertaken the following action items related to the internal GAC vessel damage assessment, repair parts orders, and internal repair efforts after the November 7 incident:

Spent carbon evacuation:

NEW Water applied quench water to the GAC vessel on November 7 to protect and mitigate damage from a potential thermal excursion. The quenching process, once initiated, ran through the weekend. A local contractor arrived on site on November 15 to review and discuss plans for having the spent carbon removed from the GAC.

Spent carbon removal began on November 19, continued through the week, and was completed on November 22. NEW Water staff immediately began the process for inspecting the inside of the GAC vessel.

Replacement carbon:

On November 11, NEW Water contacted the GAC manufacturer regarding the lead time for a full unit replacement of carbon and placed an order for the GAC manufacturer's carbon on November 12. After learning that proprietary carbon from the GAC manufacturer would take weeks to months to arrive from Europe, NEW Water researched domestic suppliers of carbon. NEW Water was ultimately able to procure a similar carbon that meets the specifications for the GAC from a domestic supplier. NEW Water ordered enough carbon to fill the entire unit on November 13 from a supplier in California. A complete supply of carbon from the domestic supplier is now onsite and ready to be placed into the GAC vessel. Additionally, approximately two-thirds of the required carbon from the GAC manufacturer is onsite. A shipment of carbon from the manufacturer containing the remaining carbon is expected to be delivered to NEW Water the first week of January.

GAC Internal Grids:

Three vertical layers of carbon within the GAC are separated by a grid composed of 192 interlocking pieces. On November 8, plant maintenance staff reviewed the internal GAC vessel parts listing to determine what parts may be required. Access hatches were opened on the GAC in an attempt to see what damage occurred. Anticipating that some damage to the grids likely occurred as a result of the thermal excursion, NEW Water ordered an initial set of replacement pieces from the GAC manufacturer in Luxembourg on November 18. After the carbon was removed from the unit, a thorough internal inspection of the GAC allowed NEW Water to fully understand the extent of damage that occurred. The initial order for replacement grid pieces placed on November 18 would not be adequate to repair all of the damage that was discovered during the internal inspection that was completed on November 25. NEW Water placed a second order for needed replacement parts with the GAC manufacturer to ensure that all repairs can

be completed. The parts shipments were shipped from Europe and arrived at NEW Water on December 18. NEW Water reviewed and inspected the parts order immediately after receipt and has confirmed that it is complete.

Internal GAC Walls:

In addition to the grids, the carbon inside the GAC is supported in place by internal fiberglass divider walls. The walls were damaged by the thermal excursion and require repair. NEW Water contacted a local fiberglass contractor on November 26 to schedule an internal inspection. The inspection was completed on November 27. NEW Water had a conference call with the GAC manufacturer and the fiberglass inspector on November 27. The fiberglass contractor ordered repair material that arrived at the contractor office the week of December 9.

NEW Water scheduled the fiberglass repair for December 26, which was the repair contractor's earliest availability.

NEW Water placed calls to three additional fiberglass repair companies within the region to inquire about a quicker repair service date. The three fiberglass repair contractors indicated that their earliest availability would be in January 2020.

NEW Water commenced repair work on December 26 using the local contractor who was already scheduled and had the needed materials in stock. Internal fiberglass repairs were completed on December 27. NEW Water staff completed the GAC vessel internal grid reinstallation on December 29.

(3) The frequency, amount and duration of the excess emissions (including any bypass) were minimized to the maximum extent practicable during periods of such emissions

Response:

NEW Water commissioned the new FBI and the air pollution control system (including the GAC) in May 2018 and planned for its first annual maintenance shutdown of the FBI in fall 2019. NEW Water developed a plan to manage sewage sludge during the planned shutdown. The shutdown started on October 19, 2019 and was scheduled to conclude with all systems back in operation starting on November 7, 2019. During the planned outage, solids generated from the liquids treatment side of NEW Water's two treatment plants (the Green Bay Facility and the De Pere Facility) would be managed by building solids inventory in the biological treatment system, storing solids in available aeration basins, and by disposing of some sludge in a regional landfill. This approach was developed to minimize landfill hauling, maintain stability within the biological aspects of the facilities, and control operating expenses. This processing approach, which removed from the system only about half of the sludge that is typically necessary, was effective throughout the duration of the original planned outage. NEW Water cannot shut down its wastewater treatment process during any time because it provides a necessary service for the public.

During the warm up of the FBI on November 7, 2019 in preparation to return to normal operation, NEW Water treatment staff observed abnormal temperature and carbon monoxide readings from on-line instrumentation. In coordination with the GAC manufacturer, CPPE, NEW Water began an investigation into the abnormal readings. Based upon concerns over the potential for a fire in the GAC, NEW Water manually initiated a water quench of the GAC vessel. An initial, limited visual inspection revealed damage to internal components of the GAC, and NEW Water began the process of evacuating the GAC of all carbon and performing a full internal inspection. The FBI remained down during the GAC evacuation process.

With the solids processing system of both treatment facilities affected since October 19, 2019 and the ability to dispose of solids from the system in the normal fashion (incineration) now significantly delayed because of the damage to the GAC, NEW Water became increasingly concerned about the long-term health of the biology of both treatment facilities. NEW Water took steps to temporarily utilize treatment plant capacity for short-term solids storage in standby aeration basins while securing additional landfill space in regional landfills.

As further described in Appendix A, NEW Water has worked with landfills and sludge-hauling contractors to secure approvals for acceptance of its sludge in landfills in Wisconsin. The two primary private landfill operators in Wisconsin are Waste Management and Advanced Disposal. Waste Management has agreed to accept sludge at three of its landfills and Advanced Disposal has agreed to accept sludge at two of its landfills in the state. NEW Water's regional municipal landfill in Outagamie County has also agreed to accept limited amounts of sludge.

Landfills can accept only limited amounts of sludge for a few reasons: (1) the sludge is a challenging consistency to work with, as it is thick and sticky and needs to be placed carefully so heavy equipment does not sink into it and become stuck, and it requires special handling at the landfill to ensure that it does not cause problems for operations; (2) landfill regulations limit how much "wet waste" landfills can accept and stay in compliance with their permits (sewage sludge is considered "wet waste"); and (3) landfills are not open 24/7 and have limited operating hours on weekends and holidays.
NEW Water is not able to incinerate and landfill sludge at the same time. When landfilling takes place, sludge is pumped from the dewatering process and deposited on the floor of a storage building designed for this purpose.

Front end loaders load the sludge from the floor to dump trucks, which then transport the sludge to landfills for disposal. The pumping equipment cannot remove all of the sludge that is produced from the treatment process. NEW Water has secured landfill approvals for all the sludge that can be pumped out of the treatment process during weekdays. Due to the limitations of the pumping equipment, more sludge builds up in the treatment plant than can be shipped offsite for disposal or storage.

Concerned about how the biological systems would withstand the volumes of sludge that were building up within the treatment process, NEW Water consulted with a nationally-recognized expert in wastewater treatment optimization and control on November 20, 2019. The expert consultant reviewed the overall plant condition and discussed observations with staff. This consultant confirmed staff's assessment that the health of the treatment plant was already showing symptoms of distress, which would worsen if sludge continued to build up in the plant. Removal of primary sludge and wasting of activated sludge from the wastewater process is critical to manage operations within final clarification design parameters and to maintain healthy microbiological conditions in the activated sludge system. Ongoing sludge build up in the plant would eventually lead to the inability to maintain the solids in the process and significant discharges of suspended solids and other pollutants in the system effluent would reach the Fox River. Given that microbiological conditions in the wastewater system occur slowly, recovery time from such an event would put adequate treatment at risk for some time.

Thus, in order to protect the health of the treatment processes and continue to treat wastewater, NEW Water started up the FBI intermittently on November 21, 2019, bypassing the GAC system due to the following circumstances: (1) NEW Water's inability to adequately process the De Pere and Green Bay wastewater solids because of landfill and hauler scheduling associated with the Thanksgiving holiday (see Appendix A for more detail); (2) no further capacity to store solids in available tanks; (3) the extended outage of the GAC due to damage to the panels; and (4) the growing concerns over the biological treatment system. The key factor in the decision to operate the FBI without the GAC was the significant concern about the health of the Green Bay Facility liquids treatment, as the continued operation of the wastewater system without the removal of solids would likely lead to extended periods of degraded treatment system performance.

In order to minimize any excess mercury emissions, NEW Water has limited incineration to processing only enough sludge to ensure that significant damage is not caused to the treatment system (i.e., no sludge is added to the existing volumes stored within the plant).

NEW Water currently anticipates that the GAC will be repaired and available for use by mid-January 2020. NEW Water completed a temporary solids processing plan on December 5, 2019 to be implemented while the GAC is being repaired.

The processing plan includes some incinerator operations and significant landfilling of sludge. This operating plan is intended to (1) protect the biology in the liquids treatment system at the Green Bay and De Pere Facilities by maximizing landfill disposal; (2) minimize the air emission impacts associated with operating without the GAC; and (3) protect the FBI refractory from damage associated with temperature cycling.

The processing plan is estimated to reduce the amount of solids incinerated without the GAC by more than 40%; however, the plan is subject to influences outside of NEW Water's ability to control including hauling and landfill availability.

The processing plan also includes NEW Water's need to return to a stand-by state two Green Bay Facility aeration basins, which were temporarily repurposed for sludge storage. The solids that accumulated in these aeration basins reduce the available Green Bay Facility aeration basin capacity by 42 to 48 million gallons per day of treatment, which is an approximate 25% to 30% reduction in available capacity. This additional capacity is needed for treatment of the community's wastewater flow during significant rain and snow melting events, as there have been a number of significant rain events over the past several years that have resulted in the need to utilize this aeration capacity, including during the winter season.

Since implementing the temporary solids processing plan, NEW Water has begun taking steps to return the aeration basins to stand-by status due to the potential for significant wet weather treatment needs and urgency to remove the heavy solids in the basins before the sludge begins to freeze as a result of low temperatures.

Please see Appendix A for a summary of steps taken to avoid operating the FBI without the GAC and the schedule for landfilling and incinerator operations.

(4) If the excess emissions resulted from a bypass of control equipment or a process, then the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage

The bypass of the GAC was necessary to avoid severe property damage (i.e., treatment plant upsets and adverse environmental impacts) resulting from the inability to adequately remove solids from the biological treatment system. NEW Water has developed an approach to landfill as much solids as possible, store some solids in the treatment plant processes, and incinerate the remaining amount of solids, as described in more detail in the response to Section 60.4861(a)(3), above. In addition, during the time the FBI is operated without the GAC, the system has other control technology in operation. That technology has been operated in compliance with parametric requirements in the air permit during all times of operation without the GAC. This approach minimizes the amount of solids incinerated and, therefore, minimizes uncontrolled mercury emissions.

(5) All possible steps were taken to minimize the impact of the excess emissions on ambient air quality, the environment and human health

NEW Water has taken the following steps to minimize the impact of emissions:

1) As described in more detail in the response to Section 60.4861(a)(1)(iv), above, NEW Water has made extensive efforts to repair and restore the operation of the GAC in a safe and expedited manner. NEW Water's efforts have limited the amount of time the FBI has operated without the GAC.

2) NEW Water has made, and continues to make, considerable efforts to minimize the amount of sludge processed without the GAC in operation, as discussed in more detail in the response to Section 60.4861(a)(3), above, and Appendix A.

3) When NEW Water operates the FBI without the GAC, all other pollution control systems are operated in accordance with their required operating ranges. This step ensures a high level of emission control without the GAC.

On December 12, 2019, NEW Water conducted an emission test on FBI emissions without the GAC. The results of the testing will be provided to EPA when available.

In the interim, NEW Water has assessed the potential impacts of the FBI emissions without the GAC based on mercury emissions testing conducted on November 2, 2018 ("November 2018 Test"). During the November 2018 Test, mercury emissions were measured in the FBI exhaust upstream of the GAC. Therefore, the results of this test estimate the emission rate without the GAC operating.

The measured mercury emission concentration from the November 2018 Test was 0.00787 milligrams per cubic meter (mg/m^3) corrected to 7% oxygen. While this emission concentration exceeds the Subpart LLLL emission limit, it meets several other standards, including the Subpart LLLL limit for new multiple hearth sewage sludge incinerators and existing fluid bed and multiple hearth sewage sludge incinerators (see 40 CFR 60 Subpart MMMM).

The measured mercury emission rate from the November 2018 Test was 0.000262 pounds per hour (lb/hr), which meets the National Emission Standard for Mercury (see 40 CFR 61 Subpart E). This emission rate also meets Wisconsin's air toxics emissions standards for mercury (see Wis. Admin. Code § NR 445, Table A). Table 1, below, compares the measured emission rate without the GAC in operation with each of these federal and state standards.

Table 1 Comparison of Estimated Mercury Emission Rate without GAC with Federal and State Standards

Regulation	Numeric Standard	Equivalent Hourly Standard	NEW Water FBI without GAC[1]	Meets Standard, Percent
Federal Standards				
Subpart LLLL New Fluid Bed Incinerator	0.0010 mg/m^3 @ 7% O_2		0.00787 mg/m^3 @ 7% O_2	Exceeds Standard
Subpart LLLL New Multiple Hearth Incinerator	0.15 mg/m^3 @ 7% O_2		0.00787 mg/m^3 @ 7% O_2	5 %
Subpart MMMM Existing Fluid Bed Incinerator	0.037 mg/m^3 @ 7% O_2		0.00787 mg/m^3 @ 7% O_2	21 %
Subpart MMMM Existing Multiple Hearth Incinerator	0.28 mg/m^3 @ 7% O_2		0.00787 mg/m^3 @ 7% O_2	3 %
40 CFR 61 Subpart E Sludge Incineration Plants	7.1 lb/24-hr	0.30 lb/hr	0.000262 lb/hr	0.09 %
Wisconsin State Standards				
NR 446.20(2) Sludge Incineration Plants	7.1 lb/24-hr	0.30 lb/hr	0.000262 lb/hr	0.09 %
NR 445 Table A for Stack Ht > 75 ft Mercury, Inorganic	1,838 lb/yr	0.21 lb/hr	0.000262 lb/hr	0.1 %
NR 445 Table A for Stack Ht > 75 ft Mercury, Inorganic	0.0405 lb/hr		0.000262 lb/hr	0.6 %

To estimate potential impacts on human health from operating the FBI without the GAC, NEW Water conducted air dispersion modeling and compared those potential impacts with state health-based standards. The ambient air quality standards for mercury are shown in the Wisconsin Administrative Code, NR 445, Table A.

[1] The emission rate and emission concentration shown on this table are based on emission testing conducted at the NEW Water Facility on November 2, 2018. The sampling location was upstream of the GAC, so the results estimate emissions without the GAC in operation.

These standards are a 24-hour average[2] concentration of 0.6 micrograms per cubic meter (µg/m³) and an annual[3] average concentration of 0.3 µg/m³. The air dispersion modeling was conducted in accordance with *Wisconsin Air Dispersion Modeling Guidelines* and the federal *Guideline on Air Quality Models* (40 CFR 51 Appendix W).

For evaluation of the 24-hour standard, the actual days the FBI has run without the GAC and is anticipated to run without the GAC (November 21, 2019 through January 31, 2020) were modeled using the 0.000262 lb/hr mercury emission rate. The resulting highest impact, 0.00068 µg/m³ is about 0.1% of the 24-hour standard.

For the annual standard analysis, the FBI was modeled as "off" for the shutdown period (October 19, 2019 through November 20, 2019), "on" at 0.000262 lb/hr during the actual days when the FBI operated or is anticipated to operate without the GAC (intermittently from November 21, 2019 through January 31, 2020), and then "on" at the permitted mercury concentration rate for the remainder of the 365 day period (February 1 through October 18, 2020). The resulting impact, 0.00002 µg/m³ is about 0.007% of the annual standard.

Table 2 – Modeling Results Compared with Ambient Air Standards for Mercury

Averaging Period	Modeled Concentration (µg/m³)	Ambient Standard (µg/m³)	*% of Standard*
24-hr	0.00068	*0.6*	*0.1%*
Annual	0.00002	*0.3*	*0.007%*

As mentioned at the beginning of this letter, while operating the FBI without the GAC might exceed a mercury emission limit, it does not pose a significant risk to the public. The air dispersion modeling evaluation demonstrates that the impacts from the emission rate are well within state health-based standards.

(6) All emissions monitoring and control systems were kept in operation if at all possible consistent with safety and good air pollution control practices

Response:

All monitoring and pollution control systems, including the FBI combustion chamber temperature, the wet scrubber, and the wet electrostatic precipitator, have operated (and will remain in operation) at all times when incineration of sewage sludge has occurred. The Continuous Emissions Monitoring ("CEM") system, which monitors and records emissions of carbon monoxide, has also remained in operation at all times the incinerator has operated.

All operating parameters required for compliance will continue to be monitored and recorded during this time as required by NEW Water's Air Operation Permit. Control systems for operating the incinerator will still remain operational with all safeguards in place for automatic control and safety interlocks.

(7) All of the actions in response to the excess emissions were documented by properly signed, contemporaneous operating logs

Response:

[2] Wisconsin's 24-hour standard is 2.4% of the mercury TLV the American Conference of Governmental Industrial Hygienists.

[3] Reference Concentration for Inhalation Exposure for mercury from EPA Integrated Risk Information System.

NEW Water will continue to operate the CEMS and monitor and record operating data as well as related pertinent information on the status of the incineration system.

NEW Water will continue to provide progress updates on the repair of the GAC to the EPA and the DNR.

(8) At all times, the affected facility was operated in a manner consistent with good practices for minimizing emissions

Response:

Please see the responses to Section 60.4861(a)(3) and (a)(5), above, for discussions regarding how NEW Water operated the facility in a manner consistent with good practices for minimizing emissions. Although not requested by the EPA or the DNR, NEW Water decided to initiate a stack test to analyze mercury emissions from the FBI operating without the GAC to determine actual mercury emissions during the period of malfunction. Air emissions testing for mercury was conducted on December 12, 2019. Results are expected in early January 2020. At the request of DNR, NEW Water has also conducted weekly analysis for mercury in its sewage sludge since the week of December 1, 2019.

NEW Water paired the stack test with samples from the sludge obtained during the stack test. This pairing will provide information about mercury that was in the sludge during emissions testing.

(9) A written root cause analysis has been prepared the purpose of which is to determine, correct, and eliminate the primary causes of the malfunction and the excess emissions resulting from the malfunction event at issue. The analysis shall also specify, using best monitoring methods and engineering judgment, the amount of excess emissions that were the result of the malfunction.

Response:

NEW Water is investigating the cause of the failure as well as the performance of the monitoring and protective systems during the event. NEW Water is in the process of assembling the appropriate team, including an independent third party, to conduct a formal root cause analysis. NEW Water will provide detailed written findings of the root cause analysis to EPA and DNR upon completion along with the amount of excess emissions resulting from the malfunction.

Sincerely,

GREEN BAY METROPOLITAN SEWERAGE DISTRICT

Thomas W. Sigmund

Thomas W. Sigmund, P.E.
Executive Director

Enclosures: Appendix A
Appendix B

cc: Louise Gross (gross.louise@epa.gov)
James Bonar-Bridges (james.bonarbridges@wisconsin.gov)
Tania Taff (tania.taff@wisconsin.gov)
Daniel Schaufelberger (schaufelberger.daniel@epa.gov)
File

APPENDIX A

Summary of Steps Taken to Avoid Operating the FBI without the GAC prior to 11.21.19 and Schedule for Landfilling and Incinerator Operations

1. Actions Taken to Avoid FBI Operation

Action	Alternative	Comment
Evaluate Alternative Disposal Options	Sludge Hauled to Outagamie County Landfill (Appleton, WI) (OC)	Hauled sludge
	Sludge Hauled to Mallard Ridge Landfill (Delavan, WI) (ADS)	Hauled sludge
	Sludge Hauled to Cranberry Creek Landfill (Wisconsin Rapids, WI) (ADS)	Hauled sludge
	Sludge Hauled to Pheasant Run Landfill (Bristol, WI) (WM)	Hauled sludge
	Sludge Hauled to Metro Landfill (Franklin, WI) (WM)	Hauled sludge
	Sludge Hauled to Orchard Ridge Landfill (Menominee Falls, WI) (WM)	Hauled sludge
	Contacted Waste Management (via third party-Full Service Organics, LLC (FSO) Management)	Seeking landfilling opportunities at regional Waste Management (WM) landfills
	Contacted Outagamie County	Seeking landfilling opportunities at Outagamie County (OC) landfill
	Contacted Advanced Disposal (via third party-Veolia)	Seeking landfilling opportunities at regional Advanced Disposal (ADS) landfills
	Contacted FSO Management	Seeking consulting services for landfill options.
	Contacted regional municipal wastewater treatment facilities	Seeking options or suggestions for temporary storage of sludge or disposal outlets.
	Contacted WDNR biosolids management engineer	Seeking options or suggestions for temporary storage of sludge or disposal outlets.
	Contacted Covanta	Seeking disposal options for sludge. Covanta was not able to manage sludge.
	Contacted Veolia	Seeking sludge disposal option at hazardous waste facilities. Veolia will not accept sludge.
	Contacted Stericycle	Seeking sludge disposal option at hazardous waste facilities. Stericycle will not accept sludge.
	Contacted Clean Harbors	Seeking sludge disposal option (or other options). Clean Harbors will not manage sludge.

Evaluated Storage Options - De Pere	Clarifier (2)	Not available. Concern over managing system solids with critical equipment repurposed
	Second Stage Aeration Basins	Not available. Piping modifications required
	Sludge Storage Tank	Not available. Decommissioning of the system already started
	Sludge Building	Not available. Decommissioning of the system already started
	Belt Filter Press Startup	Not available. Decommissioning of the system already started
Evaluate Storage Options - Green Bay	Phosphorus Release Filtrate Tanks	0.39 million gallons of available storage. Utilize storage
	Gravity Thickeners	Not available. Decommissioning of the system already started
	Primary Clarifiers (2)	Not available. Concern over managing system solids with critical equipment repurposed
	South Plant Secondary Clarifiers	Not available. Concern over managing system solids with critical equipment repurposed
	Temporary Open Air Storage Containers	Not available. Offsite odors, outdoor container placement and material handling issues
	Down Aeration Basins	Utilizing South Plant #1. Utilizing North Plant #4
Other Considerations	Ordered replacement carbon from manufacturer	2 to 6 weeks lead time. Order placed
	Inquired for carbon replacement - United States and Canada providers	Alternative identified. Order placed
	Evaluated alternative technologies for mercury removal	Contacted vendors. Mercury removal performance not able to meet Subpart LLLL
	Reduced acceptance of high strength waste	Concern over impact on digesters. Need to feed Waste Activated Sludge to the digesters. Small reduction requested
	Ordered replacement GAC grids (2 orders placed)	2 to 3 weeks lead time even with air freight. Orders placed

2. Schedule for Landfilling and Incinerator Operations

Month	Day	Incinerator Operated	Landfilling	Notes
Actual Incinerator Operation and Landfilling:				
November	8	Off	6 Truckloads	
	9	Off		
	10	Off		
	11	Off	6 Truckloads	
	12	Off	5 Truckloads	
	13	Off	6 Truckloads	
	14	Off	10 Truckloads	
	15	Off	9 Truckloads	
	16	Off	2 Truckloads	
	17	Off		
	18	Off	11 Truckloads	
	19	Off	10 Truckloads	
	20	Off	9 Truckloads	
	21	On	6 Truckloads	
	22	On		
	23	Off		
	24	On		
	25	On		
	26	On		
	27	On		
	28	Off		
	29	On		
	30	On		

December	1	On		
	2	On		
	3	**Off**		
	4	On		
	5	On		
	6	On	9 Truckloads	
	7	On		
	8	**Off**		
	9	**Off**	8 Truckloads	
	10	**Off**	9 Truckloads	
	11	On	8 Truckloads	
	12	On		
	13	On		
	14	**Off**		
	15	**Off**		
	16	**Off**	10 Truckloads	
	17	**Off**	10 Truckloads	
	18	**Off**	10 Truckloads	
	19	**Off**	10 Truckloads	
	20	On	5 Truckloads	
	21	On		
	22	**Off**		
	23	**Off**	10 Truckloads	
	24	**Off**	9 Truckloads	
	25	**Off**		
Anticipated Schedule:				
December	26	On		2
	27	On		2
	28	On		3
	29	**Off**		
	30	**Off**	10 Truckloads	
	31	**Off**	10 Truckloads	

January	1	On		
	2	On		2
	3	On		2
	4	On		3
	5	**Off**		
	6	**Off**	10 Truckloads	
	7	**Off**	10 Truckloads	
	8	**Off**	10 Truckloads	
	9	**Off**	10 Truckloads	
	10	On	10 Truckloads	
	11	On		4
	12	On		1
	13	**Off**	10 Truckloads	
	14	**Off**	10 Truckloads	
	15	**Off**	10 Truckloads	
	16	**Off**	10 Truckloads	
	17	On		
	18	On		4
	19	On		1
	20	**Off**	10 Truckloads	
	21	**Off**	10 Truckloads	
	22	**Off**	10 Truckloads	
	23	**Off**	10 Truckloads	
	24	On		
	25	On		4
	26	On		1
	27	**Off**	10 Truckloads	
	28	**Off**	10 Truckloads	
	29	**Off**	10 Truckloads	
	30	**Off**	10 Truckloads	
	31	On		

Notes:

1. FBI shutdown. Begin sending sludge to the off-loading building in preparation for landfilling following day.
2. Landfill is available on these days. Plan to run FBI to not cycle the FBI and to protect refractory.
3. Estimated shutdown time. Actual shutdown time will be based on sludge holding tank inventory.
4. Landfill is available until 1200 hours. Plan to run FBI to not cycle the FBI and to protect

APPENDIX B
Email Regarding Notice in Accordance with 40 CFR § 60.4861(b)

From:	Harrington, Arthur
Sent:	Friday, November 22, 2019 3:25 PM
To:	Mooney.john@Epa.gov
Cc:	harris.michael@epa.gov; Gross, Louise C; Schaufelberger, Daniel; Bonar-Bridges, James I - DNR; maria.hill@wisconsin.govt; Schenck, Sarah
Subject:	Confirmation of Malfunction Notification [GK-Active.FID24093]

Dear Mr. Mooney:

I wanted to use this opportunity to confirm our call today at approximately 9:30 a.m.:

Participating for NEW Water (Green Bay Metropolitan Sewerage District) were:

- Tom Sigmund, Executive Director
- Nathan Qualls, Director of Technical Services
- Julie Maas, Environmental Compliance Specialists
- Art Harrington and Sarah Schenck, Godfrey & Kahn, S.C., attorneys for NEW Water

During the call, we provided you with the following information:

- The client's facility is located at 2231 North Quincy Street, Green Bay, Wisconsin
- The facility holds Operation Permit No. 405004600-P30
- The purpose of the telephone notification was to provide you with notice pursuant to 40 CFR Sec. 60.4861 regarding a malfunction
- As we discussed, we have been in contact with DNR and Ethan Chatfield at EPA since November 12th and Louise Gross and Daniel Schaefelberger of Region 5 since November 13th about events leading up to the need for this notification

Please confirm that you are an "authorized representative" for the Administrator, as defined in 40 CFR Sec. 60.2, for the telephone notification required under 40 CFR Sec. 60.4861(b).

Best regards,

Arthur Harrington | *Attorney*
414.287.9414 direct
aharrin@gklaw.com

GODFREY KAHN
833 E. Michigan Street, Suite 1800 | Milwaukee, Wisconsin 53202-5615

This is a transmission from the law firm of Godfrey & Kahn, S.C. and may contain information which is privileged, confidential, and protected by the attorney client or attorney work product privileges. If you are not the addressee, note that any disclosure, copying, distribution, or use of the contents of this message is prohibited. If you have received this transmission in error, please destroy it and notify us immediately at (414) 273-3500.

From: Harrington, Arthur
Sent: Monday, November 25, 2019 4:49 PM
To: Gross, Louise C; Mooney, John
Cc: Schaufelberger, Daniel; Bonar-Bridges, James I - DNR; maria.hill@wisconsin.govt; Schenck, Sarah; Witte, Edward
Subject: RE: Confirmation of Malfunction Notification [GK-Active.FID24093]

Thank you, Louise. Your e-mail clarification is much appreciated and understood.

Best wishes, as well, to you and the rest of the DNR/EPA teams for a Happy Thanksgiving holiday.

Best regards,

Art

Arthur Harrington | *Attorney*
414.287.9414 direct | aharrington@gklaw.com

GODFREY KAHN

From: Gross, Louise C <gross.louise@epa.gov>
Sent: Monday, November 25, 2019 4:39 PM
To: Harrington, Arthur <ajharrin@gklaw.com>; Mooney, John <Mooney.John@epa.gov>
Cc: Schaufelberger, Daniel <schaufelberger.daniel@epa.gov>; Bonar-Bridges, James I - DNR <james.bonarbridges@wisconsin.gov>; maria.hill@wisconsin.govt; Schenck, Sarah <SSchenck@gklaw.com>; Witte, Edward <nwitte@gklaw.com>
Subject: RE: Confirmation of Malfunction Notification [GK-Active.FID24093]

Art,

To be clear, although I believe that the Region 5 Air Division Director is an appropriate recipient of the notification prescribed by 40 C.F.R. § 60.4861, that regulatory provision applies solely to the establishment of "an affirmative defense for exceedance of an emission limit or standard during malfunction." Furthermore, such a defense is available in the context of "a claim for civil penalties for exceedances of emission limits that are caused by malfunction...." To date, EPA has not brought such a claim. Nor has EPA agreed that the facts in the New Water situation, as EPA currently understands them, constitute a "malfunction," as defined in 40 C.F.R. § 60.2.

That being said, EPA may nonetheless consider the nine factors listed in 40 C.F.R. § 60.4861(a)—among others—in the context of deciding how to proceed in an particular enforcement matter. This is a decision we will be in a better position to make in the New Water case once we receive comprehensive information about the underlying facts surrounding its decision to run the incinerator without the carbon adsorption system, and its proposed schedule for coming into compliance with the applicable requirements of 40 C.F.R. Part 60, Subpart LLL.

If you have any further questions about this matter before the Thanksgiving holiday, I can be reached in the office on Wednesday.

Louise

Louise C. Gross
Associate Regional Counsel
U. S. Environmental Protection Agency
77 W. Jackson Blvd. (C-14J)
Chicago, IL 60604
(312) 886-6844

From: Harrington, Arthur <ajharrin@gklaw.com>
Sent: Friday, November 22, 2019 3:25 PM
To: Mooney, John <Mooney.John@epa.gov>
Cc: Harris, Michael <harris.michael@epa.gov>; Gross, Louise C <gross.louise@epa.gov>; Schaufelberger, Daniel <schaufelberger.daniel@epa.gov>; Bonar Bridges, James I - DNR <james.bonarbridges@wisconsin.gov>; maria.hill@wisconsin.gov; Schenck, Sarah <SSchenck@gklaw.com>
Subject: Confirmation of Malfunction Notification (GK-Active.FID24093)

Dear Mr. Mooney:

I wanted to use this opportunity to confirm our call today at approximately 9:30 a.m.:

Participating for NEW Water (Green Bay Metropolitan Sewerage District) were:

- Tom Sigmund, Executive Director
- Nathan Qualls, Director of Technical Services
- Julie Maas, Environmental Compliance Specialists
- Art Harrington and Sarah Schenck, Godfrey & Kahn, S.C., attorneys for NEW Water

During the call, we provided you with the following information:

- The client's facility is located at 2231 North Quincy Street, Green Bay, Wisconsin
- The facility holds Operation Permit No. 405004600-P30
- The purpose of the telephone notification was to provide you with notice pursuant to 40 CFR Sec. 60.4861 regarding a malfunction
- As we discussed, we have been in contact with DNR and Ethan Chatfield at EPA since November 12th and Louise Gross and Daniel Schaefelberger of Region 5 since November 13th about events leading up to the need for this notification

Please confirm that you are an "authorized representative" for the Administrator, as defined in 40 CFR Sec. 60.2, for the telephone notification required under 40 CFR Sec. 60.4861(b).

Best regards,

Arthur Harrington | *Attorney*
414.287.9414 direct
ajharrin@gklaw.com

GODFREY KAHN SC
833 E. Michigan Street, Suite 1800 | Milwaukee, Wisconsin 53202-5615

This is a transmission from the law firm of Godfrey & Kahn, S.C. and may contain information which is privileged, confidential, and protected by the attorney-client or attorney work product privileges. If you are not the addressee, note that any disclosure, copying, distribution, or use of the contents of this message is prohibited. If you have received this transmission in error, please destroy it and notify us immediately at (414) 273-3500.