

**Operating Engineer**

FLSA Status: Covered  
Bargaining Unit: District Council of Trade Unions (DCTU)

**General Summary**

Positions in this broad class operate, maintain and repair a variety of equipment and facilities used in water distribution, water storage, disinfecting and treatment, pressure regulation, and metering in the City’s potable water system, including 24-hour operation of the Water Control Center and night emergency dispatch. This position provides testing and monitoring of water quality to ensure regulatory compliance.

**Operating Engineer I - 30000152**

**Distinguishing Characteristics**

The trainee level of this class is an entry- level position in the inspection, maintenance, repair, and operation of water distribution and treatment facilities. Incumbents are responsible for participating in on-the-job training and directed self-study in order to acquire and maintain proficiency in the knowledge, skills and abilities needed to perform tasks of an Operating Engineer. Upon successful completion of the prescribed training program and acquiring the required licenses and certifications, trainees will be eligible for appointment as an Operating Engineer II.

**Typical Duties/Examples of Work**

1. Assists with and learns to inspect, maintain, repair, install, and operate storage tanks, reservoirs, valves, gauges, chlorinators, pumps, pump stations, motors, distribution meters, hydraulically operated valves, data recorders, and other equipment related to the water distribution system.
2. Assists with and learns to operate and maintain electrical centrifugal pumps at a water pumping station, to start and stop pumps using computerized controller or by manually operating the switch as conditions require, and to inspect pump packing and water seals for proper fit.
3. Assists with and learns to raise or lower gates to control proper water levels in reservoirs including on-site and remotely using computer.
4. Assists with and learns to operate a variety of shop equipment such as grinders, drills, saws, hydraulic press, metal lathe, cranes and sand/media blasters.
5. Performs general maintenance and custodial tasks to keep working areas clean, neat, and safe.
6. Assists with and learns to operate computerized vibration analysis equipment, perform oil analysis and operate laser alignment equipment.
7. Assists with and learns to calculate chlorine doses, sodium hydroxide doses, ammonia doses, water flows, volume of tanks and perform other related calculations, using basic math and formulas.
8. Assists with and learns to take water quality bacteriological samples and analyze for appropriate physical and chemical constituents; assists with and learns to calculate chemical

- constituents and adjust appropriately. Conducts distribution system water quality control tests, such as free and total chlorine residuals, turbidity, pH, and water temperature readings.
9. Assists with and learns to monitor water distribution and supply system through electronic and computerized systems; learns to make adjustments in water flow reservoir levels and corresponding chemical adjustments; assists with and learns to operate the Supervisory Control and Data Acquisition (SCADA) system in the water control center.
  10. Assists with and learns to respond to emergency alarms, isolating problem area and taking immediate corrective action or call out appropriate personnel to resolve the problem within established federal and state regulations or standard operating procedures; assists with and learns to test emergency equipment on established schedule to ensure constant emergency preparedness.
  11. Assists with and learns to maintain the operational integrity of the water distribution and water treatment facilities through routine inspection and identification of needed repair and maintenance.
  12. Assists with and learns to conduct preventive and general maintenance on a variety of small and large equipment and specialized instrumentation such as valves, pumps, chlorine residual analyzers, pH meters, turbidimeters, generators, fuel systems, conduit pipes, and various compressed gas systems.
  13. Learns to use computer technology to record water sample data.
  14. Responds to calls to work during emergencies.
  15. Performs related duties as assigned.

### **Required Knowledge, Skills and Abilities**

Knowledge of: methods, practices, care, maintenance and use of precision measuring instruments, tools and materials used in mechanical and electrical equipment maintenance; occupational hazards and necessary safety precautions applicable to machinery operation and maintenance; computers and related equipment; mechanical systems; water systems and operations

Ability to: organize and use time effectively; learn water system functions and operations; perform accurate mathematical calculations; diagnose and correct equipment problems; climb elevated storage tanks, enter underground facilities and navigate steep, uneven and rough terrain; arrange and apply proper traffic safety signs and flaggers for work zone safety.

Skill in: reading and interpreting meters and charts accurately, and in maintaining neat and accurate records of readings; reading and understanding technical manuals; writing legibly and accurately to record information and complete basic reports; understanding and following oral and written instructions; establishing and maintaining effective working relationships with other employees.

### **Special Requirements**

Valid state driver's license; some positions may require a Commercial Driver's license and additional endorsements, certifications and licenses; ability to obtain an Oregon Health Authority Water Distribution Operator Certification- Level I within 6 months of appointment; Oregon Water Treatment Operator Certification level 1 within 18 months of appointment; passing routine respiratory protection physical assessment and fit-testing. Must successfully pass Physical Capacities Test, CPR First Aid, Lock-out Tag-out certification, Fall Prevention Certification and Confined Space Certification, HAZMAT Certification, Forklift Certification, and Crane Certification.

**Classification History:**

Adopted: 2-03-99:

Class created as a result of DCTU Classification and Compensation Study 1998-99. This class is composed of the following classes:

1768 Operating Eng Trainee Adopted: 4-3-95

Revised: 6-1-04 (Clarified promotional process from Operating Eng I to Operating Eng II)

June 2009 - Change Job Class number from 1768 to 30000152, due to system change.

February 2017 – minor updates to duties and added some certifications

**Operating Engineer II - 30000153**

**Distinguishing Characteristics**

The journey level of this class performs independently the full range of technical and mechanical duties in the ongoing operation, maintenance and repair of pumps, motors, tanks, reservoirs, hydraulically operated valves, treatment systems and other plant facilities in the City's potable water system. Upon successfully acquiring knowledge of an in-depth training in the Operating Engineer districts and acquiring the required licenses and certifications, Operating Engineer II's will be eligible for appointment as an Operating Engineer III.

**Typical Duties/Examples of Work**

1. Controls and operates water supply system on a 24-hour basis to maintain water quality and quantity.
2. Plans, organizes, orders, and purchases materials and coordinates job activity with other crafts and trade personnel.
3. Reviews, analyzes and evaluates project plans, confers with engineers, design professionals and inspectors on suggested changes or modifications.
4. Inspects, maintains, repairs, installs, and operates storage tanks, reservoirs, electric and hydraulically operated valves, gauges, chlorinators, pumps, pump stations, motors, distribution meters, pressure regulators, data recorders, and other equipment related to the water distribution and supply systems.
5. Operates, repairs and maintains treatment facilities for secondary and primary disinfection; orders, handles and maintains hazardous treatment chemicals.
6. Provides customer service for pressure, flow, supply and water quality problems.
7. Maintains watch and logs instrument recordings of volume, flow, pressure or other indications of water supply conditions; operates personal computer and data collection equipment; monitors components of the water system to identify and analyze problems and potential improvements to increase efficiency and cost savings.
8. Calculates chlorine doses, water flows, volume of tanks, and performs other related calculations.
9. Operates, maintains and repairs the Emergency Water Supply system of wells and booster pumps (GWPS) on a 24/7 basis during turbidity events, conduit failures or low water conditions at Bull Run.
10. Operates and maintains the aquifer storage and recovery (ASR) injection system.
11. Operates emergency diesel and gas-driven pumps and generators during power outages.
12. Provides emergency response during 3-4 and 5-alarm fires; coordinates with Portland Fire Bureau to ensure adequate water pressure and flow.

13. Takes water quality samples and analyzes for appropriate physical and chemical dosages and feed rates; calculates dosages and chemical feed rates and adjusts appropriately; conducts distribution system water quality control tests, such as chlorine residuals, pH and water temperature readings.
14. Monitors water distribution and water treatment systems through electronic and computerized SCADA (Supervisor Control and Data Acquisition systems; makes adjustments in water flow and corresponding chemical adjustments; operates water control center facilities on assigned shift.
15. Responds to emergency alarms, isolating problem area and taking immediate corrective action or calls out appropriate personnel to resolve the problem within established federal and state regulations or standard operating procedures; tests emergency equipment on established schedule to ensure constant emergency preparedness.
16. Maintains the operational integrity of the water distribution and water treatment facilities through routine inspection and identification of needed repair and maintenance.
17. Conducts preventive and general maintenance on a variety of small and large equipment and specialized instrumentation such as valves, pumps, chlorine residual analyzers, pH meters, turbidimeters, generators, fuel systems, conduit pipes, and various compressed gas systems.
18. Operates and maintains hydro-electric systems.
19. Operates and maintains city fountains, open reservoirs and reflection ponds.
20. Uses computer technology to record water samples data and transmits to other offices, such as water quality, regulatory compliance and laboratory.
21. Orders treatment and testing chemicals, fuels, and supplies as needed to ensure continuous operation of the water treatment system.
22. Coordinates work with other sections of the Bureau; provides information about operation of the water supply and distribution system to others including employees, regulators and the public; works as a team with instrument technicians, electricians, treatment personnel and other staff.
23. Utilizes computerized vibration analysis equipment and techniques to determine mechanical faults as a tool for preventative maintenance.
24. Performs laser alignment and oil analysis on pumps and motors.
25. Performs water discharges in compliance with City of Portland BES, PWB NPDES Permits; follows all applicable discharge compliance SOP's and best management practices.
26. Installs, rebuilds, maintains and operates all regulators to maintain over 100 pressure zones within the distribution system.
27. Performs related duties as assigned.

### **Required Knowledge, Skills and Abilities**

Knowledge of: methods, practices, tools, and materials used in mechanical and electrical maintenance of water service pumps, regulators, meters, and related equipment; occupational hazards and necessary safety precautions applicable to machinery operation and maintenance; handling, storage and disposal of potentially hazardous chemicals, Portland water system; State Health, DEQ, and OSHA rules and regulations; basic water-related chemistry; hydraulics; Federal and state regulations pertaining to water treatment, treatment facilities and distribution systems.

Ability to: operate treatment facilities within established procedures; calculate chemical additions, water volume and rates of flow; collect and conduct accurate water sampling analysis using analogue and digital data-collection equipment; determine operational problems and act quickly and decisively in bringing the system back to a normal state; read and interpret blueprints, technical manuals and operation and maintenance (O&M) manuals and apply that information to

maintenance procedures; communicate effectively, orally and in writing; operate a computer and supporting software packages; analyze data, draw accurate conclusions and record findings; use proper safety equipment according to OR-OSHA standards and bureau procedures; drive to remote facilities; establish and maintain effective working relationships with employees, individuals with other agencies and the general public; operate heavy equipment; install and adjust cathodic protection and perform pipeline locates.

Skill in: operation of computers and related equipment; reading meters and charts accurately; reading technical manuals, including detailed equipment specifications, a variety of equipment diagrams and schematics, building and water system blueprints; math calculations.

### **Special Requirements**

Valid state driver's license; some positions may require a Commercial Driver's license and additional endorsements, certifications and licenses; Must possess an Oregon Health Authority Water Distribution Operator Certification Level – 2 and Water Treatment Operator Certification Level 1 at time of appointment; passing routine respiratory physical protection assessment and fit-test, CPR-First Aid, Lock-out tag-out certification, fall prevention certification and confined space certification, HAZMAT certification, forklift certification and crane certification, and pass physical capacities test.

### **Classification History:**

Adopted: 2-03-99:

Class created as a result of DCTU Classification and Compensation Study 1998-99. This class is composed of the following classes:

1748 Water HDWKS Pipe Insp. Adopted: 03-20-86

1770 Operating Engineer Adopted 12-20-77; Revised 07-12-90 draft

June 2009 - Change Job Class number from 1770 to 30000153, due to system change.

February 2017 – minor updates to duties

## **Operating Engineer III - 30000154**

### **Distinguishing Characteristics**

The OEIII level of this class typically provides leadership, and oversees and coordinates the work activities of others. It is distinguished from the Operating Engineer II by its District responsibilities, the operation and control of Portland's water supply and distribution systems using the Supervisory Control and Data Acquisition System (SCADA) and the operation of Portland's emergency water supply system.

### **Typical Duties/Examples of Work**

1. Performs in a position of operational decision-making as defined by the Oregon Health Authority for the daily operation of water control center, ground water pump station and other facilities.
2. Has complete and total control of Portland's entire water distribution system including tank and reservoir levels, pump system flow rates and pump station operation through the use of the Supervisory Control and Data Acquisition system (SCADA) on a 24/7 basis.
3. Monitors and operates Portland Water Bureau's emergency communications system through the use of radio, phone and Fire Bureau scanner; coordinates with police, fire, Water Bureau Emergency Crew, security and other emergency response personnel.
4. Oversees and coordinates the work activities of others, including field crews and trades workers.

5. Works closely with and coordinates water system needs and maintenance with inspectors, instrument technicians, electricians, private contractors, fire department and others.
6. Provides leadership, training, guidance and mentoring to Operating Engineers I & II.
7. Coordinates work schedules based on system needs and requirements of maintenance management system.
8. Plans and coordinates the work of Operating Engineers I and II.
9. Maintains, calibrates, adjusts and trouble-shoots treatment process and monitoring instruments and equipment.
10. Performs related duties as assigned.
11. Design and implement emergency isolation and pumping standard operating procedures (SOP's) for all pump stations, reservoirs and tanks.
12. Performs maintenance and coordination of all operational aspects of Bull Run supply conduits and Rights-of-way from Headworks to Mt. Tabor and GWPS.
13. Conducts hydrant flow tests for system analysis and for the Office of Permits and Development Review to facilitate the design of fire protection systems.
14. Operates and maintains City fountains, open reservoirs and reflection ponds.
15. Monitors water distribution and water treatment systems through electronic and computerized systems; makes adjustments in water flow and corresponding treatment adjustments; operates SCADA in the water control center on assigned shift.
16. Coordinates and performs water discharges in compliance with City of Portland BES, PWB NPDES Permits; follows all applicable discharge compliance SOP's and best management practices.

### **Required Knowledge, Skills and Abilities**

Knowledge of: effective principles and practices of leadership

Ability to: schedule and assign the work of others

Skill in: demonstrating techniques to others; providing training to others; providing lead direction to staff; including assigning and reviewing work

### **Special Requirements**

Same as Operating Engineer II. Must possess an Oregon Health Authority Water Distribution Operator Certification Level 2 and Oregon Water Treatment Operator Certification Level 2 at time of appointment. Must obtain Water Distribution Operator Certification Level 3 within 5 years of appointment; passing routine respiratory physical protection assessment and fit-test, CPR-First Aid, Lock-out tag-out certification, fall prevention certification and confined space certification, HAZMAT certification, forklift certification and crane certification, and pass physical capacities test.

### **Classification History:**

Adopted: 07-02

Revised: 03-09-07 to update language in Working Conditions

June 2009 - Change Job Class number from 1771 to 30000154, due to system change.

February 2017 – minor updates to duties and added requirement to obtain Water Distribution Operator Certification Level 3 within 5 years.

**Working Conditions**

Work in this class is typically performed in the field, Ground Water Pump Station, other treatment facilities and in the control center. Incumbent is typically required to negotiate rough terrain; to lift up to 50 pounds; to work outdoors in all weather conditions; to be called back to work during emergencies; to work around potentially hazardous chemicals, work in confined space and underground facilities as deep as 40'; climb and work on elevated water storage facilities at heights up to 160' and wear protective gear or clothing. Must be able to use self-contained breathing apparatus (SCBA), including passing routine respiratory physical assessment and physical capacity test.