

# Water and Wastewater Treatment Plant Operators

Operators operate the equipment in water and wastewater treatment plants in order to purify drinking water, remove domestic and industrial pollutants and solids from the water, and return clean water, biosolids and air back to the environment. Clean, safe water is essential for life and good health. Water and wastewater treatment plants remove impurities, solids, organisms, chemicals, and toxins from water and wastewater so that it is safe for people, animals, and the environment. Water plants treat water and distribute it to customers. Wastewater plants then return the clean water to rivers, lakes, and oceans. Using modern technology, water and wastewater treatment plants help provide clean water for use in homes and industries, help prevent disease, protect fish and wildlife from pollution, and protect the environment.

Water and wastewater treatment plant operators run the equipment and control the processes that clean and treat water and wastewater at treatment plants. The exact duties of operators depend on the size of the plant. In small plants, one person may run and service the equipment, make repairs, perform tests, and keep records. In large plants, with many employees, operators monitor only one process with multiple pieces of equipment. They may have titles that describe the work they do.

Wastewater entering a treatment plant goes through several processes that eliminate critical pollutants. Operators monitor meters and gauges that tell whether the equipment is operating correctly.

Wastewater treatment plant workers operate and maintain the pumps, engines, and generators that move the sewage or wastewater through primary, secondary and tertiary processes. Operators ensure that the water or wastewater has been properly disinfected. They collect samples of water or wastewater and perform routine laboratory tests. Water and wastewater treatment operators keep a log of operations. They record meter and gauge readings, and laboratory data, and fill out operational reports.

Water and wastewater treatment operators sometimes work during an emergency. Heavy rainstorms can flood the water supply and sewer pipes and exceed the capacity of the plant to handle the water or waste. A chlorine gas leak or an oxygen deficiency in the plant also calls for emergency measures. Operators are trained in emergency management response and use special safety equipment and procedures to protect public health and the facility.

Water and wastewater treatment plants must operate by specific regulatory standards which are reflected in the treatment plant permit. Operators must know and abide by the guidelines of the Clean Water Act and Safe Drinking Water Act. The list of contaminants regulated by these statutes has grown over time.

## Hours and Earnings

Water and wastewater treatment plant operators usually work eight to twelve hours a day, forty or more hours a week. Since many of these plants need to have an operator present 24 hours a day, operators may be required to work different shifts. They may rotate holiday and weekend work. In an emergency, such as an equipment failure, they often work overtime.

Earnings vary with the size of the plant and its location; and the duties and skills of the operator, as well as their education, experience, and certification. Fringe benefits for water and wastewater treatment plant operators are like those of other city, county, special district employees. Most operators receive overtime pay and shift differential for working during "off-hours". They also receive paid vacations and holidays, sick leave, life insurance, dental and medical benefits, deferred compensation and pensions on retirement.

## Education and Training

Because of the complex instrumentation and computer-controlled equipment now in use in many water and wastewater plants, employers seek applicants with at least a high school diploma. Educational requirements are increasing as treatment plants become more complex to meet new water quality standards and pollution control regulations.

Persons interested in this work should take mathematics, science, shop (to learn the care and use of tools), and subjects on industrial development. Water and wastewater treatment plant operators in some large cities and towns may have to pass civil service tests on general knowledge and mechanical aptitude.

Trainees, or operators-in-training, are trained by skilled, experienced operators. Trainees first do routine tasks. They write down meter readings, take samples of water or wastewater and sludge, and do simple upkeep and repair work on pumps, motors, and valves. Large water and wastewater treatment plants have a more formal training program with classroom or self-paced study programs.

Several colleges and technical schools offer an associate degree or a certificate for completion of a program of study in water quality and wastewater technology. Job seekers with this background have a better chance for employment and advancement. Water quality associations, or officially designated state operator training centers in some states, also conduct courses to update the skills of water and wastewater treatment plant operators.

Prominent among these agencies are the Water Environment Federation (WEF) and the American Public Works Association (APWA). Distance learning courses on water and wastewater treatment and related subjects are also available. Some large cities even pay part of the tuition for workers who take related college courses in science or engineering.

Subjects offered by state agencies and educational institutions include the principles of treatment processes and process control, collection systems, laboratory procedures, control of odors, safety, chlorination, sedimentation, biological oxidation, sludge treatment and disposal, flow measurements, supervision and management, and financial management.

Persons who wish to enroll in a program of study should call or write their state drinking water and water pollution control agency for information on approved curriculums.

### **Certification and Licenses**

Every state has national standards for water and wastewater treatment written by the federal Environmental Protection Agency (EPA). All fifty states require operators to pass a certification examination to show they are capable of overseeing various treatment processes. Higher levels of certification qualify the operator for overseeing a wider variety of treatment processes. Each state has its own certification program, and requirements vary.

Typically, there are classes of certification for different size treatment plants. For instance, operators of a plant for serving a small town may have to be high school graduates, have one year of experience in a treatment plant, and pass a written examination. Operators of a plant serving a large city may need to have four or more years of experience (two in supervisory work), take an advanced test on water or wastewater treatment operations, and may even need to have an undergraduate degree.

Some states have their own certification program related to their code of regulations. In order to ensure qualified people are operating water and wastewater treatment plants, certification is provided for agencies and private companies operating facilities to have in their job descriptions and for employees to be held accountable for the proper function of those facilities. Certification usually requires educational development, experience in the field and passing an exam. Some states have separate systems for water and for wastewater certificates.

### **Desirable Traits and Skills:**

Water and wastewater treatment plant operators should have mechanical and scientific aptitude. Manual dexterity and attention to detail are important. They should be able to plan, direct, and control a work program. The ability to get along well with co-workers will make the job easier. Operators should be able to handle routine work with equipment, and should be able to switch easily from one task to another. Most job duties associated with water and wastewater treatment can be adapted for workers with disabilities.

Persons should contact their school or employment counselors, their state office of vocational rehabilitation, or their state department of labor to explore fully their individual needs and requirements as well as the requirements.

### **Where Employed**

Water and wastewater treatment plant and systems operators held over 106,550 jobs throughout the United States in 2006. Most worked for local governments, others for state and federal governments. Others worked for private water, sewage, and sanitary utilities and services companies, which increasingly provide operation and management services to local governments on a contract basis.

Some worked in industries where pre-treatment of wastewater is required or where rural plants and factories have their own wastewater treatment facilities. Most jobs were in large cities or counties. Many worked at regional facilities that served a number of cities and towns. Although nearly all worked full-time, those who work in small towns may only work part-time at the water or wastewater treatment plant—the remainder of their time may be spent handling other municipal duties or working at multiple plant sites.

### **Employment Outlook**

The employment of water and wastewater treatment plant operators is expected to grow by 16.2 percent through the year 2014—an increase of around 15,000 jobs. An additional 33,000 positions are also expected to open due to replacement needs. A growing population and an expanding economy will increase demands for water and wastewater treatment services. New plants constructed to meet this demand will employ more operators.

In addition, the trend toward dependence on private water and wastewater treatment services should create jobs for operators in companies that offer these services. Workers with formal schooling in water quality and wastewater technology will have an edge over other job seekers both in employment and advancement because of the increasing complexity of the equipment. Employment in this field is also steady because the treatment of water and wastewater is essential for every community. Also, since the Clean Water Act in 1972, more operators with 30 years of experience are in place to retire leaving openings for those who are ambitious to enter the field and promote quickly.