



Infrastructure upgrades at O'Brien Water Reclamation Plant

As the Metropolitan Water Reclamation District of Greater Chicago's (MWRD's) O'Brien Water Reclamation Plant (OWRP) nears 100 years of service to the community, the facility's aging infrastructure is expected to meet new demands to reach heightened clean water standards. The facility is tasked with treating the surrounding communities' wastewater and returning it to the North Shore Channel as clean water, while recovering critical resources and protecting the environment despite unpredictable flows, changing weather patterns, harmful pollutants and excessive nutrients in the wastewater that is sent the facility's way. To meet these new demands, the MWRD plans to break ground in 2026 on one of its largest facility upgrades to date. Known as Battery E,

the new tanks, infrastructure, equipment and other process improvements will allow the MWRD to remove phosphorus through a biological process that better protects water quality downstream and meets stringent permits for phosphorus. Adding this fifth battery will also allow the MWRD to complete extensive upgrades throughout the plant's other four batteries, three of which are approaching 100 years old.

Working to improve water quality

Work on process improvements inside OWRP began in 2023. This project includes the installation of a sidestream fermentation zone and ancillary infrastructure to support enhanced biological phosphorus removal at the OWRP's

Battery D should be completed in 2026. Meanwhile, the MWRD has worked on the southwest side of the OWRP to remove a hill and clear ground to make way for the new Battery E, which requires four years of construction. In phased projects, the remaining aeration batteries will be upgraded to support biological phosphorus removal beginning in 2031. Upgrades to Batteries A, B and C will include comprehensive improvements to bring the century old infrastructure up to modern day standards, including biological phosphorus removal. The installation of a chemical backup system, which was awarded in 2025, will ensure compliance in meeting new phosphorus discharge levels that are permitted by August 2027 and January 2030.

O'BRIEN BATTERY E



PROJECT BENEFITS

- ✓ Critical new infrastructure
- ✓ Improved downstream water quality
- ✓ New technology and efficiency
- ✓ Job creation for construction
- ✓ Nearly \$500 million in clean water investments

MILESTONES

- **2023** Battery D work begins
- **2026** Battery D completed/
Battery E groundbreaking
- **2027** New phosphorus limits go
into effect
- **2030** Additional phosphorus
limits go into effect
- **2031** Battery B and C upgrades
take place

A drawing illustrates the future tanks and facilities to be constructed as part of the new Battery E at the MWRD's O'Brien Water Reclamation Plant.



The MWRD is clearing ground on the southwest side of its O'Brien Water Reclamation Plant to make way for new essential infrastructure that will replace aging facilities and help improve the water reclamation process by removing more phosphorus from wastewater using a biological process that meets new permits and better protects water quality downstream of the North Shore Channel.

Meeting phosphorus limits and why it matters

Phosphorus brings both life and its share of challenges. It is a non-renewable resource essential for life, but it also endangers the health of water bodies. Phosphorus enters bodies of water from several sources, such as fertilizers, urban runoff and drinking water treatment facilities where it is used to prevent corrosion in pipes. Excess phosphorus discharged to waterways can cause algae to grow and bloom, creating toxic conditions that contribute to dead zones that deplete oxygen in the water, threaten aquatic life and limit recreational enjoyment of lakes and rivers. One of the largest dead zones on Earth is in the Gulf of Mexico, which has been compared to the size of New Jersey. Because the Chicago region's water all eventually flows to the

Gulf, the U.S. EPA has mandated that the state of Illinois reduce phosphorus runoff in receiving streams by 45 percent. By implementing nutrient-reducing technologies at its three largest plants, including OWRP, the MWRD can achieve 20 percent of the state's reduction goal.

Per the EPA's National Pollutant Discharge Elimination System (NPDES) permits for OWRP, administered by the Illinois EPA, the MWRD must meet a new 1.0 milligram per liter (mg/L) monthly average of total phosphorus limit beginning in 2027, and a 0.5 mg/L annual geometric mean of total phosphorus limit by 2030. The wastewater treatment process uses beneficial bacteria to consume and remove pollutants and nutrients like phosphorus from water. These bacteria thrive in the presence of oxygen, so air is added to

the water in aeration tanks. The bacteria can be encouraged to remove extra phosphorus by strategically adjusting oxygen levels at specific points in the process. The addition of sidestream enhanced biological phosphorus removal will help the O'Brien WRP remove phosphorus and meet these new limits. However, this process decreases aeration volume and existing capacity by almost 16 percent by converting existing aeration tankage to return activated sludge fermentation tanks. Therefore, the new activated sludge aeration battery, Battery E, is being constructed to make up for the lost aeration volume. Battery E will also allow for more rehabilitation of existing Batteries A, B, and C, which are nearly 100 years old. This work ensures continued operation of the O'Brien WRP for another 100 years.

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