



**MINUTES OF THE MEETING
ENVIRONMENTAL QUALITY AND OPERATIONS COMMITTEE
MARCH 21, 2024
(via Microsoft Teams)**

COMMITTEE MEMBERS PRESENT

1. Howard Gibbs, Vice-Chairperson, Principal, District of Columbia
2. Steven Shofar, Alternate, Montgomery County
3. Jared McCarthy, Alternate, Prince George's County
4. Andrea Crooms, Alternate, Prince George's County

OTHER BOARD MEMBER PRESENT

1. Richard Jackson, Principal, District of Columbia

DC WATER STAFF PRESENT

1. David Gadis, CEO and General Manager
2. Marc Battle, Chief Legal Officer and EVP, Government and Legal Affairs
3. Wayne Griffith, Chief Administration Officer and EVP
4. Debra Mathis, Assistant Secretary to the Board

The Environmental Quality and Operations Committee meeting was called to order by Howard Gibbs, Vice-Chairperson at 9:31 AM. The meeting was held via Microsoft Teams. Debra Mathis, Assistant Secretary to the Board, DC Water called the roll.

I. BPAWTP PERFORMANCE UPDATE

Nicholas Passarelli, Vice President, Wastewater Operations presented a summary of the performance of Blue Plains Advanced Wastewater Treatment Plant (BPAWTP) performance for February 2024. The average flow through to complete treatment was 295 million gallons per day (MGD) for the month, this was a decrease from January (332 MGD). It was reported that all National Pollutant Discharge Elimination System (NPDES) permit requirements were met.

Mr. Passarelli discussed the performance of the Anacostia tunnel system and wet weather treatment at BPAWTP. It was noted that precipitation for the month was 1.4 inches and the combined wet weather flows captured by the tunnel system was 43.2 million gallons. There were no flows through Outfall 001 and no overflows from the Tunnel System during the month.

Mr. Passarelli discussed electrical energy use and onsite generation at BPAWTP. Onsite energy generation from the Combined Heat and Power (CHP) facility and solar panels for the month was 26% of the average consumption at BPAWTP. The CHP Facility generated an average of 8.3 megawatts (MW), of which 7 MW was transferred to the Blue Plains grid. The solar system generated an average of 0.5 MW, which was an increase from January. Electrical consumption for the month was 29.1 MW megawatts. The total purchased power from PEPCO averaged 21.6 MW.

Mr. Passarelli discussed biosolids production and Bloom marketing at BPAWTP. During February, 13,010 wet tons of biosolids were produced; 8,350 wet tons were sold as Bloom and the remaining 4,660 wet tons were land applied through existing land application contracts. Progress continues to be made to achieve Bloom marketing goals for FY24. To date, 26,980 tons have been marketed compared to the goal of 65,000 tons for FY24.

II. INTENSIFICATION RESEARCH UPDATE

Haydee De Clippeleir, Director, Clean Water Quality & Technology, DC Water, gave a presentation on research efforts related to intensification at BPAWTP. In this context, intensification refers to improving and optimizing treatment plant performance within existing physical, financial, and regulatory constraints. Dr. De Clippeleir discussed some of the constraints, including compliance with NPDES permit limits despite increasing flows and nutrient loads to BPAWTP, and limited availability of space onsite at BPAWTP which requires improvements to treatment processes to make use of existing infrastructure. The approach of DC Water's researchers is to do more with less and that means conducting more permit-driven proactive research, that further incorporates affordability and sustainability considerations.

Dr. De Clippeleir discussed two examples of intensification and resource recovery - one related to nutrient removal and one related to activated sludge in secondary treatment. Graphs were presented showing the relationship between space requirements (footprint) and cost of conventional and innovative treatment technologies for nutrient removal and activated sludge. It was noted that the goal in intensification is to focus on technologies which have a lower overall footprint and lower cost. For nutrient removal, technologies related to anammox fit this model, therefore DC Water focuses investment on research on anammox based processes. Similarly, for secondary treatment, densification of solids, high-rate processes and granulation fit the model.

Dr. De Clippeleir discussed intensification approaches for nutrient removal, noting that current processes in use at BPAWTP involved conventional nitrification and

denitrification. These processes require a lot of infrastructure and are quite expensive. DC Water have been doing research on anammox based processes. The Authority looked at Partial Nitritation – Anammox (PNA) and Partial denitrification – Anammox (PdNA) processes. The PNA process is cost effective, however it is very difficult to apply to full scale treatment, as it requires near-perfect conditions to be successfully applied. The PdNA process has been shown to be cost effective, by saving methanol and aeration costs. Further, the PdNA process does not require new infrastructure to be constructed for its' application, it can be applied by making modifications to existing infrastructure at BPAWTP. Adoption of this process would position operations at BPAWTP to achieve future goals for energy and carbon neutrality.

Dr. De Clippeleir described how DC Water has been assessing and testing the PdNA process for implementation since 2012. This was done in collaboration with the Hampton Roads Sanitation District (HRSD). A proof of principle pilot has been conducted since 2012 to understand the PdNA process; how to select for the reactions, how to control the reactions, what carbon sources can work and how to implement the process for BPAWTP. This led to a business case that showed the potential for this process to create value for DC Water. Implementation of the process would create capacity within existing infrastructure at BPAWTP, to treat greater nutrient loads and therefore postpone the potential need for future expansion of infrastructure at the plant. Further, the process would result in savings for costs for methanol costs, as the PdNA process uses 30-40% less methanol. With the reduction in methanol use and corresponding savings in energy use for aeration, the carbon footprint for BPAWTP will be reduced.

Dr. De Clippeleir discussed how DC Water is currently looking to implement a pilot scale demonstration of the PdNA process within the existing processes at BPAWTP. Following the initial business case evaluation for PdNA, a few issues emerged which highlighted the need to collect more information before deciding to implement PdNA at full scale. The issues are related to the design of the Integrated Fixed Film Activated Sludge (IFAS) zone and the control systems for aeration and carbon dosing. Completion of this pilot will provide additional information to help finalize the business case for full scale implementation of PdNA at BPAWTP and help with the decision on whether this is the correct approach to adopt.

Dr. De Clippeleir remarked that one of the nitrification reactors at BPAWTP will be converted to the PdNA process as part of the pilot scale demonstration. This reactor will be used to simulate what the PdNA process will look like for DC Water. Aeration systems will be tested to confirm that ammonium nitrate can be supplied to the PdNA zone. The PdNA zone is a zone within the designated nitrification reactor that will be converted into an IFAS zone. In this IFAS zone, plastic media will be added and retained with screens. The media will function as a surface on which the anammox will grow for the PdNA process. Dr. De Clippeleir discussed that though IFAS zones are commonly used in wastewater treatment, the hydraulics associated with the high flow conditions at BPAWTP are problematic for conventional IFAS designs. DC Water worked with World Water Works, Inc to develop custom plastic media to function in the PdNA process and not obstruct flows through the plant during wet weather events. The custom media is heavier,

which allows it to settle out and not block screens in the reactor during high flow conditions.

Dr. De Clippeleir discussed the timeline for implementing the pilot scale demonstration, noting that startup is planned for the summer of 2025. DC Water is currently looking to commence procurement of the equipment for the pilot and start construction planning in the summer of 2024. It was noted that the project is also supported by external funding from the District Department of Energy & Environment (DDOE), Water Research Foundation (WRF) and Oceankind. The funding from DDOE is part of a larger project which involves numerous utilities that are all doing PdNA demonstration scale testing. The value of the funding from DDOE is \$1.2 million and will be used for carbon purchasing and provision of staff. The funding from the WRF and Oceankind is \$600,000 and will be used for the purchase of equipment and for aeration control testing and development.

Dr. De Clippeleir discussed intensification approaches for the activated sludge secondary treatment system. Based on capacity analyses conducted for the secondary system, it is projected that the system will reach capacity and additional reactor volume will be needed at BPAWTP. DC Water's research group has been evaluating alternatives for creating additional capacity within existing infrastructure and without having to construct new reactors. The evaluated alternatives all relate to the physical properties of separating the activated sludge from the water in secondary treatment processes.

Dr. De Clippeleir described the high-rate contact stabilization process implemented in 2021 to address capacity issues in secondary treatment at BPAWTP. As part of the process, the quality of the microorganisms in the activated sludge were improved, resulting in more stable and higher quality effluent from secondary treatment. This process was an easy solution and came at no added cost to DC Water. A pilot that simulates the full-scale system for this process is underway.

In reference to the plastic media proposed to be introduced for the pilot scale demonstration for the PdNA process, Committee member Jared McCarthy queried whether there would be an increase in the concentrations of microplastics introduced into the water system with the use of this media. Dr. De Clippeleir confirmed there is ongoing research in the industry related to this topic and DC Water is monitoring for any outcomes from the research. Dr. De Clippeleir added that the type of plastic proposed for use in the media is of a higher grade and does not easily decompose. Further, the plastic media would be replaced or renewed at a frequency before it starts to degrade.

III. ACTION ITEMS

JOINT USE

1. Contract No. N/A – FY24 & FY25 Fleet Vehicles and Equipment – Multiple Suppliers TBD

2. Contract No. N/A – Sole Source - Partial Denitrification/Annamox (PdNA) Pilot Equipment Purchase – World Water Works, Inc
3. Contract No. 180060, Change Order No. 0003 – Miscellaneous Facilities Upgrade-Phase 7 – American Contracting Environmental Services, Inc

NON-JOINT USE

1. DDOT - Amendment to a DDOT Participation Project, Florida Avenue NE From 2nd Street to H Street NE – District of Columbia Department of Transportation
2. DDOT Participation Project – Florida Ave NE and NY Ave NE Intersection – District of Columbia Department of Transportation

John PappaJohn, Director of Procurement, Goods & Services, DC Water presented Joint Use Action Item 1.

David Parker, Vice President, Engineering & Technical Services, DC Water, presented the remaining Joint Use Action Items and Non-Joint Use Action Items.

The Committee recommended moving all Joint Use and Non-Joint Use Action Items to the full Board for approval.

IV. OTHER BUSINESS/EMERGING ISSUES

As a follow up to the February 2024 Committee Meeting, committee member Howard Gibbs confirmed that the fire hydrant that was observed in the system to be missing the color band was located on 6th St, SE just south of Pennsylvania Ave, SE. Jason Hughes, Vice President, Water Operations confirmed DC Water will follow up with the Committee to provide details on the status of the specific hydrant ahead of the April 2024 committee meeting.

V. ADJOURNMENT

The meeting was adjourned at 10:07 AM.