

City of Abilene Hamby Water Reclamation Facility and Indirect Reuse Project

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City of Abilene Hamby Water Reclamation Facility and Indirect Reuse Project

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City of Abilene Hamby Water Reclamation Facility and Indirect Reuse Project

CLIENT: City of Abilene

LOCATION: Abilene, TX

eHT provided planning, design, permitting, project management, construction management, inspection and O&M services for this project, valued at \$82 million. eHT is the prime firm for this important drought response project and is supported by Alan Plummer Associates. The Water Reclamation Facility (WRF) serving the City of Abilene was originally constructed in 1956. The City's WRF was expanded and upgraded several times over the past 50-plus years to its current capacity of 22 MGD. Having exceeded the service life for the treatment units, eHT designed a new treatment facility, with construction completed to allow discharge of advanced treated wastewater in less than 12 months in 2015. In addition to needing to replace treatment system components to maintain compliance with discharge permit limits, the City is also in the grip of a major ongoing drought. For this reason, eHT was also tasked with the design for necessary improvements to add advanced treatment processes to the WRF to support the implementation of an indirect potable reuse project for the City.

Abilene's WRF must be capable of meeting requirements for indirect potable reuse and Type I reuse. Improved system redundancy, implementation of an automated SCADA system, enhanced energy efficiency and biological and chemical nutrient removal capability are all key components for successfully meeting these treatment objectives. eHT based the project on processes including Biological Nutrient Removal (BNR), Membrane Bioreactor (MBR), Reverse Osmosis (RO), Ozone and Biologically Active Contactors (BAC) technologies in order to meet the City's project goals.

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The treatment systems ultimately selected were based on required construction footprint, repurposing of existing structures as a budget control measure, capital and operational cost, operational flexibility, lead time for construction and capability of meeting treatment goals for BOD, TSS, ammonia, total phosphorus, TDS, chloride, sulfate and emerging constituents of concern. The City's upgraded WRF includes both coarse and fine mechanical screens, coarse and fine grit removal systems, an influent wastewater pump station, flow equalization systems, a secondary BNR process designed for biological phosphorus removal, enhanced energy recovery and tertiary filtration using MBR membrane filters, RO treatment, Ozone treatment, BAC filtration, chlorine disinfection and aerobic solids storage and disposal. Also included in the scope of the project is the major amendment of the City's TPDES discharge permit for a new permitted discharge to one of the City's surface water reservoirs and a comprehensive Operations and Maintenance Manual.

eHT worked with Abilene leadership to select a Construction Manager at Risk (CMAR) using a 2-step selection process. eHT initiated preliminary design in May, 2013. CMAR selection was completed in September, 2013. Field construction started on January 25, 2014 and reclaimed water was sent to Lake Fort Phantom on January 7, 2015, less than 12 months from the first concrete pour.

In order to minimize the lead time for operators to obtain training on the new processes, eHT has also been conducting operator training sessions with the WRF operations staff on a biweekly basis throughout planning, design and into construction. eHT will continue with training sessions on each treatment process as the new facilities are brought on-line.

The successes of the project are many and are summarized below.

- **Largest MBR facility in the State of Texas;**
- **No interruptions to operations and treatment over the entire construction period;**
- **Maximum use of the existing plant site by re-purposing as many existing structures as possible;**
- **Provides an additional 7.0 MGD of water supply through re-use; and,**
- **\$82 million in design and construction with discharge of advanced treated wastewater in less than 12 months.**

The project received the 2016 Project of the Year from the WateReuse Association and the Environmental Project of the Year from ENR-Texas/Louisiana.

"Because of the recent historic drought, the directive from City leadership on operation of the new Hamby Water Reclamation Facility was to be at a level of operation required to safely send reclaimed water to Lake Fort Phantom Hill within a month of completing major construction at the facility. A normal facility upgrade project requires 6 to 12 months of operation to get used to the new technologies. With the aggressive startup schedule required for this project, eHT conducted bi-weekly operator training workshops with the City operating staff to review process theory, typical and emergency operating requirements and optimization and troubleshooting approaches for each new treatment process. Then, as the units were being built, the operators had a better understanding of the layout of each process and what equipment to expect and how it would function. Thanks to the training workshops, City operators not only gained a level of comfort with the new technologies, but the operators rapidly took ownership in the new facility and began producing high quality reclaimed water to Lake Fort Phantom Hill in early January 2015, less than a month from completing major construction."



Mickey Chaney, Assistant Director of Water Utilities, City of Abilene



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from **Jessica England**

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eHT is a civil, environmental and geotechnical engineering firm with headquarters in Abilene, TX and branch offices in Lubbock and Granbury.
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