



## GEOTECHNICAL AND WATER RESOURCES ENGINEERING



### KEY ENGINEERING ELEMENTS:

- Alternatives analysis
- Geotechnical analysis
- Seepage analysis
- Hydrology
- Design and construction of multiple outlet facilities
- Hydraulics
- Connection to existing City facilities

### CLIENT BENEFITS:

- Additional storage without additional property acquisition
- Incorporating existing structures into new facility
- Coordinating several permitting agencies
- Maintaining operation of water system during construction



## SOUTH TANI RESERVOIR DAM, ADAMS COUNTY, CO CITY OF THORNTON

Prior to joining RJH Consultants, Inc., RJH staff had the following responsibilities on the South Tani Reservoir Dam project.

### **Robert Huzjak**, Project Manager.

Primary client contact for design. Coordinated design team, led geotechnical analyses and embankment design, coordinated permitting, and provided technical review during design. Provided project management and technical assistance during construction.

### **Edwin Friend**, Project Engineer and Resident Project Representative.

Performed seepage analysis, stability analysis, and other geotechnical analyses, and prepared 33 construction drawings (for a total drawing set of 115 drawings) during design. Directed field engineers and technicians for construction observation and quality assurance testing of embankment placement, pipe installation, and concrete placement; coordinated laboratory testing; reviewed submittals; and coordinated regulator inspections during construction.

These individuals were key in the design of the South Tani Reservoir Dam, which is an earthen embankment nearly 3 miles long, constructed around the perimeter of a sand and gravel mine. The reservoir is located along the South Platte River in Thornton, Colorado, and provides raw water storage for municipal use by the City of Thornton (City). The dam is classified as a High-Hazard dam by the State of Colorado. Mr. Huzjak coordinated the overall project design, and Mr. Friend led the design of the perimeter dam (which is up to 20 feet high), and supported structural design with geotechnical analyses. Approximately 3.8 million cubic yards of material was excavated and about 1.4 million cubic yards of fill was placed on-site in the embankment and in fill areas.

Two inlet facilities and five outlet facilities were designed and constructed or connected to existing pipelines and interconnects to provide the City with numerous methods to convey raw water to other storage reservoirs or to the Columbine treatment plant.

To maintain operation of the water system during construction, a bypass canal was designed and constructed around the perimeter of the project site to provide an uninterrupted water supply to the City.

The storage of South Tani Reservoir was increased by about 270 percent without the acquisition of additional property. This project maximized the water storage of an existing site in a metropolitan area.

During design of the project, RJH staff coordinated with several regulator agencies including Colorado Division of Minerals and Geology; State Engineers Office, Dam Safety Branch; U.S. Army Corps of Engineers; and Urban Drainage and Flood Control District. The City, and these individuals worked closely with these agencies to modify the design to satisfy regulatory requirements and to streamline the permitting process.

During construction, RJH staff coordinated with these permitting agencies for site inspections to keep the permitting agencies informed of construction activities and changes to design.

RJH staff members were on-site for the duration of construction fulfilling field and resident engineer roles. RJH prepared the Construction Completion Report and reviewed the record drawings of construction.

The project was completed ahead of schedule, and filling began April 3, 2006, in time for spring runoff.