BOZEMAN MT

Memorandum

REPORT TO: City Commission

FROM: Professor Otto Stein, MSU
Shawn Kohtz, Director of Utilities

SUBJECT: Results of the Montana State University Pilot Study of Modern Treatment Wetland Technology at the Bozeman Water Reclamation Facility; A Joint Project Between MSU, DEQ, and the City

MEETING DATE: December 10, 2024

AGENDA ITEM TYPE: Plan/Report/Study

RECOMMENDATION: Receive results of the Montana State University pilot study of modern treatment wetland technology at the Bozeman Water Reclamation Facility. This is a Joint Project Between MSU, DEQ, and the City, which inform potential use of the technology in a full-scale system at the Water Reclamation Facility.

STRATEGIC PLAN: 1.1 Outreach: Continue to strengthen and innovate in how we deliver information to the community and our partners.

BACKGROUND: Engineered treatment wetlands offer a relatively inexpensive option for tertiary treatment of already high-quality effluent from the City's Water Reclamation Facility (WRF) and would enable the WRF to further reduce nutrients (nitrogen and phosphorus) prior to discharge to the East Gallatin River. Additional data was necessary to determine removal efficiencies and design criteria for Montana specific conditions; however, rough sizing criteria indicate an area as small as 30 acres would effectively treat the 8.5 million gallons per day (gpd) design flow of the Bozeman Water Reclamation Facility. As part of a greater project to pilot several different wetland technologies, MSU designed, constructed, and monitored water quality from a pilot tertiary wetland treatment system.

This project will help the City understand effectiveness and provide a design basis to use modern wetland technology for nutrient removal at the City's WRF. This technology could prove a cost effective means to provide additional nutrient removal and help meet future discharge requirements associated with the City's Montana Pollutant Discharge Elimination System (MPDES) permit.

This project is a partnership between MSU, the Montana State Department of Environmental Quality (DEQ), and the City. DEQ provided grant funds for the project in addition to the City funds associated with this project per prior

Commission approval of funding and an MOU with MSU and DEQ.

This presentation will provide a summary of results of the pilot study to date. Professor Otto Stein from MSU and the City Utilities Director Shawn Kohtz will provide a presentation of the pilot study results.

UNRESOLVED ISSUES: None

ALTERNATIVES: As suggested by the City Commission

FISCAL EFFECTS: No fiscal effects are associated with this presentation. However, the 2026-2030 capital improvement plan (CIP) provides for ongoing data collection using the existing pilot system including $50,000 in each of fiscal years 2026 and 2027. The CIP also includes $525,000 in fiscal year 30 to begin design of a full-scale tertiary wetlands treatment system at the WRF.

Report compiled on: November 21, 2024