

INDUSTRIAL WATER TREATMENT

Providing tailored water-treatment solutions across a wide range of industries

Every industry has unique water-treatment needs. Barr understands this, so we tailor our services to meet those needs. The industries we serve include:

- Power generation
- Fuel and chemical processing
- Mining
- Agriculture and food processing
- Manufacturing

Our water treatment services are used to develop environmental compliance strategies, identify and implement new or alternative water supplies, implement process improvements, and optimize systems.

Experience, knowledge, and collaboration help us meet your current and future needs

Since our founding in 1966, Barr has been helping industries with every aspect of industrial water management, from start (water supply) to finish (water treatment and discharge). Our understanding of industrial-process water systems enables us to evaluate your current issues and help you plan for future challenges (e.g., regulatory requirements and process capacity).



Treatment evaluations

Treatment evaluations are a first step for many industries as they review options for regulatory compliance, process improvements, troubleshooting, and budgeting. Barr employs a wide range of tools to support your specific project. These include defining water balances and treatment processes, preliminary design, cost estimation, process modeling, and bench- and pilot-scale testing. Our objective is to help you develop cost-effective and creative solutions for your water-treatment needs.

Sampling and bench testing

Sampling and bench testing can give you a deeper understanding of the water issues you face and help to clear a path toward solutions. Barr is particularly adept at sampling and testing new treatments for emerging issues and contaminants, as well as conducting bench testing for aquatic toxicity identification and mitigation. Using existing facility knowledge, we create tailored testing plans to support your project goals. Our well-equipped laboratory routinely provides bench testing for chemical precipitation, coagulation, flocculation, filtration, residuals management, and other site-specific treatment processes.

BARR'S SERVICES

Treatment evaluations | Sampling and bench testing | Pilot testing | Process modeling | Treatment system design

Pilot testing

Pilot testing of scalable unit processes helps to finalize design parameters, verify performance goals, and assess technical and economic feasibility. A carefully developed pilot-testing plan enables collection of high-quality data to support overall project goals, identifies uncertainties that may affect outcomes and schedule, and minimizes risk. In addition to developing testing plans, Barr can manage and analyze pilot-testing data and contemporaneous operational data from other plant processes, and troubleshoot during pilot-plant operations.

Pilot testing yields promise for mercury compliance

Barr has been integral in pilot testing treatment technologies for one of the first industrial wastewater facilities in the U.S. to receive an effluent mercury limit of 10 ppt. Using a holistic and methodical approach to reducing uncertainty and risk for our client, we developed a pilot-testing program to evaluate equipment performance, reliability, implementability, and life-cycle cost. We also developed a strategy and testing plan for managing the mercury-containing residuals from the primary treatment technology, providing comprehensive management of this contaminant. In addition, we provided data analysis, data management services, and on-site sampling.

Process modeling

Barr uses many tools to model industrial and water-treatment processes, including PetWin, CHEMCAD, METSIM, GoldSim, and PHREEQC to support process evaluations and design optimizations. We also use statistical techniques like regression analysis and multivariable ordination to identify trends and anomalies in large operational datasets. These techniques can be implemented using Python or R statistics packages.

Process modeling for physical and chemical treatment

Barr applied a modeling framework that combined GoldSim process modeling software with PHREEQC geochemistry modeling software for a comprehensive platform (GoldPHREEQC) to model physical and chemical treatment processes, including membrane separation and chemical precipitation. This was applied in preliminary design and permitting support for a large mining client and helped reduce uncertainty related to treatment outcomes and required equipment sizing. Model outcomes were used to inform system design.

Treatment system design

After helping to develop a water management strategy that meets your needs, Barr can work with you to design and implement any treatment systems that may be required. We can provide detailed design (in 2D or 3D), as well as assistance with equipment procurement, contracting, and construction oversight. We have a complete design team with supporting disciplines (environmental, civil, mechanical, geotechnical, structural, and electrical) needed to provide a complete, operating treatment system.

21st-century mining solutions

Modern mines employ advanced water-treatment processes to minimize environmental impacts from mining and beneficiation activities. Barr worked with NewRange Copper Nickel (formerly PolyMet Mining) to develop and optimize water-management plans and water-treatment systems for a new nonferrous metal mine, using a combination of chemical modeling, bench testing, and extensive pilot testing of water-treatment processes. The project plans called for multistage, advanced water treatment that includes chemical precipitation, nanofiltration, reverse osmosis, and specialty membrane treatment processes to meet stringent environmental requirements.