



Location: Mesa Verde National Park, Mesa Verde, CO

Year: 2009 (ongoing)

Construction Dollar Value: \$375K

Owner: National Park Service

Contact: Stan White, Park Buildings & Utilities Superintendent; Brian Long, Operator

Key SGM Staff: Louis Meyer, PE ; Warren Swanson, PE ; Brad Zachman, PE ; David Schieldt; William Swigert, PE, SE

Project Partners and roles: University of CO/GAC Process Testing; Preferred Contracting and Consulting/Prime Contractor; David Electric/Electrical Contractor; Tetrasolv Filtration/GAC System Supplier; Timberline Electric and Controls Corp/I&C System Integrator

Client Benefits

- Fully-automated, easy-to-operate, space-efficient solution for DBP Rule compliance and improved water quality
- D-B delivery method that kept capital costs affordable

Facility Features

- 350-GPM granular activated carbon (GAC) contactors
- VFD-driven GAC influent booster and backwash supply pumps
- House service water pumping system
- Rate of flow-control valve and flow meters
- Fully-automated, SCADA-integrated GAC control system

This project originated in an all-too-common storyline: in 2004, the National Park Service (NPS) replaced the Mesa Verde WTP's conventional treatment process with a membrane filtration unit. The membrane process's lack of disinfection byproduct (DBP) precursor removal created a DBP compliance problem. In 2009, NPS selected SGM and a locally-based construction contractor to design and build a new post-filter granular activated carbon (GAC) system for DBP control. SGM delivered staff members with strong DBP control and GAC technology backgrounds. It rounded-out this expert team by leveraging its long-standing relationship with nationally-recognized GAC and DBP expert, Dr. Scott Summers of CU-Boulder. Dr. Summers provided specialized—yet cost-effective—water quality and GAC testing services.

To ensure a best-fit solution, SGM collaborated closely with NPS's staff during pre-design. SGM evaluated all aspects of, and potential supporting solutions to, NPS's DBP problem. SGM coordinated with a regional coagulation products specialist to conduct free jar testing to evaluate DBP precursor removal via coagulation-filtration and reduce GAC operating costs. The SGM team also carefully evaluated distribution system design/operations and identified data gaps. This allowed SGM to develop a system-specific water quality and GAC testing program. Finally, SGM employed unique GAC process models to put the sampling and GAC performance testing results to good work. These state-of-the-art tests allowed SGM to estimate GAC bed life and long-term operating cost to support NPS budgeting processes.

Another key to this project's success was SGM's pro-active, high-level project communication efforts. SGM led weekly teleconferences between members of the design-build team and NPS engineers, park staff members, and contracting representatives. SGM also met with regulatory approval agencies early in the design process to identify issues and build understanding upfront. This highly-coordinated effort resulted in:

- Informed, consensus-type project decision-making processes
- Expedited regulatory approvals
- Smooth project deliverable review experiences
- Elimination of schedule and budget surprises

The success of this fast-paced design-build project was ultimately defined by an appropriate design, excellent communications, seamless regulatory approvals, and a well-planned construction effort.