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Received 02/28/2024 by SP/Vanc	Teri Gardner 2-28-24
L&I Apprenticeship Consultant	L&I Admin

Department of Labor and Industries
Apprenticeship Section
PO Box 44530
Olympia WA 98504-4530

Request for Revision of Standards

TO: Washington State Apprenticeship & Training Council

FROM: **Clark County P.U.D. No. 1 Apprenticeship Committee #163**

Please update our Standards of Apprenticeship to reflect the following changes:

- Additions shall be underlined (underlined).
- Deletions shall be struck through (~~struck through~~).
- See attached.

Form must be signed by Committee Chair *and* Secretary *or* Program's Authorized Signer

☒ Chair ☐ Authorized Signer	Date 2/28/2024	☒ Secretary	Date 2/28/2024
Print Name: Larry Jones		Print Name: Brian Roden	
Signature:		Signature:	

Approved By: **Washington State Apprenticeship & Training Council**
Signature of Secretary of the WSATC:
Date:

Attach additional sheets if necessary

Occupational Objective(s):	SOC#	Term [WAC 296-05-015]
LINEMAN	**49-9051.00**	**6000 HOURS**
METERMAN	**49-9012.00**	**6000 HOURS**
SYSTEM OPERATOR	**51-8012.00**	**6000 HOURS**
WATER SYSTEM OPERATOR	**51-8031.00**	**7000 HOURS**

IV. TERM OF APPRENTICESHIP:

Not less than three (3) years or 6000 hours of reasonable continuous employment for Lineman, Meterman and System Operator occupations.

Not less than (3.5) years or 7000 hours of reasonable continuous employment for Water System Operator occupation

VI. RATIO OF APPRENTICES TO JOURNEY LEVEL WORKERS

E.

2. **Meterman: There shall be not more than one (1) Meterman apprentice to ~~everyone~~ one (1) journey-level Meterman throughout the sponsor's work force.**

3. **System Operator: there shall be not more than one (1) System Operator apprentice for every (3) journey-level System Operators throughout the sponsor's work force.**

4. **Water System Operator: There shall be not more than one (1) Water System Operator apprentice to one (1) journey-level Water System Operator throughout the sponsor's work force.**

VII. APPRENTICE WAGES AND WAGE PROGRESSION:

C. Wage Progression Schedules:

4. **Water System Operator apprentices shall be paid not less than the following wage scale:**

Step	Number of hours/months	Percentage of journey-level rate
1	0000 - 2000 hours or 0 - 12 months	77%
2	2001 - 3000 hours or 13 - 18 months	82%
3	3001 - 4000 hours or 19 - 24 months	84.5%
4	4001 - 5000 hours or 25 - 30 months	89.5%
5	5001 - 6000 hours or 31 - 36 months	94.5%
6	6001 - 7000 hours or 37 - 42 months	98.5%

VIII. WORK PROCESSES:

D. Water System Operator — APPROXIMATE HOURS

1. Tools, Equipment and Work Place Safety.....1000
   Become familiar with tools, pipe and other materials used on the job. Exhibit proper use of personal protective equipment. Apply safety procedures for confined space entry, fall arrest, vault rescue, tower rescue, first aid, trenching & shoring, chlorine, fire and electrical. Demonstrate general plant safety and security protocols. Plan and set up work areas for safety of crew and the public. Apply flagger certification training in traffic control zones. Perform all work in conformance with OSHA regulations.

2. Logistics, Reports and Administration.....500
   Complete all necessary paperwork and forms, such as work orders, service orders expense reimbursements, time cards and work summary reports. Properly document necessary maintenance and repairs of vehicles, tools, and machinery. Use computer programs such as outlook, shared drives, and web page applications. Order equipment and supplies as instructed.

3. Vehicle/Equipment Operation 1000
   Perform pre-trip inspections. Ensure that vehicles and equipment are adequately stocked, fueled, and ready to work. Knowledge of the operation and evaluation of vehicles and equipment considering seasonal changes. Ability to safely drive and operate a combination vehicle (truck and trailer). Drive and operate a commercial vehicle such as a dump truck and vacuum truck. Ability to set up and operate public utility equipment for the operation and maintenance of water systems.

4. Distribution System Operations & Maintenance 2000
   Assist with the installation, maintenance and repair of the distribution system components. Assist with repairs to service lines, mainlines, meters, and fire hydrants. Perform installation of water meters, service lines, water mains, fire hydrants, and other water distribution related equipment. Perform leak detection and understand water loss control. Perform flushing for water quality and system operation. Develop a working knowledge of the application of chlorine, disinfection and neutralization. Ability to read water meters, perform testing & identify proper sizing. Understand and implement customer metering and billing procedures. Demonstrate ability to read and interpret maps and drawings of the water system. Application and inspection of utility/construction standards and details.

5. **Treatment System Operations & Maintenance 1500**
Develop a working knowledge of preventive maintenance, troubleshooting & repair of mechanical equipment and hydraulics. Develop a working knowledge of water system pumps and motors. Develop a working knowledge of the operation, methods and procedures of water treatment systems. Safely handle drinking water chemicals such as sodium hypochlorite, permanganate, phosphoric acid, and ferric chloride. Demonstrate the ability to operate, maintain and troubleshoot chemical feed pumps. Develop a working knowledge of water filtration and the processes involved in removing groundwater contaminants.

6. **Quality Control 500**
Perform all aspects of sampling, monitoring and testing required to maintain compliance with federal, state and local regulations. Perform field tests to verify process performance. Complete paperwork such as chain of custody forms for compliance sampling. Basic understanding of laboratory analysis reports and the ability to identify normal/out-of-range values. Maintain open communication & report results to supervisors. Recognize, report, and respond within established emergency response procedures

7. **Basic Electrical & Supervisory, Control, and Data Acquisition (SCADA) ...500**
Demonstrate ability to identify and communicate electrical issues to electricians. Be able to physically and safely access equipment displays, resets, programmable logic controllers (PLC), circuit breakers, fuses, and power supply controllers. The ability to deploy and connect portable generators for back-up power. Troubleshoot and operate water system components remotely through SCADA. Identify abnormal conditions and troubleshoot alarms. Make adjustments to settings and equipment to keep water system components operating correctly, effectively, and efficiently.

TOTAL HOURS: (3.5 Years) 7000

IX. RELATED/SUPPLEMENTAL INSTRUCTION:

A. The methods of related/supplemental training must be indicated below (check those that apply):

(X) Sponsor approved online or distance learning courses (specify) **Courses provided by Northwest Line Construction Industry JATC #487, SOS University/ North American Electric Reliability Corporation (NERC) On-line courses. Green River College**

(X) Sponsor Provided (lab/classroom)

X. ADMINISTRATIVE/DISCIPLINARY PROCEDURES:

A. Administrative Procedures:

3. Sponsor Procedures:

h. The Water System Operator Apprentice must pass the Washington Department of Health Level 2 Water Distribution Manager and the Level 2 Water Treatment Operator exam prior to being advanced to journey-level Water System Operator.

~~h.~~ i. The committee will certify to the Registration Agency and request completion certificates for all that complete the program satisfactorily.

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Department of Labor and Industries
Apprenticeship Section
PO Box 44530
Olympia WA 98504-4530

Journey Level Wage Rate

From which apprentices' wage rates are computed

TO: Washington State Apprenticeship & Training Council

FROM: Clark County P.U.D. No. 1 Apprenticeship Committee #163

Occupation:	County(ies):	Journey Level Wage Rate:	Effective Date:
Water System Operator	Clark County	$ 48.29	3/1/2023
		$	
		$	
		$	

Sponsors must submit the journey-level wage at least annually or whenever changed to the Department.

Form must be signed by Committee Chair *and* Secretary *or* Program's Authorized Signer

☐ Chair ☒ Authorized Signer	Date	☒ Secretary	Date 12/6/2023
Print Name:		Print Name: Brian Roden	
Signature:		Signature: Brian Roden	

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Rec 02/26/2024 by SP/Vanc	Teri Gardner Rec'd 2-28-24
L&I Apprenticeship Consultant	L&I Admin

Department of Labor and Industries
Apprenticeship Section
PO Box 44530
Olympia WA 98504-4530

Apprenticeship Related/Supplemental Instruction (RSI) Plan Review

Program Name Clark County P.U.D. No. 1 Apprenticeship Committee #163	
Occupation Water System Operator	
Term/OJT Hours 7000	Total RSI Hours 536
Training Provider Clark County P.U.D. No. 1 Apprenticeship Committee	

By the signature placed below, the **program sponsor** agrees to provide the prescribed RSI for each registered apprentice and assures that:

1. The RSI content and delivery method is and remains reasonably consistent with the latest occupational practices, improvements, and technical advances.
2. The RSI is coordinated with the on-the-job work experience.
3. The RSI is provided in safe and healthful work practices in compliances with WISHA and applicable federal and state regulations.
4. The RSI Plan is maintained, updated and submitted to the Department a minimum of once every 5 years (WSATC Policy 2015-01; rev, 10-21-21).
5. The RSI will be conducted by instructors who meet the qualification of the "competent instructor" as described in WAC 296-05-003:
    a. Has demonstrated a satisfactory employment performance in her/her occupation for a minimum of three years beyond the customary learning period for that occupation; and
    b. Meets the State Board for Community and Technical Colleges requirements for a professional technical instructor (see WAC 131-16-080 through -094), or be a subject matter expert, which is an individual, such as a journey worker, who is recognized within the industry as having expertise in a specific occupation; and
    c. Has training in teaching techniques and adult learning styles, which may occur before or within one year after the apprenticeship instructor has started to provide the related technical instruction.
6. If using alternative forms of instruction, such as correspondence, electronic media, or other self-study, instruction shall be clearly defined.

Signatures on next page

Form must be signed by Committee Chair *and* Secretary *or* Program's Authorized Signer

☒ Chair ☐ Authorized Signer	Date 1/23/2024	☒ Secretary	Date 1/23/2024
Print Name: Larry Jones		Print Name: Brian Roden	
Signature:		Signature: Brian Roden	

Training Provider Signature

Approved By (Print Name): Larry Jones	Title: Chair
Signature of the Training Provider:	
Date: 1/23/2024	

If additional training providers are needed, go to page 4.

SBCTC

Print Name:	Title:
Signature of the Program Administrator:	
Date:	
☐ SBCTC recommends approval	☐ SBCTC recommends return to sponsor

Program Name	Occupational Objective
Clark County P.U.D. No. 1 Apprenticeship Committee #163	Water System Operator

Note: The description of each element must be in sufficient detail to provide adequate information for review by the SBCTC and Review Committee. To add more elements, click on the plus sign that appears below the "Description of Element/Course" field.

Describe minimum hours of study per year in terms of (check one):

☒ 12-month period from date of registration.
☐ Defined 12-month school year.
☐ 2,000 hours of on-the-job training.

Element/Course: Fundamentals of Computers Year 1	Planned Hours: 55
Mode of Instruction (check all that apply) ☐ Classroom ☐ Lab ☒ Online ☐ Self-Study Provided by: Green River Community College	
Description of element/course: **Fundamentals of Computers** – Introduction of computers for home and business applications. Course content includes history, terminology, word processing, spreadsheets, databases, presentations, desktop information management, and (OLE) Object Linking and Embedding. Covers an overview of the Internet. Also provides a foundation for all Business Division computer courses. • Discuss the history of computers. • Identify the components of a computer system and explain their use. • Distinguish between software and hardware. • Make an informed decision in selecting hardware and software. • Identify ethical issues which involve computer usage. • Produce printed documents using word processing software. • Use spreadsheet software to construct simple worksheets and graphs. • Set up a small database using data management software. • Create a PowerPoint presentation. • Integrate Microsoft Office 365 software applications. • Access information from the Internet.	

Element/Course: Utility Worker Safety Year 1	Planned Hours: 33
Mode of Instruction (check all that apply) ☐ Classroom ☐ Lab ☒ Online ☐ Self-Study Provided by: Green River Community College	
Description of element/course: **Utility Worker Safety** - Examines safety concerns for water utilities including confined space entry, underground utility location, excavation safety, fire safety, electrical safety, hazardous energy control (lock out/tag out), machine guarding, and the chemical hazard communication standard. Personal protection topics includes back safety, safe stairway/ladder use, personal fall protection, blood borne pathogen awareness, respiratory, eye, hand, head, hearing, and foot protection. Reviews regulations and standards relating to these topics. • Understand the significance of a safety compliance program. • Identify opportunities to mitigate occupational health and safety risks. • Implement a confined space program. • Perform underground utility locating, marking, and notification. • Demonstrate ability to implement cave-in protection program.	

- Implement traffic control during system maintenance, repairs, and construction.
- Ability to practice lock out/tag out procedures.
- Describe the elements of fall protection.
- Inspect treatment plant safety equipment (e.g., fire extinguishers, AED, and gas detectors.
- Interpret safety data sheets.

Element/Course: Drawings and Manuals Year 1	Planned Hours: 33

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Drawings and Manuals - Includes interpretation of maps, drawings, and operation and maintenance manuals as these activities relate to the water technology field.

- Describe and apply the principles of the Federal System of Rectangular Surveys to real-world situations.
- Identify examples of maps and drawings commonly used in the water and wastewater technology field.
- Interpret standardized symbols and terminology used on maps and drawings used in the water technology field.
- Apply information contained in maps and drawings to real-world situations.
- Access information in typical operation and maintenance manuals utilized in the water technology field.
- Implement revisions to maintain an up-to-date map of the distribution systems.

Element/Course: Fall Protection Year 1	Planned Hours: 3

Mode of Instruction (check all that apply)
☒ Classroom ☐ Lab ☐ Online ☐ Self-Study
Provided by: Clark County P.U.D. No. 1 Apprenticeship Committee

Description of element/course:
Fall Protection

This class takes the student through the components of proper fall protection equipment and when these procedures are required and should be used. Discussions of strength and structural integrity for walking and working surfaces, guardrail height requirements, as well as new WISHA regulations on fall restraints and fall arrest, are integral to this course. Also included are WAC 296-155-245 requirements as well as ladder safety and how to meet WAC 296-155-480 regulations.

Element/Course: Water Tower Climbing and Rescue Year 1	Planned Hours: 6

Mode of Instruction (check all that apply)
☒ Classroom ☐ Lab ☐ Online ☐ Self-Study
Provided by: Clark County P.U.D. No. 1 Apprenticeship Committee

Description of element/course:
Water Tower Climbing and Rescue

Safely, climb, anchor and inspect water storage tanks. Facilitate hurt man rescue from a water storage tank.

Element/Course: Hazard Communication Year 1	Planned Hours: 4

Mode of Instruction (check all that apply)
☒ Classroom ☐ Lab ☐ Online ☐ Self-Study
Provided by: Clark County P.U.D. No. 1 Apprenticeship Committee

Description of element/course:
Hazard Communication

Ensure chemical safety in the workplace, information about the identities and hazards of the chemicals must be available and understandable to workers. OSHA's Hazard Communication Standard (HCS) requires the development and dissemination of such information:

Chemical manufacturers and importers are required to evaluate the hazards of the chemicals they produce or import, and prepare labels and safety data sheets to convey the hazard information to their downstream customers;

All employers with hazardous chemicals in their workplaces must have labels and safety data sheets for their exposed workers, and train them to handle the chemicals appropriately.

Element/Course: Confined Space Entry- Initial Year 1	Planned Hours: 5

Mode of Instruction (check all that apply)
☒ Classroom ☐ Lab ☐ Online ☐ Self-Study
Provided by: Clark County P.U.D. No. 1 Apprenticeship Committee

Description of element/course:
Confined Space Entry - Initial

This class covers atmospheric testing, ignitable and explosive hazards that can arise in confined spaces, as well as respiratory equipment, instrumentation and testing that is required by WISHA. This class will also cover entry supervisor, authorized attendant, and authorized entrant requirements. You will learn emergency preparedness and response.

Element/Course: Trenching, Shoring and Managing Excavation Hazards Year 1	Planned Hours: 6

Mode of Instruction (check all that apply)
☒ Classroom ☐ Lab ☐ Online ☐ Self-Study
Provided by: Clark County P.U.D. No. 1 Apprenticeship Committee

Description of element/course:
Trenching, Shoring and Managing Excavation Hazards

This course covers the roles and responsibilities of the employer to educate and assign a competent person to excavation sites.

- WA State Excavation Standards
- Excavation Hazards and Control measures
- Soil Analysis techniques and Classification
- Protective System Requirements
- Competent Person Duties
- Emergency Response

Element/Course: Water Distribution Year 1	Planned Hours: 33

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Water Distribution - Covers components of a water distribution system, operation and maintenance procedures for a water distribution system and normal and abnormal conditions in water distribution systems.

- Interpret water distribution system pressure data.
- Assess water system production capacity to meet demand.
- Interpret designs used for water distribution projects.
- Describe the purpose and function of backflow prevention and control devices.
- Implement a cross connection control program.
- Describe maintenance activities related to the following distribution system components.
    1. Mains and related equipment (hydrants and valves)
    2. Metering and related equipment
- Describe the process to Install and repair water lines.
    1. Service lines
    2. Water mains
- Explain the process to inspect and clean finished water storage facilities.
- Implement distribution system flushing.
- Implement a leak detection program (e.g., survey, testing meters, water loss audit).
- Demonstrate the ability to read water meters.

Element/Course: Elementary Algebra Year 2	Planned Hours: 55

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Elementary Algebra - Study of graphing, solving linear equations and inequalities, unit analysis, ratios, rates, proportions, solving systems of equations, Pythagorean Theorem, and applications. Course requires a graphing calculator.

- Solve linear equations, linear inequalities, systems of linear equations, and literal equations.
- Convert between the graph and the equation of a line.
- Use unit analysis to convert measurements.
- Solve ratio, rate, and proportional reasoning problems.
- Apply the Pythagorean Theorem to solve problems.

Element/Course: Introductory Composition Year 2	Planned Hours: 55

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Introductory Composition - Focuses on college-level composition skills (composition and revision processes) and college-level reading analysis. Presents a general review of the rules of English grammar and spelling.

- Express their ideas clearly in writing.
- Organize paragraphs and expository essays.
- Develop greater facility with language.
- Improve their mechanics and usage.

Element/Course: Water Regulations Year 2	Planned Hours: 22

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Water Regulations - Provides an overview of federal and state drinking water regulations including a brief history and the structure of the Safe Drinking Water Act. Reviews current drinking water regulations. Identifies water quality parameters addressed in drinking water regulations. Covers operator certification.

- Explain the public water supply regulations in the U.S.
- Demonstrate knowledge of water quality standards.
- Determine if water quality violations have occurred.
- Demonstrate knowledge of monitoring and reporting requirements.
- Evaluate water quality to determine compliance with regulatory agency standards.
- Implement public notification when reportable MCLs are exceeded.
- Summarize the purpose and requirements of consumer confidence reports.
- Demonstrate knowledge of record keeping function, policies, and requirements.
- Demonstrate knowledge of rules and regulations within the Safe Drinking Water Act
    1. Surface Water Treatment Rule
    2. Lead and Copper Rule
    3. Disinfectants/Disinfection By-Products Rule
    4. Total Coliform Rule
    5. Unregulated contaminants
- Explain the operator certification requirements under the Washington waterworks operator certification program.

Element/Course: Water Laboratory Year 2	Planned Hours: 22

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Water Laboratory - Uses theory, performance, and interpretation of basic water laboratory procedures to assess water quality. Topics include safety, sampling, alkalinity, harness, pH, coliform, jar testing, turbidity, chlorine residual, and advanced water testing procedures.

- Define terms as they apply to basic water laboratory testing.
- Handle and conduct equipment and chemicals safely.
- Identify lab equipment, chemicals, glassware.
- Demonstrate understanding of basic water laboratory practices.
- Perform basic water laboratory testing using equipment to evaluate water quality.
- Perform calculations related to basic water laboratory testing.
- Perform calibrate of laboratory instrumentation to ensure proper operation.
- Collect water samples according to standardized methods.
- Perform sample preservation and documentation for laboratory samples.
- Perform lab tests, record results, and interpret data.

Element/Course: Rigging & Signaling for Cranes Year 2	Planned Hours: 8
Mode of Instruction (check all that apply) ☒ Classroom ☐ Lab ☐ Online ☐ Self-Study Provided by: Clark County P.U.D. No. 1 Apprenticeship Committee	
Description of element/course: **Rigging & Signaling for Cranes** Program is designed to assist employer in meeting the regulatory requirements for the training and qualification of employees. Course includes classroom instruction, knowledge checks, practical workshop demonstration checklists for rigging and/or signaling, and student ID cards. This program is NOT for national certifications.	

Element/Course: Telescopic Mobile Crane Year 2	Planned Hours: 18
Mode of Instruction (check all that apply) ☒ Classroom ☐ Lab ☐ Online ☐ Self-Study Provided by: Clark County P.U.D. No. 1 Apprenticeship Committee	
Description of element/course: **Telescopic Mobile Crane** Program is designed to assist employer in meeting the regulatory requirements for the training and qualification of employees. Course includes classroom instruction, knowledge checks, practical workshop demonstration checklists for crane operators, and student ID cards. This program is NOT for national certifications.	

Element/Course: Pumps and Pumping Systems Year 3	Planned Hours: 33
Mode of Instruction (check all that apply) ☐ Classroom ☐ Lab ☒ Online ☐ Self-Study Provided by: Green River Community College	
Description of element/course: **Pumps and Pumping Systems** - Examines pumps and pump piping systems used in water applications. Emphasizes operational theory, application and basic maintenance of centrifugal pumps. • Classify the types of pumps typically found in water and wastewater utilities • Interpret pump system data to evaluate performance of pump stations and related equipment. • Describe the general and mechanical principles related to centrifugal pumping systems. • Implement start-up and shut-down procedures for centrifugal pumping systems. • Identify and schedule general maintenance and repairs on centrifugal pumping systems. • Identify normal and abnormal operating conditions for centrifugal pumping systems.	

Element/Course: Water Sources Year 3	Planned Hours: 11

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Water Sources - Provides basic information related to water sources used for public drinking water systems. Includes water supply hydrology, groundwater sources, surface water sources and water source protection.

- Summarize the aspects of water hydrology that influence water supplies.
- Identify groundwater sources and explain they are developed for use as public water supplies.
- Perform inspections of ground water well sites and report any issues that may affect water quality (e.g., contamination, flooding, well head protection).
- Measure static water level and pumping levels of wells.
- Determine if wells are under the direct influence of surface water (GWI).
- Identify surface water sources and explain how they are developed for use as public water supplies.
- Explain the purpose and elements of water supply source contingency planning.
- Summarize the major categories of water use and the major factors that cause variations in water use in a public water system.
- Summarize the factors involved in supply management and demand management.
- Compare the various legal bases for water rights and the allocation of surface water and groundwater.
- Explain the fundamental principles involved in water source protection.

Element/Course: Water and Wastewater Electrical Year 3	Planned Hours: 33

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Water and Wastewater Electrical - Electrical fundamentals for water applications including atomic theory, energy sources, circuit basics, electromagnetism, inductance, capacitance, power systems, control system component reading, electrical diagrams, electrical measurements, normal operations, and troubleshooting.

- Apply electric circuit basics to real-world situation.
- Apply power system basics to real-world situations.
- Interpret and apply information from control systems.
- Interpret and apply information from electrical diagrams.
- Perform basic electrical system measurements.
- Identify normal electrical system operation.
- Perform preventive and corrective maintenance to electric motors.
- Identify normal operation of motors and instrumentation.
- Apply elementary electrical principles to troubleshooting breakers, relays, and circuits.

Element/Course: Water Hydraulics Year 3	Planned Hours: 33

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Water Hydraulics - Examines the general principles of water hydraulics and how they relate to the operation of water distribution systems, wastewater collection systems, and water and wastewater treatment facilities. Topics include mass, density, displacement, flow, velocity, pressure, Bernoulli's theorem, friction loss, minor head loss, and flow measurement.

- Define terms as they apply to basic water hydraulics.
- Demonstrate understanding of basic water hydraulics concepts.
- Apply basic water hydraulic concepts to practical situations.
- Perform calculations related to basic water hydraulics applications.
- Aid in the design of water distribution system projects.
- Monitor water distribution system pressure.
- Monitor and calibrate flow meters.
- Determine water volume (e.g., tank, main).
- Determine water flow rate (e.g., mains, pumps, service connections).
- Identify flow characteristics (e.g., pipe size, C-factor, head loss).

Element/Course: Disinfection and Chemical Feed Systems Year 3	Planned Hours: 33

Mode of Instruction (check all that apply)
☐ Classroom ☐ Lab ☒ Online ☐ Self-Study
Provided by: Green River Community College

Description of element/course:
Disinfection and Chemical Feed Systems - Covers principles of disinfection and disinfection alternatives. Discusses operation and maintenance of chemical feed systems used in water and wastewater applications including gas chlorinators and solution feed systems. Covers safety procedures for handling chlorine.

- Explain the process objectives of water and wastewater disinfection.
- Recognize the chemical properties of chlorine sources.
- Demonstrate understanding of chlorine reactions with constituents in water and wastewaters.
- Calculate the required disinfection dosage.
- Determine the correct disinfection dosage and contact time to meet disinfection process objectives.
- Demonstrate ability to dilute and mix batches of chemical solutions to desired concentration.
- Demonstrate the ability to operate and maintain chlorine gas system equipment (e.g., cylinders and connections).
- Evaluate the operation of chemical feed equipment at chlorine gas facilities.
- Identify the major components of gas chlorinators.
- Perform routine maintenance on hypochlorite solution system disinfection equipment.
- Understand the principles of chlorine safety
- Schedule chlorine deliveries to maintain an adequate supply of the disinfection chemicals
- Describe the process to accept chemical shipments
- Implement proper handling and storage of disinfection chemicals (e.g., chain cylinders, lock the facility).
- Inspect, operate, and maintain UV and ozone disinfection equipment.

Element/Course: Water Treatment Plant Operator Level 2 Certification Exam Review Year 3	Planned Hours: 14
Mode of Instruction (check all that apply) ☒ Classroom ☐ Lab ☐ Online ☐ Self-Study Provided by: Green River Community College	
Description of element/course: **Water Treatment Plant Operator Level 2 Certification Exam Review** - Public Water Systems are required to have employees certified as WTPOs for the operation of their treatment processes. This interactive exam-preparation workshop prepares employees of Public Water Systems to operate the treatment processes in a manner that ensures the quality of water provided at the service connection meets drinking water quality standards in compliance with federal and state drinking water regulations. Description of element/course.	

Element/Course: Water Distribution Manager Level 2 Certification Exam Review Year 3	Planned Hours: 21
Mode of Instruction (check all that apply) ☒ Classroom ☐ Lab ☐ Online ☐ Self-Study Provided by: Green River Community College	
Description of element/course: **Water Distribution Manager Level 2 Certification Exam Review** This workshop, based on the ABC Need-To-Know Criteria, provides students with a review of the processes needed to help ensure that operators have the knowledge to adequately operate, maintain and manage the public water system. Attendees will review topics relevant to Water Distribution Manager level I and II Operator Certification Exam. During the course, students will practice answering mock exam questions, referenced to all categories of the ABC Need-To-Know criteria. Description of element/course.	

Additional Training Providers (if necessary)

Eric Shea	DocuSigned by: Eric Shea
Print Name Training Provider	Signature of Training Provider
Instructor, Water and Wastewater Technology	Green River College
Title of Training Provider	Organization of Training Provider
Click or tap here to enter text.	
Print Name Training Provider	Signature of Training Provider
Click or tap here to enter text.	Click or tap here to enter text.
Title of Training Provider	Organization of Training Provider
Click or tap here to enter text.	
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Title of Training Provider	Organization of Training Provider
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Title of Training Provider	Organization of Training Provider
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Title of Training Provider	Organization of Training Provider
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Print Name Training Provider	Signature of Training Provider
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Title of Training Provider	Organization of Training Provider
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Title of Training Provider

Organization of Training Provider