



Location: Rifle, CO

Year: 2006 to 2007

Construction Dollar Value: \$1.1M

Owner: City of Rifle

Contact: Charlie Stevens, Utility Director, 970-625-6272

Key SGM Staff: Jeff Simonson, PE; Chad Paulson, PE; Bill Swigert, PE, SE

Subconsultants and their project roles: Grand Valley Engineering Solutions (Electrical Engineering); Ralston Mechanical Consulting (Mechanical Engineering); HP Geotech (Geotechnical Engineering)

Client Benefits

- Greatly improved system reliability
- Smoother conventional treatment plant operations
- Improved energy efficiency
- Improved water accounting
- Reduced O&M

Challenges

- Site location in floodplain required high-profile structural design
- Startup required carefully-planned operational transition from old pump station to new facility
- Wide design flow rate range to span current winter to future summer demands required VFDs and careful pump selection

The City of Rifle historically has relied on the Colorado River and its Graham Mesa Water Treatment Plant (GMWTP) for 85% of its potable supply. When the City's existing raw water pump station, constructed in the late 1970s, began to suffer from repeated electrical and mechanical failures, the City turned to SGM to design a new reliable facility. At the same time, the City acquired a new pre-sedimentation pond to reduce peak turbidity loadings to its GMWTP. SGM engineered a new 7.5-MGD raw water pump station and river diversion structure at the new pond site. Vertical turbine pumps were outfitted with premium efficiency motors and variable frequency drives (VFDs) to provide flexible, energy-efficient operations. The VFDs allow plant operators to "dial-in" plant flow rates based on production needs and 24-hour per day plant operations. This has reduced instantaneous hydraulic loading rates and improved the performance of the facility's conventional treatment process. Additional project design features to maximize operational performance included:

- A multi-depth intake at the pump station to allow for influent water quality selection
- A large pre-sed pond with a river diversion structure equipped with gates to allow bypassing of possible river contamination events
- A pump station telemetry and control system integrated with the GMWTP SCADA system to allow for automated, remote control
- A new magnetic flow meter for improved water accounting
- A pump station auxiliary discharge line to allow bypassing the GMWTP during pump station startup or troubleshooting events
- A surge-anticipating pressure relief valve to dampen any pressure transients

Project Elements

- 7.5-MGD river diversion structure
- 7.5-MGD raw water pump station with inlet, wetwell, and pump room
- Two 1,300-GPM, 360'-TDH, 150-HP vertical turbine pumps
- One 2,600-GPM, 360'-TDH, 300-HP vertical turbine pump
- Over 2,000-LF of 18" and 8" buried PVC discharge piping
- Instrumentation, control, and telemetry systems