

DRAFT DACUM Research Chart for Class I Water Distribution System Operator

DACUM Panel

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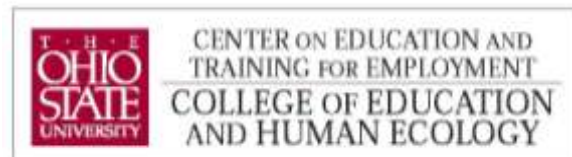
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1900 Kenny Road
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DACUM Research Chart for Class I Distribution Water Supply Operator

Duties		← Tasks →				
A	Perform Water Quality Control & Testing	A-1 Check chlorine residuals	A-2 Collect routine bacteria samples	A-3 Collect nitrate/nitrite samples	A-4 Collect iron samples	A-5 Collect asbestos samples
		A-13 Collect arsenic samples	A-14 Collect TTHM samples	A-15 Collect HAA ₅ samples	A-16 Collect unregulated contaminants samples	A-17 Prepare water samples for outside lab/ internal testing
B	Provide Customer Service	B-1 Read water meters	B-2 Respond to customer emergencies (e.g., no water, broken pipe)	B-3 Check water meter accuracy	B-4 Investigate high/unusual water usage	B-5 Turn off/on household water (e.g., vacation, leaks, non-payment)
C	Respond to Emergency Water Distribution Issues	C-1 Repair water main breaks	C-2 Complete emergency hydrant repairs (e.g., fire, flush)	C-3 Complete emergency main line valve repair	C-4 Troubleshoot booster station malfunctions	C-5 Complete booster station repairs (e.g., power loss, telemetry)
		C-12 Complete emergency service line repairs	C-13 Thaw frozen mains, service lines, hydrants	C-14 Replace frozen meters	C-15 Issue boil alerts (e.g., flyer, radio, newspaper)	C-16 Collect special bacteria samples
D	Perform Administrative Tasks	D-1 Maintain daily records & logs (e.g., distribution, maintenance, chlorine)		D-2 Complete Ohio EPA distribution MOR	D-3 Complete Ohio EPA bacteria MOR	D-4 Complete Ohio EPA TTHM report
		D-11 Complete sample citing plan	D-12 Maintain backflow reports	D-13 Participate in Ohio EPA	D-14 Update distribution mapping plan	D-15 Update maintenance plans (e.g., valves, hydrants)
		D-22 Participate in construction plan review	D-23 Participate in pre-construction meetings	D-24 Track customer complaints	D-25 Distribute shut-off notices	D-26 Calculate unaccounted-for water
E	Perform Preventive Maintenance	E-1 Exercise main line valves	E-2 Flush hydrants (e.g., fire, flush)	E-3 Maintain fire hydrants (e.g., lubricate, inspect, pressure test)	E-4 Perform flow test on fire hydrants	E-5 Paint hydrants (e.g., fire, flush)
		E-12 Perform security checks (e.g., water towers, booster stations)		E-13 Test water system alarms (e.g., water level, power failure)	E-14 Maintain SCADA system	E-15 Maintain cathodic protection system
		E-23 Perform building maintenance (e.g., equipment, booster station buildings)				
F	Repair Non-Emergency Water Distribution Components	F-1 Repair hydrants (e.g. fire and flushing)	F-2 Repair main line valves	F-3 Repair curb valves	F-4 Repair pump motors	F-5 Repair pumps

A-6 Collect lead & copper samples	A-7 Collect inorganic samples	A-8 Collect organic samples	A-9 Collect SOC samples	A-10 Collect VOC samples	A-11 Collect metals samples	A-12 Collect radiological samples
A-18 Flush main lines	A-19 Flush dead end mains	A-20 Monitor water tank turnover	A-21 Maintain backflow prevention program			
B-6 Replace water meters	B-7 Locate water utilities (e.g., main, service, meter)	B-8 Clarify bills for customers	B-9 Instruct customers on installation standards	B-10 Bill customers	B-11 Respond to customer complaints (e.g., color, odor, taste)	B-12 Provide bulk water
C-6 Implement contamination procedures	C-7 Troubleshoot total loss of water pressure issues	C-8 Troubleshoot overflowing water tower	C-9 Troubleshoot loss of raw water supply	C-10 Implement source water protection plan	C-11 Complete emergency curb valve repairs	
C-17 Respond to low chlorine residual	C-18 Coordinate traffic control					
D-5 Complete EPA water HHA5 report	D-6 Complete EPA water total chlorine report	D-7 Complete EPA water lead & copper reports	D-8 Complete EPA abnormal system conditions report (e.g., depressurization, backflow)	D-9 Update emergency contingency plan	D-10 Complete consumer confidence report	
D-16 Update safety program	D-17 Complete reports to local authorities (e.g., council, mayor)	D-18 Schedule calibration of equipment	D-19 Develop annual operating budget	D-20 Reconcile monthly operating budget	D-21 Administer inventory control (e.g., tools, materials, supplies)	
E-6 Winterize fire hydrants	E-7 Perform pump maintenance	E-8 Maintain booster station components (e.g., motors, pumps, heaters)	E-9 Maintain large pits (e.g., meters, valves)	E-10 Maintain emergency generators	E-11 Inspect water storage structures	
E-16 Coordinate water tower painting	E-17 Perform leak detection program	E-18 Coordinate maintenance contractors	E-19 Perform vehicle maintenance	E-20 Perform heavy equipment maintenance	E-21 Perform tool maintenance	E-22 Perform grounds maintenance
F-6 Repair water meters	F-7 Repair main line pipes	F-8 Replace meter pit (e.g., lids, risers, pit)	F-9 Repair valve boxes (e.g., curb, main)	F-10 Replace lead service lines	F-11 Repair service lines	F-12 Replace water system gauges

Duties		Tasks				
F	Repair Non-Emergency Water Distribution Components – cont	F-13 Repair water tower components (e.g., screens, ladders, base)		F-14 Repair electrical components (e.g., starters, fuses, circuit breakers)		F-15 Complete job site restoration (e.g., landscaping, paving, concrete)
	G	Install New Water Distribution Components	G-1 Install fire/flush hydrants	G-2 Install water mains	G-3 Install main line valves	G-4 Install service lines
G-6 Install new water meters		G-7 Install corporation stops	G-8 Install meter yokes	G-9 Install meter pits	G-10 Install curb stops/boxes	
G-11 Install sample stations		G-12 Inspect new installations	G-13 Install valve box risers	G-14 Perform new line sampling & testing		
H		Pursue Professional Development Activities	H-1 Participate in operator certification training	H-2 Obtain Class I Distribution System certification	H-3 Obtain professional memberships (e.g., AWWA, ORWA)	
	H-5 Participate in regional/state meetings	H-6 Participate in vendor training	H-7 Review professional publications	H-8 Participate in internal training	H-9 Participate in supportive training (e.g., plumbing, software, electrical)	
	H-10 Maintain contact hour records	H-11 Pursue higher level certification				

Acronyms

AWWA	American Water Works Association
CCR	Consumer Confidence Report
EPA	Environmental Protection Agency
PPE	Personal Protective Equipment
SCADA	System Control and Data Acquisition
SOC	Synthetic Organic Compound
VOC	Volatile Organic Compound
ORWA	Ohio Rural Water Association
OUPS	Ohio Utility Protection Service
OSHA	Occupational Safety and Health Administration
TTHM	Total Trihalomethane
HAA5	Halo Acetic Acid

General Knowledge and Skills

Problem solving skills
Troubleshooting skills
Organization skills
Decision making skills
CPR/first aid knowledge
Basic mechanical knowledge
Basic electrical knowledge
Basic plumbing/pipe fitting knowledge
Communication skills (written listening, speaking)
Knowledge of safety standards/OSHA requirements
Knowledge of state & federal EPA laws
Basic budgeting/financial knowledge
Schematic/blueprint/map reading skills

Worker Behaviors

Self motivated
Team oriented
Dependable
Responsible
Detail oriented
Safety oriented
Mechanically inclined
Problem solver
Diplomatic
Ethical
Independent
Pride in work
Common sense

Tools, Equipment, Supplies and Materials

Curb wrench
Hydrant wrench
Valve wrench
Speed wrench
Curb keys
Meter keys
Trash pump
Hydrostatic pump
Cutoff saw
Crimping tools
Basic hand tools
Shovels
Locating instruments
Backhoe
Dump truck
Pipe cleaner
Scraper
Hand tools
Safety signs
Calculator
Tape measure
Pipe tape measure
Pipe cutter
Cutting torch
pH meters
Chlorine meters
Colorimeter
Iron meter
Trash pumps
Digital multimeter
Portable generators
Sample bottles
Flashlights/work lights

Barricades
Air compressor/jackhammer
Differential pressure gauge
Cell phone/radio
Pneumatic tools
Digital camera
Basic office equipment
Utility truck
Mops/brooms/cleaning supplies
TV/VCR
Light bar
Metering pumps
Flow meter
Pressure washer
Hydrant markers
Air monitoring equipment/hazardous gas meter(s)
Trench boxes
Ladders
Water main repair clamps
Pipe probe
Touch meter readers
Computer & Internet
Meter reading equipment
AWWA standards
10-State standards
Ohio Administrative Code (OAC)
Equipment manuals
Operations manual
Commercial driver's license
PPE

Future Trends and Concerns

Shrinking workforce (shortage of licensed operators)
Increasing regulations
Increasing operating costs (fuels, chemicals, insurance)
Increased automation through electronics (meter reading)
Aging infrastructure
Shrinking raw water supplies
Increasing threats of terrorism/security concerns
Increased need to be multi-dimensional
Lack of employee self-motivation

DACUM Research Chart for Class II Water Distribution Operator

DACUM Panel

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1900 Kenny Road
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DACUM Research Chart for Class II Water Distribution Operator

Duties		Tasks				
A	Maintain Water Mains & Valves	A-1 Repair water main breaks	A-2 Install water mains	A-3 Flush water mains	A-4 Refurbish water mains (e.g., pigging, relining)	A-5 Perform leak detection
		A-13 Install main line valves	A-14 Adjust valve boxes (e.g., main line, service)	A-15 Maintain valve pits & vaults	A-16 Abandon old/unused service lines	A-17 Perform site restoration (e.g., lawn, concrete, asphalt)
B	Maintain Water Quality	B-1 Develop sample siting plan	B-2 Perform chlorine residual test	B-3 Collect water samples for total coliform test	B-4 Collect water samples for phosphate test	B-5 Collect water samples for lead & copper test
C	Maintain Fire Hydrants	C-1 Exercise hydrants	C-2 Exercise watch valves	C-3 Repair hydrants	C-4 Repair watch valves	C-5 Perform preventive maintenance on hydrants (e.g., paint, grease, remove chains)
D	Maintain Water Meters	D-1 Read water meters	D-2 Test water meters	D-3 Repair water meters	D-4 Replace water meters	D-5 Install remote reading devices
E	Maintain Pumps & Storage Tanks	E-1 Inspect pumps (e.g., water, chemical feed)	E-2 Perform preventative booster pump maintenance	E-3 Perform preventative chemical feed pump maintenance	E-4 Repair booster pumps	E-5 Repair chemical feed pumps
F	Maintain Distribution Records	F-1 Update backflow records	F-2 Maintain water sample reports	F-3 Prepare water main repair report	F-4 Track unaccounted-for water	F-5 Prepare daily, monthly, & quarterly reports (e.g., pumpage, demand, tank levels)
		F-12 Prepare service orders	F-13 Update inventory records	F-14 Maintain customer service records		
G	Perform Administrative Tasks	G-1 Prepare EPA reports (e.g., lab, MOR, depressurization)	G-2 Prepare employee work schedules	G-3 Assign employee tasks	G-4 Provide employee training (e.g., SOPs, safety, equipment)	
		G-11 Coordinate EPA surveys	G-12 Prepare public notifications (e.g., boil alerts, service interruptions)		G-13 Administer backflow prevention program	G-14 Prepare operations policies & procedures
H	Provide Customer Service	H-1 Provide emergency services (e.g., shut offs, no water)	H-2 Respond to customer concerns (e.g., aesthetics, high usage)	H-3 Distribute public notifications (e.g., boil alert, service interruptions)		H-4 Locate water utilities
I	Maintain Professional Development	I-1 Inspect equipment & tools	I-2 Perform preventative maintenance	I-3 Perform minor equipment repairs	I-4 Report unsafe equipment & tools	I-5 Clean equipment & tools

A-6 Repair service lines	A-7 Install service lines & taps	A-8 Locate appurtenances (e.g., valves, curb boxes, service lines)	A-9 Inspect water line installations	A-10 Inspect service line installations	A-11 Exercise main line valves	A-12 Repair main line valves
B-6 Collect water samples for TTHM	B-7 Collect water samples for HAA5	B-8 Calculate chemical dosages	B-9 Monitor residence times	B-10 Minimize detention times	B-11 Flush dead ends	
C-6 Conduct hydrant flow tests	C-7 Conduct hydrant pressure test	C-8 Replace hydrants	C-9 Install watch valves	C-10 Relocate hydrants	C-11 Locate watch valves & hydrants	C-12 Adjust hydrants (e.g., raise, lower)
D-6 Install water meters	D-7 Maintain water meter vaults/pits	D-8 Install deduct meters				
E-6 Replace booster pumps	E-7 Replace chemical feed pumps	E-8 Maintain pump facility (e.g., chemical, booster)	E-9 Inspect storage tanks	E-10 Perform minor storage tank repairs (e.g., spot paint, change lights)	E-11 Maintain grounds (e.g., mow, weed control, trimming)	
F-6 Update distribution system map (e.g., main line breaks, new installations, appurtenances)		F-7 Update hydrant flushing records	F-8 Prepare hydrant status report	F-9 Update valve operating records	F-10 File construction records & drawings	F-11 File inspection records & reports
G-5 Assist with Human Resource functions (e.g., hiring, grievances, evaluation)		G-6 Participate in meetings (e.g., staff, council)	G-7 Develop budgets (e.g., operating, capital)	G-8 Review plans & contracts	G-9 Develop Consumer Confidence Report (CCR)	G-10 Perform safety inspections (e.g., OSHA, PERRP)
G-15 Write specifications for materials & equipment	G-16 Maintain materials inventory	G-17 Track operational efficiencies	G-18 Administer disinfection by-products rule	G-19 Process correspondence (e.g., e-mails, snail mail)	G-20 Maintain databases	G-21 Update contingency plan
H-5 Distribute Consumer Confidence Report (CCR)	H-6 Provide inspection services	H-7 Turn on/off water service	H-8 Investigate unusual water usage rates	H-9 Perform service line leak detection	H-10 Coordinate with other government departments (e.g., police, fire, parks)	
I-6 Store equipment & tools	I-7 Update equipment maintenance logs	I-8 Perform software updates				

DACUM Research Chart for Class II Water Distribution Operator

Duties		Tasks			
J Continue Professional Development	J-1 Obtain contact hours	J-2 Pursue higher education	J-3 Network with peers	J-4 Participate in conferences & trade shows	J-5 Participate in safety education training
	J-6 Participate in professional organizations (e.g., AWWA, ORWA, APWA)		J-7 Participate in cross training	J-8 Research professional literature	J-9 Pursue career advancement

General Knowledge and Skills

Business conduct/ethics
 Basic computer skills
 First aid
 Multitasking skills
 Basic plumbing
 Heavy equipment operation
 Basic budgeting
 Leadership skills
 Project management skills
 Meter reading skills
 Hydraulics and pneumatics
 Public relations skills
 Hydrant operations
 Time management skills
 Basic math
 Hydrology

Documentation skills
 Organizational skills
 Read schematics and blueprints
 Basic electrical knowledge
 Troubleshooting skills
 EPA regulations
 Hazardous materials handling
 Equipment maintenance
 Basic water chemistry
 Best management practices
 Communication skills (written, verbal, listening)
 Cardiopulmonary Resuscitation (CPR)
 Fluid dynamics
 Safety regulations

Worker Behaviors

Detail oriented
 Creative
 Resourceful
 Assertive
 Observant
 Flexible
 Versatile
 Dedicated
 Safety oriented
 Self Starter
 Problem solver
 Responsive
 Responsible
 Trustworthy

Motivated
 Dependable
 Team oriented
 Change oriented
 Thick skinned
 Calm under pressure
 Adaptable
 Self-disciplined
 Supportive
 Determined
 Decisive
 Confident
 Common sense
 Mechanically inclined

Future Trends and Concerns

Shrinking labor pools
 Increased complexity of equipment
 Increasing regulatory environment
 Increased automation (SCADA, GIS, GPS)
 Increasing environmental concerns
 Increasing operating costs
 Increasing energy demands
 New material technology
 Growing Homeland Security requirements
 Increasing paperwork and documentation concerns
 Shrinking budgets
 Inferior materials
 Availability of adequate supplies of potable water
 Meeting increased demand

Acronyms

APWA American Public Works Association
 AWWA American Water Works Association
 CCR Consumer Confidence Report
 GIS Geographic Information System
 GPS Global Positioning Satellite
 HAA5 Haloacetic Acid
 MOR Monthly Operating Report
 ORWA Ohio Rural Water Association
 PERRP Public Employees Rule Reduction Program
 OSHA Occupational Safety Health Administration
 SCADA Supervisory Control and Data Acquisition
 TTHM Total trihalomethanes

Class II Water Distribution Operator

Tools, Equipment, Supplies and Materials

Basic hand tools	Gas detector	Meter reading devices
Skid loader	Spoon	Hoses
Basic garden tools	Tripod & harness	Digital camera
Power tools	Fall protection equipment	Cell phone
Hydrant wrench	Pressure washer	Asphalt roller
Valve key	Portable trash pump	Compactors
Backhoe	Testing equipment	SCADA equipment
Metal detector	Strobe lights	Line locators
Pipe cutter	2-way radio	Leak detectors
Air compressor	Generator	Dump truck
Boring machine	Personal protective equipment	Vacuum truck
Arrow board	Computer/related peripherals	Jackhammer
Pressure gauge	Tap machine	Transit
Trench Box	Partner saw	Pneumatic tools
Water line fittings	Cutting torch	Calculator
Laser level	Portable lights	Pilot tube
Emergency lights	Water sampling equipment	Water pressure gauge
Traffic control devices		Traffic cones
Ladders		