



**Wastewater Collection Operator
Certification Examination Content Outline
Classes 1-4**

Class 1	Class 2	Class 3	Class 4
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1. Equipment Operation, Evaluation, and Maintenance			
A. Adjust and calibrate gas meters, flow meters, and blower meters.			
B. Calibrate and adjust pneumatic equipment systems.			
C. Clean the collection system through the use of:			
1. hydraulic cleaning (e.g., balling, flushing, poly pigs).			
2. jet rodding.			
3. blockage removal.			
4. rodding.			
5. root control using chemical addition.			
D. Operate the following equipment:			
1. computers.			
2. heavy equipment (e.g., vehicles requiring a CDL license).			
E. Evaluate and maintain the operation of equipment by:			
1. inspecting abnormal conditions.			
2. measuring temperature.			
3. reading charts.			
4. reading gauges.			
5. reading meters.			
F. Evaluate and maintain the operation of electrical equipment:			
1. variable frequency drives (VFD's).			
2. motor control centers.			
3. low voltage equipment (e.g., flow meters, float switch, PID controls, pressure sensors).			
G. Inspect system using the following approaches:			
1. dye testing.			
2. physical inspection.			
3. smoke test.			
H. Rehabilitate and repair collection system:			
1. lift station (e.g., wet wells, fittings and piping).			
2. manholes.			
3. sewer lines.			
4. taps (e.g., top hat, grouting, protruding laterals).			
5. infiltration, inflow, exfiltration.			
I. Inspect equipment or monitor operating conditions, meters, and gauges to determine load requirements and detect malfunctions of lift station.			
J. Inspect the operation of equipment to determine malfunction.			
K. Perform system inspections (e.g., air release valves, inlets, manholes, outfalls, overflows, regulators, siphons, sluice gates).			

The blue shading indicates that a given task statement is not applicable for the class or classes shown.



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L. Perform preventative maintenance including repair, replacement, and installation of the following equipment:				
1. chemical feed systems.				
2. motors.				
3. pumps.				
4. valves.				
5. compressors.				
6. engines.				
7. gearboxes.				
8. generators.				
9. pneumatic and hydraulic systems.				
M. Operate the following equipment and/or tools:				
1. aeration tanks and blowers.				
2. air compressors.				
3. backflow prevention devices.				
4. backhoes.				
5. chain pull hoists and overhead cranes.				
6. chemical feed systems.				
7. chlorination systems.				
8. dump trucks.				
9. pumps (fixed and portable, all types).				
10. engines.				
11. flushing unit (dumping water into the system).				
12. front-end loaders.				
13. hydrant operations.				
14. hydraulic equipment (e.g., jacks, press, compactor).				
15. metal detectors and pipe locators.				
16. pneumatic tools.				
17. power tools (e.g., drills, grinders, saws).				
18. precision measuring instruments.				
19. rodding equipment.				
20. manhole guide rollers.				
21. samplers.				
22. tapping equipment.				
23. testing equipment.				
24. welding equipment (e.g., MIG, TIG, arc, plasma, oxy acetylene).				
25. fans (e.g., forced air, air extraction).				
26. easement hydro-jetter machine (portable).				



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2. Collection System Operation, Maintenance, and Restoration

A. Clean and maintain tanks (e.g., wetwells, chemical, holding).				
B. Collect and document data from charts, gauges and other instrumentation.				
C. Excavate wastewater mains and lines.				
D. Use high pressure hydraulics to clean wastewater mains and lines.				
E. Inspect structures (e.g., manholes, vaults, wet wells for damage, cave-ins, and debris).				
F. Interpret blueprints, GIS and sketches of system showing location and configuration of collection system components.				
G. Lubricate engines and pumps.				
H. Maintain all equipment (e.g., pumps, motors, chlorinators, chemical feeds) in accordance with OEM specifications.				
I. Maintain an inventory of chemicals and materials.				
J. Monitor panel board and adjust controls to regulate flow rates.				
K. Monitor CSO basin operations and functions and adjust as necessary.				
L. Operate pumping equipment during emergency bypass operations.				
M. Operate odor control devices and systems.				
N. Perform maintenance and inspection through the use of:				
1. hydraulic cleaning.				
2. rodding.				
3. closed circuit television (CCTV) camera inspection and locating.				

3. Lift Station Operation and Maintenance

A. Ensure that the following electrical devices are functioning properly:				
1. fuses.				
2. motors.				
3. relays.				
4. starters.				
B. Ensure that the following electronic devices are functioning properly:				
1. alarms.				
2. controllers.				
3. gas detection.				
4. level detection system.				
5. telemetry (e.g., RTU's, SCADA, PLC's).				
C. Ensure that the following devices are functioning properly:				
1. piping.				
2. pressure relief valves (e.g., compressors, hot water heaters).				
3. chemical addition.				



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4. pumps.				
5. valves.				
6. wetwells (e.g., screens and level controls).				
7. air relief/vacuum valves (force mains).				
8. seals.				
9. air exchangers/exhaust fans.				
10. HVAC systems.				
D. Adjust equipment and increase or decrease pumping capacity for proper flow.				
E. Perform calculations to ensure proper operations.				
F. Calibrate and adjust variable frequency drive (VFD) systems.				
G. Monitor panel board and adjust controls to:				
1. loss of head pressure.				
2. wetwell elevation.				
H. Operate the following equipment and/or tools:				
1. bar screens.				
2. wetwells.				
3. variable frequency drives (VFD's).				
4. electric motors.				
4. Collection System Monitoring, Evaluation, and Adjustment				
A. Perform adjustments on the following components of the collection system:				
1. aeration for hydrogen sulfide control.				
2. biological filters for odor control.				
3. chemical addition for hydrogen sulfide control.				
4. flow monitoring.				
5. force mains.				
6. gravity sewers.				
7. lift stations.				
8. manholes/cleanouts.				
9. measuring and control systems.				
10. pressure sewers (S.T.E.P.).				
11. vacuum sewers.				
B. Analyze and adjust chemical feed devices that inject specified amounts of chemicals into sewer systems.				
C. Analyze ongoing collection system operations for defects.				
D. Assist lab technician in the collection of wastewater and perform field/laboratory tests and analyses.				
E. Calibrate and adjust the following systems:				
1. aeration systems.				
2. atmosphere testers.				



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3. PID loop controllers.	■	■	■	
4. Programmable Logic Controllers (PLC's).	■			
5. Supervisory Control and Data Acquisition (SCADA).	■			
6. level and flow meters.				
7. telemetry equipment.				
F. Check equalization basins and CSO structures.				
G. Ensure accurate sampling of waste collection system according to standard methods.				
H. Identify physical and/or abnormal characteristics of wastewater.				
I. Inspect the installation of piping.				
J. Operate electric motors, pumps, and valves to regulate flow.				
K. Repair and replace:				
1. sewer lines.				
2. combined sewer lines.				
L. Review automated information and control system data and revise settings as required.				
M. Utilize wastewater analysis devices for chemical detection in collection systems (e.g., nitrate, hydrogen sulfide, pH, phosphorous).				
N. Operate flow sensors.				
5. Security, Safety, and Administrative Procedures				
A. Analyze/estimate cost (e.g., equipment, material, power, fuel, staffing).				
B. Analyze regulatory and/or compliance requirements.				
C. Assign work crews to work areas.				
D. Assist in the handling, delivery, and storage of chemicals.				
E. Authorize equipment repairs.				
F. Calculate cleaning and production rates.	■			
G. Compile technical and statistical data and prepare comprehensive written reports.				
H. Comply with all health and safety procedures and protocols.				
I. Conduct safety inspections.				
J. Configure traffic plans and set up signs for traffic control.				
K. Coordinate wastewater program activities with other divisions and outside agencies, contractors, and developers.				
L. Determine work schedules for closed circuit television (CCTV) crews.				
M. Determine location of underground utilities (e.g., combined sewers, cross connections, force mains, inlets, laterals, manholes, outfalls, sanitary sewers, laterals).				
N. Determine shift schedules and assign work crews to ensure continuity of operation.	■			
O. Develop operating and capital budgets.				



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P. Develop preventive maintenance procedures.				
Q. Develop safety procedures.				
R. Develop training programs (e.g., start-up and testing, standard operating procedures, and technical documentation for operations).				
S. Comply with safety standards and safety programs.				
T. Ensure compliance of discharge limits are in accordance with all applicable local, state and federal regulations.				
U. Establish wastewater policies, procedures, and guidelines.				
V. Assess training needs to upgrade operational skills.				
W. Implement a QA/QC program to ensure that products and services received meet contractual requirements.				
X. Inspect and analyze system logs records, gauges, meters, and other testing and measuring devices.				
Y. Investigate various customer issues (e.g., sewer backup and/or odor complaints).				
Z. Maintain knowledge of regulatory permit requirements.				
AA. Maintain effective working relationships with city officials, employees, public, and outside agencies.				
BB. Manage employee certification programs.				
CC. Maintain knowledge of cost accounting and budget procedures and practices.				
DD. Maintain records and file reports (e.g., internal or regulatory requirements).				
EE. Maintain knowledge of current regulatory requirements.				
FF. Monitor status of customer work orders and assure customer responsiveness.				
GG. Monitor work and job site condition to ensure protection of workers, public pedestrian and vehicular traffic.				
HH. Perform the following administrative activities:				
1. safety/security evaluation and compliance.				
2. budget development.				
3. capital improvement plan development.				
4. operation and maintenance plan development.				
5. employee supervision and performance evaluations.				
6. employee hiring.				
7. planning and organization of work activities.				
8. record keeping and evaluation of data.				
9. responses to public complaints.				
10. report writing (e.g., federal, internal, state).				



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II. Perform the following safety procedures:				
1. calibration of atmospheric testing devices.				
2. chemical spill responses.				
3. confined space entry.				
4. electrical grounding, hazards and arc flash.				
5. fires (e.g., prevention, fire extinguishers).				
6. first aid.				
7. hazardous materials.				
8. infectious diseases/blood borne pathogen protection.				
9. lifting.				
10. lockout/tagout.				
11. personal protection equipment (e.g., respiratory protection, safety glasses, gloves, hardhats, fall protection).				
12. shoring, trenching, and excavation.				
13. traffic control/work zone safety.				
JJ. Plan for the execution of the following emergency plans:				
1. sewer overflow.				
2. disasters.				
3. manhole hazards.				
4. system failure.				
5. inter-agency assistance.				
KK. Perform facility safety audits.				
LL. Prepare bid specifications.				
MM. Purchase replacement equipment.				
NN. Review/update employment policies and procedures.				
OO. Review employee reports regarding customer back up in home.				
PP. Train new operators.				
QQ. Review easement and right-of-way issues/problems.				