CEU COURSE DESCRIPTION

MODERN DISINFECTION CEU TRAINING COURSE – 20 HOURS

This course covers the fundamentals of water or wastewater disinfection, beginning with the source of the water and ending with the proper disinfection and final distribution, ensuring that the water or wastewater meets federal compliance. Task analysis and training needs assessments have been conducted to determine or set needs-to-know for this course.

The goal of this CEU course is to provide awareness training to help workers recognize the occupational hazards and health effects of different disinfectants, halogens, chlorine exposure and the exposure controls, and to familiarize the participants with the properties and safe handling of chlorine (solid, liquid, gas) and the operation of gas chlorinators and other related equipment. This course covers properties of chlorine, purpose of chlorine, chlorine terminology, dosage calculations, chlorinator equipment, chlorine cylinders, operation of gas chlorinators (start up and shut down), chlorinator maintenance, troubleshooting common problems, chlorine safety, and chlorine testing procedures.

The target audience for this course includes the following: water distribution workers, well drillers, pump installers, groundwater operators, water treatment operators, and wastewater operators. Also included are people interested in working in a water treatment/wastewater treatment or distribution facility and/or wishing to maintain CEUs for a certification license or to learn how to perform their job safely and effectively, and/or to meet education needs for promotion. All of the above listed personnel need to properly deal with disinfection procedures.

There are no prerequisites, and no other materials are needed for this course.

Course Statement of Need

Properly treated disease free water is an essential function of all water and wastewater operators. Safe drinking water and properly treated effluent free from waterborne disease is the goal of professional operators. Without chlorination and final treatment, many would die of waterborne bacterial infections. An understanding of the need of halogens and proper disinfection will prepare the operator to provide safe and finished water or effluent for the customer.

All water/wastewater operators need to completely understand commonly utilized disinfectants and processes utilized for water and wastewater treatment. Too understand and describe commonly accepted alternative methods for water and wastewater disinfection, understand and describe alternative chemicals-terms utilized for the inactivation of pathogens.

All operators need to understand and describe EPA rules regarding the use of halogens and the release of THMs and related DDBPs. Understand and describe various disinfection/disinfectant chemical feeders. Understand and describe procedures for various chlorination alarm testing systems. Understand and describe the operation and calibration of chemical feed pumps.

Every operator needs to understand and describe water sampling/bacteria sample procedures. Understand and describe common water pathogens in detail. Understand and describe OSHA Definitions, Rules, and Regulations, and OSHA's RP Standard. Understand and describe respirator protection program review.

General Objectives

At the conclusion of the class, each participant will take a written examination and complete a course evaluation. Participants will have the opportunity to acquire knowledge of the following concepts.

1. Identify various commonly used disinfectants utilized for water and wastewater treatment.
2. Identify various chemicals used for modern disinfection.
3. Evaluate various alternative methods for water and wastewater disinfection.
4. Identify various alternative chemicals utilized for the inactivation of pathogens.
5. Analyze EPA rules regarding the use of halogens and the release of THMs and related DDBPs.
6. Examine and compare various chemical feeders.
7. Describe procedures for alarm testing systems.
8. Describe the operation and calibration of chemical feed pumps.
9. Explain chlorine residual testers and the use of residual chlorine test kits.
10. Knowledge of various storage and handling requirements for chlorine cylinders, ton containers, and rail cars.
11. Understand the need and process of water sampling/bacteria sample procedures.
12. Ability to recognize the need for chemical protective clothing, chlorine safe-handling practices, decontamination.
13. Understand calculation methods of disinfectant dosage, including when to add disinfectant.
14. Review gas chlorinator operation.
15. Explore Ozonators.
16. Ability to troubleshoot various gas chlorinator and hypochlorinator issues and concerns.
17. Examination of various and commonly found water/wastewater pathogens.
18. Knowledge of various and difficult definitions dealing with Chlorine and hazardous materials.
19. Physical description of respirator types.
20. Purpose and role of PPE with dealing with Chlorine.
21. Advanced RP application and competency.
22. Review of OSHA Definitions, Rules, and Regulations, and OSHA's RP Standard.

Course Goals

I. Understanding Water Disinfection
- A. Terminology
- B. Define Different Types and Characteristics

II. Examine Halogens
- A. Define Various Halogens and Characteristics

III. Describing Alternative Disinfectant Processes
- A Define Alternative Processes and Objectives
- B Define Concepts and Terminology
- C Define Advantages and Disadvantages

IV. Identify Chlorines Uses
- A Identify the Three Forms of Chlorine
- B Understand the History and Discovery of Chlorine
- C Define the Chemical Breakdown and Processes
  - 1 Hydrochloric Acid
  - 2 Hypochlorous Acid
- D Understand Safety Procedures
- E Understand Handling and Storage Procedures

V. Understand Biological Monitoring
- A Biological Activity Inactivation Procedures
  - 1 Functions and Testing Procedures

2 Different Cell and Animal Structure
3 Operations/Applications

VI. Define Disinfection and Various Applications

Learning Objectives and Timed Outcomes

1. Disinfectants utilized for water and wastewater treatment – 145 minutes.
   a. List the commonly used water disinfectants, their potential health effects, and sources in drinking water.
   b. Describe the six criteria for selecting an appropriate disinfection system.
   c. Compare each disinfectant in terms of color removal, odor removal, and residual maintenance.
   d. Explain how DBPs are formed.
   e. Analyze “break-point chlorination.”
   f. Identify chlorine byproducts and their health effects.
   g. Discuss options for controlling chlorination byproducts.
   h. Examine the individual characteristics of each of the halogens.
   i. List the atomic mass, boiling point, melting point, and electronegativity of each halogen.
   j. Evaluate the importance of chlorine for disinfection.
2. Chemicals used for modern disinfection – 140 minutes.
   a. Compare the risks associated with chlorine, chloramines, and chlorine dioxide.
   b. Distinguish between chlorine, chloramines, and chlorine dioxide.
   c. List and describe disinfection byproducts.
   d. Analyze the results of animal research regarding DBPs.
   e. Discuss DBPs in American drinking water.
   f. Describe the risks and benefits of chlorine.
   g. Examine chlorine exposure limits set by OSHA.
   h. Identify symptoms of chlorine exposure.
   i. Summarize the history of chlorine use.
   j. Recognize the appearance and odor of chlorine in gas and liquid forms.
   k. Explain the reactivity and flammability of chlorine.
   l. Describe what happens when chlorine enters the environment.
3. Alternative methods for water and wastewater disinfection – 55 minutes.
   a. Evaluate the usefulness of sodium hypochlorite and the risks involved.
   b. Compare advantages and disadvantages of sodium hypochlorite.
   c. Describe the advantages and disadvantages of ozone.
   d. Evaluate the advantages of ultraviolet radiation for disinfection.
4. Alternative chemicals utilized for the inactivation of pathogens – 45 minutes.
   a. Identify the procedures in the chlorine dioxide process.
   b. Analyze the use of chloramines in inactivation of pathogens.
5. EPA rules regarding the use of halogens and the release of THMs and related DDBPs – 55 minutes.
   a. Describe THMs and evaluate the EPA regulations.
   b. Explain haloacetic acids and identify the EPA regulations.
   c. Examine EPA regulations regarding DDBPs.
   d. Analyze EPA regulations for pathogens.
6. Examine chemical feeders – 50 minutes.
   a. Recognize the recommendations for feeding sodium hypochlorite solutions.
   b. Compare reciprocating piston metering pumps and diaphragm metering pumps.
   c. Identify the control methods for chlorine feed systems.
   d. Describe the advantages and effectiveness of chlorine tablet feeders.
7. Describe procedures for alarm testing systems – 5 minutes.

8. Operation and calibration of chemical feed pumps – 50 minutes.
    a. Describe the importance of standby provisions and weigh scales.
    b. Describe the operating procedures for a hypochlorinator.
    c. Explain the importance of calibration and describe procedures.
9. Chlorine residual testers and the use of residual chlorine test kits – 25 minutes.
    a. Explain the purpose of chlorine test kits and how often they should be used.
    b. Describe the amperometric titration method.
10. Storage and handling requirements for chlorine cylinders, ton containers, and rail cars – 10 minutes.
    a. Describe the approved method for storing cylinders, containers, and rail cars.
    b. Identify correct procedures for movement of cylinders, containers, and rail cars.
11. Water sampling/bacteria sample procedures – 155 minutes.
    a. Explain the importance of CT values.
    b. Compare/contrast chlorine dioxide testing methods.
    c. Identify the purpose of indicator bacteria.
    d. Examine the process for bacteria sampling.
    e. Describe the three types of water samples.
    f. Compare sampling requirements for noncommunity, nontransient noncommunity, and community public water systems.
    g. Investigate necessary measures when test results are positive, including corrective measures.
    h. Describe MCLs.
    i. Explain the uses of the three methods for standard plate count.
12. Chemical protective clothing, chlorine safe-handling practices, decontamination procedures, and related emergency procedures – 35 minutes.
    a. Describe criteria for using chemical protective clothing.
    b. List components of an emergency response contingency plan.
    c. Describe procedures for spills and leaks.
    d. Identify safe-handling requirements.
13. Calculation of disinfectant dosage, including when to add disinfectant – 35 minutes.
    a. Explain how pH and temperature affect dosage.
    b. Describe the importance of chlorine residual.
    c. Evaluate how free, total, and combined chlorine are related.
14. Gas chlorinator operation – 50 minutes.
    a. Describe the purpose of a gas chlorinator.
    b. Explain the risks associated with chlorine gas.
    c. Identify each component of a chlorinator and its purpose.
    d. Examine the chlorine generator process and the components involved.
15. Ozonators – 35 minutes.
    a. Explain the process for using ozone as a disinfectant.
16. Troubleshooting and repairing a gas chlorinator and hypochlorinator – 40 minutes.
    a. Identify problems, possible causes, and solutions in the hypochlorination process.
    b. Describe the risks associated with chlorine gas.
17. Common water pathogens – 110 minutes.
    a. Compare/contrast bacteria, viruses, and protozoa.
    b. Describe potential contaminant sources.
    c. Explain “chain of transmission.”
    d. Identify bacterial diseases and their symptoms.
    e. Examine viral-caused diseases, symptoms, and effects.
        1) Evaluate the effects of protozoa and the diseases they cause.
        2) Summarize requirements for public notices.

3) Respirator protection section familiarization.

18. Knowledge of various and difficult definitions – 20 minutes.
    a. Describe the "buddy system" as it relates to respiratory protection.
    b. Define "chemical resistant."
    c. Identify the components of a "clothing ensemble."
    d. Distinguish between emergency respirator use situations and emergency situations.
19. Physical description of respirator types – 25 minutes.
    a. Compare/contrast the different types of respirators.
    b. Explain the criteria for changing respirator cartridges.
20. Purpose and role of PPE – 20 minutes.
    a. Explain the objectives for PPE training.
    b. Identify and describe general selection guidelines for PPE.
    c. Describe criteria for eye and face protection.
    d. Evaluate selection guidelines for head protection.
    e. Discuss the proper use of foot protection.
    f. Describe factors to be considered for hand protection.
    g. Analyze protective clothing applications and operations that require chemical protective clothing.
21. Advanced RP application and competency – 115 minutes.
    a. Explain proper storage and cleaning of respirators.
    b. Analyze the importance of practicing with respirators.
    c. Evaluate the information provided in the respiratory protection schedule.
    d. Identify information to be provided to a physician before a recommendation is made.
    e. Describe conditions that call for additional medical evaluations.
22. OSHA Definitions, Rules, and Regulations, and OSHA's RP Standard – 20 minutes.
    a. Identify the required components of a respiratory protection program.
    b. Define program administrator.
    c. Explain OSHA requirements for voluntary use of respirators.
    d. List and explain respirator training objectives.
    e. Discuss the requirements for annual retraining.
    f. Compare the two types of respirator fit testing.
    g. Evaluate the procedures for IDLH atmospheres.
    h. Analyze proper hazard assessment.
    i. Describe the criteria for breathing air quality.
    j. Explain "pressure-demand" SCBA and its special requirements.
    k. Identify procedures for respirators maintained for emergency use.
    l. List the criteria for determining proper respirator fit.
    m. Determine necessary points for assessment of comfort of the respirator.
    n. Explain the test exercises performed during fit testing and the duration of each exercise.

Outcome

At the conclusion of the distance learning course, each participant will take a written examination and complete a course evaluation. Participants will be graded on modern water and wastewater disinfectants, respiratory protection and related concepts.

Task Analysis and Training Needs Assessment Process Information Gathering

Task Analysis and Training Needs Assessments have been conducted to determine or set Needs-To-Know for the basis of this continuing education course. TLC has primary used Training Provider Manual for the Pennsylvania Water and Wastewater System Operator Training Program for course goal setting and learning objectives for all three training formats; conventional classroom, distance paper based and web based training.

Specific Course Goals and Timed Outcomes (Beta Testing)
Initial Beta Testing 2005. Original Master Course
Twenty students were given a task assignment survey in which to track their times on the above learning objectives (course content) and utilized a multiple-choice style answer sheet to complete their final assignment. All students were given 30 days to complete this assignment and survey. Twenty students were selected for this assignment. Thirteen of the students held water distribution or water treatment operator certification positions, and seven students were wastewater treatment operators. Fourteen out of twenty students were successfully tested. None of the test group received credit for their assignment. Six students failed the final examination. All of the students completed the reading assignment. All of the wastewater treatment operators passed the assignment. The average times were based upon the outcomes of the fourteen students who passed. Rusty Randall, Proctor, February 2005

Second Beta Testing and Course Adjustment
In the subsequent time, five hundred water/wastewater operator students were selected to complete the assignment and the completion statistics are as follows: 78 percent passing rate with an overall average score of 82 percent within a 90-day assignment completion period. The primary student response was the assignment was too difficult and too long. The average time necessary to complete each task was recorded as stated in the above objectives and timed outcome section.

The tasks were measured using times spent on each specific objective goal and final assignment grading of 70% and higher. The student survey was utilized to work out all problems in the assignment and was utilized for course corrections. Rusty Randall, Proctor, July 2012

Final Conclusion
The average time for Modern Disinfection is 20.4 hours with an average score of 82 percent.

Accreditation Formula for Figuring CEU Credit**
The results of beta testing were used in conjunction with a formula to determine average student time for accreditation purposes for intended audiences. This formula may not work for unintended audiences.
- 1 page of text = 2 minutes of student time.
- 1 word practice problem = 1 minute of student time.
- 1 word quiz/exam question = 1 minute of student time.

Course Page Count Total
1 page of text = 2 minutes of student time.
1 exam question = 1 minute of student time

525 pages times 2 equals 1050 divided by 60 minutes =17.50 hours
400 questions equals 6.50 hours
We are asking for 20 hours of credit.

Timed Averages
Student have reported the following time burden for successful completion of this distance learning course to be estimated to average of 20-21 hours per response per completed assignment or final examination. The timed burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing of the final assignment and passing the assignment with a score of 70% or better.

Beta Course Training/Assessment Short Summary
Technical Learning College identified training/assessment needs by placing identifying them in two categories; internal and external.

1. The difficulty of your course.
   Very Easy 0 1 2 3 4 5 Very Difficult

2. Please rate the difficulty of the testing process.
   Very Easy 0 1 2 3 4 5 Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.
   Very Similar 0 1 2 3 4 5 Very Different

Task Analysis and Training Needs Assessment Process Information Gathering
Task Analysis and Training Needs Assessments have been conducted to determine or set Needs-To-Know for the basis of TLC's continuing education courses. The following is a listing of some of those who have conducted extensive valid studies from which TLC has based the continuing education program upon: the Environmental Protection Agency (EPA), the Arizona Department of Environmental Quality (ADEQ), the Texas Commission of Environmental Quality (TCEQ), Pennsylvania Depart of Environmental Protection (PDEP) and the Association of Boards of Certification (ABC).

TLC has primary used Training Provider Manual for the Pennsylvania Water and Wastewater System Operator Training Program for course goal setting and learning objectives for all three training formats; conventional classroom, distance paper based and web based training.

The titles or names of subjects (Learning Objectives) may be changed for readability purposes. Some of the terms used in this document may be part of a copyrighted adult learning assessment process and in these cases, we utilize generic terminology. The needs assessment/survey maintains our training and education materials criteria. Assessments and changes are performed based on changes in technology, evaluations of the students, regulatory changes and editorial corrections. Most of this information is considered intellectual property and may not be owned by TLC but by third –parties. All of TLC's information is proprietary.

ADDIE
TLC utilizes a five-phase instructional design model consisting of Analysis, Design, Development, Implementation, and Evaluation for our continuing education courses. Each course design step has an outcome that feeds into the next step in the sequence. The five phases of ADDIE are as follows:

ANALYSIS
During the Training Needs Assessment Process Information Gathering Analysis phase, the course designer(s)(see Subject Matter Experts and Contributing Editors) identifies the learning need, the goals and objectives, the student's needs, existing knowledge, Course Statement of Need**,** and any other relevant characteristics (State or Federal Need-to-Know) and to ensure that students are learning what is relevant for their job**.**

DESIGN
This is the systematic process of specifying learning objectives from the Training Needs with a focus on Bloom's Taxonomy. A detailed storyboard following the Needs Assessment/Survey and/or Course Statement of Need will determine the course content.

DEVELOPMENT
The actual creation (production) of the training content will begin based upon the Design phase using Bloom's Taxonomy. At this time, a decision is make to proceed or table the course.

IMPLEMENTATION
During implementation, the Alpha testing plan is put into action and a procedure for course and/or assessment revision is implemented. These course materials and assessments are delivered or distributed to the student group. After delivery, the effectiveness of the training materials is evaluated in Beta testing phase. All of our courses have extensive Alpha and Beta testing to ensure job relevancy, correct information and course learning objectives are met.

EVALUATION
This phase consists of (1) formative and (2) summative evaluation from Alpha and Beta testing. Formative evaluation is present in each stage of the ADDIE process. Summative evaluation consists of tests designed for criterion-related referenced items and providing opportunities for feedback from the students and proctor. **Ongoing Course Evaluation:** Administrative and instructional staff will collect all student concerns (verbal, written and surveys) and distribute these to TLC Administrative personnel for evaluation and course corrections. Course and/or Assessment revisions are made as necessary.

Precept-Based (Micro-Learning) Training Course
TLC's training courses are based upon a form of induction training, made of topical and technical precepts that are discovered in the Needs Assessment/Survey and/or Training Needs Assessment Process Information Gathering. The training topics or learning objectives are made up of "micro-content" or "precepts"– or small chunks of information that can be easily digested. These bite-size pieces of technical information are considered to be one of the most effective ways of teaching students new or important information (regulatory or technical) because it helps the mind retain knowledge easier.

Micro-learning or precept-based training doesn't rely on the student to process a large amount of information before breaking it down. Our method includes short modules with clearly defined learning goals for each section. This method allows a student to hone in on a particular skill, then given the opportunity to exhibit their knowledge in the final assessment (assignment).

Course Training/Assessment Needs Methodology
Technical Learning College identified training/assessment needs by placing identifying them in two categories; internal and external.

Internal Methods include:
- ✓ Observation
- ✓ Interviews
- ✓ Instruments: Perception instruments and Knowledge based assessments
- ✓ Student records and reports
- ✓ Group problem analysis (Classroom or Seminars)
- ✓ Performance or Survey appraisals

External Methods include:
- ✓ Outside consultants (Completion)
- ✓ Government Certification Reviews (Training Needs)
- ✓ Records and reports from other agencies

The needs assessment/survey maintains our training and education materials criteria. Assessments and course material changes are performed based on changes in technology, evaluations of the participants and regulatory changes. Materials are assessed yearly or as needed to insure course integrity.

Course Author
Melissa Durbin
This course was co-authored by Melissa Durbin; she has over 25 years of wastewater treatment teaching experience as a college instructor. Melissa has written the several nationally accepted wastewater treatment manuals since 2001. This course has been accepted in most States for continuing education credit. Melissa has taught approximately 20,000 students about water/wastewater treatment, disinfection and related classes. She will be available to answer questions relating this course.

Extensive Academic Research
Technical Learning College's (TLC's) continuing education course material development was based upon several factors; field experience working in the water quality field, extensive academic research (teaching in the community college system), advice from subject matter experts (State officials and industry leaders), data analysis, task analysis and training needs assessment process information gathered from other states.

Both Melissa and Jeff Durbin are the two primary Instructors, Subject Mater Experts and Technical Writers have trained and/or certified more than ten thousand students. These two Instructors teach on a daily basis in a classroom setting throughout Arizona and on-line to students nationwide. See below for more information.

Advice from Subject Matter Experts
Both Melissa and Jeff Durbin are professional trainers and have been educated in current trends in professional education and continuing education needs.

Primary Course Designers Melissa and Jeff Durbin
Melissa Durbin
This course was co-designed by Melissa Durbin; she has over 25 years of teaching water and wastewater treatment experience as a college instructor. Melissa has written the several nationally accepted water and wastewater treatment manuals. Melissa has taught approximately 20,000 students about water and wastewater treatment and related classes. She will be available to answer questions relating this course.

Jeff Durbin
This course was co-designed by Jeff Durbin, over 10 years of water and wastewater treatment experience as a backflow inspector for the City of Phoenix and 20 years of water and wastewater treatment experience. Jeff has taught approximately 10,000 students about water and wastewater treatment primarily in water distribution, and pollution control (water quality) related classes. Jeff will also be able to answer any question pertaining to this course.

Extensive Academic Research
Technical Learning College's (TLC's) continuing education course material development was based upon several factors; field experience working in the water quality field, extensive academic research (teaching in the community college system), advice from subject matter experts (State officials and industry leaders), data analysis, task analysis and training needs assessment process information gathered from other states.

Both Melissa and Jeff Durbin are the two primary Instructors, Subject Mater Experts (S.M.E. and Technical Writers. See below for more information.

Advice from Subject Matter Experts
Both Melissa and Jeff Durbin are professional trainers and have been educated in current trends in professional education and continuing education needs.

Course Complier
Peter Easterberg, Detail-oriented technical writer/technical editor/desktop publisher/copy editor. 20 years' experience editing and writing feasibility and trade-off studies, test procedures, specifications, user manuals, company policies, HR forms, and ISO-9000 documents. Exceptional grammatical/written communication skills. "Go-to" person for Microsoft Word, Outlook, and general computer questions. Internet Webmaster Certificate (including HTML)

Contributing Editors
James L. Six Received a Bachelor of Science Degree in Civil Engineering from the University of Akron in June of 1976, Registered Professional Engineer in the State of Ohio, Number 45031 (Retired), Class IV Water Supply Operator issued by Ohio EPA, Number WS4-1012914-08, Class II Wastewater Collection System Operator issued by Ohio EPA, Number WC2-1012914-94

Joseph Camerata has a BS in Management with honors (magna cum laude). He retired as a Chemist in 2006 having worked in the field of chemical, environmental, and industrial hygiene sampling and analysis for 40 years. He has been a professional presenter at an EPA analytical conference at the Biosphere in Arizona and a presenter at an AWWA conference in Mesa, Arizona. He also taught safety classes at the Honeywell and City of Phoenix, and is a motivational/inspirational speaker nationally and internationally.

James Bevan, Water Quality Inspector S.M.E. Twenty years of experience in the environmental field dealing with all aspects of water regulations on the federal, state, and local levels. Experience in the water/wastewater industry includes operation of a wastewater facility, industrial pretreatment program compliance sampling, cross-connection control program management, storm water management, industrial and commercial facility inspections, writing inspection reports for industry, and technical reports per EPA permit requirements. Teacher and Proctor in Charge for Backflow Certification Testing at the ASETT Center in Tucson for the past 15 years and possess an Arizona Community College, Special Teaching Certificate in Environmental Studies. Extensive knowledge and experience in college course and assignment/assessment writing.

Dr. Pete Greer S.M.E., Retired biology instructor, chemistry and biological review.

Jack White, Environmental, Health, Safety expert, City of Phoenix. Art Credits.

Ongoing Course Evaluation
Administrative and instructional staff will collect all student concerns (verbal, written and surveys) and distribute these to Jeff Durbin and Bubba Jenkins for evaluation and course corrections.

Course Registration and Support

TLC offers complete registration and support services for all correspondence courses via e-mail, Web site, telephone, fax, and mail. TLC will attempt to provide immediate, prompt service.

When a student registers for a distance or correspondence course, he/she is assigned a "start date" and an "end date." It is the student's responsibility to note dates for assignments and keep up with the course work. If a student falls behind, he/she must contact TLC and request an end date extension in order to complete the course. It is the prerogative of TLC to decide whether or not to grant the request.

Students have 90 days from receipt of this manual to complete the assignments in order to receive their continuing education units (CEUs) or professional development hours (PDHs). A score of 70% or better is necessary to pass this course.

If students need any assistance, they should e-mail or call TLC with their concerns. In the interest of privacy, students' social security numbers are not used for tracking. Instead, a unique, alternate number is assigned to each student.

Disclaimer and Security Notice

The student shall understand that it their responsibility to ensure that this CEU course is either approved or accepted in my State for CEU credit. The student shall understand and follow State laws and rules concerning distance learning courses and understand these rules change on a frequent basis and will not hold Technical Learning College responsible for any changes. The student shall understand that this type of study program deals with dangerous conditions and will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable for any errors or omissions or advice contained in this CEU education training course or for any violation or injury caused by this CEU education training course material. The student shall contact TLC if they need help or assistance and double-check to ensure my registration page and assignment has been received and graded.

Student Verification

The student shall submit a driver's license for signature verification and track their time worked on the assignment. The student shall sign an affidavit verifying they have not cheated and worked alone on the assignment. All student attendance is tracked on the student attendance database.

Security and Integrity

All students are required to do their own work. All lesson sheets and final exams are not returned to the student to discourage sharing of answers. Any fraud or deceit and the student will forfeit all fees and the appropriate agency will be notified. A random test generator will be implemented to protect the integrity of the assignment.

Student's Identity, Attendance, and Participation Verification

A proctoring report and/or computer-tracking program validates proper identity, attendance and participation. The student shall submit a driver's license for signature verification and track their time worked on the assignment. The student shall also sign an affidavit verifying they have not cheated and worked alone on the assignment. We follow up with telephone confirmation and/or quiz review assessment. All student attendance is tracked on TLC's student attendance database.

TLC's Teaching Techniques and Assessment Tools
Our training courses are based upon a form of induction training, made of topical and technical precepts. The training topics are made up of "micro-content" or "precepts"– or small chunks of information that can be easily digested. These bite-size pieces of technical information are considered to be one of the most effective ways of teaching people new information because it helps the mind retain knowledge easier. Micro-learning or precept-based training doesn't rely on the student to process a large amount of information before breaking it down. Our method includes short modules with clearly defined learning goals for each section with a post quiz and a final assessment (quiz). This method of pre-quiz allows a student to hone in on a particular skill, then given the opportunity to exhibit their knowledge in the final assessment.

TLC's Educational Learning Objective Topics
The general course descriptions or topic titles may be different from the detailed description of the course's outline or learning objectives. These terms may be an alternative expression or a substitute but essentially having the same meaning. This is done for reading or for editing purposes. The detailed alpha and beta-testing data is not available in this document and is proprietary information belonging to a third party. The CEU course covers several educational topics/functions/purposes/objectives of compliance. The general course description of topics may be different from the detailed description. These differences are cosmetic only. The topics listed are to assist in determining which educational objective or goal that is covered for a specific educational topic area.

Student Information Personal Data Security Procedures
All information regarding the student is strict and privileged only. This information is held in secure databases and is not sold or provided to any one unless the student requests a copy or a State agency does an audit. Even during audits, we restrict confidential information unless the Agency can provide a legitimate excuse. Some of this security information and data is priority and details are not provided. Students are not provided with any passwords at this time.

Disclaimer and Security Notice
The student shall understand that it their responsibility to ensure that this CEU course is either approved or accepted in my State for CEU credit. The student shall understand and follow State laws and rules concerning distance learning courses and understand these rules change on a frequent basis and will not hold Technical Learning College responsible for any changes. The student shall understand that this type of study program deals with dangerous conditions and will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable for any errors or omissions or advice contained in this CEU education training course or for any violation or injury caused by this CEU education training course material.

Student Assistance
The student shall contact TLC if they need help or assistance and double-check to ensure my registration page and assignment has been received and graded.

Instructions for Written Assignments
The Modern Disinfection CEU correspondence course uses multiple choice and true/false questions. Answers may be written in this manual or typed out on a separate answer sheet. TLC prefers that students type out and e-mail their answer sheets to info@tlch2o.com, but they may be faxed to (928) 272-0747.

Final Examination for Credit
Opportunity to pass the final comprehensive examination is limited to three attempts per course enrollment.

Forfeiture of Certificate (Cheating)
If a student is found to have cheated on an examination, the penalty may include--but is not limited to--expulsion; foreclosure from future classes for a specified period; forfeiture of certificate for course/courses enrolled in at TLC; or all of the above in accordance with TLC's Student Manual. A letter notifying the student's sponsoring organization (State Agency) of the individual's misconduct will be sent by the appropriate official at TLC. No refund will be given for paid courses. An investigation of all other students that have taken the same assignment within 60 day period of the discovery will be re-examined for fraud or cheating.

Required Texts
This course comes complete and does not require any other materials.

Security and Integrity
All students are required to do their own work. All lesson sheets and final exams are not returned to the student to discourage sharing of answers. Any fraud or deceit and the student will result in forfeiture of all fees and the appropriate agency will be notified.

Environmental Terms, Abbreviations, and Acronyms
TLC provides a glossary in the rear of this manual that defines, in non-technical language, commonly used environmental terms appearing in publications and materials, as well as abbreviations and acronyms used throughout the EPA and other governmental agencies.

Feedback Mechanism (Examination Procedures)
Each student will receive a feedback or survey form as part of his or her study packet. The student will be able to find this form in the front of the assignment or lesson(assessment). The student can e-mail, snail mail or telephone TLC for any concern at any time.

Student Concerns
Most of student/training course related concerns are generally answered within 2 hours but not more than 24 hours. TLC has three support staff administrators with computers and telephones and have excellent communication and computer skills and able to respond and track all students and obtain or submit required forms and assignments. TLC has a dedicated computer student tracking system database that is backed-up on a daily bases and this information is secured and stored at a secure offsite location in case of fire or security problems. All student website information is tracked and documented for security measures.

Recordkeeping and Reporting Practices
TLC keeps all student records for a minimum of five years. It is the student's responsibility to give the completion certificate and/or paperwork to the appropriate government agencies. If necessary, we will electronically submit the required information to New York, Colorado, Texas, Indiana, Pennsylvania and any other required state for your certification renewals.

TLC Record Storage
TLC's training records include the following elements:
1. Individual course training (assessment) and registration page (Customer Order Record) is recorded in Excel format and the hard copies are scanned and stored in a computer database for 5 years and include the following:
a. the instructor(s) who taught each session on that date the of the training session or grading was offered (in comments section registration page) as well as which instructor was considered to be the lead instructor(s) and by the Director.
b. the name of the instructor(s) and facilitator(s) who proctored and/or graded the examination for each training session if applicable (in comments section registration page);
c. the attendance sign-in sheet(s) (registration page) for each training course or session;
d. all graded and dated validated examination answer (Assessment) sheets for each examination attempt including an explanation (written in comments and/or Excel list) for any retests as well as a narrative explaining any assistance provided to the attendee before the re-test; and
e. session evaluation(survey)forms (in comments section registration page and or Excel list).

Grading Criteria
TLC offers students the option of either pass/fail or assignment of a standard letter grade. If a standard letter grade is not requested, a pass/fail notice will be issued. Final course grades are based on the total number of possible points. The grading scale is administered equally to all students in the course. Do not expect to receive a grade higher than that merited by your total points. No point adjustments will be made for class participation or other subjective factors. For security purposes, please fax or e-mail a copy of your driver's license and always call us to confirm we've received your assignment and to confirm your identity.

Final Assignment
The final examination assignment is determined by the examination administrator or the instruction and there are generally three versions that are readily available. There are also three levels of the examination from average, (5 Answers) Difficult (5 +All of the above) and very difficult (Six answers and All of the above). The student is provided the average rated examination unless there is a condition or concern that requires a more difficult exanimation. Example, two or more students at the same address or any suspicion of cheating or potential fraud. We try to ensure the security and learning experience. Assignments/answer keys are only accessible to instructors and administrative staff that have a need to know clearance.

Failure
If the student fails the examination, they are provided with two more chances to successfully pass the exam with a score of 70% or better. The student may receive a different and randomly generated exam. Upon failure of an exam, the student can submit their concerns in writing or submit a survey form and has the option to receive instructor assistance that would be equivalent to conventional classroom assistance in discovering the areas that are deficient. The instructor has the option in describing the assistance method or procedure depending upon the student's deficiencies.

Grading Criteria
TLC will offer the student either pass/fail or a standard letter grading assignment.
A 900 – 1000 points
B 800 – 899 points
C 700 – 799 points
D 600 – 699 points
F <600 points

In order to successfully pass this course, you will need to have 70% on the final exam. The entire assignment is available on TLC's Website in a Word document format for your convenience.

Forfeiture of Certificate (Cheating)
If a student is found to have cheated on an examination, the penalty may include--but is not limited to--expulsion; foreclosure from future classes for a specified period; forfeiture of certificate for course/courses enrolled in at TLC; or all of the above in accordance with TLC's Student Manual. A letter notifying the student's sponsoring organization (State Agency) of the individual's misconduct will be sent by the appropriate official at TLC. No refund will be given for paid courses. An investigation of all other students that have taken the same assignment within 60-day period of the discovery will be re-examined for fraud or cheating. TLC reserves the right to revoke any published certificates and/or grades if cheating has been discovered for any reason and at any time. Students shall sign affidavit agreeing with all security measures. The student shall submit a driver's license for signature verification and track their time worked on the assignment. The student shall sign an affidavit verifying they have not cheated and worked alone on the assignment.

Note to students: Keep a copy of everything that you submit.
If your work is lost, you can submit your copy for grading. If you do not receive your certificate of completion or quiz results within two or three weeks after submitting it, please contact us immediately. We expect every student to produce his/her original and independent work.

Any student whose work indicates a violation of the Academic Misconduct Policy (cheating, plagiarism) can expect penalties as specified in the Student Handbook, which is available through Student Services; contact them at (928) 468-0665. A student who registers for a distance learning course is assigned a "start date" and an "end date." It is the student's responsibility to note due dates for assignments and to keep up with the course work. If a student falls behind, she/he must contact the instructor and request an extension of her/his *end date* in order to complete the course. It is the prerogative of the instructor to decide whether or not to grant the request.

Your assignments are due on time. Any assignment or mailed-in examination that is one to five days late will be marked down one letter grade. Any assignment or mailed-in examination that is turned in *later* than five days will not be accepted and will be recorded in my grade book as "non-participating" and you can be withdrawn from class. (See final grade options.)

Proctoring Instructions
Students enrolled in Technical Learning College's CEU courses that require proctored testing and **who do not live in the physical service area** of the Technical Learning College Test Center must nominate and gain prior approval of a proctor who will monitor course tests. A new proctor nomination form is required for each term and for each class.

PROCTORS, *If Necessary…*
A proctor is an individual who agrees to receive and administer a student's test(s) from Technical Learning College at the proctor's business email address. The test(s) will be ethically and professionally administered in a suitable testing environment (e.g., college/library or professional office). The proctor will return the test(s) to the Technical Learning College Test Center via fax immediately after administration, and the proctor will mail the exam within one (1) work day of administration to the Technical Learning College Test Center.

Proctors certify in writing to the Technical Learning College Test Center that the student completed the test according to all of the specific directions provided in the proctor guidelines

letter. As the Proctor Nomination Form indicates, the student will identify the specific test(s) the proctor will monitor.

Any proctor the student nominates must be acting in the official capacity in one of the following positions:

- **College or University Personnel:** Dean, Department Chair, Student Records, Professional Staff Member of an adult/continuing education office or counseling center, Librarian, Professor, or any official testing center personnel if the tests are administered in the center.
- **Armed Forces Education Office Personnel**
- **Public or Private School Personnel:** Superintendent, Principal, Guidance Counselor, or Librarian.
- **Other:** Civil Service Examiner, Librarian for City/County, HR Professional, or Education/Training Coordinator.

The following persons do not qualify as proctors:

- **Co-workers, someone who reports to you or your immediate supervisor**
- **Friends**
- **Neighbors**
- **Relatives**

Nominating a Proctor

Students are responsible for identifying, nominating, and making all of the arrangements for the proctoring of their course tests, including the payment of any fees for services and the return of test materials to Technical Learning College Test Center (cost of FAX or postage). The proctor must be able to receive the student's test(s) via email as attachments. The Technical Learning College Test Center does not accept Yahoo, AOL, G-mail, Hotmail, or etc. email addresses.

If the student is unable to find a suitable proctor, they must contact the Technical Learning College Test Center for assistance immediately via email.

Proctor Nomination Form

Students will use the Proctor Nomination Form for nomination and approval of a proctor. The student will complete the top part of the form for each course s/he is taking, even if the same proctor is used for all tests. The student must click on the submit button for the data to be electronically transmitted to the Technical Learning College Test Center.

Disclaimer Notice

It is ultimately the student's responsibility to ensure that this CEU course is either approved or accepted in my State for CEU credit. The student shall understand State laws and rules change on a frequent basis and believe this course is currently accepted in their State for CEU or contact hour credit, if it is not, the student shall will not hold Technical Learning College responsible. The student shall also understand that this type of study program deals with dangerous conditions and that the student shall will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable for any errors or omissions or advice contained in this CEU education training course or for any violation or injury caused by this CEU education training course material. The student shall will call or contact TLC if help or assistance is needed and double-check to ensure the registration page and assignment has been received and graded.

Affidavit of Exam Completion
The student shall affirm that they alone completed the entire text of the course. The student shall affirm that they completed the exam without assistance from any outside source. The student shall understand that it is their sole responsibility to file or maintain their certificate of completion as required by the state.

Refund Policy
We will beat any other training competitor's price for the same CEU material or classroom training. Student satisfaction is guaranteed. We will refund course fees if the course is not accepted for credit by the State. Otherwise, any other problem will be given an exchange credit towards an acceptable or approved course for the State. Once we are notified of the refund or exchange, we will generally issue a refund in 30 days of the problem and exchange within the same day.

Continuing Education Units
You will have 90 days from receipt of this manual to complete it in order to receive your Continuing Education Units (**CEUs**) or Professional Development Hours (**PDHs**). A score of 70% or better is necessary to pass this course. If you should need any assistance, please visit our Assistance Page on the website. Please e-mail all concerns and the final test to info@tlch2o.com.

Mission Statement
Our only product is educational service. Our goal is to provide you with the best possible education service possible. TLC will attempt to make your learning experience an enjoyable opportunity.

ADA Compliance
TLC will make reasonable accommodations for persons with documented disabilities. Students should notify TLC and their instructors of any special needs. Course content may vary from this outline to meet the needs of these particular students.

Note to Students
Keep a copy of everything that you submit! If your work is lost, you can submit your copy for grading. If you do not receive your certificate of completion or other results within two to three weeks after submitting it, please contact your instructor.

Note to Students
Keep a copy of everything that you submit! If your work is lost, you can submit your copy for grading. If you do not receive your certificate of completion or other results within two to three weeks after submitting it, please contact your instructor.

Student is required to submit the following information for assignment grading…
1. 70 PERCENT ON FINAL ASSESSMENT
2. DRIVER'S LICENSE
3. SCHEDULE OF TIME WORKED ON ASSIGNMENT
4. AFFIDAVIT OF EXAM COMPLETION
5. PROCTOR CERTIFICATION
6. TELEPHONE CONFIRMATION

Educational Mission
To provide TLC students with comprehensive and ongoing training in the theory and skills needed for the environmental education field,

To provide TLC students with opportunities to apply and understand the theory and skills needed for operator certification,

To provide opportunities for TLC students to learn and practice environmental educational skills with members of the community for the purpose of sharing diverse perspectives and experience,

To provide a forum in which students can exchange experiences and ideas related to environmental education,

To provide a forum for the collection and dissemination of current information related to environmental education, and to maintain an environment that nurtures academic and personal growth.

At the finish of this course…
At the conclusion of this training course, the student will receive twenty hours of continuing education on modern disinfection techniques related to the proper treatment of water or wastewater. This course will primary deal with chlorine and pathogen destruction but other halogens and disinfection processes will be covered.

CUSTOMER SERVICE RESPONSE CARD

NAME: _____

E-MAIL_____PHONE_____

PLEASE COMPLETE THIS FORM BY CIRCLING THE NUMBER OF THE APPROPRIATE ANSWER IN THE AREA BELOW.

1. Please rate the difficulty of your course.

   Very Easy 0 1 2 3 4 5 Very Difficult

2. Please rate the difficulty of the testing process.

   Very Easy 0 1 2 3 4 5 Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.

   Very Similar 0 1 2 3 4 5 Very Different

4. How did you hear about this Course? _____

5. What would you do to improve the Course?

_____

_____

How about the price of the course?

Poor_____ Fair ____ Average ____ Good____ Great_____

How was your customer service?

Poor___ Fair ____ Average ____ Good _____ Great_____

Any other concerns or comments.

_____

_____