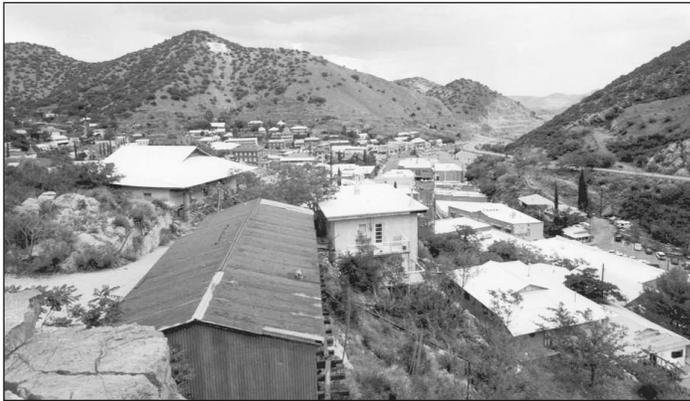


BISBEE: SUCCESSFUL TREATMENT AND COLLECTION SYSTEM IMPROVEMENTS

By Greg Haldane and Mike Fleury, Brown and Caldwell

ONCE A MINING METROPOLIS, THIS CITY OF BISBEE, ARIZONA TELLS A STORY IN ITS HISTORIC CHARM – and a century old wastewater system that has reached the limits of its useful life. Located 90 miles southeast of Tucson, the City currently operates three small wastewater treatment facilities and 239,000 linear feet of wastewater sewer lines. Parts of the conveyance system were built in the early years of the 20th century. Due to age, steep rocky terrain and high inflow and infiltration rates, much of the wastewater infrastructure is now inadequate to meet state regulations and effluent discharge limits. As a result, the City is under a Consent Order from ADEQ to rehabilitate its wastewater conveyance system and build a new regional wastewater treatment plant.

To comply, the City is building a new 1.22-mgd regional wastewater treatment plant and effluent disposal system, as well as rehabilitation and/or replacement of 120,000 linear feet of collection lines. Several wastewater treatment options were evaluated, and extended-aeration activated sludge was selected as the treatment



Old Historic Bisbee

alternative. Ancillary treatment process selections included mechanical screening, vortex grit removal, ultraviolet disinfection, aerobic digestion of solids, and air drying of biosolids in sludge drying beds.

Funding the entire \$30-million wastewater project would have been far beyond the City's means, but an innovative combination of grants and loans from state, federal, and bi-national agencies is making the City's critical infrastructure improvements possible. The City approved a funding package that includes a \$2-million-city

contribution and another \$28 million in grants and loans. The funding agencies include Arizona's Water Infrastructure Authority (WIFA), Border Environmental Cooperative Commission (BECC), United States Department of Agriculture Rural Development (USDA RD), and North American Development Bank (NAD Bank). Many border towns and cities faced with costly compliance issues are turning to similar funding models to make large infrastructure improvements possible.

Ultimately, two effluent disposal/reuse options will be implemented from the new San Jose WWTF: 1) effluent discharge to Waters of the United States (Greenbush Draw) and 2) effluent reuse (future) at a local golf course for turf irrigation. Based on these effluent disposal/reuse options, anticipated effluent wastewater quality limits and characteristics for principal constituents were developed. These limits were based on the following: State of Arizona Class B+ standards for reuse of effluent for irrigation purposes on golf courses; AAC R18-9-B204 Best Available Demonstrated Control Technology requirements; anticipated State of Arizona APP requirements; and anticipated Arizona Pollution Discharge Elimination System (AZPDES) permit requirements for discharge to a Water of the United States. The AZPDES permit will include requirements for biochemical oxygen demand, total suspended solids, and trace substances limitations, as

BISBEE

continued from page 1

well as biomonitoring. Class B+ reuse designation requires secondary treatment, disinfection, and nitrogen removal.

Infrastructure improvements will consist of conventional dig and replace, and trenchless rehabilitation. During the course of the preliminary investigations for the sewer rehabilitation, many of the closed circuit television (CCTV) inspections were reviewed to evaluate defects and determine the necessity of rehabilitation. Reviewing the CCTV tapes prioritized the rehabilitation recommendations and saved the city money. In addition, CCTV inspection of another 23,000 feet of pipe was conducted and uncovered major defects in several trunk lines previously considered in good condition. Additional assessment investigations were performed to characterize the condition of the collection system. The approach involved installation of flow monitors, smoke testing portions of the sewer system, and developing rehabilitation recommendations which maximized I/I reduction while minimizing impacts to tourism and businesses. The additional CCTV inspection and condition assessment were completed on a fast track schedule to maintain the project timetable. The evaluation criteria incorporated project cost, estimated longevity of existing systems, potential I/I contribution, and the potential for future maintenance concerns.

Brown and Caldwell performed the wastewater treatment and collection system evaluation and final design. As well, their team assisted with the necessary documents for the State and Federal grants and loans. The project design was completed in a fast-track



Typical HCS in Old Historic Bisbee.

fashion to ensure timely BECC certification with resulting financial commitments. It was imperative to the community members to see progress being made towards completion of the project. The citizen's committee continues to monitor the progress of the bidding and construction. In the meantime, Bisbee remains as charming as ever. If you visit and spend some money, you'll help pay off their new system even faster...

