

### HIGHLIGHTS

Two-phase water treatment evaluation.

Regulatory analysis.

Evaluation of ozone, ultrafiltration, nanofiltration, and UV disinfection treatment technologies.

Bench-scale testing at Carollo's water research laboratory.

The City of Mankato hired Carollo to assess the challenges that its water treatment facility may face from increasingly stringent water quality regulations and heightened consumer awareness, and to determine what existing/emerging technologies exist to meet or exceed Mankato water customer expectations and increase the treatment capacity. Water treatment challenges included seasonal fluctuations in the levels of nitrates, TOC, and DBP precursors.

The water treatment plant evaluation project involved two phases. Phase 1 consisted of a regulatory analysis and a water treatment plant process evaluation. The regulatory analysis involved a summary of existing and future regulations, an overview of the compliance of the Mankato plant, a comprehensive filter evaluation, and confirmation of the CT available in the on-site reservoir.

Phase 2 involved surveying and evaluating new technologies, including ozone, ultra and/or nanofiltration membranes, and UV disinfection, to determine if they hold promise for future application at the plant. Softened water shipped to Carollo's water research laboratory provided a basis for developing ozone demand and decay data using Carollo's unique bench-scale equipment. Carollo presented and discussed the investigative results with Mankato staff in a series of workshops and summarized the findings in a project report which detailed the conclusions, recommendations, and preliminary costs of optimizing the existing facility, increasing plant capacity, and adding other technologies to enhance water quality.



*Faced with increasingly stringent water quality regulations and growing public awareness, Mankato retained Carollo to recommend alternatives, including ozonation facilities, to optimize its water treatment plant and increase capacity.*