



Metropolitan Water Reclamation District of Greater Chicago

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Title: Authorization to enter into an Agreement with Gross-Wen Technologies, Inc. to Conduct a Pilot-Scale Demonstration of Carbon Capture and Nutrient Recovery from Wastewater Using Revolving Algae Biofilm System at the Stickney Water Reclamation Plant

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TRANSMITTAL LETTER FOR BOARD MEETING OF JULY 14, 2022

COMMITTEE ON MONITORING AND RESEARCH

Mr. Brian A. Perkovich, Executive Director

Authorization to enter into an Agreement with Gross-Wen Technologies, Inc. to Conduct a Pilot-Scale Demonstration of Carbon Capture and Nutrient Recovery from Wastewater Using Revolving Algae Biofilm System at the Stickney Water Reclamation Plant

Dear Sir:

Authorization is requested to enter into an agreement with Gross-Wen Technologies, Inc. (GWT), at no cost, to conduct a pilot-scale demonstration of carbon capture and nutrient recovery from wastewater using a Revolving Algae Biofilm (RAB) system at the Stickney Water Reclamation Plant (WRP) for a period of 12 months, from August 2022 to July 2023.

The Monitoring and Research (M&R) Department of the Metropolitan Water Reclamation District of Greater Chicago (District) will partner with GWT, to conduct a pilot test of the RAB system to remove ammonia from anaerobic digestion centrate sidestream at the Stickney WRP. Information learned from this pilot will help inform the industry on efficacy of this process and inform the District's strategy on ammonia removal from centrate. Ammonia loading at the Stickney WRP has potential to be a concern in the winter due to limited nitrification capacity and probable increase in low temperature flows when the second stage of McCook Reservoir goes online in 2029. The M&R Department is looking at all potential options to address this issue.

The RAB technology was developed and patented by Iowa State University (ISU) and the District tested the technology for phosphorus (P) removal at the Terrence J. O'Brien (O'Brien) WRP under a Memorandum of Understanding. The RAB technology is currently being commercialized by GWT, an ISU-affiliated startup company. The work at the O'Brien WRP focused mainly on P removal and was completed in December 2021. The results showed that the technology is not economically feasible for full-scale application to remove P from secondary effluent at District facilities. Recent process enhancements in the RAB system for treating waste

streams high in ammonia concentrations provides a significant opportunity to study the removal and recovery of nitrogen from centrate sidestream and thus reducing energy usage in the mainstream wastewater treatment, and to determine a conceptual cost at the Stickney WRP.

A \$90,000 grant to GWT from Imagine H2O's Urban Water Challenge Program has enabled GWT to cover all costs to conduct a 12-month pilot study at the Stickney WRP. Imagine H2O is a 501(c)(3) non-profit organization that empowers people to develop innovation to solve water challenges globally.

For this proposed study, GWT would deliver and install a mobile test reactor of the RAB pilot unit system, related equipment, materials, supplies, and services that may be needed to conduct the pilot study. The unit and related items will be returned to GWT at the end of the agreement.

The District will provide an appropriate site for the pilot-scale equipment, access to centrate and discharge of RAB effluent, electrical connection, and staff support for regular sampling of RAB influent and effluent, algal biomass harvesting, and analysis of samples according to the study plan. This small pilot will be installed north of the Ostara Building and treat up to 2,000 gallons of centrate per day and will not affect any processes in the WRP.

Information from the pilot-study will be used to perform techno-economic analysis of RAB technology for possible full-scale implementation at the District. Staff is compiling data from other ammonia removal methods, and information learned from this pilot will help inform a path forward for this challenge.

It is hereby recommended that the Board of Commissioners authorize the Executive Director of the District to execute the agreement with GWT to conduct a pilot test of RAB technology at the Stickney WRP. This is consistent with Strategic Plan Goal 1 (Resource Management) and Goal 5 (Enterprise Resilience).

Requested, Edward W. Podczerwinski, Director Monitoring and Research, EWP:RA:KK:rg
Respectfully Submitted, Josina Morita, Chairman Committee on Monitoring and Research
Disposition of this agenda item will be documented in the official Regular Board Meeting Minutes of the Board of Commissioners for July 14, 2022