Oregon Environmental Services Advisory Committee
Application for Sponsor Distance Education
OESAC CEU Committee

P. O. Box 577 • Canby, OR 97013-0577
Phone: (503)698-6486
Email: info@oesac.org • Web: http://www.oesac.org

Course title: _____DW/WW Treatment series – Operations & Process Control

Instructor(s): _____see individual course description within these course bundle

Location(s): _____ www.ceuplan.com

Date(s): _____anything – 365/7/24

Requested CEUs (1 hour class time = .1 CEU; do not include time for breaks, lunch) – see course description

DW: ___1.10____ WW: ___.50____ O2-I: _____ O2-SP: _____

Has this course been through OESAC review before? XX No ☐ Yes If yes, what was the previous OESAC number _____

Course Format: Online/Internet XX Webinar ☐ CD Rom ☐ Correspondence Course ☐ Video ☐

One time class ☐ Recurring ☐ Recurring Dates: _____ On-going ❑

Was the content of this course designed by qualified subject matter experts?
Yes XX No ☐ - see course description with instructor bio

Is CEU awarded based on beta-testing results? Yes XX No ☐ If no, supply accrediting formula and submit results - see the IACET Instructional Course Design Worksheets

Is the requested course being bundled with like courses? Name each individual course on a separate paper. *(See instructions)* - see attached worksheet for each course listed in this DW/WW Treatment series – Operations & Process Control

Training Objective: _____see IACET Instructional Course Design Worksheet for Learning Outcomes

Target Audience: _____ DW = drinking water, DS – distribution system, and WW - wastewater

Method of Tracking Attendance: ___ on file and supplemental information and details available on administrator site: www.ceuplan.org

Are quizzes or other forms of review and feedback included in this course?
Yes XX No ☐ - each training course within CEU Plan includes quiz of true-false, multiple choice, and fill-in-the-blank, along with final essay question.

If yes, what is the minimum passing score for successful completion of this course? _ 70%

Does this course promote a product or apparatus or offer such to those attending? Yes ☐ No XX

If YES, this must be explained on a separate attachment to this application and disclosed

Course contact name: ____ William Edgar, Program Administrator

Address: _____ Post Office Box 10355

City, State, Zip: _____ Brooksville, FL 34603

Phone: _____ (352) 754-1259 Fax: __ N/A

Email: _____ wwedgar@ceuplan.org

Sponsor: _____ CEU Plan

Address: _____ same as above

City, State, Zip: _____

Contact: _____

Phone: _____ Fax: _____

Email: _____

Enclosed:
Instructor Biography ☐
Course Agenda ☐
Course Timeline ☐
Course Brochure ☐

Check #: _____
Amount enclosed: $_____

Do you want to be listed on the website as an available course? (Contact Sponsor)
Yes XX No ☐

If you want to list newly scheduled classes from an already approved course, you must send the new schedule to OESAC.

CEU ID #	Course Category	Course Number	CEU Hrs.	✓	Oregon - Consolidated - DW/WW Course Title	instructor	Approval Expiration Date
					Submitted in 2025		
					Course Series: # 10043 - 2025 - Quickie Review for Water		
332	DW only		2		Advanced Mathematics for Water Treatment & Distribution Operators	Pugh/Swit	**submitted 10.31.2025**
346	DW only		3		Drinking Water Treatment Process	Pugh	**approved**
347	DW only		1		Reservoir Storage and Direct Filtration Plant Tour	Pugh	
					Course Series: # 10046 -10047 -- World of Chlorine		
361	DW/WW		1		Chlorine - Introduction - streaming version	Edgar	
362	DW/WW		1		Chlorine - Components of - streaming version	Edgar	
363	DW/WW		1		Chlorine - Chlorinators - streaming version	Edgar	
364	DW/WW		1		Chlorine - Procedures - streaming version	Edgar	
365	DW/WW		1		Chlorine - Chlorine Dioxide - streaming version	Edgar	
			1.10 = IACET CEUs				
					submitted 4.22.2025		
338	DW/WW	6470	1		Operator Math Made Easy - overview	Krauth	**submitted 4.22.2025**
339	DW/WW	6470	1		Data & Risk Assessment suggestions for 2024	Hofer	**approved 5.16.2025**
340	DW/WW	6470	1		Plastic Piping System - overview	Edgar	
341	DW/WW	6470	1		Pipeline Maintenance - overview for 2024	Leverette	
342	DW/WW	6470	1		Lab Practices - overview for 2024	Doss	
343	DW/WW	6470	1		Operations - overview for 2024	Legg	
351	WW only	6470	1		Activated Sludge - I -- process and overview series	Edgar	
352	WW only	6470	1		Activated Sludge - II -- process and overview series	Edgar	
353	WW only	6470	1		Activated Sludge - III -- process and overview series	Edgar	
354	WW only	6470	1		Activated Sludge - IV -- process and overview series	Edgar	
355	WW only	6470	1		Activated Sludge - V -- process and overview series	Edgar	

2025 - Quickie Review for Water

Quickie Review for Water Operations – Hot Topics 2025 is a six-hour series, including process review, drinking water rule updates, a water reservoir tour and an advanced math review for water treatment plant operators and distribution systems. This combination of topics was suggested by operators for inclusion in this series. During the production cycle of 2024, our tech team has utilized our AI apps to convert and develop this update to some Classic Courses. The content has been re-created with the latest in voice generation and streaming illustrations. As a bonus, these online continuing education courses are available for unlimited play during your studies. Whether to clarify a concept or to go further into details presented, you are free to re-play any segment of this training as often as you need.

This Hot Topics annual series involves a review of water treatment and distribution tasks, starting with a three-hour review of water treatment processes, various types of filtrations, 2025 updates to various EPA drinking water rules, a tour of the headworks of a reservoir storage and drinking water treatment plant, and an advanced math review of the formulas and calculations required for water operations. The drinking water treatment process segments will enhance your understanding of process types, both your and others, to give a better understanding of how they function. Included in this Quickie Review is a current look at the various USEPA rules related to your drinking water system. Lastly, the revised advanced math course has been converted to AI with visual and audio enhancements, offering a good brush-up on formulas and a great study guide to prep for an exam with computer-based testing. Later in 2025, we will be collecting and tabulating your comments and preferences to develop a forthcoming new topics series.

This package includes the following Courses:

10043 - 2025 - Quickie Review for Water
Advanced Mathematics for Water Treatment & Distribution Operators
Drinking Water Treatment Process
Reservoir Storage and Direct Filtration Plant Tour

Course Series Package includes current and emerging topics in a themed environment of self-paced studies, instructionally designed to reinforce basic and commonsense techniques for day-to-day operational activities, and to encourage the "Need-to-Do" attitude instead of the "wait and see" in preventive maintenance. Some in these series are summaries of overall technical topics covered in greater detail.

Author Full Name: Jeff Pugh

Experience: Jeff is a chemist by profession and has experience in design, construction, operation, and troubleshooting of pilot-to-industrial sized membrane systems including RO membrane softening, ultra-filtration, and microfiltration (mostly in non-traditional applications). He also has experience with other water treatment techniques including ion exchange, sorption and chemical treatment. He specializes in mineral scale formation, inhibition, fouling and performance restoration of membrane systems. He has managed R & D, technical, and analytical laboratories, he lectures and has been published frequently in technical journals.

Title: **Advanced Mathematics for Water Treatment & Distribution Operators**

IACET CEU Calculations - Required to complete this Course: two hours

Course Summary:

Advanced Mathematics for Water Treatment & Distribution Operators is a two-hour Course broken down into six sections of course material with a short quiz following each section. This course provides an unlimited time available during the course studies to repeat any or all of the training sections involved in calculations and formulas used by you on a day to-day basis. Whether you need to calculate the water tank volume, check the calibration of your pressure gauge and pipe lines; this course includes these discussions with some examples and formula exercises ….

This course is designed for water treatment plant operators, distribution system staff, and anyone preparing for an exam, especially a computer-based exam. The course provides some unique opportunities to repeat formula presentations which are confusing or unfamiliar to you. Copies of formula sheets are available to save and practice.

standard beta allows one minute for each question and answer. As this being a mathematical course, the student will be spending additional time in the calculation exercise. The essay requirement listing three things that they have learned from the course with a 10-15 word description of each thing is a non-measured time element of the course; it is not included the beta testing.

Please review the CEU Plan – IACET Instructional Course Design Worksheet which provides further details in the sectional breakdown of the two-hour course and formulas utilized in the training. On the worksheets, you will find a breakdown of the course into six sections followed by the 1st and 2nd tier of beta testing performed, during the course design and production stages. Individual learning outcomes are itemized for each section and includes any special assessments incorporated into the upgrade of this original text base course.

Learning Outcomes:

By the end of this training course, you will have the ability to:

- review basic formulas for converting to measurements
- illustrate the different formulas associated with distance, velocity, and volumes
- explain how to figure the volume in a water tank
- define the procedures for calculating flowrates
- illustrate the effects on a water tank when you calculate more going OUT, than coming IN
- describe linear velocity
- understand the procedure for calculating flow rates within the pipe
- demonstrate the calculations for water pressure in a secondary floor
- calculate contact time for disinfection
- indicate short-circuiting and how to estimate – evaluate the causes
- summarize the chlorine residual validation through calculations
- calculate contact time for disinfection

Course Breakdown:

The following course breakdown illustrates the individual sections:

- Section 1 - Review and Introduction to Formula Balls
- Section 2 –Volume and Flowrates
- Section 3 – Linear Velocity – Overflow Rate - Weir Loading Rates
- Section 4 – Weight of Water and Water Pressure
- Section 5 – Detention Time
- Section 6 – Concentration and Dosage

Learning Outcomes – Assessment Analysis:

- ***Assessment Analysis – Level 3 - CEU Plan Beta Testing*** will be performed in the winter of 2025. At the beginning of 2025, student feedback and comments will be reflected in the final beta testing, along with cumulative average of student tracking and monitoring posted during the July – November 2025 test period.
- The ***Level 1*** and ***Level 2 Beta Testing*** has been completed and complies with the ANSI / IACET 1-2018 Standard, along with the internal review by CEU Plan.

CEU ID #	Course Title	Instructor	CEU Hours
332	Advanced Mathematics for Water Treatment & Distribution Operator	Jeff Pugh	two

CEU Plan – Content & Instructional Course Design Worksheet

Activation - 10.30.2024

CEU Plan # 332 – Advanced Mathematics for Water Treatment and Distribution Operators

Instructor: Pugh / Switzer

amount of course hours: **two**

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content:** 13.17 Minutes **quiz:** 13 minutes **accumulative: 26** minutes	Review and Introduction to Formula Balls	● review basic formulas for converting to measurements ● describe formula ball and how it works ● illustrate the different formulas associated with distance, velocity, and volumes	Streaming Based Online Video Clip and Math exercises illustrating content within this section	**Computer Based Exam** **Contact time is measured to IACET standards and State requirement**	Required text reading of content material and view of streaming clip, via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images View the video clip on	Inform students of the required studies in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 2	**content:** 13.00 Minutes **quiz:** 4 minutes **accumulative: 17** minutes	Volume and Flowrates	● define the procedures for calculating flowrates ● explain how to figure the volume in a water tank ● illustrate the effects on a water tank when you calculate more going OUT, than coming IN	Streaming Based Online Video Clip and Math exercises illustrating content within this section	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3	**content:** 15.42 Minutes **quiz:** 10 minutes **accumulative: 26** Minutes	Linear Velocity Overflow Rate and Weir Loading Rates	● describe linear velocity ● understand the procedure for calculating flow rates within the pipe ● calculate the surface overflow rates of your plant	Streaming Based Online Video Clip and Math exercises illustrating content within this section	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to download worksheet and proceed to the quiz will be indicated. Complete the essay and evaluation form, prior to course being complete.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 4	**content:** 11.59 Minutes **quiz:** 10 minutes **accumulative:** **22** Minutes	Weight of Water and Water Pressure	● indicate the water pressure in your system ….. and ● how to calculate and validate the pressure gauge on your system ● demonstrate the calculations for water pressure in a secondary floor	Streaming Based Online Video Clip and Math exercises illustrating content within this section	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 5	**content:** 15.59 Minutes **quiz:** 11 minutes **accumulative:** **27** Minutes	Detention Time	● describe detention time ● calculate contact time for disinfection ● indicate short-circuiting and how to estimate – evaluate the causes	Streaming Based Online Video Clip and Math exercises illustrating content within this section	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 6 **FOR 2 Hour Courses** Final Course Requirements	**content:** 18.40 Minutes **quiz:** 10 minutes **accumulative:** 29 minutes	Concentration And Dosage	● describe how to determine the correct dosage for disinfection ● illustrate the calculations for mass concentration ● summarize the chlorine residual validation through calculations ● demonstrate the formula and calculations required for your HTH dosage	Streaming Based Online Video Clip and Math exercises illustrating content within this section	**Computer Base - Final Exam** Essay Question - listing objectives that they learned from the course and how they apply to their job and workplace **Final Course Essay and Evaluation form**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section Essay – listing 3 things learned and how they apply to their workplace	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Accumulative Time:

sec 1 =	26		sec 4 =	22					
sec 2 =	17		sec 5 =	27					
sec 3 =	26		sec 6 =	29					

accumulative time total : 147 minutes = two hours = 0.2 CEU

**** standard beta allows one minute for each question and answer. As this being a mathematical course, the student will be spending additional time in the calculation exercise. The essay requirement listing three things that they have learned from the course with a 10-15 word description of each thing is a non-measured time element of the course; it is not included the beta testing.**

Assessment Analysis- Level 3 - CEU Plan Beta Testing will be performed during the winter of 2025. At the beginning of 2025, student feedback and comments will be reflected in the final beta testing results, along with accumulative average of student tracking and monitoring posted during the February - July 2025 test period. The Level 1 and Level 2 Beta Testing have been completed and comply with the ANSI I IACET 1-2023 Standard, along with the internal review by CEU Plan.

Author Full Name: Jeff Pugh

Experience: Jeff is a chemist by profession and has experience in design, construction, operation, and troubleshooting of pilot-to-industrial sized membrane systems including RO membrane softening, ultra-filtration, and microfiltration (mostly in non-traditional applications). He also has experience with other water treatment techniques including ion exchange, sorption and chemical treatment. He specializes in mineral scale formation, inhibition, fouling and performance restoration of membrane systems. He has managed R & D, technical, and analytical laboratories, he lectures frequently and has been published in various technical journals.

Category: Treatment Processes

Course Title: **Drinking Water Treatment Processes**

IACET CEU Calculations - Required to complete this Course: three hours -- video w/text

Course Summary:

Drinking Water Treatment Processes is a three-hour overview of the various water treatment process, with some of facts about each, along with an in-depth review of the current USEPA Rules affecting water treatment. The instructor, Jeff Pugh, has spent many years in research and developmental aspects of water treatment. This course is an update and expansion of the Water Treatment Techniques series, starting off with a view of water resources and supplies, and continuing with a break-out of the treatment processes.

After the review of the treatment processes, we will explore advanced techniques, featuring indications of softening and hardness issues found in our water supplies. The course explains some acronyms used in water treatment and includes discussions of inorganic and organic chemicals found in the raw water.

The remaining portions of the course, sections 7 – 9 deal with an overview of the various USEPA Rules governing the water treatment, to include:

- Arsenic Rule – 40CFR141.23
- Lead and Copper Rule – 40CFR141.86
- Nitrate and Nitrite Rule – 40 CFR 141.11
- Disinfectants and Disinfection By-Products Rule – 40CFR141 Subpart L
- Total Coliform Rule – 40 CFR Part 141 Subpart Y
- Groundwater Rule – 40 CFR Part 141 Subpart S
- Surface Water Treatment Rule – 40 CFR Part 141 Subpart H
- Consumer Confidence Rule – 40 CFR Part 141 Subpart O
- Public Notification Rule– 40 CFR Part 141 Subpart Q

Learning Outcomes:

By the end of this training course, you will have the ability to:

- compare the various water resources & supplies
- explain turbidity measurement
- indicate the use of direct filtration
- list different disinfectants used in water treatment
- understand the chlorine residual requirements and hazards
- provide an overview of the Arsenic Rule (40CFR 141.23)
- detail the requirements of the Lead and Copper Rule (40CFR141 – subpart 1)
- indicate the procedures required in the Nitrate and Nitrite Rule (40CFR141.11)
- examine treatment plant for Disinfection By-Products compliance

Course Breakdown:

The following course breakdown illustrates the individual sections:

- Section 1 - Introduction and Description of Water Resources
- Section 2 – Intake Coagulation - Flocculation - Sedimentation
- Section 3 – Filtration, Post-Treatment and Chemical Addition
- Section 4 - Disinfection
- Section 5 – Advanced Treatment Operations
- Section 6 – Inorganic and Organic Chemicals and Radionuclides Rules
- Section 7 – Arsenic, Lead and Copper, and Nitrates and Nitrites Rules
- Section 8 – Microbial Rules
- Section 9 - Monitoring Rules, Public Notification and Consumer Confidence Report Rules and Summary

Learning Outcomes – Assessment Analysis:

- ***Assessment Analysis – Level 3 - CEU Plan Beta Testing*** will be performed in the winter of 2025. At the beginning of 2025, student feedback and comments will be reflected in the final beta testing, along with cumulative average of student tracking and monitoring posted during the July – November 2025 test period.
- The ***Level 1*** and ***Level 2 Beta Testing*** has been completed and complies with the ANSI / IACET 1-2018 Standard, along with the internal review by CEU Plan.

CEU ID #	Course Title	Instructor	CEU Hours
346	Drinking Water Treatment Processes	Jeff Pugh	three

CEU Plan – Content & Instructional Course Design Worksheet

Preparing for Activation - 08.22.2024

CEU Plan # 346 – Drinking Water Treatment Process

Instructor: Jeff Pugh

amount of course hours**:** **three**

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content:** 15.00 Minutes **quiz:** 10 minutes **accumulative: 25** minutes clips: 0.45 4.48 4.34 4.52	Introduction and Description of Water Resources Water Cycle Hydrologic Cycle Surface Water Groundwater	● compare the various water resources & supplies ● explain surface water supplies ● describe groundwater and aquifer water supplies	Text Based Streaming Based Online Video Clip illustrating content within this section	**Computer Based Exam** **Periodic Table** **pdf attachment for student studies and future reference**	Required text reading of content material and view of streaming clip, via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required studies in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 2	**content:** 11.00 Minutes **quiz:** 10 minutes **accumulative:** **21** minutes clips: Raw Water Coagulation Sedimentation	Treatment Processes Intake Coagulation Flocculation Sedimentation 4.17 3.40 1.50	● understand the sedimentation process ● explain turbidity measurement ● compare the process of coagulation and flocculation	Streaming Based Online **Contact time is measured to IACET standards and State requirement**	**Computer Based Exam** **Periodic Table** **pdf attachment for student studies and future reference**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3	**content:** 16.25 Minutes **quiz:** 10 minutes **accumulative:** Minutes clips: Filtration Chemical Addit Distribution	Treatment Processes Filtration Post-Treatment Chemical Addition 5.28 6.47 4.11	● indicate the use of direct filtration ● describe the post treatment process ● list some of the water hardness elements in your water	Streaming Based Online **Case Study exercise with discussion – midway in the content section**	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to download worksheet and proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 4	**content:** 13.07 Minutes **quiz:** 10 minutes **accumulative:** **23** Minutes	Disinfection	● list different disinfectants used in water treatment ● explain how microorganism is affected by disinfection ● understand the chlorine residual requirements and hazards	Streaming Based Online	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 5	**content:** 16.56 Minutes **quiz:** 10 minutes **accumulative:** **27** Minutes clips: Dissolved Air Lime Softening Membrane Sep Ion Exchange Adsorption	Advanced Treatment Operations 2.25 3.30 3.49 3.25 3.56	●explain the dissolved air flotation ● knowledge of lime softening ● evaluate the dissolved hardness components	Streaming Based Online	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 6	**content:** 13.48 Minutes **quiz:** 10 minutes **accumulative:** 24 minutes clips: Acronyms Chemical Cont.	Inorganic and Organic Chemicals and Radionuclides Rules 4.41 9.07	● define the PWS – CWS – NCWS acronyms used in water treatment ● explain the difference between surface and ground water supplies ● discuss the various chemical contaminants	Streaming Based Online	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 7	**content:** 16.00 Minutes **quiz:** 10 minutes **accumulative:** **26** minutes clips: Lead & Copper Arsenic Nitrate & Nitrite Lead & Copper Arsenic Nitrate & Nitrite	Arsenic, Lead and Copper, and Nitrates and Nitrites Rules 40 CFR 141 – subpart 1 40 CFR 141.23 40 CFR 141.11 8.37 3.59 3.45	● provide an overview of the Arsenic Rule (40CFR 141.23) ● detail the requirements of the Lead and Copper Rule (40CFR141 – subpart 1) ● indicate the procedures required in the Nitrate and Nitrite Rule (40CFR141.11)	Streaming Based Online	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 8	**content:** 15.05 Minutes **quiz:** 10 minutes **accumulative: 25** minutes clips: DBP Total Coliform Groundwater Surface Wate	Microbial Rules 2.46 5.33 3.21 3.25	● examine treatment plant for Disinfection By-Products compliance ● illustrated the Total Coliform Rule ● indicate the delivery of a blend source and ground-water supply	Streaming Based Online	**Computer Based Exam**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 9 Final Course Requirements	**content:** 16.21 Minutes **quiz:** 10 minutes **Accumulative: 26** Minutes Clip: Summary Monitoring Notification CCR	Monitoring Rules, Public Notification and Consumer Confidence Report Rules and Summary 5.55 1.58 4.33 3.55	● discuss the treatment process steps for river water supply ● compare treatment techniques for reservoir vs. aquifer water operations ● understand the consumer confidence reporting rule	Streaming Based Online	**Computer Based Exam** Essay Question - listing objectives that they learned from the course and how they apply to their job and workplace **Final Course Essay and Evaluation form**	Required view of streaming clip, listen to audio presentation via streaming – View table, Charts, and Photograph Images Essay – listing 3 things learned and how they apply to their workplace	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Accumulative Time:

sec 1 =	25		sec 4 =	23		sec 7 =	26			
sec 2 =	21		sec 5 =	27		sec 8 =	25			
sec 3 =	26		sec 6 =	24		sec 9 =	26			

accumulative time total : 223 minutes = 3 hours = 0.3 CEU

**** standard beta allows one minute for each question and answer. The essay requirement listing three things that they have learned from the course with a 10-15 word description of each thing is a non-measured time element of the course; it is not included the beta testing.**

Assessment Analysis- Level 3 - CEU Plan Beta Testing will be performed during the spring of 2025. At the beginning of 2025, student feedback and comments will be reflected in the final beta testing results, along with accumulative average of student tracking and monitoring posted during the July - November 2025 test period. The Level 1 and Level 2 Beta Testing have been completed and comply with the ANSI I IACET 1-2018 Standard, along with the internal review by CEU Plan.

Student Feedback:

- to be inserted, upon course activation and student feedback and final beta testing completed
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Author Full Name: Jeff Pugh

Experience: Jeff is a chemist by profession and has experience in design, construction, operation, and troubleshooting of pilot-to-industrial sized membrane systems including RO membrane softening, ultra-filtration, and microfiltration (mostly in non-traditional applications). He also has experience with other water treatment techniques including ion exchange, sorption and chemical treatment. He specializes in mineral scale formation, inhibition, fouling and performance restoration of membrane systems. He has managed R & D, technical, and analytical laboratories, he lectures and has been published frequently in technical journals.

Category: Treatment Processes

Course Title: **Reservoir Storage and Direct Filtration Plant Tour**

IACET CEU Calculations - Required to complete this Course: one hour

Course Summary:

Reservoir Storage and Direct Filtration Plant Tour is a one-hour course, describing the reservoir storage of a northeastern community regional water supply. The reservoir storage and water supply is presented in a streaming format with a discussion of the intake system from the reservoir to the direct filtration water facility. Illustrations are given of the air scouring system - -used for minimizing any plugging -- and cleaning of the intake screens.

As the water supply continues to the treatment plant, segments of the treatment process are described, Including the ozone disinfection system and the dual-media filtration system. The operator describes these procedures, and we apologize for some motor noise, the necessity for this process Is important to share.

The final section illustrates the filters and backwash process; plus giving operational aspects of backwashing the filters. A segment on the pH control system is shown. And lastly, a view of their SCADA and control system is shown, to allow some ideas and feedback from a plant operating with a reservoir storage and source.

Learning Outcomes:

By the end of this training course, you will have the ability to:

- define drought storage with reservoir supply
- understand the air scouring of intake screens for cleaning
- describe the benefits of dual-media filtration
- explain how to improve the water flow through your filters
- illustrate the filtration and back wash process
- describe a direct filtration plant
- explain the pH control method
- describe reservoir storage
- illustrate intake sampling
- indicate the ozone disinfection process

Course Breakdown:

The following course breakdown illustrates the individual sections:

- Section 1 - Introduction to Storage and Water Filtration Plant
- Section 2 - Ozone Pre-Disinfection and Filtration
- Section 3 - Filter Backwash, Post-Treatment Chemical Addition, and SCADA Control

Learning Outcomes – Assessment Analysis:

- ***Assessment Analysis – Level 3 - CEU Plan Beta Testing*** will be performed in the winter of 2025. At the beginning of 2025, student feedback and comments will be reflected in the final beta testing, along with cumulative average of student tracking and monitoring posted during the July – November 2025 test period.
- The ***Level 1*** and ***Level 2 Beta Testing*** has been completed and complies with the ANSI / IACET 1-2018 Standard, along with the internal review by CEU Plan.

CEU ID #	Course Title	Instructor	CEU Hours
347	Reservoir Storage and Direct Filtration Plant Tour	Jeff Pugh	one

CEU Plan – Content & Instructional Course Design Worksheet

CEU Plan # 347 - Reservoir Storage and Direct Filtration Plant Tour

Activation - 08.26.2024

Instructor: Jeff Pugh

amount of course hours**:** one

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content:** 12.41 Minutes **quiz:** 14 minutes **accumulative: 27** minutes	Introduction to Storage and Water Filtration Plant	● describe reservoir storage ● define drought storage with reservoir supply ● illustrate intake sampling ● understand the air scouring of intake screens for cleaning	Text Based Streaming Based Online Video Clip illustrating content within this section	**Computer Based Exam** **Contact time is measured to IACET standards and State requirement**	Required text reading of content material and view of streaming clip, via streaming – take quiz upon completion of course material section View table, Charts, and Photograph Images	Inform students of the required studies in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be

							indicated.
Lesson Name Section 2	**Time** **content:** 16.27 Minutes **quiz:** 11 minutes **accumulative: 27** minutes	**Content Description** Ozone Pre-Disinfection and Filtration	**Learning Outcomes** ● indicate the ozone disinfection process ● describe the benefits of dual-media filtration ● explain how to improve the water flow through your filters	**Learning Styles** Streaming Based Online	**Assessment** **Computer Based Exam**	Instructional Materials Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section	**Comments** Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3 Final Course Requirements	**content:** 15.20 Minutes **quiz:** 9 minutes **accumulative: 24** Minutes	Filter Backwash, Post-Treatment Chemical Addition, and SCADA Control	● illustrate the filtration and back wash process ● describe a direct filtration plant ● explain the pH control method	Streaming Based Online **Case Study exercise with discussion – midway in the content section**	**Computer Base Exam** Essay Question - listing objectives that they learned from the course and how they apply to their job and workplace **Final Course Essay and Evaluation**	Required view of streaming clip, listen to audio presentation via streaming – take quiz upon completion of course material section	Inform students of the required assignments in the top header of the content section. At the conclusion of the course section, instructions to download worksheet and proceed to the quiz will be indicated.

					form		

Accumulative Time:

sec 1 =	27										
sec 2 =	27										
sec 3 =	24										

accumulative time total : 78 minutes = 1 hours = 0.1 CEU

**** standard beta allows one minute for each question and answer. The essay requirement listing three things that they have learned from the course with a 10-15 word description of each thing is a non-measured time element of the course; it is not included the beta testing.**

Assessment Analysis- Level 3 - CEU Plan Beta Testing will be performed during the winter of 2025. At the beginning of 2025, student feedback and comments will be reflected in the final beta testing results, along with accumulative average of student tracking and monitoring posted during the February - July 2025 test period. The Level 1 and Level 2 Beta Testing have been completed and comply with the ANSI I IACET 1-2018 Standard, along with the internal review by CEU Plan.

Student Feedback:

- to be inserted, upon course activation and student feedback and final beta testing completed
-
-
-
-
-
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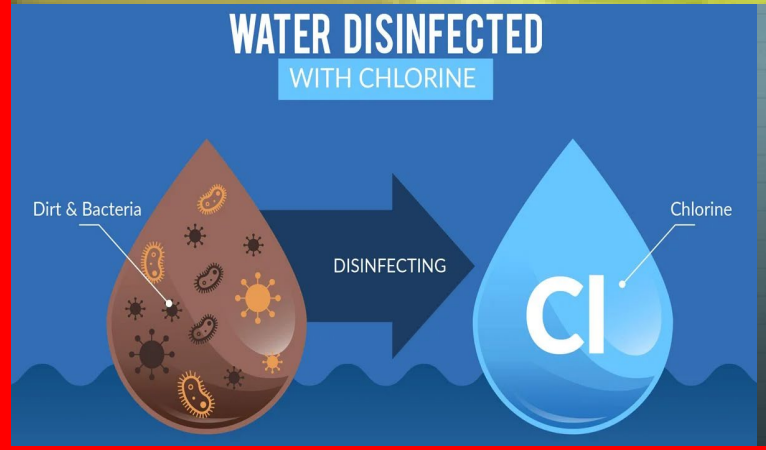
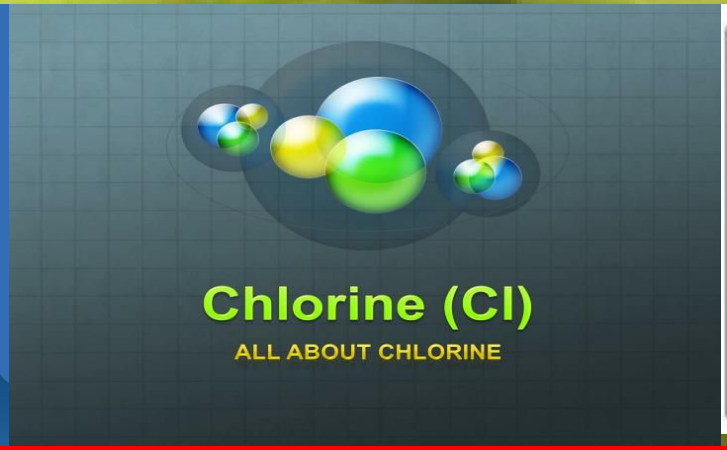
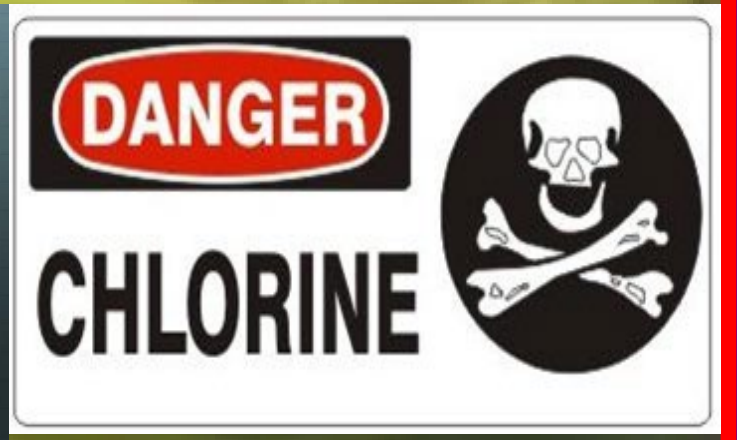
World of Chlorine

series in Disinfection







World of Chlorine is a five-hour, fast paced series dealing with gaseous chlorine.

The series begins with a review of chlorine:

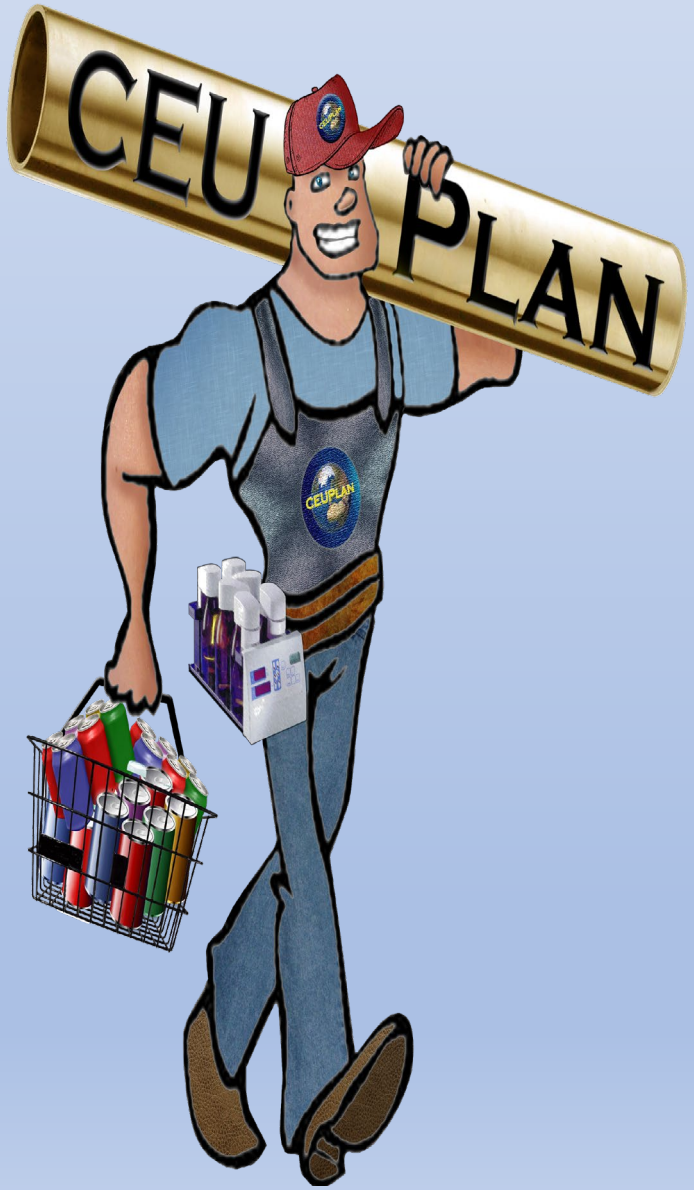
- What is chlorine?
- How is it handled?
- What equipment and processes are involved?
- Injecting chlorine into your water supply
- Chlorinator - troubleshooting tips

Chlorine is primarily used as a disinfectant, to kill bacteria, viruses and other microorganisms, making it essential for safe drinking water, sanitation and public health. Chlorine is used in swimming pools and cooling towers to kill algae and germs, and to remove impurities and control microbial growth.

Whether you need a review, prepping for exams, training on-the-job or troubleshooting the system, this course series covers the major topics involved in chlorine disinfection of wastewater and drinking water treatment systems.

World of Chlorine *…. Course lineup includes:*

361	DW/WW	1	Chlorine - Introduction - streaming version	Edgar
362	DW/WW	1	Chlorine - Components of - streaming version	Edgar
363	DW/WW	1	Chlorine - Chlorinators - streaming version	Edgar
364	DW/WW	1	Chlorine - Procedures - streaming version	Edgar
365	DW/WW	1	Chlorine - Chlorine Dioxide - streaming version	Edgar



We have attached our course description, the learning outcomes, learning outcomes, instructor bio, amount of IACET CEUs, and our instructional course design worksheets. These worksheets illustrated the content sections, amount of content time with quiz, an itemized list of outcomes for each content section, and the accumulative time.

Author Full Name: Charlie Meyers / Bill Edgar

Experience: Bill has over forty-five (45) years of experience in water, wastewater, and environmental projects throughout the State of Florida. He is responsible for numerous applications and installations, including several facilities that have received local and/or national recognition. He worked with *Professional Testing of Tallahassee* in the development of certification exams for the Florida Construction Licensing Board for the positions of Certified General Contractor and Certified Mechanical Contractor. In addition, Edgar is involved with the State of Florida, Department of Environmental Protection Operator Certification Program in the review and development of certification exams for all licensed wastewater treatment plant operators.

Course Title: Chlorine – Introduction to Chlorine

ANSI/IACET CEU Calculations - Required to complete this Course: 1-hour course

Course Summary:

Introduction to Chlorine is a one-hour course, where the course instructor, shares some of his experiences of "What is Chlorine", chlorine compounds, mixture with water, along with Breakpoint Chlorination.… how to manage your dosage and feed rates. This course provides the History of Chlorine, since its discovery in 1774. The course continues with the Typhoid Fever outbreak, 1913, when C.F. Wallace designed a pressurized chlorinator, and need for chlorine residuals.

This course is an overview of Chlorine – gas and liquid process, along a few helpful tips to assist you. This course is designed to provide a review of techniques and operating procedures for evaluating and operating a chlorination system for disinfecting, whether in a gaseous or liquid solution, we will look at developing a process control program from some of these original concept – tried and proven, operational techniques. The purpose of this course is to present the introduction to the chlorine process from a somewhat different perspective.

Learning Outcomes: By the end of this training course, you will have the ability to:

- discuss the use of chlorine for disinfection
- explain how high chlorine concentrations affects eyes, nose and throat
- interpret the Break Point of Chlorine
- classify the effects of chloramines
- differentiate Total Chlorine and Free Chlorine available residuals
- Learn how unreacted ammonia can serve as food for algae and bacteria

Course Breakdown: The following breakdown describes the individual sections:

- Section 1 – Theory of Chlorination
- Section 2 – Chlorine
- Section 3 – Break-Point Chlorination

CEU ID #	Course Title	Instructor	CEU Hours
361	**Chlorine – Introduction to Chlorine**	Edgar	one

Content & Instructional Course Design Worksheet

Activation - 5.23.2025

CEU Plan # 361 – Chlorine – Introduction to Chlorine

Instructor: Bill Edgar

Course hours: **one**

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content: 17.44** Minutes **quiz: 10** minutes **Cumulative: 27** minute	Theory of Chlorination	● discuss the use of chlorine for disinfection ● explain how high chlorine concentrations affects eyes, nose and throat ● Knowledge when designing a chlorine injection station and understanding of chlorine demand	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section **Case Study exercise with discussion – midway in the content section**	Computer Based Exam **Contact time is measured to IACET standards and State requirement**	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 2	**content: 15.35** Minutes **quiz : 10** minutes **Cumulative: 25** minute	Chlorine	● describe chlorine gas ● identify various indicators of chlorine ● classify the effects of chloramines ● interpret the Break Point of Chlorine	Streaming Based Online monitor of student's progress measured in elapsed time Video Clip illustrating content within this section	Computer Based Exam	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3	**content : 14.29** Minutes **quiz: 10** minutes **Cumulative: 24** minute	Break-Point Chlorination	● Learn how unreacted ammonia can serve as food for algae and bacteria ● Knowledge when designing a chlorine injection station and understanding of chlorine demand ● differentiate Total Chlorine and Free Chlorine available residuals	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	**Computer Base - Final Exam** Essay Question - listing objectives learned from the course **Final Course Essay and Evaluation form**	Download a pdf – chlorine handout – supplemental for future reference in this series Essay – listing 3 things learned and how they apply to their workplace	Inform students of the required assignments in the top header of the content section. **Complete the essay and evaluation form, prior to course being complete.**

Cumulative Time:

sec 1 =	27										
sec 2 =	25										
sec 3 =	24										

Cumulative time total : 76 minutes = 1 hours = 0.1 CEU **updated to streaming 5.23.2025**

**** Standard beta allows one minute for each question and answer. The essay requirement listing three things that student has learned from the course with a 10-15 word description of each is a non-measured time element of the course; it was not included the 2nd tier beta testing.**

Author Full Name: Charlie Meyers / Bill Edgar

Experience: Bill has over forty-five (45) years of experience in water, wastewater, and environmental projects throughout the State of Florida. He is responsible for numerous applications and installations, including several facilities that have received local and/or national recognition. He worked with *Professional Testing of Tallahassee* in the development of certification exams for the Florida Construction Licensing Board for the positions of Certified General Contractor and Certified Mechanical Contractor. In addition, Edgar is involved with the State of Florida, Department of Environmental Protection Operator Certification Program in the review and development of certification exams for all licensed wastewater treatment plant operators.

Course Title: Chlorine – Components of Chlorine

ANSI/IACET CEU Calculations - Required to complete this Course: 1-hour course

Course Summary:

Components of Chlorine is the second part of our Disinfection process and overview series. This course is an overview of gas chlorine – containers and connections to them, along a few helpful tips to assist you. This course is designed to provide a review of techniques and operating procedures for feeding chlorine into your water stream for disinfecting, whether in a gaseous or liquid solution, we will look at developing an operational chlorine system and how it is fed and measured from some of these original concept – tried and proven, operational techniques.

We will discuss the heart of the chlorine operations .. from the flexible connection and manifolds, switch-over units, drop leg and drains, the importance of vacuum tubing and piping size and lengths, valves, strainers, and vacuum injectors … this gets your thinking about how many parts and maintenance areas to be concerned about … and we cannot go too far without mentioned chlorine scales to properly tell the remaining contents in the cylinders.

Learning Outcomes: By the end of this training course, you will have the ability to:

- explain how to properly maintain the equipment and identifying each component
- learn that chlorine cylinders are only filled to about 85 percent of their volumetric capacity
- indicate the types of piping utilized in gas system installations
- understanding of chlorine evaporators with chlorine as a liquid application
- explain the procedure for connecting a chlorine cylinder
- describe the automatic switchover units

Course Breakdown: The following breakdown describes the individual sections:

- Section 1 – Chlorine Containers
- Section 2 – Chlorine Piping and Safety
- Section 3 – Chlorine Evaporators

CEU ID #	Course Title	Instructor	CEU Hours
362	**Chlorine – Components of Chlorine**	Edgar	one

Content & Instructional Course Design Worksheet

Activation - 5.23.2025

CEU Plan # 362 – Chlorine – Components of Chlorine

Instructor: Bill Edgar

Course hours: **one**

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content: 14.56** Minutes **quiz: 10** minutes **Cumulative: 25** minute	Chlorine Containers	● explain how to properly maintain the equipment and identifying each component ● indicate the various cylinder types that Gaseous chlorine is shipped in ● learn that chlorine cylinders are only filled to about 85 percent of their volumetric capacity ● list types of chlorine containers	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	Computer Based Exam **Contact time is measured to IACET standards and State requirement**	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 2	**content: 17.16** Minutes **quiz : 10** minutes **Cumulative: 27** minute	Chlorine Piping and Safety	● indicate the types of piping utilized in gas system installations ● explain the procedure for connecting a chlorine cylinder ● describe the automatic switchover units ● understand the vacuum injector	Streaming Based Online monitor of student's progress measured in elapsed time Video Clip illustrating content within this section	Computer Based Exam	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3	**content : 17.12** Minutes **quiz: 9** minutes **Cumulative: 26** minute	Chlorine Evaporators	● understanding of chlorine evaporators with chlorine as a liquid application ● discuss the use of chlorine evaporators to expedite the release of chlorine from storage to the chlorinator ● Describe a chlorine evaporator	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	**Computer Base - Final Exam** Essay Question - listing objectives learned from the course **Final Course Essay and Evaluation form**	Required view of streaming clip, listen to audio discussion via streaming – take final quiz upon completion of course material section Essay – listing 3 things learned and how they apply to their workplace	Inform students of the required assignments in the top header of the content section. **Complete the essay and evaluation form, prior to course being complete.**

Cumulative Time:

sec 1 =	25										
sec 2 =	27										
sec 3 =	26										

Cumulative time total : 78 minutes = 1 hours = 0.1 CEU **updated to streaming 5.23.2025**

**** Standard beta allows one minute for each question and answer. The essay requirement listing three things that student has learned from the course with a 10-15 word description of each is a non-measured time element of the course; it was not included the 2nd tier beta testing.**

Author Full Name: Charlie Meyers / Bill Edgar

Experience: Bill has over forty-five (45) years of experience in water, wastewater, and environmental projects throughout the State of Florida. He is responsible for numerous applications and installations, including several facilities that have received local and/or national recognition. He worked with *Professional Testing of Tallahassee* in the development of certification exams for the Florida Construction Licensing Board for the positions of Certified General Contractor and Certified Mechanical Contractor. In addition, Edgar is involved with the State of Florida, Department of Environmental Protection Operator Certification Program in the review and development of certification exams for all licensed wastewater treatment plant operators.

Course Title: Chlorine – Chlorinators
ANSI/IACET CEU Calculations - Required to complete this Course: 1-hour course

Course Summary:

In this course, Chlorinators. the third in the series including a Type of Chlorinators in this section followed Operational Concepts in section two and the final section is about the methods of control….we will talk about the direct feed and the solution feed chlorinators, we gained better knowledge of injector – ejector assemblies and double – triple checking sometimes for the vacuum line, then we jumped over to the vacuum regulator and its valve components and rate indicator and valve. You are going to have a better understanding of chlorinators, as used in the water and wastewater industry, range from a low of four pounds per day to a maximum of ten thousand pounds per day. They come in three basic arrangements: cylinder mounted, wall mounted and floor mounted. From the early floor cabinet model to the wall mounted chlorinators for a small to large flows per day.

This brings us to the summary our studies and some things to look out for in your daily operations … a discussion related to the Methods of Control where gas chlorinators have some type of arrangement to vary the flow of chlorine through the feed rate valve, whether manual control or some chlorinators have electronic actuators connected to the flow rate valve for an automatic control. Dosage control can set the feed rate from twenty-five to two hundred percent of a four to twenty milliampere flow signal.

Learning Outcomes: By the end of this training course, you will have the ability to:

- Describe the various types of gas chlorinators and cylinders
- Discuss the importance of changing out the CL2 cylinders on a regular basis
- Coordinate and explain how to start up the chlorinator
- Calculating chlorine usage and demand for the system
- Explain a gas chlorinator daily operation

Course Breakdown: The following breakdown describes the individual sections:

- Section 1 – Type of Chlorinators
- Section 2 – Operational Concepts
- Section 3 – Methods of Control

CEU ID #	Course Title	Instructor	CEU Hours
363	**Chlorine – Chlorinators**	Edgar	one

Content & Instructional Course Design Worksheet

Activation - 5.29.2025

CEU Plan # 363 – Chlorine – Chlorinators

Instructor: Bill Edgar

Course hours: **one**

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content: 13.34** Minutes **quiz: 10** minutes **Cumulative: 23** minute	Types of Chlorinators	● Describe the various types of chlorinators and cylinders that gaseous chlorine is available ● Discuss the importance of changing out the CL2 cylinders on a regular basis ● Understand the components of a vacuum regulator ● Explain the importance of a rate valve or rota-meter	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section **Case Study exercise with discussion – midway in the content section**	Computer Based Exam **Contact time is measured to IACET standards and State requirement**	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 2	**content: 16.25** Minutes **quiz : 10** minutes **Cumulative: 26** minute	Operational Concepts	● Coordinate and explain how to start up the chlorinator ● Explain the importance of having a booster pump in your chlorine system ● Describe the difference between sonic and differential controls for Cl system	Streaming Based Online monitor of student's progress measured in elapsed time Video Clip illustrating content within this section	Computer Based Exam	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3	**content : 9.39** Minutes **quiz: 10** minutes **Cumulative: 19** minute	Methods of Control	● Calculating chlorine usage and demand for the system ● understand the feed rate valve ● Identify the tools required for emergency troubleshooting ● describe the manual and methods of automatic control of your chlorine system	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	**Computer Base - Final Exam** Essay Question - listing objectives learned from the course **Final Course Essay and Evaluation form**	Required view of streaming clip, listen to audio discussion via streaming – take final quiz upon completion of course material section Essay – listing 3 things learned and how they apply to their workplace	Inform students of the required assignments in the top header of the content section. **Complete the essay and evaluation form, prior to course being complete.**

Cumulative Time:

sec 1 =	23										
sec 2 =	26										
sec 3 =	19										

Cumulative time total : 68 minutes = 1 hours = 0.1 CEU

updated to streaming 5.21.2025

**** Standard beta allows one minute for each question and answer. The essay requirement listing three things that student has learned from the course with a 10-15 word description of each is a non-measured time element of the course; it was not included the 2nd tier beta testing.**

In 2017, the original text base version was tested in compliance with IACET Standards. This text base version has been updated in 2025 and AI tools were utilized in the course update and content development.

Assessment Analysis- Level 3 - CEU Plan Beta Testing was performed during January, 2025. At the beginning of 2025, student feedback and comments were collected in the final beta testing results, along with cumulative average of student tracking and monitoring posted during the July - October, 2025 test period. The Level 1 and Level 2 Beta Testing has been completed and comply with the ANSI I IACET 1-2023 Standard, along with the internal review by CEU Plan.

Author Full Name: Charlie Meyers / Bill Edgar

Experience: Bill has over forty-five (45) years of experience in water, wastewater, and environmental projects throughout the State of Florida. He is responsible for numerous applications and installations, including several facilities that have received local and/or national recognition. He worked with *Professional Testing of Tallahassee* in the development of certification exams for the Florida Construction Licensing Board for the positions of Certified General Contractor and Certified Mechanical Contractor. In addition, Edgar is involved with the State of Florida, Department of Environmental Protection Operator Certification Program in the review and development of certification exams for all licensed wastewater treatment plant operators.

Course Title: Chlorine – Chlorine Procedures
ANSI/IACET CEU Calculations - Required to complete this Course: 1-hour course

Course Summary:

In the fourth course in this Chlorine series, we are going to focus the operations of a chlorine feed system, first we will start with the starting up and shutting down of your chlorinator. The steps in operating your chlorinator, both from a start-up or re-start-up after repairs were made and all the way to shutting one down for servicing or testing. We discuss the various types of chlorinators and cylinders that gaseous chlorine is available and the importance of changing out the chlorine cylinders on a regular basis. The second section will describe dosage and applications that we face all the times and some of the toys that you have today in assist in operation.

And lastly, some of the problems you face with your chlorinators… our conversation turns to the importance of changing out the chlorine cylinders on a regular basis, how to start up the chlorinator, calculating chlorine usage and demand for the system, the switching out the chlorine cylinders on a regular basis, Identify the tools required for emergency troubleshooting. And moving, we will tackle the nasty side, but fun to many, the troubleshooting. What are some of the critical issues you face, when troubleshooting and isolating problem. We hope these tips and tricks are helpful in building your skill sets in the area of disinfection.

Learning Outcomes: By the end of this training course, you will have the ability to:

- Explain the switching out the Chlorine cylinders on a regular basis
- Discuss the importance of changing out the CL2 cylinders on a regular basis.
- Calculating chlorine usage and demand for the system
- Identify the tools required for emergency troubleshooting
- Coordinate and explain how to start up the chlorinator

Course Breakdown: The following breakdown describes the individual sections:

- Section 1 – Start Up
- Section 2 – Dosage
- Section 3 – Chlorinator Problems

CEU ID #	Course Title	Instructor	CEU Hours
364	**Chlorine – Chlorine Procedures**	Edgar	one

Content & Instructional Course Design Worksheet

Activation - 5.29.2025

CEU Plan # 364 – Chlorine – Chlorine Procedures

Instructor: Bill Edgar

Course hours: **one**

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content: 10.09** Minutes **quiz: 10** minutes **Cumulative: 20** minute	Start Up	● Discuss the importance of changing out the CL2 cylinders on a regular basis. ● Coordinate and explain how to start up the chlorinator. ● indicate the steps to shut-down your chlorine system ● list the steps to ensure solution line back pressure	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	Computer Based Exam **Contact time is measured to IACET standards and State requirement**	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 2	**content: 24.44** Minutes **quiz : 10** minutes **Cumulative: 34** minute	Dosage	● Calculating chlorine usage and demand for the system ● Analyze the titration method ● Examine for Trihalomethanes ● Identify the colorimetric detection method in samples	Streaming Based Online monitor of student's progress measured in elapsed time Video Clip illustrating content within this section	Computer Based Exam Hand-Out of troubleshooting and helpful tips are included in downloadable pdf	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3	**content : 15.48** Minutes **quiz: 10** minutes **Cumulative: 25** minute	Chlorinator Problems	● Explain the switching out the Chlorine cylinders on a regular basis ● Identify the tools required for emergency troubleshooting ● Describe symptoms to a chlorinator problem ● Recall the importance of proper vacuum for injector operation	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	**Computer Base - Final Exam** Essay Question -listing objectives learned from the course **Final Course Essay and Evaluation form**	Required view of streaming clip, listen to audio discussion via streaming – take final quiz upon completion of course material section Essay – listing 3 things learned and how they apply to their workplace	Inform students of the required assignments in the top header of the content section. **Complete the essay and evaluation form, prior to course being complete.**

Cumulative Time:

sec 1 =	20											
sec 2 =	34											
sec 3 =	25											

Cumulative time total : 79 minutes = 1 hours = 0.1 CEU

updated to streaming 5.21.2025

**** Standard beta allows one minute for each question and answer. The essay requirement listing three things that student has learned from the course with a 10-15 word description of each is a non-measured time element of the course; it was not included the 2nd tier beta testing.**

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Author Full Name: Charlie Meyers / Bill Edgar

Experience: Bill has over forty-five (45) years of experience in water, wastewater, and environmental projects throughout the State of Florida. He is responsible for numerous applications and installations, including several facilities that have received local and/or national recognition. He worked with *Professional Testing of Tallahassee* in the development of certification exams for the Florida Construction Licensing Board for the positions of Certified General Contractor and Certified Mechanical Contractor. In addition, Edgar is involved with the State of Florida, Department of Environmental Protection Operator Certification Program in the review and development of certification exams for all licensed wastewater treatment plant operators.

Course Title: Chlorine – Chlorine Dioxides

ANSI/IACET CEU Calculations - Required to complete this Course: 1-hour course

Course Summary:

In this course, we will explore several ways to generator chlorine dioxide using chlorine gas and sodium chlorite for the water and waste industry in section two and the final section describes the major use of chlorine dioxide is bleaching pulp for kraft paper. The disinfection of public water supplies has been used to prevent the transmission of waterborne diseases throughout the world. Although chlorine has been used as the primary disinfectant in the United States, its safety was investigated in nineteen hundred seventy-four when chlorination of drinking water was found to result in the formation of trihalomethanes, also referred to as THMs.

We have opened our tool box and shared some steps in operating a chlorine dioxide system. In summary, we describe the various processes of on-site production of chlorine dioxide, as a disinfectant, the importance of safety and precautions on a regular basis. And moving forward, we explore how chlorine dioxide is a powerful oxidizing agent and micro biocide, making it useful for microbiological control.

Learning Outcomes: By the end of this training course, you will have the ability to:

- Understanding other uses of chlorine dioxide as bleaching pulp for craft paper
- Describe the advantages of chlorine dioxide over chlorine
- Address taste & odor issues
- Discuss how it works faster at a wider pH range than cl2
- Demonstrate how chlorine dioxide doesn't react with ammonia to form chloramines

Course Breakdown: The following breakdown describes the individual sections:

- Section 1 – What is Chlorine Dioxide?
- Section 2 – How is it Made?
- Section 3 – How it is Used and the Major Use?

CEU ID #	Course Title	Instructor	CEU Hours
365	**Chlorine – Chlorine Dioxides**	Edgar	one

Content & Instructional Course Design Worksheet

Activation - 5.29.2025

CEU Plan # 365 – Chlorine – Chlorine Dioxides

Instructor: Bill Edgar

Course hours: **one**

Unit/Lesson Name	Time Allotted	Content Description and/or Purpose	List Learning Outcomes	Method Used (Demonstrate Accommodation of Different Learning Styles	Assessment Method	Instructional Materials Used	Comments/ Notes
Section 1	**content: 21.17** Minutes **quiz: 10** minutes **Cumulative: 31** minute	What is Chlorine Dioxide?	● Understanding other uses of chlorine dioxide as bleaching pulp for craft paper ● Learn about chlorine dioxide ● Describe the advantages over chlorine.	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	Computer Based Exam **Contact time is measured to IACET standards and State requirement**	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.

Lesson Name	Time	Content Description	Learning Outcomes	Learning Styles	Assessment	Instructional Materials	Comments
Section 2	**content: 22.33** Minutes **quiz : 8** minutes **Cumulative: 30** minute	How is it Made?	● Address taste & odor issues. ● Discuss how it works faster at a wider pH range than cl2 ● Understanding other uses of chlorine dioxide as bleaching pulp for craft paper	Streaming Based Online monitor of student's progress measured in elapsed time Video Clip illustrating content within this section	Computer Based Exam Hand-Out of troubleshooting and helpful tips are included in downloadable pdf	Required view of streaming clip, via streaming – take quiz upon completion of course material section View Table, Charts, and Photographic Images	Inform students of the required text reading in their course enrollment confirmation – Auto response At the conclusion of the course section, instructions to proceed to the quiz will be indicated.
Section 3	**content : 18.28** Minutes **quiz: 9** minutes **Cumulative: 18** minute	How it is Used and the Major Use?	● Learn about chlorine dioxide and advantages over chlorine. ● Demonstrate how chlorine dioxide doesn't react with ammonia to form chloramines ● Explain the disinfectant aspects by use of chlorine dioxide system	Streaming Based Online monitor of student's progress measured in elapsed time (in minutes) Video Clip illustrating content within this section	**Computer Base - Final Exam** Essay Question -listing objectives learned from the course **Final Course Essay and Evaluation form**	Required view of streaming clip, listen to audio discussion via streaming – take final quiz upon completion of course material section Essay – listing 3 things learned and how they apply to their workplace	Inform students of the required assignments in the top header of the content section. **Complete the essay and evaluation form, prior to course being complete.**

Cumulative Time:

sec 1 =	31										
sec 2 =	30										
sec 3 =	18										

Cumulative time total : 79 minutes = 1 hours = 0.1 CEU

updated to streaming 5.21.2025

**** Standard beta allows one minute for each question and answer. The essay requirement listing three things that student has learned from the course with a 10-15 word description of each is a non-measured time element of the course; it was not included the 2nd tier beta testing.**

In 2017, the original text base version was tested in compliance with IACET Standards. This text base version has been updated in 2025 and AI tools were utilized in the course update and content development.

Assessment Analysis- Level 3 - CEU Plan Beta Testing was performed during January, 2025. At the beginning of 2025, student feedback and comments were collected in the final beta testing results, along with cumulative average of student tracking and monitoring posted during the July - October, 2025 test period. The Level 1 and Level 2 Beta Testing has been completed and comply with the ANSI I IACET 1-2023 Standard, along with the internal review by CEU Plan.