

**MALCOLM
PIRNIE**

INDEPENDENT ENVIRONMENTAL
ENGINEERS, SCIENTISTS
AND CONSULTANTS

Operations Optimization

**MALCOLM
PIRNIE**

Solutions for Life™

Malcolm Pirnie, Inc.
Laurie Sullivan, P.E.
303-316-6508

100 Fillmore Street, Suite 100
Denver, CO 80220

State College PA
Jim DeWolfe, P.E., CWO
814-867-1477

1224 North Atherton St.
State College, PA 16803



Improving water treatment efficiency



about us

For more than 100 years, Malcolm Pirnie has combined experience, innovation and insight to help clients and their communities create enduring solutions that make our world cleaner and safer. As leaders in the drinking water industry from cutting-edge research to state-of-the-art facility design and construction, our staff includes experts in all facets of drinking water production, including administration, maintenance, operations, and engineering design. To enhance opportunities for successful optimization activities, our operational experts also recognize and utilize the substantial insight of plant operators by involving them fully in the effort.

Our unique approach to facility optimization

Today water treatment utilities face ever-increasing pressure not only to achieve regulatory compliance, but also to do so reliably and efficiently

- **simply meeting current finished water quality requirements does not constitute an optimized water treatment plant.** While standard methods do exist for optimizing facilities, we enhance these methods with a unique approach - mobilizing an optimization team of treatment experts who are both **engineers and operators**, and thus can serve as a link between operations staff and utility management personnel.

Our vast experience means that our team has the experience and know-how to properly identify inefficient operational practices and performance-limiting factors (PLFs) and develop practical, implementable strategies to address them. To create a successful operations optimization program, we emphasize two key goals:

- Identify “quick wins” that can easily be implemented so that the process is appreciated and momentum gained for long-term improvements
- Establish a prioritized schedule for long-term improvements so the utility has a practical, implementable plan for action

Our optimization programs address a wide variety of factors:

- **Regulatory compliance** - Balancing disinfection and particulate removal and maintaining chemical stability in distribution systems
- **Residuals Management** - Minimizing sludge and characterizing residuals
- **Chemical usage** - Optimizing through process targets and efficient mixing, while minimizing usage by investigating treatment alternatives and process assessment
- **Ageing Infrastructure** - Adapting/improving existing infrastructure to comply with new regulations while implementing asset management programs
- **Consistent operation** - Establishing standard operating procedures (SOPs) and educating operators
- **Establishing process targets** - Applying standards from Partnerships for Safe Water (PFSW) and other programs.



Malcolm Pirnie's Optimization Team

Unique Approach	Utilize individuals who are Operators and Engineers
Extensive experience	Over 100 completed nationwide Optimization projects
Operator training	Hands-on experience in offering workshops to facilitate operator education



Operator Buy-in: The Key to Success

Every operations optimization program should utilize the collective knowledge and have general buy-in of the operations staff. Operators frequently have substantial insight into potential optimization activities and are given an arena in which they can be heard. Malcolm Pirnie's operational experts specialize in the following:

- Operator education focused on “hands-on” training
- Building trust-based relationships
- Bridging the communication gap between operators, management and other departments

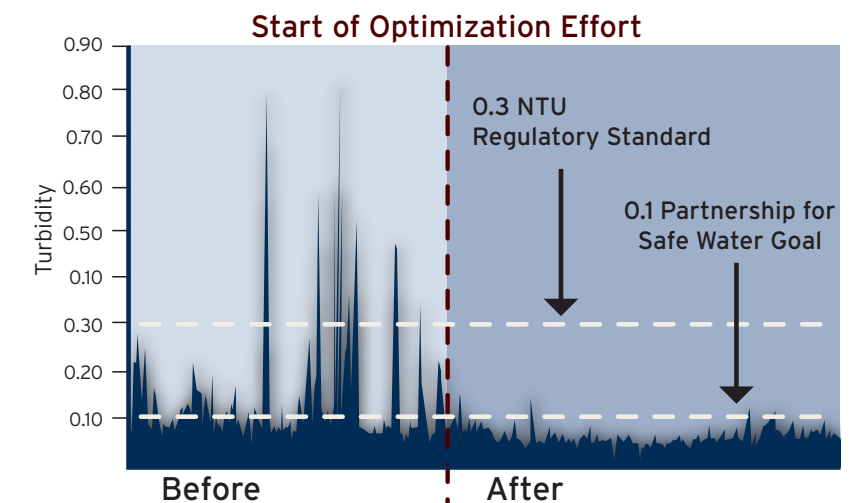
Our record of proven success

We have performed over 100 successful operations optimization efforts in cities nationwide, including:

- City of Golden, CO
- City of Birmingham, AL
- City of Dallas, TX
- City of Bethlehem, PA
- City of Wilmington, DE
- City of Phoenix, AZ

Operations optimization success story

Malcolm Pirnie performed a Comprehensive Performance Evaluation (CPE) at a customer city because the water plant was experiencing turbidity violation issues. Malcolm Pirnie's optimization team helped facilitate changes to plant operations – all non-capital in nature – and the plant realized incredible improvements in performance.



Inefficient coagulation due to incomplete mixing was corrected with a simple, low-cost solution.