

## Clarksville Water System Overview

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The Clarksville Water System is one of the largest in Tennessee with approximately 60,000 customers. Below is a brief description of what composes the physical water system and the operations staff who perform an excellent job of operating and maintaining the system following regulations set forth by the Tennessee Department of Environment and Conservation (TDEC) and Environmental Protection Agency (EPA).

### Water Treatment Plant

The Clarksville Water Treatment Plant is a state-of-the-art microfiltration membrane facility that is rated at 28 million-gallons/day (MGD) and can peak at rates of 30 MGD. The water plant is also equipped with an onsite sodium hypochlorite generation system (chlorine).

Raw water is pumped to the plant from the Cumberland River. A positively-charged coagulant is added to the water to cause the negatively-charged particles in the raw water to attract and form ionic bonds (coagulation). Potassium permanganate is added to oxidize inorganic and some organic materials making them easier to coagulate, flocculate and settle with the particles. The flocculation process increases the coagulated particles to a size and weight that will settle in large sedimentation basins. Settled water is then filtered, removing the smallest particles that remain. The microfiltration process filters all particulates greater than 0.1 micron in size and provides a direct barrier against bacteria, protozoa, and some viruses. The chlorination process following filtration effectively disinfects all pathogens that may be still present. A corrosion inhibitor is added after filtration to help protect water lines in the system. In addition, fluoride is added to the water post-filtration.

The water plant is currently staffed with 17 employees covering the disciplines of operations, maintenance, laboratory and management. Each employee is trained fully to understand the water treatment processes and properly operate the plant. State certification is required of all designated staff once they are qualified to sit for the state examination.

### Water Distribution System

The water distribution system is comprised of 17 water tanks, 4 water booster stations (not including the water plant high service pump station), and nearly 1,000-miles of water mains. In order to operate and maintain this system, Clarksville Gas and Water staffs a total of 40 employees to maintain this system with disciplines including water construction (for repair and in-house replacement of water lines, etc.), water tank and water booster pump station maintenance, cross connection control (including



inspection of backflow prevention devices), water line flushing, and management. State certification is required of all designated staff once they are qualified to sit for the state examination.

The distribution system also includes another very important group of employees; meter readers, service and maintenance technicians and customer service personnel. Additionally, an electronic controls specialist operates and maintains a complex Supervisory Control and Data Acquisition (SCADA) system to enable Operations to monitor and operate both the water treatment plant and water distribution system. Other water operations support divisions include an internal Engineering group, Finance/Accounting and Purchasing, Fleet and Building Maintenance, and Information Technology.

Clarksville Gas and Water, under the direction of the General Manager, is operated by a staff of division managers that maintain the daily operations of their respective divisions; Water/Wastewater Operations, Gas, Shared Services, Engineering, and Finance.