

# DACUM Research Chart for Wastewater Class 1 Operator

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Duties		← Tasks →				
<b>A</b>	<b>Conduct Routine Sampling &amp; Monitoring</b>	A-1 Check flow readings (e.g., influent, effluent)	A-2 Collect samples for contract testing	A-3 Record effluent color, odor, & turbidity	A-4 Perform effluent total chlorine analysis	A-5 Perform influent/effluent temperature analysis
		A-12 Perform effluent fecal coliform analysis <sup>1</sup>	A-13 Perform volatile solids analysis <sup>1</sup>	A-14 Perform suspended solids analysis (e.g., MLSS, RASSS) <sup>1</sup>		
<b>B</b>	<b>Manage Process Control</b>	B-1 Conduct plant walk-through	B-2 Perform alkalinity test	B-3 Conduct centrifuge spin (e.g., ML, RAS)	B-4 Perform mixed liquor/clarifier ammonia test	B-5 Measure sludge blanket
		B-13 Check aeration tank pH	B-14 Check aeration tank temperature	B-15 Adjust chemical feed rate	B-16 Manage wet weather events	
<b>C</b>	<b>Perform Plant Maintenance (Routine/Preventative)</b>	C-1 Lubricate blowers	C-2 Lubricate pumps	C-3 Lubricate electric motors	C-4 Lubricate rotor bearings (e.g., RBC, oxidation ditch brushes)	
		C-12 Clean chemical feeder pumps	C-13 Refill chemicals	C-14 Scrape clarifier hopper	C-15 Clean clarifier weir	C-16 Check skimmer operation
		C-24 Perform standardization of chemical reagents	C-25 Maintain grit tanks	C-26 Pump trash traps	C-27 Pump grease traps	C-28 Clean scum chamber
<b>D</b>	<b>Perform Collection System Maintenance (Routine/Preventative)</b>	D-1 Check collection system lift stations	D-2 Exercise collection system generators	D-3 Lubricate compressor in collection system lift station	D-4 Lubricate lift station motors	D-5 Check collection system lift station belts
		D-12 Schedule jet cleaning of collection system	D-13 Perform camera inspection of collection system	D-14 Conduct smoke testing of collection system		D-15 Conduct dye testing of collection system
<b>E</b>	<b>Maintain Safe Work Environment<sup>4</sup></b>	E-1 Develop contingency plan	E-2 Maintain hazardous materials plan (e.g., SARA, CERCLA)	E-3 Catalog MSDS information (e.g., chemicals, hazardous materials)	E-4 Maintain safety signage	E-5 Provide personal protective equipment
		E-13 Prevent slip, trip, & fall hazards				

<sup>1</sup> May be performed in-house or by an outside/contract lab.

<sup>2</sup> System may have one or the other operated seasonally.

<sup>3</sup> Occurs at both the plant and in the collection system.

<sup>4</sup> Safety is a factor in nearly all job tasks.

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A-6 Perform influent/effluent pH analysis	A-7 Measure effluent dissolved oxygen	A-8 Perform influent/effluent CBOD test <sup>1</sup>	A-9 Perform influent/effluent total suspended solids test <sup>1</sup>	A-10 Perform influent/effluent ammonia test <sup>1</sup>	A-11 Perform influent/effluent phosphorus test <sup>1</sup>	
B-6 Perform 30-minute settleability test	B-7 Measure mixed liquor dissolved oxygen	B-8 Adjust flow equalization	B-9 Perform microscopic evaluation of mixed liquor	B-10 Adjust sludge wasting	B-11 Adjust return rates	B-12 Adjust aeration
C-5 Lubricate clarifier gear box	C-6 Check belts	C-7 Check air filters	C-8 Exercise plant back-up generator(s)	C-9 Maintain comminutor/screening equipment	C-10 Maintain UV disinfection system <sup>2</sup>	C-11 Maintain chlorine/dechlorination system <sup>2</sup>
C-17 Maintain sand filters	C-18 Calibrate colorimeters (e.g., chlorine, ammonia)	C-19 Calibrate pH meters	C-20 Calibrate DO meters	C-21 Calibrate flow meters	C-22 Calibrate scales	C-23 Ensure backflow prevention device testing
C-30 Exercise valves	C-31 Perform grounds maintenance	C-32 Inspect treatment process tanks	C-33 Inspect diffusers in aeration tanks	C-34 Perform equipment maintenance (e.g., construction equipment, vehicle)	C-35 Check motor amperage draw <sup>3</sup>	C-36 Maintain sampling equipment
D-6 Bioaugment fats, oils, & grease	D-7 Address odor control problems	D-8 Maintain collection system level controls (e.g., floats, bubblers, transducers)		D-9 Maintain collection system air release valves	D-10 Exercise valves on force mains	D-11 Inspect manholes
D-16 Complete repairs identified by camera/smoke/dye testing of collection system		D-17 Inspect wet wells & dry wells	D-18 Perform utility locates			
E-6 Maintain eye wash stations	E-7 Maintain fire extinguishers	E-8 Perform lock out/tag out procedures	E-9 Perform confined space safety procedures	E-10 Perform general housekeeping	E-11 Perform trench excavation safety procedures	E-12 Complete incident reports

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Duties		Tasks				
<b>F</b>	<b>Manage Recordkeeping</b>	F-1 Maintain operational logs (e.g., daily, monthly, annual)	F-2 Document maintenance logs (e.g., dates, maintenance performed, personnel)	F-3 Maintain lab bench sheets (e.g., CBOD, TSS)	F-4 Document lab equipment calibration	
		F-11 Perform computer back-ups	F-12 File reports & logs	F-13 Prepare NPDES permit renewal application for Ohio EPA	F-14 Develop an operation & maintenance manual	
<b>G</b>	<b>Manage Biosolids Disposal</b>	G-1 Develop biosolids management plan	G-2 Stabilize biosolids (e.g., pH adjustment, aerobic digestion)	G-3 Perform biosolids analysis	G-4 Dispose of biosolids (e.g., landfill, land apply, haul to POTW)	G-5 Maintain biosolids hauling records
<b>H</b>	<b>Address Emergency Situations</b>	H-1 Coordinate mutual aid agreements	H-2 Respond to auto dialers/alarms	H-3 Notify regulatory agencies of public health issues (e.g., Ohio EPA, local health department, Ohio DNR)	H-4 Repair broken blocked gravity lines	
<b>I</b>	<b>Participate in System Improvements</b>	I-1 Address inflow/infiltration issues	I-2 Plan upgrades to existing infrastructure	I-3 Participate in new construction design process	I-4 Inspect new construction (e.g., mains, lift stations, plant)	
<b>J</b>	<b>Perform Administrative Functions</b>	J-1 Develop facility/collection system budget	J-2 Address customer issues (e.g., backups, odor complaints)	J-3 Administer grants & loans	J-4 Participate in employee selection process	J-5 Maintain personnel timesheets
		J-13 Schedule contract maintenance	J-14 Conduct plant tours	J-15 Prepare expense reimbursement reports	J-16 Purchase operational supplies (e.g., office, lab, chemicals)	
<b>K</b>	<b>Pursue Professional Development Opportunities</b>	K-1 Maintain Class I certification	K-2 Participate in training seminars	K-3 Participate in conferences/trade shows	K-4 Review trade publications	K-5 Maintain resource library

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F-5 Document age of lab reagents	F-6 Maintain chain of custody records	F-7 Prepare MORs for Ohio EPA	F-8 Prepare annual SSO report for Ohio EPA	F-9 Prepare annual CSO report for Ohio EPA	F-10 Maintain correspondence with regulatory agencies (e.g., Ohio EPA, local health department)	
G-6 Prepare annual sludge report for Ohio EPA						
H-5 Repair broken blocked force mains	H-6 Coordinate emergency equipment repairs (e.g., generators, blowers, pumps)					
I-5 Inspect new service connections	I-6 Test new installations (e.g., vacuum, mandrel, pressure)					
J-6 Maintain personnel files	J-7 Counsel employees	J-8 Complete employee performance evaluations	J-9 Train subordinates	J-10 Participate in meetings (e.g., public, department)	J-11 Maintain replacement parts inventory	J-12 Maintain plant security
J-17 Enforce local waste-water rules & regulations						
K-6 Network with Class I operators	K-7 Network with technical assistance unit	K-8 Maintain membership in trade organizations (e.g., OTCO, ORWA, OWEA)		K-9 Pursue additional certifications	K-10 Present professional development topics	

## General Knowledge and Skills

Basic biology  
Basic chemistry  
Grant writing  
Basic hydraulics  
Budgeting  
OSHA safety requirements  
Equipment operation  
Basic math skills  
Problem solving skills  
Multi tasking skills  
Time management skills  
Communication skills  
Mechanical skills  
Driving/navigation skills  
Office skills (filing, recordkeeping)  
Environmental regulations (local, state, federal)

## Tools, Equipment, Supplies and Materials

Backhoe  
Skid loader  
Dump truck  
Lawn mower  
Sewer jetter  
Hand tools  
Trash pump  
Personal protective equipment  
Common cleaning equipment  
Common lab supplies  
Common office supplies  
Scales  
Settleometer  
Core sampler  
Centrifuge  
pH meter  
Chlorine meter  
Ammonia meter  
DO meter  
Dessicator  
Refrigerator  
BOD incubator  
USA Bluebook  
Rain gauge  
Automatic samplers  
Portable flowmeter

Grounds management supplies  
Chemicals  
Valve wrench  
Lubricants  
Muffle furnace  
Lab oven  
Microscope  
Degreasers/deodorizers  
Dye  
Smoke canisters  
Ladders  
Blowers  
Pressure washer  
Deionized water  
Sewer camera  
Logbook  
Operations and maintenance manual  
Reference books  
Portable generators  
Fax machine  
Computer/peripherals  
Internet access  
Chemical pumps  
Marking paint  
Marking flags  
Trade journals

## Worker Behaviors

Ethical  
Integrity  
Committed  
Proactive  
Reactive  
Self-disciplined  
Open-minded  
Willingness to learn  
Self-motivated  
Detail oriented  
Common sense

Decisive  
Sense of humor  
Environmentally conscious  
Cost conscious  
Cooperative  
Creative  
Versatile

## Future Trends and Concerns

Governmental intervention  
Lack of funding for operations, compliance and improvements  
Retirement of qualified operators  
Aging collection system infrastructure  
Growing demand on existing systems  
Public awareness of environmental issues  
Pass-through of pharmaceuticals into streams/waterways  
Future development of rules/regulations at local, state and federal levels  
Facility security concerns

## Acronyms

CSO	Combined Sewer Overflow
SSO	Sanitary Sewer Overflow
RBC	Rotating Biological Contactor
CBOD	Carbonaceous Biochemical Oxygen Demand
DO	Dissolved Oxygen
TSS	Total Suspended Solids
MLSS	Mixed Liquor Suspended Solids
RAS	Return Activated Sludge
WAS	Waste Activated Sludge
RASSS	Return Activated Sludge Suspended Solids
POTW	Publicly Owned Treatment Works
OTCO	Operator Training Committee of Ohio
ORWA	Ohio Rural Water Association
OWEA	Ohio Water Environment Association
ML	Mixed Liquor
DNR	Department of Natural Resources
SARA	Superfund Amendments and Reauthorization Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act