

DRINKING WATER AND WASTEWATER SYSTEMS OPERATOR CERTIFICATION PROGRAM HANDBOOK

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Division of Training, Technical and Financial Services



DEPARTMENT OF ENVIRONMENTAL PROTECTION
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AUTHORITY: Water and Wastewater Systems Operator's Certification Act (63 P.S. §1001 et seq.) and 25 Pa. Code Chapter 302 - Administration of the Water and Wastewater Systems Operators' Certification Program

POLICY: Department of Environmental Protection (Department) staff and the State Board for Certification of Water and Wastewater Systems Operators (Certification Board) will follow the policies and procedures stated and referenced herein.

PURPOSE: The purpose of this document is to provide procedural guidance to the regulated community to ensure compliance with the requirements of the Water and Wastewater Systems Operators' Certification Program.

APPLICABILITY: The policies and procedures herein provide guidance to Department personnel and the regulated community concerning the implementation of the Drinking Water and Wastewater Systems Operator Certification Program.

DISCLAIMER: The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the Department or the Certification Board to give these rules that weight or deference. This document establishes the framework, within which the Department and the Certification Board will exercise their administrative discretion in the future. The Department and the Certification Board reserve the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 164 pages

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Chapter 1 - Introduction

The purpose of the Drinking Water and Wastewater Systems Operator Certification Program is to protect public health, safety and the environment and promote the long-term sustainability of the Commonwealth's drinking water and wastewater treatment systems by ensuring that certified operators with the appropriate knowledge, skills and abilities are available to make the necessary process control decisions. This handbook is designed to be a reference for the operator and the system owner to help achieve this goal.

A. Background

- 1. What do the 1996 Amendments to the Safe Drinking Water Act (SDWA) and the U.S. Environmental Protection Agency (EPA) Federal Guidelines require?** The 1996 Amendments to the SDWA directed the EPA to establish guidelines specifying minimum standards for certification and recertification of operators of community and nontransient noncommunity public water systems. EPA is required to withhold 20% of a State's Drinking Water State Revolving Fund unless a State has adopted, and is implementing, an operator certification program that meets these guidelines. The minimum standards established in the guidelines which are of interest here include:
 - Classification of all systems, facilities and operators:
 - a. Based on indicators of potential health risk with standards for certification and certificate renewal for each classification.
 - b. Provisions for owners to place systems under the direct supervision of a certified operator(s) with a valid certificate equal to or greater than the classification of the system.
 - c. Designation of a certified operator to be available for each operating shift.
 - Provisions for ensuring all process control decisions are made by a certified operator.
 - Operator Qualifications:
 - a. Take and pass an examination. Exam questions must be validated.
 - b. Have a high school diploma or General Equivalency Diploma (GED), or relevant training and experience.
 - c. On-the-job experience.
 - Enforcement:
 - a. Appropriate enforcement capabilities such as orders, compliance agreements and penalties.
 - b. Revocation or suspension of a certificate for misconduct including "fraud, falsification of application or operating records, gross negligence in operation, incompetence, and/or failure to use reasonable care or judgment in the performance of duties."

- Certification Renewal:
 - a. Training requirements for renewal.
 - b. Fixed cycle for renewal not to exceed three years.
 - c. Recertification if individual fails to renew within 2 years of certificate expiration.

2. What does the Water and Wastewater Systems Operators' Certification Act (Act) require? The Act provides the Commonwealth of Pennsylvania with the legal authority to implement a program that is in compliance with the minimum program standards established by EPA described above in question 1. In addition the Act:

- Applies the same minimum standards established by EPA for all community and nontransient noncommunity water systems to all wastewater treatment systems designed to collect, convey or treat wastewater and from which effluent in excess of 2,000 gallons per day is discharged into waters of this Commonwealth.
- Requires the submittal and review of a Criminal History Record from the Pennsylvania State Police as a condition for certification. Please refer to Chapter 3, Section C.
- Requires all certified operators to take and pass mandatory security training developed by the Department. Please refer to Chapter 4, Section D.

3. Who must comply with the requirements of this program? Owners and operators of the following systems must comply with the requirements of the Drinking Water and Wastewater Systems Operators' Certification Act:

- Community Water System - A public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
- Nontransient Noncommunity Water System - A noncommunity water system that regularly serves at least 25 of the same persons over 6 months per year.
- Consecutive Water System - A public water system that obtains all of its water from another public water system and resells the water to a person, provides treatment to meet a primary maximum contaminant level or provides drinking water to an interstate carrier. The term does not include bottled water and bulk water systems.
- Wastewater System - A structure designed to collect, convey or treat wastewater and from which effluent in excess of 2,000 gallons per day is discharged into waters of this Commonwealth.
- Collection System with Pump Stations - A system of pipelines or conduits, pumping stations and force or gravity mains used for collecting and conveying wastes to a point of treatment and disposal.

4. Who is exempt? Owners and operators of the following systems are exempt from the requirements of the Drinking Water and Wastewater Systems Operators' Certification Act:

- A wastewater treatment system with a permitted average daily discharge flow of less than 2,000 gallons per day.
- A wastewater treatment system regulated under Chapter 73 (relating to standards for onlot sewage treatment facilities).
- An industrial wastewater system used to treat, recycle or impound industrial or agricultural wastes within the boundaries of the industrial or agricultural property.
- An industrial wastewater pretreatment system in which treated wastewater is released to a collection system of a wastewater treatment plant that is regulated under Chapter 302.
- An industrial wastewater treatment system that is an NPDES permitted point source discharge.
- A system designed to only collect and treat stormwater.
- Other systems that are exempted by the Department by rules and regulations, guidelines or policy.

B. State Board for Certification of Water and Wastewater Systems Operators (Certification Board)

- 1. What is the Certification Board?** The Certification Board was created by the Water and Wastewater Systems Operators' Certification Act to review and act upon applications for certification, recertification and certificate renewal of water and wastewater systems operators, to administer examinations prepared by the Department to determine the competency of applicants for certification and recertification and revoke, suspend, modify or reinstate certificates upon petition of the Department. The Certification Board consists of 7 members; the Department Secretary or representative, and six additional members appointed by the Governor. Each appointment shall be for a period of four years duration.
- 2. Who are the members of the Certification Board and who do they represent?** The current members of the Certification Board are:
 - An employee of a political subdivision who is certified to operate a water or wastewater system or a certified operator who represents a State association of political subdivisions;
 - An individual certified to operate a water system;
 - An individual certified to operate a wastewater system;

- A certified operator who is the owner or official of a privately owned water or wastewater system;
 - A member on the teaching staff of the civil, environmental or sanitary engineering department of an accredited Pennsylvania university or college;
 - A member of the general public who is knowledgeable in water or wastewater systems;
 - The Secretary of the Department or a representative.
3. **When does the Certification Board meet?** Regular meetings of the Certification Board are established on an annual basis before the end of each calendar year. At a minimum, the Certification Board meets quarterly. Additional meetings may be scheduled based on workload and need. To access the meeting schedule, agendas and handouts, meeting minutes, by-laws, membership list, etc. go to the Department website at www.dep.state.pa.us. Once there, click on **Public Participation** (left side of screen), then **Advisory Committees** (center of screen), then **State Board for Certification of Water and Wastewater System Operators** (bottom center of screen).

C. Sources of Information

1. **Department Operator Information Center Webpage** - This site provides valuable information about the Operator Certification Program and directs the user to specific topics of interest or need (i.e., Education and Training, Documents and Forms, Certification and Licensing, Change of Available Operator Form, Technical Assistance, and Certification Exam Schedule). The webpage can be accessed at www.dep.state.pa.us (DEP Programs: operator).

2. **Program Administrative and Technical Staff**

Certification Questions: 717-787-5236 or RA-OperatorWebsite@pa.gov
Supply your contact information within your message including: First and Last Name, Department Client ID Number and email address.

Training Questions: 717-772-0122 or DEPWSTechTrain@pa.gov To find and take a Department-approved training course or to view your transcript www.earthwise.dep.state.pa.us/edu.

Technical Assistance: 717-787-0122 for specific information regarding the Capability Enhancement (CE) Program or the Water and Wastewater Outreach Assistance Program.

Contact us by mail:

State Board for Certification of Water and Wastewater Systems Operators
Rachel Carson State Office Building
P.O. Box 8454
Harrisburg, PA 17105-8454

Division of Training, Technical and Financial Services
Bureau of Safe Drinking Water
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3. **Department Regional Offices:** For specific information on the classification of a water or wastewater system, contact the appropriate Department Regional Office inspector, sanitarian, environmental protection compliance specialist or water quality specialist. Information regarding the Department Regional Offices and staff is available through the DEP website at www.dep.state.pa.us (on left; click on Regional Resources).

Chapter 2 - Becoming a Certified Operator

The Water and Wastewater Systems Operators' Certification Act (Act) requires operators to demonstrate the appropriate skills, knowledge and abilities to make the correct process control decisions needed to meet water quality standards. To become certified an applicant must pass the appropriate examination(s), meet the minimum education and experience requirements and submit an application for certification to the Certification Board in accordance with program procedures.

A. Education Requirements

- 1. Can I still become a certified operator if I didn't finish high school?** An applicant who was operating a water or wastewater treatment system prior to February 21, 2002 can become a certified operator without either a high school diploma or General Equivalency Diploma (GED). The applicant must provide written verification by the applicant's supervisor or another certified operator with direct knowledge of the applicant's working experience with the application for certification. For those operators who started working in a system after February 21, 2002, the operator must have either a high school diploma or a GED to meet the minimum education requirements.
- 2. I passed a General Equivalency Diploma (GED) test. Does this satisfy the high school requirement?** Yes; an applicant for certification must have a high school diploma or a GED to meet the minimum education requirements.
- 3. If I have a bachelor's degree in a technical discipline, do I still have to pass an examination and meet the experience requirements?** Yes. However, the minimum experience requirements are reduced, depending on the level of additional education achieved. A summary of these requirements is below under experience requirements.
- 4. How does the Certification Board determine my qualifying education?** Applicants for certification must have a high school diploma or a General Equivalency Diploma (GED), or must verify that they were working as an operator before February 21, 2002. The application for certification provides a section to confirm this information. Upon applying for certification applicants should attach a copy of their diploma or GED to the application. Also, any documentation to support additional qualifying education (college transcripts and/or course completion certificates) applicants want considered to reduce the experience requirements should accompany the application.
- 5. What if I disagree with the Certification Board's determination?** Department staff reviews every application for certification action and provides a recommendation to the Certification Board for action. The applicant has the option to discuss the specifics of the application with the Certification Board before the Certification Board takes action. The Certification Board's decisions are appealable to the Environmental Hearing Board.

B. Experience Requirements

- 1. What is meant by Track I and Track II?** Track I identifies the experience requirement necessary to qualify for certification when the applicant meets the basic educational requirement (high school diploma or a GED).

Track I experience requirements for wastewater system operators.

<u>Class</u>	<u>Minimum Experience</u>
A	4 years
B	3 years
C	2 years
D or E	1 year

Track I experience requirements for water system operators.

<u>Class</u>	<u>Minimum Experience</u>
A	4 years
B	3 years
C	2 years
D or E	1 year
Dc or Dn	6 months

Track II provides a reduction in the experience requirements when the applicant has successfully earned one of the following:

- A certificate of completion of a Department-approved certificate program in water or wastewater treatment, or both (CP).
- An associate degree in water or wastewater operations, or both, approved by the Department (ASP).
- An associate degree in environmental sciences, physical sciences, engineering or engineering technology not approved by the Department (AS).
- A bachelor's or graduate degree in biology, chemistry, environmental sciences, physical sciences, sanitary or environmental engineering or engineering technology from a nationally accredited college or university (BS/BA).

Track II experience requirements for wastewater system operators.

<u>Class</u>	<u>CP</u>	<u>ASP</u>	<u>AS</u>	<u>BS/BA</u>
A	2 years	1 year	3.5 years	2 years
B	1 year	6 months	2.5 years	1 year
C	6 months	6 months	1.5 years	6 months
D	6 months	6 months	6 months	6 months
E	6 months	6 months	6 months	6 months

Track II experience requirements for water treatment system operators.

<u>Class</u>	<u>CP</u>	<u>ASP</u>	<u>AS</u>	<u>BS/BA</u>
A	2 years	1 year	3.5 years	2 years
B	1 year	6 months	2.5 years	1 year
C	6 months	6 months	1.5 years	6 months
D	6 months	6 months	6 months	6 months
E	6 months	6 months	6 months	6 months
Dc or Dn	0 months	0 months	6 months	0 months

2. **What is operating experience?** Experience for certification is achieved by participating in a combination of activities related to process control under the supervision of an operator certified in the appropriate subclassifications. The Certification Board will consider the following types of activities for qualifying experience:
 - Operating mechanical equipment related to process control
 - Maintaining mechanical equipment related to process control
 - Collecting and analyzing chemical and biological samples related to process control and regulatory compliance activities.
 - Performing calculations related to process control
 - Preparing or standardizing chemical and biological solutions
 - Interpreting, compiling and completing monitoring data
 - Recommending appropriate process control measures.
 - Participating in onsite assessment, inspection or evaluation of plant processes.
 - Calibrating chemical feed systems
 - Using equipment to monitor and measure flows through a water/wastewater system.

3. **Can I substitute training for experience?** An applicant for operator certification using Track I may supplement up to 50% of the required operating experience by successfully completing additional education beyond the minimum education requirement. One month of experience can be credited for the successful completion of every 10 contact hours of Department-approved training courses in water or wastewater treatment, as applicable, or 1.5 months experience may be credited for the successful completion of one college credit in water or wastewater treatment related courses from an accredited college or university. The Department will approve these courses in accordance with its training approval process guidelines.

4. **Does distribution or collection system experience count as experience at the treatment plant?** No; distribution or collection system experience does NOT count as experience for treatment plant certification.

5. **How is experience counted if an operator works part-time?** One year of experience is equal to 220 working days or 1,760 hours of employment. Experience will be prorated for time periods less than 1 year. Experience is counted up to the first day of the month after the applicant submits an application for certification action.

6. **I am a full-time operator but work at different types of systems. How will my experience be calculated?** The applicant needs to provide detailed descriptions of the treatment systems where experience was obtained as part of the application for certification action. Remember, experience for certification is achieved by participating in a combination of activities related to process control under the supervision of an operator certified in the appropriate subclassifications. *Focus on the operating duties and responsibilities for each system.* For applicants whose experience was obtained at a system in Pennsylvania, the final class is based on the cumulative total of years spent at the system with the highest class and any systems classified at two lower levels.

For applicants applying for certification based on reciprocity, the final class of certification is based on the highest class of system where the applicant meets the minimum experience requirements. Time at individual systems is not cumulative. Finally, up to 50% of the operating experience gained at a water system can be applied towards the experience requirements for wastewater system certification and vice-versa. A minimum of one year of operating experience is required for each technology subclassification.

7. **Am I required to pass through each class of certification or can I go straight to a higher class?** The class of certification an individual obtains is solely based on experience. Therefore, an operator does not need to be certified at a lower class of certification before obtaining a higher class. In addition, for operators who gained operating experience in Pennsylvania, experience for a class may be obtained at a system at the classification level requested or two classification levels alphabetically lower. For example, an applicant working at a Class C system in Pennsylvania can apply for a Class A certificate if they meet the Class A requirements.
8. **How is qualifying experience determined?** An applicant should provide detailed descriptions of the treatment systems where experience was obtained. *An applicant needs to focus on the operating duties and responsibilities for each system where the applicant worked.* The Department assesses the qualifications for the class and each subclasses of treatment based on this information and provides a recommendation to the Certification Board for consideration. The more detail provided relative to the specific tasks listed under operating experience in question 2, the easier it is to evaluate an application.
9. **What if I disagree with the Department's assessment of my operating experience?** If an operator disagrees with the Department's assessment of experience, that operator can write to the Certification Board explaining his/her position or ask to attend the next meeting of the Certification Board. The operator will be allowed to present his/her rationale as to why the determination of experience was incorrect and identify the higher level of certification he/she feels should be awarded. If the operator is still not satisfied with the decision of the Board, it can be further appealed to the Environmental Hearing Board.
10. **My former supervisor has died; how do I verify my experience?** If your former supervisor has died, then another person knowledgeable of your experience can sign the application. These would include the new supervisor, another operator, coworker or other system personnel. However, be aware that this person is attesting to your

experience and any falsification of the application is subject to enforcement procedures and penalties.

C. Examinations

1. **Where can I obtain training materials?** The Department's Water and Wastewater Training Modules can be obtained from an Approved Examination Provider or calling the Department, Division of Training, Technical and Financial Services at 717-787-0122 or emailing the request to DEPWSTechTrain@pa.gov. Additional training materials can also be obtained from the California State University, Sacramento, CA, via their website at www.owp.csus.edu or by calling 916-278-6142. Also internet searches are a valuable tool for obtaining a host of information on water and wastewater subjects.
2. **What about courses to prepare for the examination?** Courses to prepare for the examination are offered by a number of Approved Examination Providers. The Department's Earthwise Academy has a complete listing of courses offered by these providers and is accessed at the following link, www.ahs2.dep.state.pa.us/edu/Default.aspx.

In addition, the Department offers many courses that would enhance the operator's general knowledge, skills and abilities to pass the examinations. A listing of these courses can also be found on the Earthwise Academy website.

3. **What subject matter is covered on the various certification examinations?** There are three types of examinations: General, technology-specific and stand-alone examinations. To become certified, the applicant must pass the general and at least one technology-specific examination or one of the stand-alone examinations. The General examinations cover the knowledge, skills and abilities (KSAs) common to any water or wastewater system, respectively. The technology specific exams cover only those specific KSAs needed to operate that technology. Appendix A is a complete listing of the KSAs for each water and wastewater examination, grouped by the Need-to-Know Criteria Category.
4. **How do I start preparing for a certification examination?** The questions on the examination are all multiple choice. All examinations are closed book. A formula/conversion sheet will be provided. The examinees are expected to bring a non-programmable calculator and pencils. Courses to prepare for the examination are offered by a number of different Approved Examination Providers. Check their respective websites for courses listings. A complete listing of Approved Examination Providers can be found on the Department's Earthwise Academy website. The Academy can be accessed at the following link: www.ahs2.dep.state.pa.us/edu/Default.aspx. The Academy also offers many courses that would enhance the operators' general knowledge, skills and abilities to pass the examinations. Finally, the Department's Water and Wastewater Training Modules can be obtained from an Approved Examination Provider or calling the Department, Division of Training, Technical and Financial Services at 717-787-0122 or emailing the request to DEPWSTechTrain@pa.gov. These modules were first designed as an instructional tool for training providers, but many operators have also used them as a study guide.

5. **If I fail my examination, how can I get further feedback on my mistakes other than just the score?** The Department recently obtained the necessary equipment for scoring examinations in-house. Therefore, once program staff is comfortable with the software, the ability to provide a more specific breakdown of an applicant's score will be possible. This might help an examinee focus on specific areas he/she needs to study to pass the examination.
6. **Can I just show up at an examination site and take an examination?** No; an individual cannot just show up for an examination. Examinees must first register for an examination through an Approved Examination Provider, usually by completing the examination application and paying the registration fee to the Approved Examination Provider.
7. **How do I apply for an examination?** The examinations are offered at various times throughout the year and at many locations throughout the Commonwealth. An examinee can register for examinations through an Approved Examination Provider by completing an examination application and paying the required fee to the Approved Examination Provider. The examinee will receive a confirmation from the Approved Examination Provider, through a Letter of Notification. The examinee must have photo identification and the Letter of Notification for admission to the examination. Exact dates and locations for examinations are listed on the Department's Operator Information Center webpage at www.dep.state.pa.us (DEP Programs: operator).
8. **How many examinations may I take at one examination session?** An examinee can take as many examinations as he/she thinks can be completed in a 4-hour examination session. Based on past experience, it is not recommended that an examinee take more than five examinations at one time.
9. **If I have registered to sit for an examination and cannot take the test, how do I cancel my registration?** An applicant needs to immediately contact the Approved Examination Provider. Failure to notify the Approved Examination Provider so that the applicant's name can be removed from the registration list will result in being assessed the \$35 Department examination fee. Remember, the \$35 examination fee is assessed by the Department. The Approved Examination Provider may have its own cancellation or refund policy regarding any additional costs assessed by the provider to deliver the examination.
10. **How often and where are examinations offered?** The examinations are offered at various times throughout the year and at many locations throughout the Commonwealth. Exact dates and locations for exams are listed on the Department's Operator Information Center webpage at www.dep.state.pa.us (DEP Programs: operator). These dates and locations are also listed on the various Approved Examination Provider websites.
11. **Do I have to attend a class to become a certified operator?** No; training or experience is not required to take an examination. You do not have to attend a class to become a certified operator. However, training taken before becoming a certified operator can reduce the amount of operating experience required for certification.

12. **Can I take a certification examination before I meet the eligibility requirements for certification?** Yes; an applicant can take examinations before meeting the eligibility requirements. If the applicant passes the required examinations for certification, but fails to meet the eligibility requirements, the applicant can be issued an Operator-In-Training (OIT) status. This OIT status can assist the operator in gaining employment and the opportunity to acquire the necessary experience to gain full certification. The OIT status lets the employer know that the operator has passed the required examination(s) and only needs to acquire the necessary operating experience to become a fully certified operator.
13. **I passed a subclass examination; why am I not certified?** To be initially certified as a treatment system operator, an applicant must pass the Part I General Examination for either water or wastewater and at least one of the technology specific subclass examinations. To be initially certified as a distribution or collection system operator, the applicant needs to pass the Class E stand alone distribution or collection system examination (they do not need to pass a Part I General Examination).
14. **When will I be notified if I pass or fail?** Applicants will be notified approximately four weeks after the examination session if they passed or failed the examinations.
15. **After taking an examination, how will I be notified of the results?** An applicant will be notified through the mail (by letter) approximately four weeks after the examination.
16. **If I fail an examination, how long must I wait to retake it?** If an applicant fails an examination there is no waiting period before the applicant can retake an examination. An applicant can retake the examination at the next examination session.
17. **What options do I have if the next certification examination is not scheduled for several months?** Currently, there are no other options. However, as part of a pilot program in 2009, on-line examinations were provided as an alternative to classroom/paper based examinations. The Certification Board hopes to restart the delivery of on-line examinations in the near future.
18. **Are the on-line examinations the same as the paper examinations?** Yes; they are exactly the same.

D. Operator in Training (OIT)

1. **What is the purpose of the OIT certificates?** Designation as an “Operator in Training” is a special designation offered by the Certification Board to those operators who have passed their examinations but have not yet satisfied the experience requirements.
2. **Can an individual with an OIT certificate be considered as the properly certified operator for a treatment facility?** No, not until the OIT meets the experience requirements for the class of the system and the appropriate certification. The minimum amount of experience required can be reduced by obtaining additional training or education above the high school level. See the explanation of the Track I and Track II experience requirements in Section B.1 above. What the OIT certificate does provide is assurance to potential employers that, given a period of time, the employee they are hiring will become a certified operator.

3. **If I become an OIT, how do I get my certification?** After an applicant takes and passes an examination, the individual must apply for certification by completing and submitting an application for certification with the required fee. If, upon review of the application by the Department, it becomes apparent that the applicant does not have enough experience to obtain the class of certification requested, program staff will contact the applicant to give him/her the option of either receiving an OIT certificate or an operator certificate for the class commensurate with the amount of operating experience already earned. If the applicant chooses the OIT certification, the Certification Board will act on the request to issue this certificate. Once approved by the Certification Board, the applicant will receive a letter documenting the OIT status. This letter will further explain that when the additional experience is successfully completed, the OIT's supervisor (or an appropriately certified operator who has knowledge of the OIT's experience if the supervisor is not available) will need to write a letter to the Certification Board documenting the OIT's completion of the required experience for the class certificate needed for certification. The application does not need to go back to the Certification Board for further action since the Certification Board already approved the application for an OIT. The Department staff can evaluate and determine if the operator now has the proper experience and issue the certificate.

E. Certification Classes and Subclassifications

1. **How do I determine which examinations I need to take?** In order to make process control decisions an operator must have received certification for the same class or higher and all the treatment technologies as the system where the operator is working. System class is an alphabetical letter assigned by the Department to water or wastewater systems based upon the design capacity of that system. Subclassification is a number assigned by the Department to water or wastewater systems based upon the treatment process used by that system. Appendix B is a listing of the system classes and definitions of all the treatment technology subclassifications. If an operator is unsure of the system's classification or the needed examinations, the operator should contact the local Department Regional Office Sanitarian or Water Quality Program Specialist.

There is an examination for each treatment technology subclassification. In addition, all operators wanting to get certified to operate a treatment system must also take the Part 1 General Examination. The only exceptions are those operators of small drinking water systems with a ground water source serving less than 500 people or with less than 150 connections that disinfect with either Gaseous Chlorine Disinfection or Nongaseous Chemical Disinfection. Operators of these types of systems can choose to take the stand-alone Dc examination or the Part 1 General Examination and the examination for either subclassification 11 or 12, depending on the form of disinfection the system utilizes. Operators who want to be certified in drinking water distribution or wastewater collection can take the stand alone examinations for these two types of systems.

2. **What are the advantages and disadvantages to obtaining a stand-alone certification for small systems, distribution or wastewater collection systems?** The advantage of the stand alone certification is that an applicant can become a certified operator by passing a single examination. The disadvantage of this certification is that, for the Class E certification, the operator cannot make process control decisions at a water or

wastewater treatment facility. Also, distribution or collection system experience does not count toward operating experience at a water or wastewater treatment facility. In the case of the Dc, small water system with disinfection classification, the main disadvantage is this certificate is not upgradeable. Therefore, if the operator chooses to move to another system, or if the system where the operator is currently serving as the available operator has to increase its treatment capacity or add another form of treatment, the operator will be required to take the Part 1 General Examination and the appropriate treatment technology subclassification examinations and re-apply for initial certification in order to continue to serve as an available operator.

- 3. What happens if my system is upgraded to increase capacity or adds a new treatment technology? Can I still make process control decisions?** In order to make process control decisions an operator must have received certification for the same class or higher and all the treatment technologies as the system where the operator is working. If the certification that the available operator has does not correspond to the new classification for the system, then the operator will need to upgrade his/her certification accordingly before making any process control decisions. If the system owner and the operator agree to meet the conditions for accelerated certification as described in Chapter 6, the existing available operator can continue to make process control decisions for the system while it is being upgraded. If not, the owner must hire another certified operator who has the correct level of certification.

Chapter 3 - The Application Process

The Board has defined processes in place for the review and approval of applications for certification, certificate upgrade, certification through reciprocity and certificate renewal.

A. General Information

- 1. What is a complete application?** An application for certification action for either certification or recertification must include:
 - An original or copy of the applicant's Pennsylvania State Police criminal history record, issued no more than 90 days prior to the date the application is received by the Certification Board Secretary.
 - For education purposes, a copy of the applicant's high school diploma or GED or a statement of completion of high school or achievement of GED along with written verification by the applicant's supervisor or another certified operator with direct knowledge of the applicant's experience working as an operator in a water or wastewater system before February 21, 2002.
 - Documentation of the applicant's experience verified by the applicant's supervisor or another certified operator with direct knowledge of the applicant's experience.
 - An official copy of the applicant's college transcripts, if applicable.
 - Copies of certificates of completion of Department-approved training courses, if applicable.
 - The applicant's notarized signature.
 - The applicable program fees.

- 2. How/Where can I get the application forms?** Forms can be obtained by contacting the State Board for Certification of Water and Wastewater Systems Operators Board Secretary at P.O. Box 8454, Harrisburg, PA 17105-8454, or through the Department's Operator Information Center at www.dep.state.pa.us (DEP Programs: operator). The Department will send an application for initial certification to the applicant when they have successfully passed enough examinations to be eligible for certification.

- 3. Is there a cost to apply?** The fee for initial certification for Class A, B, C and D is \$150, and \$100 for Class Dc or Class E. This is in addition to the \$35 examination session fee that is assessed for each examination session the applicant registered to attend. The same fee structure applies to applications for initial certification through reciprocity, except there is no examination session fee.

- 4. How do I get a client ID?** Applicants are assigned a client ID number the first time the applicant registers for an examination. This number is given to the applicant at the examination session and is included in all future correspondence the Department or the Certification Board has with that applicant.

- 5. Who reviews my application?** The Certification Board Secretary and Department program staff review applications for completeness. The Board Secretary will try to notify the applicant within 14 days of receipt if the application is incomplete, indicating the specific information required to make the application complete.

When an application is complete, the Certification Board Secretary and Department program staff will review the application and make a recommendation for action to the Certification Board designating the appropriate class and subclassification. If the Certification Board determines additional information from the applicant is needed to complete the review of the recommendation, final action can be delayed until the information is provided by the applicant. The Certification Board will try to take action on an application for certification within 120 days of receipt of a complete application.

- 6. Who approves my application?** The Certification Board approves or denies applications for certification action. Once approved, the Certification Board Secretary will issue the operator's certificate within 60 days of the Certification Board action. The certificate will include the issuance and expiration dates, class and subclassifications, client ID and certification identification numbers and pocket card for identification purposes. The issuance date on the certificate corresponds with the date of the Certification Board action and the operator is assigned to the current three-year renewal cycle (either the first day of January, April, July or October). The certificate is valid for a three year period and will expire on the date indicated unless suspended, modified or revoked by the Certification Board prior to expiration.
- 7. What happens if my application is denied?** The Certification Board can deny an application for failure to meet the eligibility requirements for certification (including failure to complete continuing education requirements), noncompliance with rules and regulations related to the operation of a water or wastewater system or based on a criminal conviction related to the operation of a water or wastewater system. When the Certification Board denies an application for certification action, the Certification Board Secretary will notify the applicant in writing within 60 days of the Certification Board decision, describing the applicant's right to appeal the action to the Environmental Hearing Board.
- 8. Can I appeal the denial of my application?** Yes; an applicant can appeal the Certification Board's decision to the Environmental Hearing Board.
- 9. How do I obtain replacement certificates and cards?** A written request that includes the \$25 fee for the replacement of a certificate or wallet card should be sent to the Certification Board Secretary. The Certification Board Secretary will make every effort to fulfill the request within four weeks of receiving this request.

B. Operator and System Owner Fee Schedule

The following operator and system owner fee schedule has been established.

1. **Operators:**

Initial Certification Class A, B, C, D	\$ 150
Initial Certification Class Dc, Class E	\$ 100
Certification through Reciprocity Class A, B, C, D	\$ 150
Certification through Reciprocity Class Dc, Class E	\$ 100
Certificate Renewal	\$ 60
Examination Session	\$ 35
Replacement of Certificate or Pocket Card	\$ 25
Post-presentation Credit Application	\$ 250

2. **Owners:**

Annual Service Fee Class A System	\$ 500
Annual Service Fee Class B System	\$ 150
Annual Service Fee Class C System	\$ 100
Annual Service Fee Class D and E Systems	\$ 65

C. Initial Certification

1. **What is the process for obtaining an operator certificate?** To become certified, an applicant must submit an application for certification to the Certification Board in accordance with program procedures, pass the appropriate examinations or a comparable examination from another state through reciprocity and meet the minimum education and experience requirements. The whole process can take two to six months depending on staff resources and timing. The steps in the process include:

- a. *The applicant registers for an examination.* Training, education or experience is not required to sit for an examination. However, the Department and the Certification Board strongly encourage applicants to take Department-approved training prior to taking an examination. To register for an examination, the applicant must contact an Approved Examination Provider (AEP). Information on sources of training, approved courses, scheduled examination sessions, AEP's and examination locations can be found on the Department's Operator Information Center Webpage at www.dep.state.pa.us (DEP Program: operator). Information on Department-approved training is found on the Department's "Earthwise Academy". The Academy can be accessed at the following link: <http://www.ahs2.dep.state.pa.us/edu/Default.aspx>.
- b. *The applicant takes and passes the required examination(s).* See Chapter 2-C for a complete description of the examination process.
- c. *The applicant is sent his/her test scores and a certification application.* If the applicant passes the required examinations for certification, the Certification Board Secretary sends the applicant an "Application for Certification to Operate a

Water or Wastewater System” along with a letter summarizing the applicant’s examination results.

- d. *The Applicant submits the Application, Fees, and Criminal History Record.* The applicant details his/her experience and education and obtains a Criminal History Record report from the Pennsylvania State Police. To qualify for certification, in addition to passing the required examinations, an applicant must meet the minimum operating experience and education requirements.
 - e. *Certification Board Review.* The Certification Board Secretary reviews an applicant’s education and operating experience and develops a recommendation for certification for Certification Board action. If the applicant has a criminal record, the Criminal History Record report is referred to a Department investigator for review and analysis in accordance with Certification Board procedures. The results of this analysis are considered by the Certification Board before final action on the application for certification is taken. Once the Certification Board approves an application for certification, the Board Secretary will issue the operator certificate.
2. **How do I get a Criminal History Report (CHR)?** All applicants for initial certification must provide a CHR with their application. Requests for CHRs must be made to the Pennsylvania State Police and there is a \$10 cost. The request for the CHR can be made using the SP-164 form or through the State Police [PATCH](#) (*Pennsylvania Access To Criminal History*) system at www.portal.state.pa.us/portal/server.pt?open=512&objID=4451&&PageID=458621&level=2&css=L2&mode=2. If completed through the PATCH system the CHR will be emailed within a couple of weeks.

To obtain the SP-164 form, contact

www.portal.state.pa.us/portal/server.pt?open=512&objID=4451&&PageID=458621&level=2&css=L2&mode=2. It usually takes four weeks to receive a CHR in the mail once the SP-164 form has been submitted.

3. **What does a Criminal History Report (CHR) investigation entail?** Having a criminal record does not automatically disqualify an applicant from getting certified. The Certification Board has an investigative process in place if an applicant has a misdemeanor or felony conviction as documented on the CHR. This process is used to determine whether or not the conviction is related to the operation of a water or wastewater treatment system and warrants denial of the application. A CHR that shows a criminal conviction is referred to a Department staff person, who reviews that record with one Certification Board member and the Certification Board’s legal counsel. If these three people determine additional investigation is necessary, the Department investigator will search the court records and other information to determine the situation behind the conviction. If it becomes evident that the conviction may be related to the operation of a water or wastewater system, the Department staff person will ask for additional information from the appropriate Department Regional Office as to the applicant’s compliance history. The applicant will also be notified that the Certification Board will be reviewing the application, inviting the applicant to a meeting of the Certification Board to present any additional relevant information. If the committee of three makes the

determination that this additional level of investigation is warranted, processing the application can be delayed by four to six months, depending on the availability of regional office and court records. Once the Certification Board has heard all the evidence and given the applicant the opportunity to provide any additional explanation, the Certification Board will take action to deny the application or issue the operator certificate. The decision taken by the Certification Board at this time is appealable to the Environmental Hearing Board.

4. **I got several parking and speeding tickets over the years. Will this show up on my Criminal History Report (CHR) or will this keep me from being an operator?** No; based on the Certification Board's authority, the Certification Board may deny an application for certification action based on a conviction of either any *felony* or a *misdemeanor* related to the trade, occupation or profession for which the certification is sought. A felony or misdemeanor conviction does not mean automatic revocation. The Certification Board bases its decision on the investigative process described above to insure any denial of an application is based solely on a conviction related to the operation of a water or wastewater treatment system.
5. **Do I need a Criminal History Report (CHR) if I am upgrading my certificate?** No; the Board requires a CHR to accompany an application for initial certification, certification by reciprocity, or recertification.

D. Certificate Upgrade

1. **How do I upgrade my certificate?** The Certification Board will approve a complete application for certification upgrade of an existing certificate to the appropriate class when the applicant meets the additional experience requirements for the upgrade in class. The Board will approve a complete application for certification action to upgrade an existing certificate to add another subclassification when the applicant passes the Part II Treatment Technology Specific Examination and completes a year of operating experience with that technology, if needed. The Certification Board will replace the applicant's existing certificate with an upgraded certificate that maintains the operator's current three-year renewal cycle. Any changes in continuing education requirements resulting from an upgrade will not go into affect until the certified operator's next full three-year renewal cycle. Class Dc and grandparented certificates cannot be upgraded. The application form can be found on the Department's Operator Information Center webpage at www.dep.state.pa.us (DEP Programs: operators). There is a link on the right hand side of the page to all documents and forms needed for this program.
2. **If I upgrade my certificate, will my three-year cycle change?** No; an operator's three-year renewal cycle never changes. Any changes in the continuing education requirements will not go into affect until the operator's next full three year cycle.
3. **We added nutrient reduction treatment technology to our current plant. Do I need to upgrade my certificate or re-test?** The designated available operator(s) for the system must be certified in Activated Sludge (Subclassification 1) in order to make process control decisions for the added nutrient reduction technology. If the available operator(s) do not have that level of certification, the operator can participate in the accelerated certification program described below to expedite this process. Participation

in the accelerated certification program will allow the operator to remain the available operator for the system while the operator is completing the program. At a minimum, the operator will need to successfully pass the Activated Sludge examination.

4. **When is an upgrade in certification needed?** An operator certificate upgrade is required when an increase in treatment capacity of the system no longer qualifies the available operator to make process control decisions for that system. When the capacity of the system is increased so as to change the classification of the system, the existing available operators will qualify for an accelerated certification upgrade by applying for an upgrade in class before the larger system becomes operational. Additional experience or training is not required.

An operator certificate upgrade is required when the addition of a different treatment technology to a system no longer qualifies the available operators to make process control decisions for that system. To obtain this upgrade, the operator must successfully pass the appropriate technology subclassification examination and gain one-year operating experience. The one-year operating experience can be waived if the operator and the owner of the system choose to participate in the accelerated certification program described below.

Operators with a grandparented water or wastewater certificate or holding the Class Dc drinking water small system certificate cannot upgrade their certificate. To add additional subclassifications or to operate a system with a larger design capacity, these operators will need to meet all the requirements for initial certification.

5. **What is accelerated certification?** With an increase in treatment capacity or the addition of a different treatment technology to a system, available operators may no longer qualify to make process control decisions for that system until the available operator(s) certificate(s) are upgraded. However, through accelerated certification, the available operator(s) of the system may continue to make process control decisions for the system if the conditions for accelerated certification are met. If not, the owner of the system will need to find another available operator with the appropriate class and subclassifications to make process control decisions until the existing certified operators at the system meet the additional examination and/or experience requirements.

When the capacity of the system is increased so it changes the classification of the system, the existing available operators may qualify for an accelerated certification upgrade by applying for an upgrade in class before the larger system becomes operational. Additional experience or training is not required.

When a different treatment technology is added to a system that results in a change of the subclassification of the system, the existing available operators may also qualify for an accelerated certification upgrade if:

- a. The owner obtains the appropriate NPDES, public water supply or Clean Streams Law permit from the Department;

- b. The operator successfully completes an onsite, Department-approved training program from the manufacturer or consulting engineer on the proper operation and maintenance of the new treatment technology;
- c. The operator passes, or previously passed, the appropriate Part II Technology Specific examination for the new treatment technology (the additional experience required would be waived);
- d. The manufacturer or consulting engineer provides the Certification Board and the Department with written documentation that the available operators for the system have successfully completed the formalized start-up training and assistance program and are competent in the operation of the treatment technology.

E. Reciprocity

1. **What is reciprocity?** Upon submittal of a complete application for certification, the Certification Board may issue a certificate to an applicant holding a valid water or wastewater operator certificate from another state, territory, the District of Columbia or a Certification Board-approved reciprocity register. The applicant becomes certified in the Commonwealth of Pennsylvania without further examination or completion of additional operating experience based on the documentation provided in the application for certification and verification from the other state, territory or Certification Board-approved registry that the applicant holds a valid certificate issued by them.
2. **Does Pennsylvania grant reciprocity to out-of-state certificate holders?** The Certification Board may issue a certificate to an applicant holding a valid water or wastewater operator certificate from another state, territory, the District of Columbia or a Certification Board approved reciprocity registry (the Board recognizes the Association of Boards of Certification Registry and United States Military or Coast Guard discharge papers documenting water or wastewater operation as reciprocity registers) when the applicant meets the requirements for certification and demonstrates the out-of-State certificate was issued as the result of passing an examination comparable to one administered by the Certification Board.

The Certification Board Secretary will determine whether the content of the examination is comparable to an examination prepared by the Department and obtain confirmation from the state, territory or Board approved registry that issued the applicant's certificate that the applicant holds a valid certificate, and is in compliance with applicable laws, regulations and other requirements. Operators previously certified in Pennsylvania are not eligible to apply for reciprocity if the Board revoked, suspended or modified the operator's certificate or the operator failed to meet the continuing education requirements for the most recent three-year renewal cycle.

3. **How do I apply for certification through reciprocity?** An applicant must submit a complete application for certification action with all the necessary documentation and must demonstrate that he/she has a valid certificate issued by another state, territory, the District of Columbia, or Certification Board-approved registry. The application must be signed and notarized by a supervisor with a working knowledge of the applicant's operating experience. The application must include a Criminal History Report (CHR)

from the Pennsylvania State Police dated no more than 90 days prior to the date the applicant signs the application. The appropriate processing fee payable to the Commonwealth of Pennsylvania and any documents in support of the application must also be attached to the application. Documents in support of the application would include verification of certification from the other state, a copy of transcripts from any college and/or university, and verification from the training sponsor for enrollment in special training courses and programs that the applicant has satisfactorily completed.

Upon the Certification Board's review of the applicant's education, experience and CHR, if qualified, an applicant will be officially approved by the Certification Board and awarded a certificate of a class and subclassification commensurate with an applicant's qualifications and in accordance with the Board's reciprocity policy. The application form can be found on the Department's Operator Information Center at www.dep.state.pa.us (DEP Programs: operator). Click on the link "***Documents and Forms***" on the right side of the page.

- 4. How are reciprocity applications reviewed?** The Certification Board Secretary will review the application for certification action for completeness. If the application is not complete, the Board Secretary will try to notify the applicant within 14 days from receipt of the application of the specific information required to make the application complete. When an application is complete, the Board Secretary will review the application using policy and procedures defined by the Certification Board Guidelines and make a recommendation for action to the Certification Board designating the appropriate class and subclassification. The Certification Board will try to take action on an application within 120 days of receipt of a complete application. The Certification Board Secretary will try to issue the operator's certificate within 60 days of the Certification Board action. The issuance date on the certificate corresponds with the date of the Certification Board's action and the operator is then assigned to the current three-year renewal cycle (either the first day of January, April, July or October). The certificate is valid for a three-year period and will expire on the date indicated unless suspended, modified or revoked by the Certification Board prior to expiration.

Note: An applicant's application for reciprocity may be delayed by the fact that the legal entity (another state, territory, the District of Columbia, or Board approved registry) that issued the applicant's certification must independently verify the applicant's certification status, and confirm the applicant is in compliance with their laws, regulations and any other requirements.

Chapter 4 - Certificate Renewal and Continuing Education Requirements

An operator has a number of requirements that must be met in order to maintain an operator certificate including the completion of continuing education requirements.

A. Requirements for Certificate Renewal

- 1. If my certificate expires, do I have to re-take a written examination?** If an operator certificate expires and the operator has **not** met the continuing education requirements within the three-year certificate renewal cycle, then the operator will have to meet all requirements for initial certification including passing the examinations, meeting the education and experience requirements, obtaining a Criminal History Report from the Pennsylvania State Police and paying the initial certification fee. However, an operator whose certificate expired but who **has** completed the necessary continuing education contact hours within the three-year certificate renewal cycle may renew the certificate within two-years following the date of expiration. This is done by submitting a complete application for certificate renewal. The operator would remain in the original renewal cycle. An operator, who fails to renew his/her operator certificate within two years of the expiration date, even though the continuing education requirements have been met, will have to meet all the requirements for initial certification as described above.

A certified operator whose certificate has expired is no longer certified and cannot make process control decisions for a system until such time as the operator has submitted the necessary paperwork for certificate renewal or the Certification Board has taken action on an application for initial certification to issue a new operator certificate.

- 2. How much continuing education is required and when must I get it?** All continuing education requirements must be successfully completed during the certified operator's three-year renewal cycle. Operators seeking renewal of their certificates shall meet the continuing education contact hour requirements per Operator Class as follows:

Contact hour requirements for wastewater system certified operators.

Operator Class	Contact Hours for First Three-Year Renewal Cycle	Contact Hours for Subsequent Three-Year Renewal Cycle
A	15	30
B	15	30
C	15	30
D	8	15
E	8	15
Grandparented	8	15

Contact hour requirements for water system certified operators.

Operator Class	Contact Hours for First Three-Year Renewal Cycle	Contact Hours for Subsequent Three-Year Renewal Cycle
A	15	30
B	15	30
C	15	30
D	8	15
E	8	15
Dc	4	9
Dn	3	6
Grandparented	8	15

B. Certificate Renewal Process

- 1. How will I know when it's time to renew my certificate?** The Certification Board will try to notify certified operators at least 60 days before their certificate expires by sending them a renewal application. Operators are responsible for ensuring the mailing address and contact information the Certification Board has on record is correct and current. The Certification Board cannot be held responsible for returned or lost applications due to incorrect contact information. It is recommended that the operator contact the Certification Board Secretary if an application for certificate renewal is not received at least 30 days before the expiration of his/her certificate. The contact information for the Board Secretary is as follows:

State Board for Certification of Water and Wastewater Systems Operators
Rachel Carson State Office Building
P.O. Box 8454
Harrisburg, PA 17105-8454
Phone: 717-787-5236 or RA-OperatorWebsite@pa.gov

The operator should provide the following information when contacting the Certification Board Secretary: First and Last Name, Client ID Number, phone number and email address.

- 2. How do I apply for renewal?** To renew an operator certificate, the certified operator must complete the renewal application sent by the Certification Board Secretary and send it to the address listed at the top of the form with a check or money order for \$60 payable to the Commonwealth of Pennsylvania. The renewal application form contains a certification statement to be signed by the operator to certify that all information provided in the renewal application form is true and complete. The Certification Board Secretary will not process the renewal application without this signature. Falsification of this application will result in denial of certificate renewal and/or certificate revocation. The Certification Board Secretary will process renewal applications as quickly as possible. However, the operator is considered certified at the point the Certification Board Secretary receives the application for certificate renewal until such time as a new certificate is issued or the Certification Board takes action to deny the application.

3. **What is the renewal period for my certificate?** An operator certificate must be renewed every three years. The issue and expiration dates are printed on the certificate.
4. **Why didn't I receive a renewal notice?** If the Certification Board Secretary or the Department does not have a correct mailing address for an operator, the operator might not receive the renewal notice. Remember, it is the responsibility of the certified operator to notify the Certification Board Secretary of any changes of address or contact information. The change-of-address form can be found at the Department's Operator Information Center at www.dep.state.pa.us (DEP Programs: operator). Failure to receive a renewal application from the Certification Board does not release a certified operator from all the program requirements established by the Water and Wastewater Systems Operator's Certification Act or the Chapter 302 Regulations, Administration of the Water and Wastewater Systems Operators' Certification Program.
5. **Will the Certification Board notify me before my certificate expires?** Approximately 60 days prior to an operator's certificate expiration, the Certification Board Secretary will try and mail the operator an application for certificate renewal. Failure to receive a renewal application from the Board does not release a certified operator from the requirements of the Water and Wastewater Systems Operator's Certification Act or the Chapter 302 Regulations, Administration of the Water and Wastewater Systems Operators' Certification Program. It is up to the operator to ensure his or her contact information is correct and the renewal application is submitted in a timely fashion.
6. **How long before my application is approved or denied?** The Certification Board Secretary will process renewal applications as quickly as possible. However, the operator is considered to remain certified at the point the Certification Board receives the application for certificate renewal until such time as a new certificate is issued or the Certification Board takes action to deny the application. The renewal applications for those operators whose transcripts are not current on Earthwise Academy will take longer to process. A certificate renewed after the certificate has expired will have the effective issuance date of when the Certification Board Secretary finished the processing of the renewal application. The expiration date will be three years after the expiration date of the lapsed certificate.
7. **Why do all of my certificates expire on different dates?** The only operators who have more than one certificate are those who are certified to operate both water and wastewater treatment systems. When the new program requirements were put in place in October 2002, it was decided to phase-in the continuing education requirements and put every existing certified operator into different three-year certificate renewal cycles based on their level of certification. Every certified operator was put into one of twelve renewal groups, with approximately 1,000 operators in each group. The cycles alternated between drinking water and wastewater. As a result, the certificates for operators who have both a water and a wastewater certificate will expire on different dates.
8. **How do I apply for extensions?** The certified operator may request an extension of the expiration date of his/her certificate to complete the continuing education requirements for medical reasons, military service or other extenuating circumstances. A request for an extension must be submitted to the Certification Board Secretary in writing within

90 days after the certificate has expired, documenting why the operator feels the Certification Board should grant the extension.

- 9. What if I don't have enough continuing education contact hours to renew?** If an operator does not have enough continuing education credits to renew, the operator must meet all requirements for initial certification as described above, unless the Certification Board grants an extension. The Certification Board may grant an extension for situations such as a medical condition that prevents the operator from working, military service or other extenuating circumstances. All requests for an extension must be submitted in writing within 90 days after the certificate has expired.

C. Continuing Education

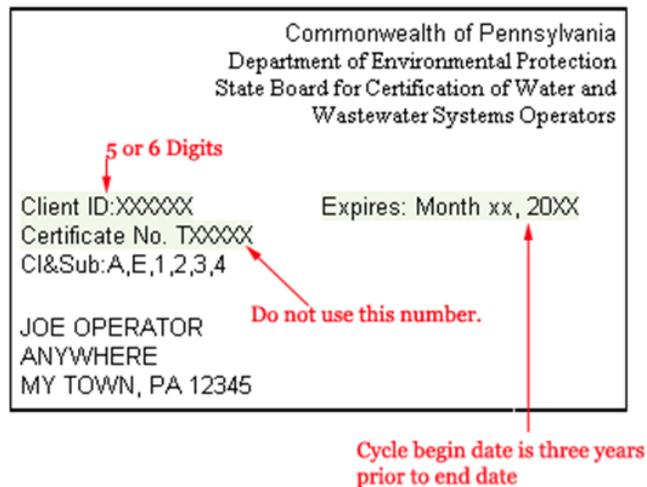
- 1. Are there exceptions to the continuing education requirements?** No, there are no exceptions. However, an operator can request an extension from the Certification Board. The Certification Board may grant an extension provided that the certified operator requests an extension in writing with appropriate justification no later than 90 days after the certificate has expired and the certified operator agrees to meet all the conditions established by the Certification Board. The Certification Board Secretary will provide an explanation of the Certification Board's decision and any requirements for compliance in writing to the certified operator.
- 2. Do the classes I take in preparation for the examination count as continuing education contact hours for renewal?** It depends. If an operator is not certified, then the classes and contact hours taken in preparation for an examination **do not** count toward certificate renewal. However, the operator can receive credit for these courses towards completion of the experience requirements. If the operator is already certified, then any course and contact hours taken in preparation for an examination will count toward certificate renewal, provided it is Department-approved for the type of certificate the operator has. For example, an operator certified in wastewater treatment could take a course to prepare for the wastewater collection system examination and have that count towards the continuing education requirement. However, a course to prepare for the drinking water distribution examination would not count.
- 3. What is a continuing education contact hour?** A contact hour is the standard unit of measure assigned by the Department for participation in a Department-approved training/education experience. One contact hour of continuing education is equal to one hour of actual time spent completing a training session.
- 4. How many continuing education contact hours is college credit worth?** Each college credit is equivalent to 15 contact hours.
- 5. What is the difference between a continuing education unit (CEU) and a continuing education contact hour of training?** A CEU is 10 hours of actual training or 10 continuing education contact hours. Therefore, a course worth 3.0 CEUs would be worth 30 continuing education contact hours of training.
- 6. How do I obtain continuing education?** The continuing education requirement is met by attending Department-approved courses, conferences or a certificate program from an

approved training provider. A complete listing of all Department-approved courses and a calendar of approved conferences is maintained in the Earthwise Academy. The Academy can be accessed at the following link: www.ahs2.dep.state.pa.us/edu/Default.aspx. Courses taken more than once in the same cycle will not count towards completion of the continuing education requirement. If an operator finds a course that is not approved by the Department, the operator may be able to get credit for the course by submitting a Post-Presentation Credit Application to the Department for approval. The cost for processing this application is \$250 and is non-refundable. Approval for a course through this method is not guaranteed, so the operator is taking a chance that the course will count towards the continuing education requirement.

7. **Can I take training that hasn't been approved by the Department?** It is not recommended that an operator take training that isn't pre-approved by the Department. However, if an operator takes a course that is not approved, the operator may be able to get "post-presentation credit" for the course by completing the "Post-Presentation Credit Application." A fee of \$250 payable to the Commonwealth of Pennsylvania must be included with the submittal of the Post-Presentation Credit Application. Submittal of this application does not guarantee the contact hours will be awarded.
8. **How will I know whether or not the training I want to take will be acceptable?** All Department-approved training is listed in the Earthwise Academy catalog (courses) or on the calendar (conferences). Another way to determine whether or not a course is approved is to ask the training provider to provide the Department course ID number. All Department-approved courses have been assigned a course ID. If the training provider cannot provide the course ID, or the operator cannot find the course in the Earthwise Academy catalog or on the conference calendar, the training event is not approved and the operator will not get credit for completing the training unless a Post-Presentation Credit application has been approved by the Department. In addition, each course is associated with a specific training provider and ONLY that training provider is authorized to teach that particular course. The Earthwise Academy also lists courses for specific training providers. If there is a particular provider that an operator prefers, the operator can go into the Earthwise Academy catalog and search the Training Sponsor drop-down box to see if they are approved. If the training sponsor is approved, a list of the sponsor's approved courses will appear at the bottom of the page.
9. **Is there a list of pre-approved courses that I can obtain from the Department?** The Earthwise Academy Catalog has a complete listing of all approved courses and the Calendar for conferences. The Earthwise Academy can be accessed at the following link: www.ahs2.dep.state.pa.us/edu/Default.aspx.
10. **How do I make sure I get credit for training?** When an operator passes the certification examination, the Certification Board Secretary will send the operator a certificate and a wallet card. The operator should bring the card to all Department-approved training to ensure completion of the course is properly documented. All training for continuing education is tracked by the operator's Client ID. To ensure an operator gets credit for continuing education training, the operator needs to:
 - Register for only Department-approved training courses,

- Sign in when attending training,
- Provide the correct Client ID to the training provider,
- Check his/her transcript after the training is completed to see if the course has been added. The training providers have 30 days to report course completion to the Department. If the course is not listed on the operator's transcript within the 30 days, the operator should contact the training provider to resolve this issue. Operators can find their transcript through the Earthwise Academy, using their Client ID as the password.

- 11. How can I find out how many continuing education contact hours I have and find my operator number?** When an operator passes the certification examination, DEP will send a certificate and a wallet card. The operator should bring the card to all DEP-approved training to ensure the training is properly credited. An operator can check and verify completed contact hours by checking his/her transcript on the Earthwise Academy site at: www.ahs2.dep.state.pa.us/edu/Default.aspx . Access to a transcript is through the operator's Client ID. The operator's Client ID is found on the operator's certificate or wallet card as shown below:



- 12. What evidence should I keep in my records to prove that I've completed the required number of continuing education contact hours?** An operator should keep all certificates of completion provided by the training provider for each renewal cycle. Once the operator certificate is successfully renewed, any documentation relative to the expired certificate can be discarded.
- 13. I'm a bi-operable operator; do I need to take this training twice?** Courses taken may be applicable to drinking water, wastewater or both. If a course is applicable to both, then a bi-operable operator can get credit for taking the course for both certificates by only taking the training once. If the operator chooses to take a course applicable to only drinking water or wastewater, then the credit can be applied to only the one certificate. The operator can determine whether or not the course is approved for drinking water, wastewater or both by looking at the "target industry designation" in the course description in the Earthwise Academy catalog.

14. **What if I earn more credits than I need?** Currently, hours **are not** banked or carried over into the next three-year certificate cycle. In other words, operators cannot count excess contact hours toward the continuing education requirements for a subsequent renewal cycle. Operators should track completed contact hours to avoid taking excess hours unless they want to take additional training for their own education. The Department has done a preliminary review of the resources needed to provide this service and has come to the conclusion that additional resources would be needed. It is estimated that the certificate renewal fee would have to be doubled. This analysis will be refined and reviewed with the Certification Board and the Certification Program Advisory Committee. Their conclusions will be submitted to the Environmental Quality Board for consideration when the regulations are reviewed again. This review is required once every three years as part of the conditions for the assessment of fees.
15. **I completed a course; how are my continuing education contact hours reported to the Department?** The training provider is required to upload a class roster into Earthwise Academy within 30 days of the course completion. If an operator does not see the course listed on their transcript after 30 days from the completion date, the operator should contact the training provider to resolve this issue.
16. **Can I receive partial credit for a course if I arrive late or leave early?** No partial credit is given for any course or conference. The minimum attendance to receive credit is set by the training provider. The attendee must attend the entire course and complete all of the course assessments.
17. **Can I receive continuing education contact hours for attending trade association conferences or workshops?** Yes; only if they are approved by the Department. One contact hour of continuing education credit is awarded for each half day of a conference or workshop. A complete listing of approved conferences may be found on the Earthwise Academy calendar. They **are not** listed as courses in the catalog.
18. **Is there an obligation for the owner to provide training to meet an operator's continuing education requirement?** Owners are not legally obligated to provide training. Many operators have noted that their employers do pay for training. It may depend on the conditions established in a union contract or if there are stipulations in an employment contract between an operator and the owner.

D. Security Training

1. **Do I need to take system security training?** Yes; every certified operator shall successfully complete a Department-approved system security training course. Bi-operable operators need to successfully complete the Department-approved system security training course only once. Non-certified operators cannot get credit for taking this course until after becoming certified.
2. **How much time do I have to take this training?** This requirement must be completed at the end of your first full three year cycle that starts after September 18, 2010. Every operator has a minimum of three years to complete this training. For example, if the operator's next complete cycle starts January 1, 2011, the system security training requirement would need to be completed by December 31, 2013.

3. **What if I don't pass the system security training?** The operator must successfully complete this training. Therefore, if the operator does not pass it the first time, it will need to be re-taken until the course is completed successfully.
4. **Where do I find this training?** The training is being made available in a web-based (Course ID 2954), correspondence (Course ID 2953), or classroom-based (Course ID 2952) format. These are the only courses that fulfill the requirement. An operator needs to only take one of these three versions. The web-based version is available through DEP's Earthwise Academy eLearning site at: www.ahs2.dep.state.pa.us/edu/Default.aspx. A number of different training providers provide the classroom and/or correspondence version of the course. A listing of which training providers are approved for delivery of this training can be found on the Earthwise Academy catalog.
5. **Will this training count as contact hours toward my continuing education requirement?** Yes, in addition to fulfilling the security requirement, these contact hours count toward the continuing education requirement. The classroom and correspondence versions are worth five contact hours. The web-based version is worth 3.5 contact hours. The difference in hours is due to an extra exercise that is in the classroom and correspondence version of the course that could not be translated into the web-based version.

Chapter 5 - Grandparenting

Some systems were allowed to grandparent existing operators working at their system as of February 21, 2002. This chapter describes what systems were allowed to do this and what the requirements are to maintain that certification.

A. General Information

- 1. What is grandparenting?** Changes to the program were defined in the Act that required nontransient noncommunity water systems and wastewater collection systems with pump stations to have a certified operator for the first time. The Act provided grandparenting provisions that allowed the existing operators of these systems, who were working at the system on or before February 21, 2002, to qualify for certification without meeting the requirements for initial certification as required by the Act. This provision limited the time period for water or wastewater system owners to request this site-specific operator certification for their operators. The deadline for the submittal of an application for certification for grandparenting was February 21, 2004. The Certification Board issued all these certificates in September 2004.
- 2. Can I receive a grandparented certificate now?** No. This opportunity for owners to request grandparenting for their existing operators expired February 21, 2004.
- 3. Are there any restrictions as to where a grandparented operator can work?** A grandparented operator certificate is only valid for the system where the operator was working on February 21, 2002. This system is listed on the operator's certificate. If a grandparented certified operator leaves this system or conditions change at the system such as where an upgrade is needed, this grandparented certificate is no longer valid and the operator must meet all the requirements for initial certification before making any further process control decisions. This includes passing an examination and meeting the education and experience requirements. The grandparented operator must meet the continuing education requirements for certificate renewal in order to maintain the certificate.

Chapter 6 - System Classes and Subclassifications

An operator must hold the proper class and subclassification of certification that corresponds to the system class and subclassification to make a process control decision at that system. A system class is based on the capacity of the drinking water or wastewater treatment system. The subclassification is based on the type(s) of treatment technologies utilized at the system. Stand alone certifications are also available for small water systems, wastewater collection systems and water distribution systems. A complete listing of the system classes and subclassifications is in Appendix B.

A. Definitions

- 1. What are the different levels of system classes and subclasses?** There are six water classes and 14 water treatment technology subclassifications for drinking water systems. There are five wastewater classifications and four wastewater treatment technology subclassifications for wastewater treatment systems. The Department assigns a system class based on the size (hydraulic design capacity) of the drinking water or wastewater treatment system while subclassifications are based on the type of physical, biological or chemical methods used by the treatment system. These are summarized in Appendix B.
- 2. What is a stand alone classification?** A stand alone classification is one whereby an applicant can become a certified operator by simply passing a single examination. The applicant is not required to pass the Part I General Examination and at least one subclass examination. There are three stand alone classifications:
 - Water Class E - Distribution System
 - Water Class Dc - Small ground water system with less than 150 connections or 500 customers, whichever is less, that utilizes either gaseous or non-gaseous forms of chlorine for disinfection only.
 - Wastewater Class E4 - Satellite and Single Entity Collection System with Pump Station

B. Connection between System Classification and Operator Certification

- 1. How will I know what my system class and subclassifications are?** System class is an alphabetical letter assigned by the Department to water or wastewater systems based upon the classification of a system (based on size) or an alphabetic letter assigned to an individual's certificate. Subclassification is a number assigned by the Department, to water or wastewater systems, based upon the treatment process used by that system or the number assigned to an operator's certificate based upon meeting the certification requirements for a specific treatment process and passing the appropriate examinations. Appendix B is a listing of the system classes and a definition of all the treatment technology subclassifications. Every year the system owner gets a form from the Department to update the information on the available operators designated for the system. This form indicates the classification that the Department has assigned to the system. The owner should cross-reference the designation on this form with the definitions in Appendix B. If the owner feels the Department's classification is incorrect, the owner should contact the Department Regional Office to resolve this issue.

2. **What is an available operator?** The available operator, designated by the system owner, is a certified operator who is on site or available to be contacted as needed to make process control decisions for the system in a timely manner. To be an available operator, the operator must have the same class of certification, or higher, and the appropriate subclassification(s) as the system. The operator certification classes and subclasses coincide with the system classification as defined in Appendix B.
3. **What does it mean to be “appropriately” certified?** An operator who is “appropriately” certified is an operator whose level of certification coincides with the class and subclassification of the system. The classes and subclassifications for both the system classification and the operator’s certification are defined in Appendix B.

C. **Changes to System Class or Subclassification**

1. **How do I get my system class and/or subclassification changed if I do not agree with how the Department has classified my system?** The owner, or permit holder, of the system needs to contact the appropriate Department Regional Office. The Regional “permit section engineer” that issued the permit should be contacted. If a review of the system characteristics justifies an update of the system’s classification, the Department Regional Office person can make the necessary correction in the Department’s database. The owner can also contact the technical support number listed above under Chapter 1, C (Sources of Information).
2. **What happens to a system’s classification if the design capacity is increased or a new treatment technology is added or removed?** Upon written notice provided to the owner, the Department may change the class or subclassification of a treatment system because of changes in the conditions or circumstances at a system. This may include, but is not limited to; an increase in capacity that changes the class of the system, the addition or loss of a treatment technology, other federal or state regulatory changes in requirements relating to the treatment technology used at a system, or the issuance of a permit changing the class or subclassification of a system.

Remember, the system owner is responsible to ensure that a properly certified operator is available to make process control decisions. If something resulted in a change to the system’s class, the designated available operator for the system may not be properly certified to operate a system with the higher class and would need to apply for an upgrade in his/her certificate before the system becomes operational. The operator will not need any additional training or experience to get the upgrade to operate the larger system once it is operational. See Appendix B for the definition of the system classes.

The addition of a treatment technology may result in the addition of a subclassification to the system’s classification. If the designated available operator for the system is not certified to operate this treatment technology, the operator will need to pass the examination for that subclassification and obtain one year of operating experience. The one-year operating experience can be waived if the operator and the owner elect to comply with the conditions for an accelerated certification as described in question 3. If they choose not to comply with the conditions for accelerated certification, the owner must hire another available operator certified to operate the new treatment technology.

- 3. When do the accelerated certification provisions apply and how can a system operator and owner use these provisions to stay in compliance?** The accelerated certification provisions apply when upgrades to a system will result in a change to the system classification. This is usually the result of an increase in capacity that changes the class of the system or the addition or loss of a treatment technology which changes the subclassification.

If the system's capacity is increased to the point where the system class changes, the existing available operator may need to apply for an upgrade in the level of certification to coincide with the higher system class. The available operator can get the higher level of certification needed by applying for an upgrade in certification *before* the system becomes operational.

If the system adds a treatment technology, and the existing available operator is not certified to operate this new technology, the available operator must successfully pass the examination for that technology. In addition, one year of operating experience is needed. This year of operating experience can be waived if the following conditions are met:

- The owner has all the necessary permits from the Department.
- The operator successfully completes an on-site Department-approved training program from the manufacturer or consulting engineer on the proper operation and maintenance of the new treatment technology.

To stay in compliance, the system owner and available operator need to complete the conditions for accelerated certification. If they choose not to do that, then the owner needs to designate another available operator who is appropriately certified.

Chapter 7 - System Operation and Process Control

There are specific requirements and protocols that must be met in the day-to-day operation of a system including the responsibilities of operators and owners. This chapter describes the duties owners and operators may perform, identifies who can make process control decisions and describes the various tools operators and owners can use to effectively operate a system in compliance with federal and state rules, regulations and their permit conditions.

A. General Requirements

- 1. What is a process control decision?** A process control decision is any decision that maintains or changes the water quality or quantity of a water system or wastewater system in a manner that may affect the public health or environment.

- 2. If we are a small system and we have only one certified operator, how can that operator ever go on vacation?** The system owner is responsible for insuring all process control decisions are made by a properly certified available operator. This operator does not necessarily need to be on-site all the time. For practical purposes, there are a number of ways a system owner can comply with this requirement, including:
 - Hire more than one certified operator to cover all shifts of system operation.
 - Designate an operator-in-responsible-charge who develops standard operating procedures for use by non-certified or other certified operators working at the system. These procedures must also define when an available operator must be contacted.
 - Hire a circuit rider for the system or share an available operator with a neighboring system.
 - Install a Programmable Logic Control (PLC) or Supervisory Control and Data Acquisition System (SCADA) to be used in combination with an available operator.

The Department has the authority to order the system owner to hire additional operators if necessary to ensure all process control decisions are made by a certified operator.

- 3. Can a single operator serve as the chief operator for both the distribution system and the water treatment facility?** Yes; water operators with a Class A, B, C or D water certificate and the Class E certification for the distribution system can make process control decisions in both the treatment facility and the distribution system. Similarly, wastewater operators with a Class A, B, C or D wastewater certificate that also make process control decisions in the collection system must have the E4 certification.

- 4. The local fire department is responsible for maintaining fire hydrants in the distribution system. Must their personnel be certified in order to flush the hydrants?** No; the Department does not deem the flushing of fire hydrants to be a process control decision. However, it would be a good idea for the fire department to coordinate the flushing of these hydrants with the certified operator for the distribution system.

B. Duties of Operators

- 1. How do I notify the Department that I will no longer be serving as the licensed operator in charge at a system or that I am the new licensed operator at a system?**
System owners of water or wastewater systems are to notify the Department, in writing, within 10 calendar days of the addition, loss, change or replacement of an available operator. To contact the Department regarding a change in operators or system status, a “Change of Available Operator Form” can be found on the Department’s Operator Information Center webpage at www.dep.state.pa.us (DEP Programs: operator). Once at the Operator Information Center webpage click on the bullet on the right side of the screen entitled “Change of Available Operator Form” and follow the instructions. The required information can be sent in electronically or by mail to the address listed in the instructions.
- 2. Why should I keep a log of my process control decisions or any other pertinent information regarding system operations?** Operators are encouraged to maintain some type of a log (book, computer, meeting minutes, etc.) of process control decisions to establish a baseline and history of operations throughout the years, assist operators in running the system given different seasonal weather conditions, serve as a useful training tool, assist in developing standard operating procedures and perhaps establish more effective and efficient procedures for running the system. It can also serve as a tool and record for the operator and the owner in any enforcement matters.
- 3. Must I do all the operator tasks listed in the regulations to be a certified operator?**
No, the listed operator tasks in the regulations are simply examples of tasks an operator might be expected to perform. This list was never intended to be an all inclusive list. Because of the many variations of water or wastewater systems and management of those systems, a comprehensive list of duties is not possible.
- 4. Why must I report to the system owner any known or potential violations?** This is a statutory requirement. The sole purpose for this report, and the only time the report should be written or submitted to the owner, is when the operator believes the current policy or a decision of the owner is causing, or may be causing, a violation of any applicable federal or state laws, regulations, permit conditions or requirements (See Section 13(e)(2) of the Act). The mechanism for submitting this report is up to the operator. It can be as simple as an email, or as complicated as certified mail. In the end, in order for this report to serve the purpose for which it is intended, the mechanism of delivery should be in such a format that the operator can prove that: (1) he/she wrote and submitted the report and (2) the owner received the report.

The report should include the:

- Name of the certified operator making the report,
- Date and time,
- Nature of the violation or system conditions,
- Suspected cause of the violation or system conditions (including the lack of needed resources),
- Degree of severity or threat to public health, safety or the environment of the violation or system conditions

- Any actions or mitigating measures associated with process control necessary to prevent or eliminate a violation.

This report is a method of capturing the best professional judgment of the operator at that specific time. It is not intended to require the operator to do extensive engineering studies or investigations in order to stay in compliance with this provision. An example of a report is in Appendix C. It is recommended that the operator and owner sit down together and agree on the format and the protocols for submittal of this report as soon as possible.

- 5. Are verbal reports to the system owner acceptable or must it be in written form? How about by email?** An operator can report to the system owner any known or potential violations in any method he/she is comfortable with including verbal, written or email reports. The Department recommends some form of written report as compared to verbal report as this creates a paper trail. An example of a report is in Appendix C. It is recommended that the operator and owner sit down together and agree on the format and the protocols for submittal of this report as soon as possible.
- 6. I always thought that the owner, not the operator, was liable for my process control decisions. Has this changed?** The Department has had the authority under the Clean Streams Law or the Pennsylvania Safe Drinking Water Act to hold both the operator and the owner responsible for actions relative to the operation of a water or wastewater treatment system that resulted in a violation of either statute. The Drinking Water and Wastewater Systems Operators' Certification Act (Act) did not change that and states "it is the duty of both the owner and the operator" to comply with applicable Federal and State laws applicable to water and wastewater systems. All this act did was strengthen these provisions by requiring that all process control decisions be made by a certified operator. The certified operator is the recognized professional responsible for process control at a system. This is why the operator is licensed. As long as the operator uses professional judgment and makes every effort to stay in compliance with all rules and regulations related to the operation of a water or wastewater system, the operator will have nothing to worry about.

C. Duties of Owners

- 1. Does a properly certified operator need to be present at the treatment facility all the time that it is in operation?** No; an available operator does not need to be present at the treatment facility all the time that it is in operation. An appropriately certified operator must be available to make all process control decisions during all periods of system operation. The operator can be "available" by being on-site or able to be contacted in a timely manner to make process control decisions.
- 2. If the "chief" operator goes on vacation, what level of certification does the "fill-in" operator need to have?** The Department recommends that the fill-in operator be an appropriately certified operator, meaning the operator's certificate is of a class equal to or of a higher class than the system class and all the subclasses corresponding to the treatment technologies utilized at the system. However, if the "chief" operator agrees to be available to make process control decisions even while on vacation then the "fill-in" operator can be an uncertified operator or not appropriately certified. The "chief"

operator would need to be contacted by phone, email, or some other timely method to direct the “fill-in” operator in making any process control decisions. Another option would be for the “chief” operator to serve as the operator-in-responsible-charge of the system and write standard operating procedures for all operations of the system that the fill-in operator could follow. The certified operator would still need to be available, but this would minimize the amount of time the operator would need to be directly contacted.

3. **If the water supplier hires a contractor to do work on the distribution system, does the contractor need to be certified?** No; the contractor does not need to be certified as long as a properly certified operator makes any and all process control decisions with respect to the contractor’s work.
4. **Can a Professional Engineer without an operator’s certificate be an available operator or an operator-in-responsible-charge for a water or wastewater system?** No, a Professional Engineer without an operator’s certificate cannot be an available operator or an operator-in-responsible-charge for a water or wastewater system. Engineers must meet the same requirements for certification as any operator.
5. **If my operator is filing frivolous reports for everything the operator does, must I reply to everything? What is my responsibility?** The owner is responsible for making a “good faith” effort to respond to a report from an operator where the operator believes a current situation is either resulting, or has the potential to result, in a violation of the system permit or any rule or regulations related to the operation of a water or wastewater system. An example of such a report is in Appendix C. The owner has the ability to direct the operator in the day-to-day reporting processes that should be followed at the system. Further discussion between the owner and operator to define what the owner and operator feel are “frivolous” reports is an appropriate “good faith” response.
6. **Is it mandatory to provide copies of system permits to my operators?** Yes; it is a duty of the owner to provide copies of any system permits governing the operation of the water or wastewater system to the designated available operator(s) or operator-in-responsible-charge. The owner can have the Department provide these permits to the operators by submitting a written request to the appropriate Regional Office indicating which operators should get the copies and their contact information. Posting them or locating them where everyone has access to them should suffice.
7. **Is it mandatory to file an Available Operator Report with the Department?** Yes; upon written request and receipt of an Available Operator Report from the Department, a system owner must report the following:
 - The system name, address, phone number and email address (if available).
 - The name and title of the system representative providing the information.
 - The system owner name, address, phone number and email address (if available).
 - The Public Water System Identification (PWSID) numbers, NPDES permit number or Water Quality Management Part II permit number for their system.
 - The name, client ID, address, phone number and email (if available) of all available operators employed by the owner at the system and the operators’ classes and subclassifications.

- The designation of an operator-in-responsible-charge if the owner chooses to develop and utilize standard operating procedures.

The Department intends to mail these Available Operator Report forms at least once a year to system owners. Additionally, a system owner is to notify the Department in writing within 10 calendar days of the addition, loss, change or replacement of an available operator. The owner shall provide at that time the name, client ID, and class and subclassification of all operator changes. To contact the Department regarding a change in operators or system status, a “Change of Available Operator Form” can be found at the Department’s Operator Information Center at www.dep.state.pa.us (DEP Programs: operator). Once at the Operator Information Center webpage click on the bullet on the right side of the screen entitled “Change of Available Operator Form” and follow the instructions. The owner can complete the required information and send it electronically or by mail to the address in the instructions.

- 8. What if I don’t report a change in the designation of my available operator within the ten days prescribed by the regulations?** An owner who does not report changes in the available operators or operator-in-responsible-charge is not in compliance with program requirements established in the Water and Wastewater Systems Operators’ Certification Act and could be subject to enforcement action. The Department could issue the owner an order to come into compliance within a specified time frame. If the owner still chooses to not comply, the owner is subject to further fines and penalties.
- 9. Must I designate an available operator for my system?** Every water or wastewater system, regulated under the Water and Wastewater Systems Operators’ Certification Act, must have an available operator(s) responsible for making process control decisions for the system. The Act further requires the owner to designate who these individuals are and report this information to the Department upon request.
- 10. Am I required to have a specific number of available operators for my system?** A system owner is responsible for insuring all process control decisions are made by an available operator. Since each system is different, it is not possible to prescribe a specific number of certified operators to be required for each system. There are a number of ways a system owner can comply with this requirement, including:
 - Hire one or more appropriately certified operators to cover all shifts of system operation.
 - Designate an operator-in-responsible-charge who develops standard operating procedures for use by non-certified or other certified operators working at the system.
 - Hire a circuit rider for the system.
 - Install a Programmable Logic Controls (PLCs) or Supervisory Control and Data Acquisition Systems (SCADA) to be used in combination with an available operator.

The Department does have the authority to order the system owner to hire additional operators, if necessary, to ensure all process control decisions are made by an appropriately certified operator.

11. Must I post the operator's certificate in a visible location in the plant? Yes, it is required that the certificates of all available operator(s) be posted in a visible location in the system. There should also be procedures put in place in an obvious location for contacting them if they are not onsite to make any necessary process control decisions.

12. Where can I get a list of certified operators in my area? You can request a list of certified operators by contacting the Department through one of the following ways:

- Email: RA-OperatorWebsite@pa.gov
- Phone: 717-787-0122
- Mail: State Board for Certification of Water and Wastewater Systems Operators
Rachel Carson State Office Building
P.O. Box 8454
Harrisburg, PA 17105-8454

Supply your contact information including first and last name and email address, if available. The Department has the right to recover any and all costs incurred in fulfilling a request for information.

D. Standard Operating Procedures (SOPs)

- 1. What is the difference between an available operator and an operator-in-responsible-charge?** The Drinking Water and Wastewater Systems Operators' Certification Act and the EPA guidelines do not distinguish the roles between an available operator and an operator-in-responsible-charge. Chapter 302 regulations, the Administration of the Water and Wastewater Systems Operator Certification Program, make a distinction between the two types of certified operators by requiring the operator-in-responsible-charge to approve any standard operating procedures developed for the system. If the system chooses not to utilize standard operating procedures as one method to ensure compliance with the requirement that all process control decisions be made by a certified operator, there is no need to designate an operator-in-responsible-charge.
- 2. When should standard operating procedures be utilized?** Standard operating procedures can be utilized at anytime. The main purpose for the development of these procedures is to allow operators, certified and non-certified, under the operator-in-responsible-charge's direct supervision to implement process control decisions. The procedures should identify steps to be followed in specific situations. Also, the procedures must identify those situations where the operator-in-responsible-charge must be contacted to make a process control decision. Example standard operating procedures have been provided in Appendix D to help with the development of these procedures.
- 3. Am I required to have standard operating procedures for my system?** No, standard operating procedures are not required. The use of standard operating procedures is an optional method, available to the owner and the individual designated as the operator-in-responsible-charge, to allow operators under the operator-in-responsible-charge's direct supervision to implement process control decisions. The decision to use standard operating procedures depends on the complexity of the process and the abilities of the

personnel at the system. Standard operating procedures must be approved by the operator-in-responsible-charge.

- 4. Can I have a contractor formulate my standard operating procedures?** Yes, a contractor can formulate and develop standard operating procedures. However, these procedures must be approved, in writing and dated, by the operator-in-responsible-charge and must be available at the system for review by the Department. If anything goes wrong where a violation occurs as a result of following these procedures, the responsibility for this violation lies with the operator-in-responsible-charge who approved them, not the contractor who developed them. Example standard operating procedures have been provided in Appendix D to help with the development of these procedures.
- 5. What factors will the Department use to determine the effectiveness of standard operating procedures?** As a tool, the Department has created a template for the development of standard operating procedures. Example standard operating procedures using this template are included in Appendix D. The following are examples of the factors the Department may use in determining the effectiveness of standard operating procedures:

 - Were the purpose, objectives and location of the procedures clearly defined?
 - Were the normal characteristic ranges of influent and effluent to the treatment unit clearly defined?
 - Were the trigger mechanisms clearly delineated for the treatment unit process?
 - Were the procedural steps complete and in a logical sequence?
 - Were safety considerations detailed so that the worker was protected during each step of the procedure?
 - Was the flow of the steps sufficient to minimize time and maximize effectiveness?
 - Do the standard operating procedures result in a usable process control decision?
 - Were quality controls clearly defined for follow-up checks on the effectiveness of the procedure or the results of the process control decision?
 - Were other related process control decisions easily referenced in the standard operating procedures?
 - Are communication protocols and emergency contact procedures and information clearly referenced and defined?
- 6. Does using standard operating procedures create any additional liability?** The certified operator is always responsible for the process control decisions he/she makes. In the case of standard operating procedures; not only is the operator-in-responsible-charge responsible for all process control decisions, he/she may also be accountable for any violations of federal or state law or rules and regulations or permit conditions applicable to the operation of a water or wastewater system that occur when another operator follows the standard operating procedures approved by the operator-in-responsible-charge. Ultimately, the decision to use standard operating procedures is the owner's. It is the operator-in-responsible-charge's responsibility to ensure the standard operating procedures are up to date and properly followed.

7. **As an operator-in-responsible-charge, I developed standard operating procedures for a system. I have now left that system for another job. Am I still liable for the standard operating procedures I approved?** No; the operator-in-responsible-charge who left the system would no longer be liable for standard operating procedures for that system. The new operator-in-responsible-charge should review, and revise as necessary, the existing standard operating procedures and approve them. The new operator-in-responsible-charge assumes responsibility for the results of the standard operating procedures.
8. **Can a system continue to use standard operating procedures developed by a previous operator-in-responsible-charge?** Yes, a system can continue to use standard operating procedures developed by a previous operator-in-responsible-charge. These procedures should be reviewed and approved, in writing and dated, by the new operator-in-responsible-charge for the system.

E. Process Control Plans

1. **Does every system need to complete a Process Control Plan?** No, not every system needs a Process Control Plan. There should be no need to develop a process control plan where the system has an effective operations and maintenance plan and an emergency response plan as required by Chapter 109, the Safe Drinking Water regulations or another plan developed as a permit condition or in response to another action taken by the Department. The Department will consider the following criteria when determining whether or not to require a process control plan:
 - Whether the system has a significant history of non-compliance.
 - Whether the system is having difficulty with a new treatment technology.
 - Whether there is any other unique situation where development of a process control plan is warranted.

The Department will notify the owner in writing when it determines a process control plan is needed. An example of a Process Control Plan has been included in Appendix E.

2. **Can I use a contractor to complete my Process Control Plan?** Yes, a contractor can complete a Process Control Plan for a system, provided the available operator(s) or operator-in-responsible-charge of the system who will be responsible for the implementation of the plan is part of the discussions and has a complete understanding of the plan.
3. **How often do I need to update my Process Control Plan?** A Process Control Plan should be reviewed and updated as needed to identify any system changes. At a minimum, the plan should be reviewed and updated, if needed, on an annual basis.

F. Operation of Multiple Systems (Circuit Riders)

1. **Can a single operator serve as the available operator for multiple treatment facilities?** Yes, a certified operator may make process control decisions at more than one system. The certified operator must possess a certificate of the same class or of a

higher class than the system class as well as all of the subclasses that have been assigned to each specific system.

2. **Can a water or wastewater system contract for a certified operator?** Yes, a water or wastewater system can contract for a certified operator. The certified operator must possess a certificate of the same class or of a higher class than the system class and his/her certificate must contain all of the subclasses that have been assigned to each specific system. The Department calls these operators “Circuit Riders”. A circuit rider is defined as, “a management program in which a certified operator may make process control decisions at more than one system of different ownership.”

3. **How many systems can a circuit rider operate?** Currently there is no limit to the number of systems a circuit rider may operate. However, the Department may direct an owner or available operator to cease participation in a circuit rider program if one of the following applies:
 - The system is in violation for failure to meet the requirements of the Water and Wastewater Systems Operators’ Certification Act; the Chapter 302, Administration of the Water and Wastewater Systems Operator Certification Program Regulations, and any federal or state law or rules and regulations promulgated thereto applicable to the operation of a water or wastewater system.
 - There is a threat to public health, safety and the environment due to the actions of the circuit rider.
 - Changes have occurred at the system that are not included in the system specific management plan.

4. **Must I develop a workplan for every system I have under contract?** Unless the following information is specified in a contract between the circuit rider and the owner, the circuit rider must develop and submit a general work plan to the owner of each system that includes:
 - The name and location of the circuit rider’s primary business.
 - The name and location of each system to be included in the circuit rider program.
 - The classification and subclassification of each system included in the circuit rider program.
 - The number of estimated hours per week the circuit rider works at each system (time physically present at a system; not including travel time), with the method of documentation to be used for each visit.

An example template for a work plan is included in Appendix F.

5. **Will my contract with a system owner that defines the services and hours satisfy the work plan requirement?** It may; if the contract with a system owner defines all the required elements of the general workplan and the system specific management plan. An example workplan and system specific management plan is included in Appendix F.

6. What does the management plan need to contain? A circuit rider shall develop and submit a system specific management plan to the owner of each system describing the information relevant to the owner's system. This management plan must include:

- The names and contact information of the available operators for that system, with a copy of the operators' certificate to be prominently displayed at the system.
- The standard operating procedures and a process control plan for the system.
- The name and method of contacting the circuit rider in case of an emergency.
- An estimate of the response time needed to be physically present at the system.

An example template for a system specific management plan is included in Appendix F.

Chapter 8 - Using the Website

The Department's Operator Information Center is an Internet website created by the Department, Bureau of Safe Drinking Water. The website is designed to help drinking water and wastewater system operators stay on top of the latest regulatory requirements, continuing education courses, and water and wastewater technologies and issues. Owners and operators should use the website to obtain detailed technical and administrative information on state regulations, schedules for upcoming events, online responses to operator certification questions, operator training information, and links to a host of operator professional organizations and associations. The website can be accessed at www.dep.state.pa.us (DEP Programs: operator).

A. General Information

- 1. I do not own a computer; what do I do?** Today computers are everywhere. They are fast, affordable and provide easy access to vast amounts of information. Therefore, the Department strongly suggests that operators have access to and use a personal computer. Even if an operator does not personally own one, computers for public use can be found at most libraries, schools, college campuses, some office supply stores and many town recreation centers.

Also, there are a number of phone numbers for an operator to call for further information. However, the number of staff available to answer an operator's questions is limited. Questions about the processing of certification applications, fees and testing are the responsibility of the Operator Certification Section. This section deals with the basic administration of the program and can be contacted at 717-787-5236. The Division of Training, Technical and Financial Services is responsible for technical support including program development. This includes rules, regulations and guidelines. This Division can be contacted at 717-787-0122. The Division of Training, Technical and Financial Services is also responsible for the implementation of the training components of the program. The enforcement of the new requirements is shared between the Bureau of Safe Drinking Water and the Department regional offices. There may not be one phone contact to answer all of your questions. It is more effective to use the Department's Operator Information Center webpage first before calling the Department program staff.

- 2. I am not computer literate; what do I do?** More and more operators are interested in computer on-line services (i.e., administrative, training and testing opportunities). The Department's goal is a paperless environment for its entire program. Having access to a computer and knowing how to use it is imperative. If an operator has access to a computer but is still uncomfortable using it, there are a number of training courses the operator can take; some of which are Department-approved for continuing education credit.
- 3. Do I need a password to access the Department website?** No; to access the Department Operator Information Center website an operator does not need a password. However, to access and view a continuing education transcript (which is located in Earthwise Academy), an operator needs a Department Client ID (The Client ID can be found on the left side about halfway down on an operator's certificate or on the operator's wallet card).

4. **Are the Department website and Earthwise Academy the same?** No, the Department Operator Information Center webpage is located at www.dep.state.pa.us (DEP Program: operator). This webpage allows instantaneous access to every aspect of the program. This webpage allows the operator to directly access personal files and receive emails about certification issues, provides valuable information about the Operator Certification Program, and directs the user to specific topics of interest or need such as Documents and Forms, Certification and Licensing, Change of Available Operator Form, Technical Assistance, and Certification Exam Schedule.

Earthwise Academy, located at the following link, www.ahs2.dep.state.pa.us/edu/Default.aspx, is the treatment plant operator's one-stop shop for all things related to training. Certified operators can view their continuing education transcript, search for Department approved training courses, and take the Department's web-based training courses.

Chapter 9 - Regulations

There are a number of rules and regulations that available operators should be familiar with besides the Chapter 302 regulations relative to the Operator Certification Program. This chapter describes these regulations and the relevant sections operators and owners need to understand.

A. General Information

- 1. As a certified wastewater system operator, what rules and regulations should I be knowledgeable about?** A certified wastewater system operator should be knowledgeable of at least the following acts and regulations:

The Federal Clean Water Act (33 U.S.C. §§ 1251-1387)

The Pennsylvania Clean Streams Law (35 P.S. §§ 691.1-691.1001)

The Water and Wastewater Systems Operators' Certification Act (63 P.S. §§ 1001-1015.1)

Pennsylvania Regulations:

25 Pa. Code Ch. 91 (relating to General Provisions)

25 Pa. Code Ch. 92a (relating to National Pollutant Discharge Elimination System Permitting, Monitoring and Compliance)

25 Pa. Code Ch. 93 (relating to Water Quality Standards)

25 Pa. Code Ch. 94 (relating to Municipal Wasteload Management)

25 Pa. Code Ch. 95 (relating to Wastewater Treatment Requirements)

25 Pa. Code Ch. 252 (relating to Environmental Laboratory Accreditation)

25 Pa. Code Ch. 302 (relating to Administration of the Water and Wastewater Systems Operators' Certification Program)

Appendix G is a guide listing important information every certified wastewater system operator needs to know.

- 2. As a certified drinking water system operator, what rules and regulations should I be knowledgeable about?** A certified drinking water system operator should be knowledgeable of at least the following acts and regulations:

The Pennsylvania Safe Drinking Water Act (35 P.S. §§ 721.1-721.17)

1996 Amendments to the Federal Safe Drinking Water Act (42 U.S.C. §§ 300f-300j26)

The Water and Wastewater Systems Operators' Certification Act (63 P.S. §§ 1001-1015.1)

Pennsylvania Regulations:

25 Pa. Code Ch. 109 (relating to Safe Drinking Water)

25 Pa. Code Ch. 252 (relating to Environmental Laboratory Accreditation)

25 Pa. Code Ch. 302 (relating to Administration of the Water and Wastewater Systems Operators' Certification Program)

The Department maintains a webpage, "Drinking Water Regulations, Standards and Resources" where a certified operator can find most of the information needed in order to stay in compliance. This webpage can be accessed through the Department website at www.dep.state.pa.us (DEP Programs: drinking water). The link to the page is on the right hand side of this webpage.

3. **What do I need to know about the permit for my system?** At a minimum, the permit for a system defines the list of pollutants an operator should be concerned about, the pollutant discharge limitations and the sampling requirements for their system (type and frequency of sampling, reporting requirements, special conditions that must be met, etc.).
4. **Where do I obtain a copy of the permit for my system?** It is the duty of the owner of a water or wastewater system to provide a copy of all current, relevant water and wastewater permits to all available operators, unless the owner submits a written request to the Department requesting that the Department provide this information to the available operators. Posting these permits where everyone has access to them should suffice.
5. **How do the Chapter 252, Environmental Laboratory Accreditation Regulations apply to me?** There will be a laboratory supervisor subclassification for individuals responsible for the supervision of testing or analysis of environmental samples and reporting of analytical data for water supply systems in a Pennsylvania-accredited environmental laboratory operated by a water system. There will be a laboratory supervisor subclassification for individuals responsible for supervision of the testing or analysis of environmental samples and reporting of analytical data for wastewater systems in a Pennsylvania-accredited environmental laboratory operated by a wastewater or industrial waste system. A certified operator, wanting to remain the designated laboratory supervisor for a drinking water or wastewater system accredited laboratory, must successfully pass the examination for this subclassification and obtain two years experience in the testing and analysis of environmental samples for drinking water or wastewater systems. There will be one examination to get certified as a laboratory supervisor, regardless of whether the certification is relative to a drinking water or wastewater system. The need-to-know criteria and the knowledge, skills and abilities (KSAs) and the examination specifications are listed at the end of Appendix A.

Section 252.302(h)(3), relating to the qualifications of the laboratory supervisor, states that certified operators who are serving as the laboratory supervisor for a drinking water or wastewater system on September 18, 2010, will have 12 months after the Certification Board makes the drinking water or wastewater laboratory subclassification examination available to meet these requirements. The Certification Board expects to make this examination available sometime in 2012. Certified operators who meet the other qualifications defined in Chapter 252 or were grandfathered as a laboratory supervisor by the Laboratory Accreditation Program, do NOT need to obtain the laboratory supervisor certification to continue serving as a laboratory supervisor for a drinking water or wastewater system.

6. **What can happen to me if I am in violation of any applicable rules and regulations or permit conditions?** The Department has a defined enforcement process that it follows whenever a violation occurs. This process is in place to facilitate quick resolution of the violation and to identify who the responsible parties are for the violation. As a result of this investigative process, if the Department finds the certified operator or system owner responsible for the violation, there are a number of things that can happen.

- a. Compliance Assistance - The system and the operator could be referred to the Outreach Assistance Provider Program or the Drinking Water Capability Enhancement Program. These two programs provide one-on-one assistance to systems to help them address problems they are experiencing and to facilitate compliance. In most cases, this is the preferred course of action.
- b. Consent Order and Agreement - The Department may decide to enter into an agreement with the system owner and the operator that defines a schedule that must be met to bring the system into compliance. If the Department feels the actions of the operator are serious enough, the operator may be asked to *voluntarily* surrender his/her certificate. This decision is the operator's to make. Between 1980 and 2010, the Department has reported 15 of these agreements to the Certification Board for implementation.
- c. Department Petitions the Certification Board - If the Department feels that the certified operator's certificate should be suspended, revoked or modified, it can petition the Certification Board to do so. The Board can revoke, suspend or modify a certificate for misconduct, including but not limited to:
 - Negligence (departure from the conduct expected of a reasonably prudent person acting under similar circumstances) in the operation of a water or wastewater system
 - Fraud
 - Falsification of application
 - Falsification of operating records
 - Incompetence (lacking qualification or ability) or failure to use reasonable care or judgment in performance of duties as specified in the Act or other applicable Federal or State laws and regulations.

The Certification Board will hold a formal hearing following the rules and procedures set forth in the Administrative Code. The Certification Board will take action on the Department's petition at its next scheduled meeting after the hearing is held. The decisions of the Certification Board are appealable to the Environmental Hearing Board. Between 1980 and 2010, 19 petitions have been submitted to the Certification Board. Of those 19, 13 settled before the Board could hold a hearing. The Board took action to suspend or revoke the operator's certificate in all but one of the remaining six cases.

- d. Criminal Action - The Department can decide to file criminal charges if it feels the actions of the operator or system owner criminally violate any law relative to the operation of a water or wastewater system. If convicted, the operator or owner would have a criminal record. This is rarely done. Between 1980 and 2010, the Certification Board has a record of nine operators where the Department filed criminal charges. The Certification Board has denied the application for certificate renewal for six operators out of 10,000 due to a criminal violation related to the operation of a water or wastewater system.
- e. Civil Fines and Penalties - Using the authority in the Clean Streams Law or the Safe Drinking Water Act, the Department can assess fines and penalties against

the operator, the system owner or both. Of the approximately 40 operators assessed a fine under one or the other of these acts between 1980 and 2010 that were reported to the Certification Board, 16 have been assessed a fine or penalty between \$100 and \$5,000. The average fine appears to be approximately \$500. The Department may also assess a civil penalty of up to \$1,000 per day for a violation of the Water and Wastewater Systems Operators' Certification Act.

APPENDICES

A. Need-to-Know Criteria for Drinking Water and Wastewater Examinations

These criteria identify the specific Knowledge, Skills and Abilities (KSAs) an applicant should understand to successfully pass the examination. The KSAs are broken down into specific Categories. The percentage of questions on the examination for each Category is defined by the subject matter experts based on the relative importance of each category of KSAs to the job of an operator.

Base Question is a question that requires multiple KSAs to select the correct answer that touches on essential elements of an operator's job relative to that examination content. Base questions do not rotate in or out of the examination but are replaced periodically by a similar question.

Category is a grouping of KSAs related to the general day to day activities of an operator.

KSAs are those understandings and abilities selected by Subject Matter Experts as needed to qualify for a specific certification class or subclassifications.

B. Definition of Classes and Subclasses for Systems and Operators

C. Operator Report to the System Owner Example Template

D. Standard Operating Procedure Example Templates

- Drinking Water Filter Backwash
- Sodium Bicarbonate Feed Adjustment

E. Process Control Plan Example Template

F. Circuit Riders

- General Work Plans and System Specific Management Plan Introductions
- General Work Plan and System Specific Management Plan Example Template

G. Important Wastewater System Information

APPENDIX A

Need-to-Know Criteria for Drinking Water Examinations

The following information identifies the basic composition of each drinking water and wastewater examination. This consists of identifying examination specific categories (with the percentage of questions used on the examination for each category) followed by the specific knowledge, skills and abilities (KSAs) an applicant should understand to successfully pass the examination.

Drinking Water Part 1 General

Number of Base Questions: 3

Operator Certification Program Administration Questions: 4

Total Number of Questions: 34

Number of Questions Needed to Pass: 20

Collect Samples and Interpret Analyses

Knowledge of:

- basic chemistry
- drinking water regulations
- normal characteristics of water
- proper chemical handling and storage
- proper sampling techniques and procedures
- quality control and assurance practices

Ability to:

- recognize abnormal analytical results

Perform Administrative Duties

Knowledge of:

- facility operation and maintenance
- monitoring and reporting requirements
- principles of public relations
- record keeping requirements
- regulations

Ability to:

- accurately transcribe and interpret data
- coordinate emergency response with other organizations
- organize information
- perform basic math
- recognize unsafe work conditions
- review reports
- translate technical language into common terminology

Operate Equipment

Knowledge of:

- general electrical and mechanical principles
- hydraulic and pneumatic principles
- regulations
- safety procedures
- start-up and shutdown procedures

Ability to:

- monitor and adjust equipment

Evaluate Characteristics of Source Water

Knowledge of:

- hydrology
- normal characteristics of water
- sanitary survey process
- watershed and wellhead protection

Ability to:

- discriminate between ground water and surface water characteristics
- discriminate between normal and abnormal conditions

Perform Safety Procedures

Knowledge of:

- potential causes and impact of disasters on facility
- risk management
- safety regulations

Ability to:

- assess likelihood of disaster occurring
- identify potential safety hazards and unsafe work conditions
- implement written safety procedures
- select and operate safety equipment
- train others
- emergency plans

Comply with Part 141 National Primary Drinking Water Regulations (13%)

Perform Maintenance

Knowledge of:

- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricants and fluids
- safety regulations
- start-up and shutdown procedures

Ability to:

- calibrate equipment
- diagnose and/or troubleshoot process units
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions

- order necessary spare parts
- perform general maintenance and repairs
- record information

Drinking Water Class E - Distribution Systems

Number of Base Questions: 5

Operator Certification Program Administration Questions: 4

Total Number of Questions: 49

Number of Questions Needed to Pass: 30

Processes

Knowledge of:

- conditions requiring start-up/shutdown of the support system and equipment
- grounding issues for meter installation
- trenching and shoring procedures
- interaction with other support systems and equipment and the total treatment process to perform operating, start-up/shutdown, construction and installation procedures for processes and units
- plans specifications and other references

Ability to:

- conform to safety procedures to perform operating, start-up/shutdown, construction and installation procedures for processes and units
- conform to standards imposed by process parameters, laws and regulations to perform operating, start-up/shutdown, construction and installation procedures for processes and units
- identify safety hazards to perform operating, start-up/shutdown, construction and installation procedures for processes and units
- identify each element of a system/equipment/components and describe its purpose
- perform necessary calculations to perform operating, start-up/shutdown, construction and installation procedures for processes and units
- perform inspection procedures
- perform necessary actions at the appropriate time, location and frequency and explain reasons for taking these actions, including consequences of not taking action
- recognize indicators, identify causes and perform procedures for normal and abnormal conditions using proper troubleshooting techniques
- record necessary information to perform operating, start-up/shutdown, construction and installation procedures for processes and units
- use necessary tools, test equipment and reference manuals to perform operating, start-up/shutdown, construction and installation procedures for processes and units

Support Mechanisms

Knowledge of:

- conditions requiring start-up/shutdown of the support system and equipment
- interaction with other support systems and equipment and the total treatment process to operate, maintain and perform start-up/shutdown procedures on support systems and equipment

Ability to:

- conform to safety procedures to operate, maintain, and perform start-up/shutdown procedures on support systems and equipment
- conform to standards imposed by process parameters, laws and regulations to operate, maintain and perform start-up/shutdown procedures on support systems and equipment
- describe the purpose of system/equipment/components.
- identify causes of abnormal conditions using proper troubleshooting techniques to operate, maintain, and perform start-up/shutdown procedures on support systems and equipment
- identify and locate each part requiring maintenance and recognize when maintenance is needed
- identify safety hazards to operate, maintain, and perform start-up/shutdown procedures on support systems and equipment
- perform necessary actions at the appropriate time, location and frequency and explain reasons for taking these actions, including consequences of not taking action
- perform necessary calculations to operate, maintain, and perform start-up/shutdown procedures on support systems and equipment
- recognize indicators of normal and abnormal conditions using proper troubleshooting techniques to operate, maintain, and perform start-up/shutdown procedures on support systems and equipment
- record necessary information to operate, maintain, and perform start-up/shutdown procedures on support systems and equipment
- use necessary tools, test equipment and reference manuals to operate, maintain, and perform start-up/shutdown procedures on support systems and equipment

Quality Control

Knowledge of:

- physical, chemical and microbiological characteristics and their effects
- public health principles, laws and regulations

Ability to:

- identify and describe source quality and quantity
- perform duties and tasks in compliance with laws and regulations
- perform quality control and assurance procedures

Collects Samples and Interprets Lab Analyses (to be added later)

Knowledge of:

- basic microbiology, chemistry and physical science
- drinking water regulations
- normal characteristics of water
- quality control and assurance practices
- safety procedures

Ability to:

- implement proper chemical handling and storage
- implement proper sampling procedures
- recognize abnormal analytical results

Performs Lab Analyses (to be added later)

Knowledge of:

- basic laboratory techniques
- drinking water regulations
- normal characteristics of water
- quality control and assurance practices

Ability to:

- follow written procedures for analyses
- recognize abnormal analytical results

General (Basic Sciences)

Knowledge of:

- basic hydraulic concepts and terms; including friction loss, head loss, hydraulic grade, and flow
- concepts of basic chemistry
- square and cube whole numbers, proper fractions, improper fractions, mixed numbers and decimals

Ability to:

- calculate percent removal
- convert fractions to percentage and vice-versa
- convert from English units to metric units and vice-versa
- define and describe the significance of basic concepts in water chemistry
- define units of expression; such as ppm, mg/l, lbs/MG
- develop and read tables
- identify and describe the chemicals used in water
- interpret and use maps and plans
- perform addition, subtraction, multiplication and division of whole numbers and decimals
- plot and interpret graphs; including line, bar, percentage and broken line

Safety

Knowledge of:

- basic categories of safety hazards
- grounding issues for meter installation
- trenching and shoring procedures

Ability to:

- describe chemical safety procedures
- describe confined space safety procedures
- describe personal safety procedures for worker safety
- identify basic safety procedures for working environment

Administration

Knowledge of:

- necessary reference materials, manuals, standards, laws and regulations
- technical and regulatory information

Ability to:

- perform actions at appropriate time, location and frequency, and explain reasons for taking these actions, including the consequences of not taking action
- record necessary information

Drinking Water Dc - Small Systems with Disinfection

Number of Base Questions: 1

Operator Certification Program Administration Questions: 4

Total Number of Questions: 73

Number of Questions Needed to Pass: 46

Operate and Maintain System

Knowledge of:

- different types of storage
- disinfectant concepts and properties
- disinfectant processes and design parameters
- disinfection concepts
- facility operation and maintenance
- function of tools
- normal chemical range
- personal protective equipment
- principles of distribution repair
- principles of measurement
- proper application, handling and storage of disinfectants
- proper lifting procedures
- regulations
- report findings
- start-up and shutdown procedures

Ability to:

- adjust disinfection feed rates
- adjust equipment
- adjust flow patterns
- calculate dosage rates
- confirm disinfectant strength
- diagnose and/or troubleshoot process units
- discriminate between normal and abnormal equipment conditions
- evaluate and adjust operation of equipment
- flush lines
- identify a cross connection
- identify hazards where backflow prevention is required
- inspect and maintain storage tanks
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure disinfectant weight and volume
- monitor electrical and mechanical equipment

- perform general maintenance and repairs
- perform basic math
- prepare disinfectants
- record information
- troubleshoot the storage system

Source Water Characteristics and Protection

Knowledge of:

- normal characteristics of water
- well-head protection

Ability to:

- communicate observations verbally
- discriminate between normal and abnormal conditions

Collect, Perform and Interpret Laboratory Analyses

Knowledge of:

- principles of measurement
- proper disinfectant handling and storage
- proper sampling techniques and procedures
- quality control and assurance practices
- record keeping requirements
- regulations
- Safe Drinking Water Act

Ability to:

- interpret Material Safety Data Sheets
- perform disinfection calculations
- recognize abnormal analytical results

Establish Safety Plans and Apply Safety Procedures

Knowledge of:

- Pa One Call requirements
- potential causes and impact of disasters on facility
- proper safety procedures
- regulations
- risk management

Ability to:

- communicate safety hazards verbally
- demonstrate safe work habits
- identify a safe atmosphere
- identify potential safety hazards and unsafe work conditions
- interpret Material Safety Data Sheets
- operate safety equipment

Perform Administrative Duties

Knowledge of:

- facility operation and maintenance
- monitoring and reporting requirements

- public notification requirements
- recordkeeping functions and policies
- regulations

Ability to:

- develop and deliver Consumer Confidence Reports
- determine what information needs to be recorded
- evaluate facility performance
- interpret and transcribe data
- perform basic math

Drinking Water Subclassification 1 - Conventional Filtration

Number of Base Questions: 2

Operator Certification Program Administration Questions: 0

Total Number of Questions: 53

Number of Questions Needed to Pass: 31

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements

- perform process control calculations
- prepare chemicals

Collect Samples and Interpret Analyses (to be added later)

Knowledge of:

- drinking water regulations
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- proper sampling procedures
- quality control and assurance practices
- safety procedures

Ability to:

- recognize abnormal analytical results

Perform Laboratory Analysis (to be added later)

Knowledge of:

- approved methods
- basic biology, chemistry, and physical science
- basic laboratory techniques
- drinking water regulations
- laboratory equipment and procedures
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- quality control and assurance practices
- safety procedures

Ability to:

- calibrate instruments
- follow written procedures for analyses
- perform laboratory calculations
- recognize abnormal analytical results

Operate Equipment

Knowledge of:

- drinking water treatment concepts
- function of tools
- general, electrical and mechanical principles
- hydraulic and pneumatic principles
- regulations
- safety procedures
- start-up and shutdown procedures

Ability to:

- monitor, evaluate and adjust equipment

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 2 - Direct Filtration

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 44

Number of Questions Needed to Pass: 27

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures

- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Collect Samples and Interpret Analyses

Knowledge of:

- drinking water regulations
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- proper sampling procedures
- quality control and assurance practices
- safety procedures

Ability to:

- recognize abnormal analytical results

Perform Laboratory Analysis

Knowledge of:

- approved methods
- calibrate instruments
- basic biology, chemistry, and physical science
- follow written procedures for analyses
- basic laboratory techniques
- perform laboratory calculations
- drinking water regulations
- laboratory equipment and procedures
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- quality control and assurance practices
- safety procedures

Ability to:

- recognize abnormal analytical results

Operate Equipment

Knowledge of:

- drinking water treatment concepts
- function of tools
- general, electrical and mechanical principles
- hydraulic and pneumatic principles
- regulations
- safety procedures
- start-up and shutdown procedures

Ability to:

- monitor, evaluate and adjust equipment

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 3 - Diatomaceous Earth Filtration

Number of Base Questions: 1

Operator Certification Program Administration Questions: 0

Total Number of Questions: 22

Number of Questions Needed to Pass: 16

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Collect Samples and Interpret Analysis (to be added later)

Knowledge of:

- drinking water regulations
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- proper sampling procedures
- quality control and assurance practices
- safety procedures

Ability to:

- recognize abnormal analytical results

Perform Laboratory Analysis

Knowledge of:

- approved methods
- basic biology, chemistry, and physical science
- basic laboratory techniques
- drinking water regulations
- laboratory equipment and procedures
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- quality control and assurance practices
- safety procedures

Ability to:

- calibrate instruments
- follow written procedures for analyses
- perform laboratory calculations
- recognize abnormal analytical results

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Drinking Water Subclassification 4 - Slow Sand Filtration

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 18

Number of Questions Needed to Pass: 13

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Collect Samples and Interpret Analysis (to be added later)

Knowledge of:

- drinking water regulations
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- proper sampling procedures
- quality control and assurance practices
- safety procedures

Ability to:

- recognize abnormal analytical results

Perform Laboratory Analysis (to be added later)

Knowledge of:

- approved methods
- basic biology, chemistry and physical science
- basic laboratory techniques
- drinking water regulations
- laboratory equipment and procedures
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- quality control and assurance practices
- safety procedures

Ability to:

- calibrate instruments
- follow written procedures for analyses
- perform laboratory calculations
- recognize abnormal analytical results

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 5 - Cartridge or Bag Filtration

Number of Base Questions: 1

Operator Certification Program Administration Questions: 0

Total Number of Questions: 17

Number of Questions Needed to Pass: 11

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Collect Samples and Interpret Analysis (to be added later)

Knowledge of:

- drinking water regulations
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- proper sampling procedures

- quality control and assurance practices
- safety procedures

Ability to:

- recognize abnormal analytical results

Perform Laboratory Analysis (to be added later)

Knowledge of:

- approved methods
- basic biology, chemistry and physical science
- basic laboratory techniques
- drinking water regulations
- laboratory equipment and procedures
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- quality control and assurance practices
- safety procedures

Ability to:

- calibrate instruments
- follow written procedures for analyses
- perform laboratory calculations
- recognize abnormal analytical results

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures
- assign work to proper trade

Ability to:

- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Drinking Water Subclassification 6 - Membrane Filtration

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 24

Number of Questions Needed to Pass: 15

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters
- drinking water regulations

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Collect Samples and Interpret Analysis (to be added later)

Knowledge of:

- drinking water regulations
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- proper sampling procedures

- quality control and assurance practices
- safety procedures

Ability to:

- recognize abnormal analytical results

Perform Laboratory Analysis (to be added later)

Knowledge of:

- approved methods
- basic biology, chemistry and physical science
- basic laboratory techniques
- drinking water regulations
- laboratory equipment and procedures
- Material Safety Data Sheet
- normal characteristics of water
- principles of measurement
- proper chemical handling and storage
- quality control and assurance practices
- safety procedures

Ability to:

- calibrate instruments
- follow written procedures for analyses
- perform laboratory calculations
- recognize abnormal analytical results

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Drinking Water Subclassification 7 - Corrosion Control

Number of Base Questions: 1

Operator Certification Program Administration Questions: 0

Total Number of Questions: 32

Number of Questions Needed to Pass: 21

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 8 - Chemical Addition

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 40

Number of Questions Needed to Pass: 24

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Operate Equipment

Knowledge of:

- drinking water treatment concepts
- function of tools
- general, electrical and mechanical principles
- hydraulic and pneumatic principles
- regulations

- safety procedures
- start-up and shutdown procedures

Ability to:

- monitor, evaluate and adjust equipment

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 9 - Ion Exchange and Greensand

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 34

Number of Questions Needed to Pass: 22

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment

- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Operate Equipment

Knowledge of:

- drinking water treatment concepts
- function of tools
- general, electrical and mechanical principles
- hydraulic and pneumatic principles
- regulations
- safety procedures
- start-up and shutdown procedures

Ability to:

- monitor, evaluate and adjust equipment

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment

- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Drinking Water Subclassification 10 - Aeration and Activated Carbon Adsorption

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 42

Number of Questions Needed to Pass: 26

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Operate Equipment

Knowledge of:

- drinking water treatment concepts
- function of tools
- general, electrical and mechanical principles
- hydraulic and pneumatic principles
- regulations
- safety procedures
- start-up and shutdown procedures

Ability to:

- monitor, evaluate and adjust equipment

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 11 - Gaseous Chlorine Disinfection

Number of Base Questions: 1

Operator Certification Program Administration Questions: 0

Total Number of Questions: 47

Number of Questions Needed to Pass: 33

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 12 - Nongaseous Chemical Disinfection

Number of Base Questions: 1

Operator Certification Program Administration Questions: 0

Total Number of Questions: 32

Number of Questions Needed to Pass: 20

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements
- perform process control calculations
- prepare chemicals

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 13 - Ultraviolet Disinfection

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 32

Number of Questions Needed to Pass: 20

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust flow patterns
- adjust process units
- diagnose and/or troubleshoot process units
- evaluate process units
- maintain processes in normal operating condition

Advanced Reactor Concepts

Knowledge of:

- different types of ultraviolet control systems and their efficiencies
- disinfection processes and theory
- general biology
- water treatment design parameters

Ability to:

- complete process control calculations
- diagnose and troubleshoot process units
- interpret testing results
- maintain normal operating conditions

Comply with Regulations

Knowledge of:

- regulatory requirements

Ability to:

- record information
- report findings

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- assess likelihood of disaster occurring
- implement written safety procedures
- select and operate safety equipment

Drinking Water Subclassification 14 - Ozonation

Number of Base Questions: 2

Operator Certification Program Administration Questions: 0

Total Number of Questions: 38

Number of Questions Needed to Pass: 23

Monitor, Evaluate and Adjust Process

Knowledge of:

- chemical properties
- drinking water regulations
- general biology and chemistry
- general electrical principles
- hydraulic principles
- normal chemical range
- personal protective equipment
- physical science
- principles of measurement
- proper application and storage of chemicals
- proper chemical handling and storage
- proper lifting procedures
- treatment concepts and processes
- water treatment design parameters

Ability to:

- adjust chemical feed rates
- adjust flow patterns
- adjust process units
- calculate dosage rates
- confirm chemical strength
- diagnose and/or troubleshoot process units
- evaluate process units
- interpret Material Safety Data Sheets
- maintain processes in normal operating condition
- measure chemical weight and/or volume
- perform basic math
- perform physical measurements

- perform process control calculations
- prepare chemicals

Operate Equipment

Knowledge of:

- function of tools
- general, electrical and mechanical principles
- hydraulic and pneumatic principles
- regulations
- safety procedures
- start-up and shutdown procedures

Ability to:

- monitor, evaluate and adjust equipment

Perform Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- hydraulic and pneumatic principles
- lubricant and fluid characteristics
- safety regulations
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot equipment
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal operating conditions
- order necessary spare parts
- record information

Perform Safety Procedures

Knowledge of:

- emergency plans

Ability to:

- implement written safety procedures
- assess likelihood of disaster occurring
- select and operate safety equipment

Drinking Water Subclassification 15 - Laboratory Supervisor

(Note - This is the same exam as the Wastewater Subclassification 5 - Laboratory Supervisor Examination. A certified operator only needs to take this examination once to be certified in both subclasses, if the operator is already a certified water and wastewater system operator.)

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 41

Number of Questions Needed to Pass: To be determined when subclassification certificates are available

Collect and Preserve Samples

Knowledge of:

- contamination sources
- duplicates and splits
- sample types
- sampler setup
- sampling techniques and equipment

Ability to:

- determine appropriate sample location

Be familiar with:

- chain of custody procedures
- holding times, preservatives and storage conditions
- permit requirements
- safety procedures for sample collection and preservation
- sample identification and labeling procedures
- the sterilization process

Prepare and Analyze Samples

Knowledge of:

- apparatus preparation
- contamination sources
- holding times
- interferences
- method limitations
- reagent purity
- sample preparation techniques
- laboratory pure water classification (types I, II, III)
- interferences
- method limitations

Ability to:

- identify common laboratory apparatus and glassware
- maintain and operate equipment and/or instruments
- perform calculations
- prepare reagents
- weigh and/or measure accurately

- calibrate instruments
- determine appropriate sample volume
- follow written procedures
- select proper test method
- use aseptic techniques

Be familiar with:

- dilution techniques
- documentation requirements
- laboratory pure water standards
- quality assurance and/or quality control procedures
- safety procedures
- common acid and alkali solutions
- quality assurance and/or quality control practices
- additive volumes
- analytical procedures
- basic math and statistics

Interpret Results

Knowledge of:

- interferences
- method limitations

Ability to:

- evaluate and interpret data
- follow written procedures
- recognize abnormal analytical results and determine appropriate corrective action
- summarize results of analysis

Be familiar with:

- quality assurance and/or quality control practices
- reporting requirements
- basic math and statistics

Operate and Maintain Equipment and Instruments

Knowledge of:

- basic math
- biology and chemistry
- computers
- electronic equipment
- instrumental techniques

Ability to:

- determine appropriate corrective action
- follow written procedures
- identify common laboratory apparatus and glassware
- interpret data
- interpret manuals

Be familiar with:

- Environmental Protection Agency (EPA) approved procedures
- labware cleaning procedures

- proper installation procedures
- recordkeeping requirements

Quality Assurance and/or Quality Control

Knowledge of:

- auditing procedures
- basic statistics
- chemistry
- biology and microbiology

Ability to:

- determine appropriate corrective action

Be familiar with:

- approved analytical methods
- permit and recordkeeping requirements
- regulations

Manage Laboratory

Knowledge of:

- approved analytical methods
- basic math
- computer spreadsheets and databases
- recordkeeping policies

Ability to:

- accurately transcribe data
- determine what information needs to be recorded
- evaluate laboratory performance
- evaluate and interpret data
- generate plans
- summarize results of analysis

Be familiar with:

- documentation requirements
- permit requirements
- regulations
- reporting requirements

Need-to-Know Criteria
Wastewater Examinations

Wastewater Part 1 General

Number of Base Questions: 5

Operator Certification Program Administration Questions: 4

Total Number of Questions: 82

Number of Questions Needed to Pass: 54

Monitor, Evaluate and Adjust Process

Knowledge of:

- biological science
- general chemistry
- general electrical principles
- mechanical principles
- normal chemical range
- principles of measurement
- regulations
- wastewater treatment concepts and treatment processes
- wet weather operations

Ability to:

- adjust chemical feed rates, flow patterns and process units
- calculate dosage rates
- confirm chemical strength
- evaluate, diagnose and troubleshoot process units
- maintain processes in normal operating condition
- measure and prepare chemicals
- perform basic math and process control calculations

Evaluate Operation and Perform Preventative and Corrective Maintenance

Knowledge of:

- facility operation and maintenance
- general electrical and mechanical principles
- process control instrumentation
- start-up and shutdown procedures

Ability to:

- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot process units
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal conditions
- monitor and adjust equipment
- perform general maintenance and repairs
- record information
- report findings

Interpret Laboratory Analyses for Process Control

Knowledge of:

- biological science
- general chemistry
- normal characteristics of wastewater
- sampling procedures
- 40 CFR 136

Ability to:

- interpret results
- recognize abnormal analytical results

Sludge Management

Knowledge of:

- classifications of sludge
- differences in primary and secondary sludges
- digestion process (anaerobic and aerobic)
- sludge dewatering equipment
- sludge disposal procedures
- sludge thickening equipment

Ability to:

- correctly estimate sludge generation rates
- perform basic math

Evaluate Physical and Chemical Characteristics of Wastestream

Knowledge of:

- normal characteristics of wastewater

Ability to:

- communicate observations verbally and in writing
- discriminate between normal and abnormal conditions

Operate Equipment

Knowledge of:

- electrical and mechanical principles
- function of tools
- start-up and shutdown procedures
- types and different uses of pumps
- types and different uses of valves

Ability to:

- adjust operation of equipment
- evaluate operation of equipment
- monitor operation of equipment

Establish Safety Plans and Apply Safety Procedures

Knowledge of:

- emergency plans
- personal protective equipment
- potential causes and impact of disasters on facility

- proper application, handling and storage of chemicals
- proper lifting procedures
- safety regulations

Ability to:

- assess likelihood of disaster occurring
- demonstrate safe work habits
- identify potential safety hazards and unsafe work conditions
- interpret Material Safety Data Sheets
- select and operate safety equipment

Perform Administrative Duties

Knowledge of:

- monitoring and reporting requirements
- principles of public relations
- regulations

Ability to:

- determine what information needs to be recorded
- interpret and transcribe data
- perform basic math

Perform Laboratory Analyses for Accreditation by Rule

Knowledge of:

- biological science
- chain of custody
- general chemistry
- laboratory regulations
- laboratory equipment and procedures
- principles of measurement
- proper chemical handling and storage
- quality control and assurance practices
- sampling procedures
- 40 CFR 136

Ability to:

- calibrate instruments
- perform laboratory calculations
- recognize abnormal analytical results
- normal characteristics of wastewater

Wastewater Class E - Collection Systems

Number of Base Questions: 2

Operator Certification Program Administration Questions: 4

Total Number of Questions: 78

Number of Questions Needed to Pass: 50

Maintenance

Knowledge of:

- function of tools
- general electrical and mechanical principles
- general hydraulic principles
- hazardous situations
- instrumentation
- lubricants and fluids
- pipe fittings and joining methods
- pipe line construction principles
- piping material, type and size
- safety regulations
- start-up and shutdown procedures
- system operation and maintenance
- types of pumps

Ability to:

- adjust equipment
- assign work to proper trade
- calibrate equipment
- diagnose and/or troubleshoot process units
- differentiate between preventive and corrective maintenance
- discriminate between normal and abnormal equipment conditions
- evaluate data and identify cause of damage and/or problems
- follow written procedures
- monitor and evaluate operation of equipment
- perform general maintenance and repairs
- order necessary spare parts
- read plans and profiles
- record information

General Processes

Knowledge of:

- bypasses
- combined sewer overflows
- general electrical and mechanical principles
- general hydraulic principles
- hazardous situations
- hydrogen sulfide and methane gas generation
- instrumentation
- regulations
- types of materials used for construction

Ability to:

- adjust equipment
- diagnose and/or troubleshoot process units
- maintain processes in normal operating condition
- manage corrosion
- monitor equipment

- perform mathematical calculations
- perform physical measurements

Perform Safety Procedures

Knowledge of:

- combined sewer overflows
- emergency plans
- fall protection
- potential causes and impact of system disasters
- risk management

Ability to:

- assess likelihood of disaster occurring
- coordinate emergency response with other organizations
- demonstrate safe work habits
- generate written safety procedures
- identify potential safety hazards and unsafe work conditions
- interpret Material Safety Data Sheets
- select and operate safety equipment

Operate Equipment

Knowledge of:

- function of tools
- general electrical and mechanical principles
- general hydraulic principles
- safety regulations
- start-up and shutdown procedures
- system operation and maintenance
- types of pumps
- wastewater treatment concepts

Ability to:

- adjust equipment
- monitor and evaluate operation of equipment
- odor control concepts

Perform Administrative Duties

Knowledge of:

- computer operations
- local codes and ordinances
- monitoring and reporting requirements
- principles of public relations
- recordkeeping functions and policies
- regulations
- system operation and maintenance

Ability to:

- evaluate system performance
- interpret data and review reports

- order necessary spare parts
- perform mathematical calculations

Wastewater Subclassification 1 - Activated Sludge

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 43

Number of Questions Needed to Pass: 24

Monitoring and Process Control

Knowledge of:

- settling characteristics

Ability to:

- adjust and maintain disinfection systems to meet permit requirements for fecal coliform
- calculate and adjust dissolved oxygen according to loadings
- calculate and adjust return activated sludge rates
- calculate F to M ratio
- calculate hydraulic retention time, clarifier loading rates
- calculate mean cell residence time
- calculate sludge volume index
- determine and adjust chemical feed rates
- determine proper waste activated sludge rate
- develop and implement a wet weather operational strategy that maximizes flow through the facility while minimizing or eliminating the wash out of solids
- input data and make changes to SCADA systems for proper operation
- interpret MLSS (mixed liquor) and MLVSS
- interpret micro life relative to process performance
- make adjustments to maintain the proper micro life
- measure sludge blanket depth
- relate physical observations and process performance
- troubleshoot in accordance with settling characteristics

General Processes

Knowledge of:

- different types of aeration systems and their efficiencies
- tertiary treatment systems and their application

Ability to:

- list advantages and disadvantages of each process
- operate safely in a wastewater system

Nutrient Removal

Knowledge of:

- principles of nutrient removal including nitrification
- principles of process control

Ability to:

- perform math calculations

Solids Handling and Disposal

Knowledge of:

- classifications of sludge
- differences in primary and secondary sludges
- digestion process (anaerobic and aerobic)
- sludge thickening equipment
- sludge dewatering equipment
- sludge disposal procedures

Ability to:

- correctly estimate sludge generational rates

Equipment

Knowledge of:

- different types of aeration systems
- different types of aeration systems and appropriate controls
- different types of pumps and their applications
- electrical motors and associated control systems
- different valve types and their application

Ability to:

- determine appropriate chemical feed equipment and to calibrate said equipment
- troubleshoot pump systems

Maintenance

Knowledge of:

- different lubricants and how they are applied, checked and changed in all equipment
- different types of bearings and their application and maintenance

Ability to:

- determine amperage draw and voltage supplied to electrical motors, and understand what changes
- determine proper seal face configuration for the application of a mechanical seal
- develop and implement a preventative maintenance program in accordance with manufacturers recommendations
- inspect and adjust stuffing box on pumps and/or replace mechanical seals
- properly align motor shafts with shafts of driven equipment
- read and/or calibrate different types of meters and interpret results

Wastewater Subclassification 2 - Fixed Film

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 31

Number of Questions Needed to Pass: 22

Monitoring and Process Control

Knowledge of:

- the microlife involved in the process with an understanding of the roles these organisms play
- nuisance organisms and how to control them

Ability to:

- calculate loadings for process control and NPDES reporting
- determine and adjust recirculation rates to obtain optimum treatment
- determine organic and hydraulic loading rates
- determine treatment unit efficiency
- develop and implement a wet weather operational strategy that maximizes flow through the facility while minimizing or eliminating the wash out of solids
- input data and make changes to SCADA systems to effectively control the process
- make visual observations, identify problems and take corrective action

General Processes

Knowledge of:

- different types of fixed film media
- differences in primary and secondary treatment
- nitrification and/or nutrient removal ability of each type
- tertiary treatment systems and their application
- trickling filter distribution systems

Ability to:

- identify different process types
- list advantages and disadvantages of each process
- work safely in a wastewater system

Equipment

Knowledge of:

- different types of trickling filter distribution systems
- different types of RBC drives and associated problems with shafting and/or maintenance
- different types of pumps and their applications
- different valve types and their application
- electrical motors and associated control systems

Ability to:

- determine appropriate chemical feed equipment and to calibrate said equipment
- troubleshoot pump systems

Solids Handling and Disposal

Knowledge of:

- classifications of sludge
- differences in primary and secondary sludges
- digestion process (anaerobic and aerobic)
- sludge disposal procedures
- sludge dewatering equipment
- sludge thickening equipment

Ability to:

- correctly estimate sludge generational rates

Maintenance

Knowledge of:

- different lubricants and how they are applied, checked and changed in all equipment
- different types of bearings and their application and/or maintenance
- trickling filter seals

Ability to:

- determine amperage draw, and voltage supplied to electrical motors, understand what changes in amperage draw indicate
- determine proper seal face configuration for the application of a mechanical seal
- develop and implement a preventative maintenance program in accordance with manufacturers recommendations
- inspect and adjust stuffing box on pumps and/or replace mechanical seals
- properly align motor shafts with shafts of driven equipment
- read and/or calibrate different types of meters and interpret results

Wastewater Subclassification 3 - Treatment Ponds and Lagoons

Number of Base Questions: 7

Operator Certification Program Administration Questions: 0

Total Number of Questions: 32

Number of Questions Needed to Pass: 18

General Processes

Knowledge of:

- algal impact
- differences between soluble and particulate biochemical oxygen demand (BOD)
- diurnal differences in lagoon operations and the impact on treatment
- nutrient removal limitations of lagoon systems
- theory of photosynthesis, biological sciences

Ability to:

- distinguish between different types of ponds and lagoons
- identify different process types
- identify the two types of aerobic treatment
- interpret data
- list advantages and disadvantages of each process
- monitor, adjust and evaluate process

Monitoring and Process Control

Knowledge of:

- diurnal differences in treatment
- seasonal differences

Ability to:

- control flow and flow patterns

Solids Handling and Disposal

Ability to:

- monitor solids accumulation

Maintenance

Knowledge of:

- insect and animal control - vector control
- weed control

Ability to:

- operate diffusers
- operate and maintain blowers
- operate and maintain mechanical aerators

Wastewater Subclassification 5 - Laboratory Supervisor

(Note - This is the same exam as the Drinking Water Subclassification 15 - Laboratory Supervisor Examination. A certified operator only needs to take this examination once to be certified in both subclasses, if the operator is already a certified water and wastewater system operator.)

Number of Base Questions: 0

Operator Certification Program Administration Questions: 0

Total Number of Questions: 41

Number of Questions Needed to Pass: To be determined when subclassification certificates are available

Collect and Preserve Samples

Knowledge of:

- contamination sources
- duplicates and splits
- sample types
- sampler setup
- sampling techniques and equipment

Ability to:

- determine appropriate sample location

Be familiar with:

- chain of custody procedures
- holding times, preservatives and storage conditions
- permit requirements
- safety procedures for sample collection and preservation
- sample identification and labeling procedures
- the sterilization process

Prepare and Analyze Samples

Knowledge of:

- apparatus preparation
- contamination sources
- holding times
- interferences
- method limitations
- reagent purity

- sample preparation techniques
- laboratory pure water classification (types I, II, III)
- interferences
- method limitations

Ability to:

- identify common laboratory apparatus and glassware
- maintain and operate equipment and/or instruments
- perform calculations
- prepare reagents
- weigh and/or measure accurately
- calibrate instruments
- determine appropriate sample volume
- follow written procedures
- select proper test method
- use aseptic techniques

Be familiar with:

- dilution techniques
- documentation requirements
- laboratory pure water standards
- quality assurance and/or quality control procedures
- safety procedures
- common acid and alkali solutions
- quality assurance and/or quality control practices
- additive volumes
- analytical procedures
- basic math and statistics

Interpret Results

Knowledge of:

- interferences
- method limitations

Ability to:

- evaluate and interpret data
- follow written procedures
- recognize abnormal analytical results and determine appropriate corrective action
- summarize results of analysis

Be familiar with:

- quality assurance and/or quality control practices
- reporting requirements
- basic math and statistics

Operate and Maintain Equipment and Instruments

Knowledge of:

- basic math
- biology and chemistry
- computers

- electronic equipment
- instrumental techniques

Ability to:

- determine appropriate corrective action
- follow written procedures
- identify common laboratory apparatus and glassware
- interpret data
- interpret manuals

Be familiar with:

- EPA approved procedures
- labware cleaning procedures
- proper installation procedures
- recordkeeping requirements

Quality Assurance and/or Quality Control

Knowledge of:

- auditing procedures
- basic statistics
- chemistry
- biology and microbiology

Ability to:

- determine appropriate corrective action

Be familiar with:

- approved analytical methods
- permit and recordkeeping requirements
- regulations

Manage Laboratory

Knowledge of:

- approved analytical methods
- basic math
- computer spreadsheets and databases
- recordkeeping policies

Ability to:

- accurately transcribe data
- determine what information needs to be recorded
- evaluate laboratory performance
- evaluate and interpret data
- generate plans
- summarize results of analysis

Be familiar with:

- documentation requirements
- permit requirements
- regulations
- reporting requirements

APPENDIX B

3900-FM-BSDW0109 2/2012
Instructions

DEFINITIONS OF CLASSES

WASTEWATER

Class A – Serving an average of more than 5 million gallons per day.

Class B – Serving an average of greater than 1 million gallons per day but less than or equal to 5 million gallons per day.

Class C – Serving an average of greater than 100,000 gallons per day but less than or equal to 1 million gallons per day.

Class D – serving an average of less than or equal to 100,000 gallons per day.

Class E – Satellite collection system with a pump station (will be combined with wastewater subclassification 4)

Class E

► **Collection system** – A system of pipelines or conduits, pumping stations and force or gravity mains used for collecting and conveying wastes to a point of treatment and disposal.

► **Satellite collection system** – A wastewater system consisting only of collection facilities with at least one pump station, which is designed to convey in excess of 2000 gallons per day of untreated wastewater to a wastewater system owned by a different entity.

WATER

Class A – Serving an average of more than 5 million gallons per day.

Class B – Serving an average of greater than 1 million gallons per day but less than or equal to 5 million gallons per day.

Class C – Serving an average of greater than 100,000 gallons per day but less than or equal to 1 million gallons per day.

Class D – Serving an average of less than or equal to 100,000 gallons per day.

Class E – Distribution and consecutive water systems without treatment.

Class Dc- Serving no more than 500 individuals or having no more than 150 connections, where the source of water for the system is exclusively groundwater and requires only disinfection.

Class E

► **Consecutive water system** – A public water system that obtains all of its water from another public water system and resells the water to a person, provides treatment to meet a primary maximum contaminant level or provides drinking water to an interstate carrier. The term does not include bottled water and bulk water systems. If treatment is provided the examination for the type of treatment utilized must also be taken.

► **Distribution system** – Pipelines, appurtenances, devices and facilities that convey potable water under pressure to customers. If treatment is provided the examination for the type of treatment utilized must also be taken.

DEFINITIONS OF SUBCLASSES

WASTEWATER

Subclassification 1 (Activated Sludge) – A treatment technology that mechanically introduces air into wastewater to achieve microbiological suspended growth treatment such as extended aeration, sequential batch reactors, contact stabilization, conventional, step feed or oxidation ditch.

Subclassification 2 (Fixed Film) – A wastewater treatment technology that uses a fixed contact media to achieve treatment such as trickling filters and rotating biological contactors.

Subclassification 3 (Treatment Ponds & Lagoons) – A wastewater treatment technology that utilizes a pond, lagoon or wetlands with anaerobic or facultative biological processes for the treatment of wastewater and meets the following criteria: (i) A design hydraulic detention time in the treatment process of 15 days or greater; (ii) A biological treatment process that does not have any return activated sludge system and (iii) A biological treatment process that is impacted by diurnal fluctuations as a result of photosynthesis.

Subclassification 4 (Single Entity Collection Systems) – A wastewater collection system consisting only of collection facilities with at least one pump station which is designed to convey in excess of 2000 gallons per day of untreated wastewater to a wastewater treatment system owned by the owner of the collection system.

Subclassification 5 (Laboratory Supervisor) - An individual having the knowledge, skills and abilities necessary to supervise laboratory procedures and the reporting of analytical data for an environmental laboratory operated by a wastewater system in accordance with industry, State and Federal standards. An operator must already be certified in wastewater treatment to add this subclassification.

WATER

Subclassification 1 (Conventional Filtration) – A series of processes for the purpose of substantial particulate removal consisting of coagulation, flocculation, clarification and granular media filtration. The clarification step must be a solid/liquid separation process where accumulated solids are removed during this separate component of the treatment system.

Subclassification 2 (Direct Filtration) – A series of processes implemented for the purpose of substantial particulate removal consisting of coagulation, and filtration. The term includes flocculation after coagulation, but does not include sedimentation.

Subclassification 3 (Diatomaceous Earth Filtration) – A process for the purpose of substantial particulate removal, in which a precoat cake of diatomaceous earth filter media is deposited on a support membrane (septum) and, while the water is filtered by passing through the cake on the septum, additional filter media, known as body feed, is continuously added to the feed water, to maintain the permeability of the filter cake.

Subclassification 4 (Slow Sand Filtration) – A process for the purpose of substantial particulate removal by physical and biological mechanisms during the passage of raw water through a bed of sand at low velocity, generally less than 0.4 meters per hour.

Subclassification 5 (Cartridge or Bag Filtration) – A process for the purpose of substantial particulate removal by straining with bag or cartridge filters manufactured of various materials and pore sizes.

Subclassification 6 (Membrane Filtration) – A pressure or vacuum driven separation process in which particulate matter larger than one micrometer is rejected by an engineered barrier, primarily through a size-exclusion mechanism, and which has a measurable removal efficiency of a target organism that can be verified through the application of a direct integrity test. The term includes the common membrane technologies of microfiltration, ultrafiltration, nanofiltration and reverse osmosis.

Subclassification 7 (Corrosion Control & Sequestering) – A water treatment process designed to mitigate the adverse effects of corrosion in drinking water.

Subclassification 8 (Chemical Addition) – A water treatment process designed to improve the quality of the water being treated through the addition of chemicals such as lime, soda ash, caustic soda and permanganate.

Subclassification 9 (Ion Exchange & Green Sand) – A water treatment process such as greensand filtration, ion exchange, or activated alumina designed to improve the quality of water being treated by removal of inorganic constituents.

Subclassification 10 (Aeration & Activated Carbon Adsorption):

Aeration – A water treatment process designed to improve the quality of water being treated by introducing air or oxygen into water to remove undesirable dissolved gases, to remove volatile organic compounds or to oxidize inorganic compounds so they can be removed as particulates.

Activated Carbon Adsorption – A water treatment process designed to improve the quality of water being treated by using activated granular or powdered carbon to remove specific organic chemical compounds by adsorption.

Subclassification 11 (Gaseous Chlorine Disinfection) – A water treatment process designed to inactivate pathogenic organisms from water being treated utilizing gaseous chlorine.

Subclassification 12 (Nongaseous Chemical Disinfection) – A water treatment process designed to inactivate pathogenic organisms from water being treated utilizing nongaseous chemical elements or compounds.

Subclassification 13 (Ultraviolet Disinfection) – A water treatment process that inactivates pathogenic organisms using light with a wavelength range of 1000 to 4000 angstroms.

Subclassification 14 (Ozonation) – A water treatment process designed to inactivate pathogenic organisms from water being treated utilizing ozone.

Subclassification 15 – Laboratory Supervisor – An individual having the knowledge, skills and abilities necessary to supervise laboratory procedures and the reporting of analytical data for an environmental laboratory operated by a drinking water system in accordance with industry, State and Federal standards. An operator must already be certified in drinking water treatment to add this subclassification.

APPENDIX C
EXAMPLE TEMPLATE
Operator Report to the System Owner

OPERATOR REPORT TO OWNER

Under 25 Pa. Code §302.1201(c) Duties of Operators

“Certified operators shall report to the system owner known violations or system conditions that may be or are causing violations of Federal or State law or rules and regulations promulgated thereto or permit conditions and requirements applicable to the operation of water or wastewater systems. When submitted, the report must include the following:”

1. NATURE OF THE VIOLATION OR SYSTEM CONDITIONS:

2. SUSPECTED CAUSE OF THE VIOLATION OR SYSTEM CONDITIONS INCLUDING THE LACK OF NEEDED RESOURCES:

3. DEGREE OF SEVERITY OR THREAT TO PUBLIC HEALTH SAFETY OR THE ENVIRONMENT OF THE VIOLATION OR SYSTEM CONDITIONS:

4. RECOMMENDED ACTIONS OR MITIGATING MEASURES NECESSARY TO PREVENT OR ELIMINATE A VIOLATION:

5. SIGNATORY REQUIREMENTS:

PRINTED NAME _____ **TITLE** _____

SIGNATURE _____ **DATE** _____

APPENDIX D

Standard Operating Procedures

INTRODUCTION

The Water and Wastewater Systems Operator's Certification Act requires water and wastewater systems owners to employ an appropriately certified operator(s) to make all process control decisions for the system. To be an appropriately certified operator, an individual must possess a valid certificate containing the class and subclass(es) matching the class and subclass(es) of the system. The owner is required to designate at least one appropriately certified operator as an operator-in-responsible-charge and/or available operator for the system. A **process control decision** is any decision which maintains or changes the water quality or quantity of a water system or wastewater system in a manner that may affect the public health or environment. An **available operator** is an appropriately certified operator designated by the system owner to be on-site, or able to be contacted as needed, to make process control decisions in a timely manner to protect the environment and the public health. The **operator-in-responsible-charge** is the designated available operator who has approved standard operating procedures (SOPs) for the system. An uncertified operator or inappropriately certified operator may implement any process control decision that is clearly defined in these approved SOPs. These operators may NOT make any other process changes without written or verbal instruction from the operator-in-responsible-charge.

In general, SOPs are a set of written instructions to be followed by water or wastewater system personnel in implementing a process control decision. It provides individuals with the information they need to perform a process control decision properly and facilitates consistency in the quality and integrity of the end result. Keep in mind that SOPs are not required. The use of SOPs is an optional method, available to the owner and the operator-in-responsible-charge, to allow operators under the operator-in-responsible-charge's direct supervision to implement process control decisions. Remember, if a specific procedure or process is approved in the SOP, an operator must follow it exactly. The operator should contact the operator-in-responsible-charge for guidance as to how to proceed if anything is unclear.

The following example templates are designed to provide guidance in the preparation and use of SOPs within a water or wastewater facility. Furthermore, it will provide guidance to DEP staff in assessing the quality of SOPs.

PURPOSE

SOPs detail the work processes to be conducted or followed by individuals at a water or wastewater facility when implementing a process control decision. They ensure process control decisions are performed in compliance with federal and state regulations and are specific to the organization or facility whose activities are described within the plan. When properly utilized, they provide operational consistency and quality control while minimizing the opportunity for miscommunication. SOPs will not benefit a system if they are not written correctly or followed by system personnel. Therefore, they should be reviewed and re-enforced by management (i.e. the direct supervisor) on a regular basis. Current copies of the SOPs also should be readily accessible for reference in the work areas of those individuals actually performing the activity, either in hard copy or electronic format that cannot be altered.

BENEFITS

The development and use of SOPs promotes regulatory compliance and quality assurance through consistent implementation of a process or procedure within the organization, even if there are temporary or permanent personnel changes. SOPs make a great addition to personnel training programs since they provide detailed work instructions. When historical data or procedures are being evaluated for current use, SOPs can also be valuable for reconstructing system activities when no other references are available. Ultimately, the benefits of valid SOPs are reduced work effort along with improved operational quality and comparability, credibility and legal defensibility.

DEVELOPMENT OF STANDARD OPERATING PROCEDURES

PROCESS CONTROL DECISIONS

A process control decision can be further defined as a treatment process which, when implemented, affects the quantity and quality of water in a water or wastewater system that may affect human health or the environment. Process control decisions may include but are not limited to:

- Adjusting chemical feed rates
- Starting or stopping recycle flows
- Adjusting flow through process units
- Adjusting the speed of a process unit
- Placing a treatment unit in or out of service

SOPs detail the steps of an operation in the order in which they should be performed. It may not be possible to include procedures for all anticipated situations or water quality conditions. Any process control decision outside the scope of the SOPs or simply not covered by the SOPs must be made by the operator-in-responsible-charge. The operator-in-responsible-charge bears all responsibility for any and all decisions made by uncertified, or inappropriately certified, individuals under his or her direct supervision who follow the SOPs.

PRE-DEVELOPMENT/BRAINSTORMING

An SOP is a written procedure that all water or wastewater treatment system workers should follow when performing and implementing water or wastewater treatment process control decisions. Unfortunately, many SOPs are written without an appreciation for the workers, their environment or access to the supplies they will need. The writer may never have examined the workspace or watched the tasks to be directed by the SOP. Sometimes the document is written without consultation with the workers. In some facilities, the task of writing an SOP is done by outside sources such as a consultant-engineering firm. An SOP is a complex document. The writer should consider the steps required in an operation, the nature of the task, and the ability of the worker to accomplish the task. Often, an SOP is written in a way that assumes that the worker has had training in the area relevant to the task described.

The operator-in-responsible-charge and/or designated management personnel should evaluate all treatment processes and determine whether or not changes to a process, or a series of processes, would constitute a process control decision. After all treatment processes have been evaluated, SOP drafts should be created outlining the step-by-step procedures to be implemented for each process under varying conditions. Individuals with knowledge of the activity, the system, and the infrastructure should

be involved with all stages of development. These individuals are essentially subject-matter experts who actually perform the work or use the process.

Except for the simplest of operations, a single person cannot develop an effective and comprehensive SOP. A team approach is recommended and may include the job supervisor, the operator-in-responsible-charge and a safety and health professional if available. Teams are especially important for multi-tasked processes where the experiences of a number of individuals are critical. Such collaboration also promotes “buy-in” from potential users of the document. SOPs should contain sufficient detail to enable someone with limited experience or knowledge to successfully reproduce the procedure without supervision. Precautions for the employees’ overall health and safety should be addressed, especially training and personal protective equipment. The SOP also should address the precautions needed to prevent any impacts to the environment; whether it is the immediate workplace environment, the effluent stream, or the surrounding community. When an SOP has been properly written, the result is satisfactory completion of the work with regard to efficiency, risk and safety.

EXAMPLE OF PRE-DEVELOPMENT/BRAINSTORMING

In preparing to write an SOP, the operator-in-responsible-charge demonstrates how a particular procedure must be completed and contributes necessary information about the correct use and understanding of the equipment involved. The safety person notes the hazards of the job and lists the protective equipment that should be required. The writer outlines the steps with regard to efficiency, convenience of the workspace and equipment to be used while the supervisor acts as an advisor to monitor the required efficiency.

Once this study has been made, the team can formulate a draft SOP that contains all the essentials with regard to preset conditions that they determine. These conditions should include the purpose of the procedure, associated trigger parameters, interferences and all the steps of the procedure, including associated hazards and precautions.

FORMAT OF THE SOP

All SOPs should include identifying information -- for instance, a title and/or number, and the author’s name and contact information. The body of the SOP identifies the objective or reason for the procedure, any trigger parameters and gives all the steps in order including safety information for each step. It should list all the required personal protective equipment, training, and directions for emergencies. In general, technical SOPs written under the auspices of the Operator Certification Program should include the following thirteen (13) elements:

1. Title Section
 - a. Name and Number of SOP
 - b. Effective Date
 - c. Revision Date
 - d. Author

2. Scope
 - a. Describing the purpose or objective of the process or procedure including the identification of the individual treatment unit by type and the treatment process provided by the unit
 - b. Location where the work is to be done
 - c. Reference of the unit process to a flow diagram of the entire treatment process (to be contained in the SOP Binder)
 - d. Normal characteristic ranges (chemical, flow) for influent and effluent for the treatment unit and the anticipated level of treatment provided by the treatment unit
3. Applicability (specific workers covered by this SOP)
 - a. Personnel Qualifications (denoting the minimal experience the SOP follower should have to complete the task satisfactorily, and citing any applicable requirements such as certification, training, or years of experience)
4. Summary of Method (briefly summarizing the procedure)
5. Definitions (identifying any acronyms, abbreviations, or specialized terms used)
 - a. References include the California State University, Sacramento water and wastewater manuals and the Internet.
6. Identification of Trigger Parameters - A trigger parameter is an identified treatment unit process where a potential major disturbance to the unit process or operational situation delineated by specific water quality or quantity numerical value(s) and/or an equipment numerical value(s) mandates a process control change to maintain the water quality or quantity of that treatment unit.
7. Cautions indicating activities that could result in equipment damage or potential process problems; listed up front and at the critical steps in the procedure.
8. Interferences where any component of a process may interfere with completion of the procedures; listed up front and at the critical steps in the procedure.
9. Health and Safety Warnings indicating operations that could result in personal injury or loss of life and explaining what will happen if the procedure is not followed or is followed incorrectly; listed here and at the critical steps in the procedure.
10. Equipment and Supplies listing the specific equipment, materials and supplies needed for the procedure.
11. Procedure identifying all pertinent steps, in order, highlighted by materials needed to accomplish the procedure, cautions, interferences and safety warnings.

12. **Quality Assurance and/or Quality Control (QA/QC) Section** - QA/QC activities are designed to allow self-verification of the quality and consistency of the work. Describe here the QA/QC checks or programs (self-checks, equipment calibrations, sampling protocols) for treatment process performance evaluation that are required to demonstrate successful performance of the method. Specific criteria and procedures for each should be included. Describe the frequency of required QA/QC checks and discuss the rationale for decisions. Describe the limits/criteria for QA/QC data results and actions required when QA/QC data exceed QA/QC limits or appear in the warning zone. Describe the procedures for reporting QA/QC data and results and any emergency contact or assistance information.
13. **Reference Section** - Documents or procedures that interface with the SOP should be fully referenced, such as related SOPs (related process control decisions for the treatment unit, and wet weather, O&M, emergency response SOPs) or published literature. Citations of operations such as those to O&M, Emergency Response or Wet Weather manuals are not a substitute for the description of the processes or methods contained in the SOP. Those operations should be attached when necessary or referenced to a separate SOP.

Not all elements may be applicable for a particular SOP nor need be utilized. The procedures must identify step by step instructions to be followed in specific situations and further identify those situations where the operator-in-responsible-charge must be contacted to make a process control decision.

WRITING THE SOP

SOPs should be written in a concise, step-by-step, easy-to-read format. The information presented should not be ambiguous or overly complicated. The active voice and present verb tense should be used. The term “you” should not be used, but implied. Unlike other forms of writing, standard operating procedures are written from a technical perspective. This means they should be:

1. **Clear and concise** - The SOP needs to get to the point and avoid wordy sentences. The SOP should be communicated in the fewest possible words, phrases, and paragraphs.
2. **Complete** - The SOP needs to contain all the necessary information to perform the procedure.
3. **Objective** - SOPs contain facts, not opinions.
4. **Coherent** - SOPs show a logical thought process by sequentially listing all steps necessary to complete the procedure.

SOPs can serve as benchmarks for performance reviews, training aids, or in the case of quality standards, a starting point for improvement. The following tips may prove useful in writing SOPs:

1. **Always have a specific reader in mind.** Understand the type of person who will be reading the procedure, the level of experience of the reader and tailor the writing accordingly.
2. **Before starting to write, decide the exact purpose of the procedure then make sure the SOP contributes to that purpose.** For instance, will the procedure not only serve as a detailed tool for performing process control decisions but also for training purposes, or as a summary to provide a periodic refresher?

3. Use the principle: “Tell readers what you are going to tell them, then tell them, then tell them what you have just told them.” Quite simply, this means starting with an introductory paragraph that briefly describes the procedure. This is followed by a complete description of the procedure, using the most appropriate writing technique (paragraphs, bullet points, and so on) to communicate key aspects of the procedure. Finally, concluding sections should be written that include quality control and quality assurance procedures and references to related SOPs.
4. Make an outline of the procedure prior to writing. The purpose of an outline is to establish an orderly relationship between a group of activities. An outline provides a framework for any documentation. When writing an outline:
 - a. Make a list of topics to be covered. The order is not important; just don’t omit anything that you feel is appropriate to the topic.
 - b. Decide on major groups. Groups may include scope, applicability, definitions, triggers, safety issues, procedures, QA/QC and references.
 - c. Insert the topics under the appropriate major group.
5. Write the rough draft. Keep in mind that a good procedure is rarely achieved on the first draft. Write rapidly, ignoring spelling, punctuation, and grammar. Refer to the outline in Step #4 as the draft is written to serve as a guide.
6. Revise the draft. Wait 24 hours before making revisions. Revising too soon is less effective because the writer often sees not what is on the paper, but what was meant. Examine what the sentences say, and then be willing to rewrite every part of the procedure.
7. Write the final draft. Incorporate all of the latest revisions.

In addition to the preceding tips on writing SOPs, there are pitfalls to avoid, including:

1. Vague, meaningless words.
2. Excessive words to describe an activity.
3. Long, complicated sentences or paragraphs.
4. Acronyms, abbreviations, slang, symbols or other shortcuts of expression that are not clearly defined for the reader.
5. Repeating the same points too often.
6. Assuming conclusions are obvious to the reader.

EVALUATION OF THE SOP

Once an SOP has been created, it needs to be evaluated. This would be best accomplished by observing an individual implementing the procedures defined in the SOP. This individual should be someone other than the original writer. The following criteria may be used to determine the utility of the SOP:

1. Were the purpose, objectives and location of the procedures clearly defined?

2. Did the SOP identify, by name, the operators that may utilize the SOP to make process control decisions?
3. Did the SOP identify the treatment process/es covered by the SOP?
4. Were the normal characteristic ranges of influent and effluent to the treatment unit clearly defined?
5. Were the trigger mechanisms clearly delineated for the treatment unit process?
6. Were the procedural steps complete and in a logical sequence?
7. Were safety considerations detailed so that the worker is protected during each step of the SOP?
8. Was the flow of the steps sufficient to minimize time and maximize effectiveness?
9. Did the SOP result in a usable process control decision?
10. Were QA/QC controls clearly defined for follow-up checks on the effectiveness of the procedure or the results of the process control decision?
11. Were other related process control decisions easily referenced in the SOP?
12. Are communication protocols and emergency contact procedures and information clearly referenced and defined?

SOP REVIEW AND APPROVAL

SOPs should be reviewed and validated by one or more individuals with appropriate training and experience. The finalized SOPs must be approved by an operator-in-responsible-charge. Generally the immediate supervisor, or plant superintendent, and the organization's management officer should also review each SOP. DEP recommends signature approvals indicating that an SOP has been both reviewed and approved by the operator-in-responsible-charge and management.

FREQUENCY OF REVISIONS AND REVIEWS

SOPs should remain current. Therefore, SOPs should be updated and re-approved whenever procedures are changed. Modification is necessary only to the pertinent section(s) of an SOP. Changes should be indicated under the document control notation section of the Title Section and include the date/revision number for that section. Also SOPs should be systematically reviewed on a periodic basis to ensure that the policies and procedures remain current and appropriate. The review date should be added to each SOP that has been reviewed. If an SOP describes a process that is no longer followed, it should be withdrawn from the current file and archived.

The review process should not be overly cumbersome; otherwise, SOPs will never get reviewed. Management should indicate the SOP review schedule (i.e. frequency of review) in the organization's Operations and Maintenance Plan. That plan should also indicate the individual(s) responsible for ensuring that SOPs are current.

STORAGE METHODS

It is recommended that all SOPs be kept together in an individual binder both in hardcopy form and electronic format that cannot be altered on a computer for central reference and revision.

The hardcopy binder should be tabbed for quick and easy reference. Tabbing could consist of normal operations, wet weather operations, emergency response operations, daily operator activities, process treatment units from influent to effluent or any combination thereof. Also it is recommended that the binder contain a table of contents perhaps breaking down the above general tabs into individual treatment units with further subdivisions by process control decisions per treatment unit. All of the above is an individual facility choice, but it must be noted that the SOPs may serve as an essential element of the DEP field inspectors' audit process.

SUMMARY

SOPs are not required. The use of SOPs is an optional method, available to the owner and the operator-in-responsible-charge, to allow operators under the operator-in-responsible-charge's direct supervision to implement process control decisions. Remember, if a specific procedure or process is approved in the SOP, an operator must follow it exactly. The procedures must identify step by step instructions to be followed in specific situations and further identify those situations where the operator-in-responsible-charge must be contacted to make a process control decision. Not all elements may be applicable for a particular SOP nor need be utilized every time. An SOP should be reviewed and updated to reflect process or conditional changes.

The net result of using SOPs is a more uniform operational process. SOPs help any water or wastewater system maintain a high level of proficiency and production and an even higher level of safety for the worker as well as the facility. Up-to-date workplaces will have them in use and available for review. If your facility does not, you should lead the way to providing them.

EXAMPLE TEMPLATE

Drinking Water Filter Backwash

Effective Date: 03/14/03

Revision Date: 03/01/04

By: John Doe

I. Scope

Purpose:

Suspended material in the water must be removed by passing the water through a bed of granular material called filter media. Filter media is contained in the filter units. Over time materials removed from the water build-up in or on the filter media and the filter must be backwashed by reversing the flow of water through the filter media to remove the entrapped solids and thereby maintain filter effectiveness and efficiency.

Location:

Filters - In the center floor area of the ground floor of the Main Control Building
Filter Control Panels - At the north end of each filter

Normal Operating Range: Filter

Filter Effluent Turbidity < 0.10 NTUs
Filter Headloss < 9 feet

II. Applicability

Personnel with one (1) months or more experience as a Water Operator I, or personnel having completed the in-house operator training program - "Water Operator I Training".

III. Summary

Upon an automatic or manual shutdown of the filter turn both switches to the OFF position on the filter control panel. Manually open the filter effluent valve and drain filter. Manually close filter effluent. Complete Filter Performance Sheet and also Daily Plant Operational Log on the plant computer. Check and ensure equalization tank is empty. Call Wastewater Plant (123-4567). Initiate backwash of the filter. Hose down the filter walls. When filter backwash is complete reset filter panel switches and the pneumatic actuator switches. Reset Alarm 1 to setting on turbidimeter to "99.0". When at least 3 steps are showing in the backwash equalization tank, turn both clarifier toggle switches to the ON position. Close lid on backwash equalization tank.

EXAMPLE TEMPLATE

IV. Definitions

Backwashing - The process of reversing the flow of water back through the filter media to remove the entrapped solids.

Head - The vertical distance (in feet) equal to the pressure (in psi) at a specific point. The pressure head is equal to the pressure in psi times 2.31 ft/psi.

Head Loss - The head, pressure or energy (they are the same) lost by water flowing in a pipe or channel as a result of turbulence caused by the velocity of the flowing water and the roughness of the pipe, channel walls or restrictions caused by fittings. Water flowing in a pipe loses head, pressure or energy as a result of friction losses. The head loss through a filter is due to friction losses caused by material building up on the surface or on the top part of a filter.

Turbidity - The cloudy appearance of water caused by the presence of suspended and colloidal matter. In the waterworks field, a turbidity measurement is useful to indicate the clarity of water. Technically, turbidity is an optical property of the water based on the amount of light reflected by surrounding particles. Turbidity cannot be directly equated to suspended solids because white particles reflect more light than dark-colored particles and many small particles will reflect more light than an equivalent large particle.

Turbidimeter - An instrument for measuring and comparing the turbidity of liquids by passing light through them and determining how much light is reflected by the particles in the liquid. The normal measuring range is 0 to 100 and is expressed in Nephelometric Turbidity Units (NTUs).

V. Triggering Mechanisms

- ◆ Effluent turbidity spike > 0.10 NTU
- ◆ Headloss > 9'

VI. Cautions

N/A

VII. Interferences

N/A

VIII. Health and Safety

N/A

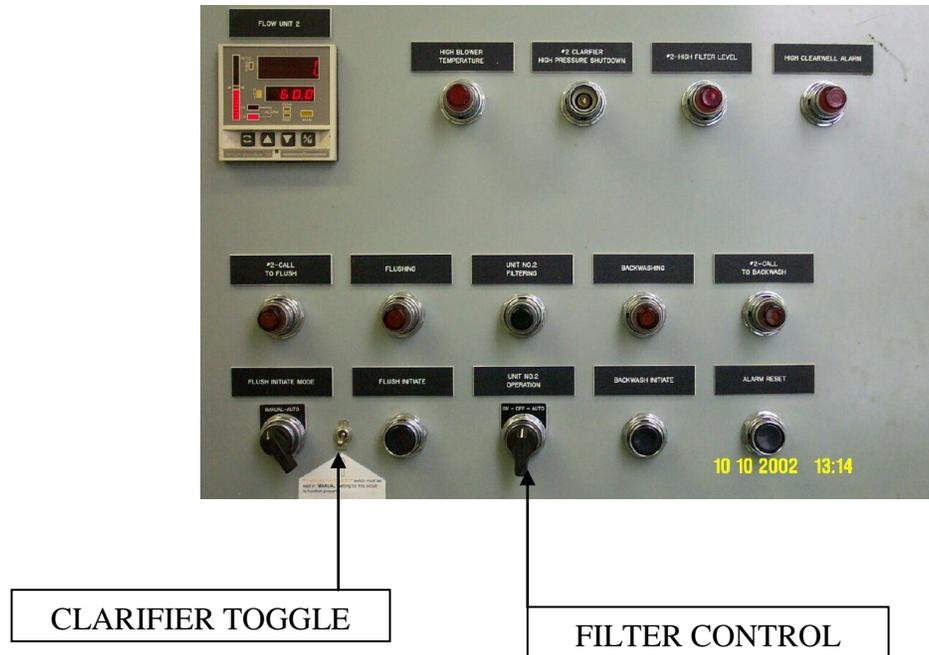
IX. Equipment and Supplies

N/A

EXAMPLE TEMPLATE

X. Procedures

1. If filter requiring backwash automatically shutdown or was manually shutdown due to head loss, shutdown plant by turning both filter control switches to the “OFF” position.



2. Manually force open filter effluent valve and drain filter to the first joint on the surface sweep.
3. Manually force filter effluent closed.

If filter backwash is required due to turbidity spike omit steps #2 and #3.

4. Record raw meter reading and head loss on “**Filter Performance Sheet**” and calculate filter run hours.
5. Enter backwash time on “**Filter Performance Sheet**” and also “**Daily Plant Operational Log**” in plant computer.
6. Open lid on backwash equalization tank (in parking lot); if empty proceed, if not wait until empty.
7. Call Wastewater Plant (**123-4567**) and inform personnel or leave message on machine that a backwash will be conducted.
8. Turn filter control switch to “**ON**” position while simultaneously pressing “**Backwash Initiate**” button.
9. Hose down filter walls and observe backwash sequence.

EXAMPLE TEMPLATE

10. When backwash sequence is complete turn opposite filter clarifier toggle switch to the “**OFF**” position and turn filter control switch to the “**ON**” position; open console door and leave open.
11. Return to the filter being backwashed and set its filter effluent valve pneumatic actuator switch to the “**MAN**” position.
12. Turn the pneumatic actuator switch on the rewash valve to the “**AUTO**” position; when this valve automatically opens and finds its position, set the pneumatic actuator switch back to the “**MAN**” position. (This holds the valve in this position.).
13. Change Alarm 1 setting on turbidimeter to “**99.0**”.
14. Observe turbidity spike during rewash and backwash equalization tank level simultaneously.
15. If turbidity spike drops below 0.30 NTU and tank is still not near the overflow, proceed to step “**16**”. (If tank is near overflow, shutdown plant and wait for tank to drain until at least 3 steps are visible, then resume filter to waste until turbidity drops below 0.30 NTU and proceed to step “**16**”.)
16. Turn effluent valve pneumatic actuator switch back to the “**AUTO**” position.
17. Turn rewash valve pneumatic actuator switch back to the “**AUTO**” position.
18. When rewash valve closes turn its pneumatic actuator switch back to the “**MAN**” position.
19. Reset Alarm 1 on turbidimeter back to “**.30**” NTU.
20. Turn filter control switch back to the “**AUTO**” position.
21. Turn opposite filter control switch to the “**AUTO**” position also.
22. When at least 3 steps are showing in the backwash equalization tank, turn both clarifier toggle switches to the “**ON**” position.
23. Close lid on backwash equalization tank.

XI. Quality Control

Turbidimeter should record less than 0.10 NTUs for filter effluent after backwash procedure has been completed.

XII. References

Filter Performance Sheet on plant computer.
Daily Plant Operational Log on plant computer.

EXAMPLE TEMPLATE

Example Template SOP

Sodium Bicarbonate Feed Adjustment

Effective Date: 03/14/03

Revision Date: 03/30/07

By: John Doe



I. Scope

Purpose:

The increase or decrease of the addition or dosage of sodium bicarbonate prior to the filter unit treatment process is for the purpose of increasing coagulation thereby increasing filtration efficiency and always maintaining an alkalinity of 30 mg/l or greater in the finished water. An alkalinity of 30 mg/l or greater in the finished water provides a sufficient buffering capacity to decrease and prevent corrosivity of the water in the distribution system.

Location:

Chemical Feed Pumps - Along the east wall of the ground floor of the Main Control Building.

Filters and Filter Sampling Points - In the center floor area of the ground floor of the Main Control Building

Finished Water Sampling Point - A sink located along the east wall of the ground floor of the Main Control Building, immediately north of the chemical feed pumps.

EXAMPLE TEMPLATE

Normal Operating Ranges:

Filter Sampling Points - Alkalinity has ranged from a low of 15 to a high of 35 mg/l. The ideal value to be maintained at these points is 25 mg/l.

Finished Water Sampling Point - Alkalinity should never drop below 30 mg/l.

II. Applicability

Personnel with six (6) months or more experience as a Water Operator I or personnel having completed the in-house operator training program - "Water Operator I Training".

III. Summary

First take samples at the Filter Influent Sampling Points and the Finished Water Sampling Point and analyze for alkalinity according to Alkalinity Lab Procedure SOP #4. If the filter influent sample alkalinity is above or below the range of 23 to 27 mg/l of alkalinity then decrease or increase, respectively, the chemical feed pump for sodium bicarbonate by 4%. Wait eight (8) minutes and then re-sample and re-analyze for alkalinity. If the Finished Water Sample is below 30 mg/l then check the finished water pH to ensure between 7.4 and 7.6. If outside pH range then adjust per Sodium Hydroxide SOP #10. Re-verify the filter influent water alkalinity.

IV. Definitions

Alkalinity - The capacity of water to neutralize acids. This capacity is caused by the waters content of carbonate, bicarbonate, hydroxide, and occasionally borate, silicate and phosphate. Alkalinity is expressed in milligrams per liter of equivalent calcium carbonate. Alkalinity is not the same as pH because water does not have to be strongly basic (high pH) to have a high alkalinity. Alkalinity is a measure of how much acid must be added to a liquid to lower the pH to 4.5.

Coagulation - The clumping together of very fine particles into larger particles (floc) caused by the use of chemicals (coagulants). The chemicals neutralize the electrical charges of the fine particles, allowing them to come closer and form larger clumps. This clumping together makes it easier to separate the solids from the water by settling, skimming, draining or filtering.

Corrosivity - An indication of the corrosiveness (decomposition or destruction of a material by chemical action) of water. The corrosiveness of water is described by the waters pH, alkalinity, hardness temperature, total dissolved solids, dissolved oxygen concentration and the Langelier index.

Hardness - A characteristic of water caused mainly by the salts of calcium and magnesium such as bicarbonate, carbonate, sulfate, chloride and nitrate. Excessive hardness in water is undesirable because it causes the formation of soap curds, increased use of soap, deposition of scale in boilers, damage in some industrial processes and sometimes causes objectionable taste in drinking water.

NaHCO₃ - Sodium Bicarbonate

EXAMPLE TEMPLATE

V. Triggering Mechanisms

The total alkalinity at the Filter Influent Sampling point must be maintained between 23 and 27 mg/l with the target being 25 mg/l.

The total alkalinity at the Finished Water Sampling Point must always be greater than 30 mg/l.

VI. Cautions

Sodium bicarbonate is an irritant.

VII. Interferences

N/A

VIII. Health and Safety

Sodium bicarbonate is considered to be relatively safe. As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing. See MSDS for further information.

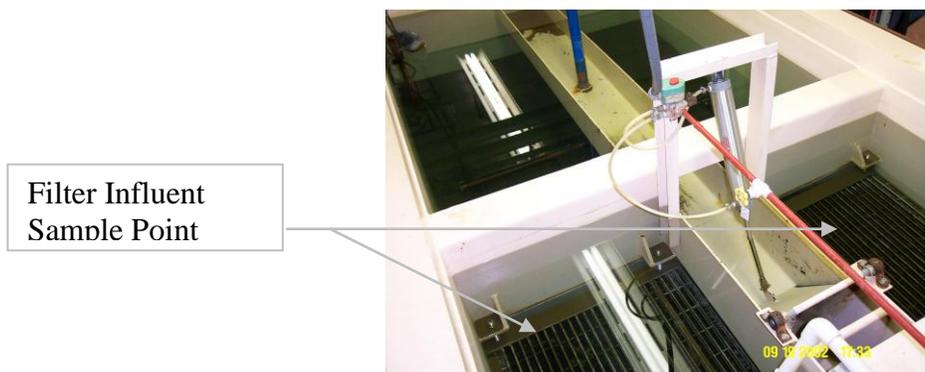
IX. Equipment and Supplies

250 ml plastic sampling bottles for alkalinity samples

X. Procedures

Proper NaHCO_3 dosage shall be conducted by the following:

- ◆ Measurement of total alkalinity shall be conducted at the filter influent sample point



- ◆ The total alkalinity at this point must be maintained between 23 and 27 mg/L with the target being 25 mg/L
- ◆ If the measured total alkalinity at the filter influent sample point is less than 23 mg/L:
 1. Increase chemical feed pump setting by 4%

APPENDIX E
Process Control Plan Example Template

General Information

WWTP Name: _____

WWTP NPDES Permit:

PA							
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Address: _____

Telephone No.: _____ **Email Address:** _____

Municipality: _____

County: _____

System Type: (Please Check) AS TF, RBC P&L CS

Class & Subclass: _____

1. Flow Diagram

2. Location of Pertinent Information

Item	Location
Collection System Map	
Facility USGS Map	
Facility Drawing	
Permits	
Technical Manuals	
O&M Plan	
Standard Operating Procedures	
Daily Operation Logs	
Emergency Response Plan	
* Preventive and Emergency Maintenance Plan (process control-related equipment)	
* Emergency Operations Procedures	
* Wet Weather Strategy	
* Solid Waste Disposal Plan	

* Attached as Appendices to this report.

7. Treatment Unit - Process Control

Treatment Unit	Process Control Decision	Trigger Parameter	Monitoring Method	Adjustment Method	Title of SOP

8. Collection System Information

A. Main Pump Stations:

Station ID	Location
1.	
2.	
3.	
4.	
5.	
6.	

B. Main Pump Stations Information:

Station ID	Pump Type	Manufacturer	H.P.	Capacity (gpm)	Phase, Voltage

9. Chemical Treatment Information

A. Disinfection:

Chemical(s) Used: _____

Type of Chemical Feed: _____

Location of Disinfection System: _____

Location of Chem. Storage: _____

B. Treatment 1:

Chemical(s) Used: _____

Type of Chemical Feed: _____

Location of Disinfection System: _____

Location of Chem. Storage: _____

C. Treatment 2:

Chemical(s) Used: _____

Type of Chemical Feed: _____

Location of Disinfection System: _____

Location of Chem. Storage: _____

D. Other Chemical Treatment Information:

10. Biosolids Information

Amount Produced per Week: _____
Type or Class: _____
Treatment Method: _____
Disposal Method: _____

11. NPDES Reporting Requirements

Requirement – Value

Requirement – Value							

12. Receiving Water Body Information

Name: _____
Location: _____ Flow: _____
DEP Designated Water Uses: _____

13. Other Pertinent System Information

Other operational or system information of importance.



EXPLANATORY NOTES:

The Department may require a system to have a process control plan that includes, as necessary, the following:

1. A flow diagram of the entire treatment process.
2. The identification of individual treatment units by type.
3. A description of the treatment process provided by each treatment unit.
4. The anticipated level of treatment provided by each treatment unit.
5. The normal influent and effluent operating ranges for each wastewater or water treatment unit.
6. A description of the average and seasonal characteristics of the raw water or wastewater influent.
7. Any standard operating procedures.
8. The methods to be utilized to monitor and adjust treatment processes.
9. The identification of the key processes and equipment associated with these processes.
10. An outline of how key processes and equipment will be monitored if the system is without staff during daily operations.
11. The trigger parameters for each unit that requires a process control decision.
12. A preventive and emergency maintenance plan for all process control-related equipment including a replacement parts inventory and emergency repair method.
13. The procedures for emergency operations when security has been breached or natural disasters threaten public safety, the environment and property.
14. The wastewater treatment methods and strategies to assure proper treatment during wet weather operations.
15. A plan for wasting, treating and disposing of solids associated with wastewater treatment.

Plans required under other Department rules and regulations applicable to the operation of a drinking water or wastewater system may satisfy the requirement for a process control plan as determined by the Department.

APPENDIX F Circuit Riders

INTRODUCTION

The Water and Wastewater Systems Operators' Certification Act ("Act"), 63 P.S. §1001 - §1015.1 and regulations promulgated thereto at 25 Pa. Code Chapter 302, mandate that each regulated facility have an appropriately certified operator to make process control decisions. The owner is required to report to the Department the name(s) of these available operator(s), including the operator(s)-in-responsible-charge should the owner decide to use standard operating procedures (SOPs) to facilitate compliance with the Act. Employing a circuit rider is another option that allows many of the smaller water and wastewater systems to meet the requirements of the Act without the cost of a full-time employee. A circuit rider is defined as "a management program in which a certified operator may make process control decisions at more than one system of different ownership."

Program regulations under 25 Pa. Code §302.1207(e) and (f) require the circuit rider to develop and submit a general work plan and a system specific management plan that cover each system the circuit rider is responsible for operating. In the work plan, circuit riders should outline their company particulars such as name and location of the circuit riders primary business, name and location of each system along with the classification and subclassification of each system, and the number of estimated hours per week the circuit rider works at each system (time physically present at a system; not including travel time), with the method of documentation to be used for each visit. The system/facility specific management plan includes SOPs for the system to ensure that the circuit rider is knowledgeable of the actual operations, system personnel understand what needs to be done when the circuit rider is not on-site and that test reports and results are representative of the actual system operational conditions. Essentially, the work and management plans specify the management methods employed by the circuit rider and operational specifics of the facilities under the umbrella of the circuit rider. It's a road map that leads to a clearly defined system/facilities operations strategy and guarantees that operations deliver against precise regulatory compliance objectives.

This Appendix is intended to provide guidance in the preparation and use of work and management plans by circuit riders for operations of multiple water or wastewater systems/facilities.

REQUIREMENTS FOR CIRCUIT RIDERS

A circuit rider may be in-responsible-charge of more than one water or wastewater system if the following conditions are met:

1. The circuit rider has a certificate of a class at least equal to or higher than the class and all the treatment sub-classifications of each facility the circuit rider is responsible for operating.
2. The circuit rider is able to provide adequate supervision to all units involved.
3. A General Work Plan and System Specific Management Plan or contract conforming to the requirements in 25 Pa. Code §302.1207(e) and (f) signed by the circuit rider are submitted to the owner or governing body of each system to be under the responsible charge of the circuit rider.
4. SOPs are in place for every system under the responsible charge of the circuit rider.

5. The circuit rider agrees to be present for sanitary surveys and inspections conducted by Department staff when provided at least 24 hours notice of the survey or inspection.

As applied to the Operator Certification Program, “adequate supervision” means that sufficient time is spent at a water or wastewater system on a regular basis to ensure that the circuit rider, as the certified operator-in-responsible-charge, is knowledgeable of the actual operations and that test reports and results are representative of the actual operational conditions. A “daily visit” is the time that a circuit rider, as the operator-in-responsible-charge, is present physically on-site at the facility during a twenty-four (24) hour period. A circuit rider will be credited for no more than one (1) daily visit per facility within a twenty-four (24) hour period.

ELEMENTS OF THE GENERAL WORK PLAN AND SYSTEM SPECIFIC MANAGEMENT PLAN

When applicable, a written General Work Plan and System Specific Management Plan must be completed by the operator-in-responsible-charge of multiple treatment systems/facilities (circuit rider). These plans are subject to review by the Department and should consist of the following elements:

1. Cover page (See Template)
 - a. The name of the business
 - b. Complete address, phone number, fax number and email address
 - c. Name and title of person(s) who prepared the plan
 - d. Completion date
2. Signatory Requirements (See Template)
 - a. Signature of the person who prepared the plan, date completed, revision date(s)
 - b. Department Reviews
 - i. Signature of reviewer
 - ii. Date reviewed
3. General Work Plan (See Example Template)
 - a. Company Profile
 - Company Name
 - Address
 - Telephone number
 - Business primary contact person
 - b. Inventory of Systems/Facilities of Responsibility: List of all systems that are the responsibility of the circuit rider including: (1) the name, address, phone number, fax

number and email address, (2) the name of the owner and the owner's contact information, (3) the classification and sub-classification for each system and (4) the name of any employees of the circuit rider who will serve as the certified operator(s) for the system with the corresponding certificate class and subclassification.

- c. System/Facility Visits: A general overview of the number of visits per month, days of the week and the hours per day the circuit rider or the circuit rider's employee(s) will spend at each system of responsibility (time physically present at a system; not including travel time).
4. System/Facility Specific Management Plan (See Example Template) - Each management plan should give an overview of the flow of the daily activities at each facility and the strategies that support them. There should be enough information to show that the circuit rider understands and has planned for the daily execution of the business of the facility. The primary purpose of the management plan section is to show that the circuit rider is focused on the critical operating factors that will maintain the regulatory compliance of each facility.
- a. General System/Facility Information: The name, address, phone number, fax number, email address, classification and sub-classification and contact information for the owner of all water and wastewater systems under the responsible charge of the circuit rider.
 - b. Workforce at the System/Facility: All persons including employees of the circuit rider, certified operators (both properly and not properly certified for the system) and uncertified operators who will actually perform work at the system on a part-time or full-time basis. Information should include name, title, contact information and operator certificate class and subclassifications.
 - c. Process Control Plan
 - i. Location of pertinent information
 - ii. Design capacity
 - iii. Distribution system or collection system information
 - iv. Treatment unit process information (unit processes, inspection and monitoring, related SOPs titles)
 - v. Chemical treatment information
 - vi. Biosolids information
 - vii. Reporting requirements
 - viii. Receiving water body or water source information
 - ix. Other pertinent system information

- x. Operation Strategy: Overview of the operations strategy that the circuit rider will utilize to ensure clear understanding of actual operational conditions and that test reports and results are representative.
 - 1) System/Facility Visits
 - a) Days per week and hours spent per visit by the circuit rider or the circuit rider's employees
 - b) Specific tasks to be performed
 - c) Visit Documentation: Methods including primary documentation (such as written in ink in a bound logbook) of every visit to the system by the circuit rider and any associated documentation to be completed that visit.
- d. Emergency Response Information:
 - i. Contact Information: 24/7 emergency contact information for the system including the circuit rider contact person and persons for the system including name, telephone number, facsimile number and electronic email address.
 - ii. Response Time per System: An estimate of the maximum emergency response time to each system of responsibility from the central office of the circuit rider and the system located farthest away from the system.
 - iii. Local emergency response contact information.
 - iv. If chlorine gas is used onsite, document the location of emergency repair kits and safety equipment.

FREQUENCY OF REVISIONS AND REVIEWS

The Department realizes that operating a water or wastewater system is a dynamic process. However, circuit rider general workplans, system specific management plans, as well as applicable contracts, need to remain current. Therefore, whenever conditions are significantly changed, these plans and applicable contracts should be updated. If desired, only the pertinent section(s) needs to be revised, indicating the date and section revised in the Signatory Requirements page. Major long-term changes such as adding systems, days or hours of system visits or personnel changes should initiate an immediate revision.

DEPARTMENT PLAN EVALUATION

The Department will periodically and systematically review and evaluate general workplans, system specific management plans and contracts to ensure that the policies and procedures remain current and appropriate. The Department may evaluate these documents and any other information pertinent to a water or wastewater system under the supervision of a circuit rider and may determine any of the following; including, but not limited to:

1. The time provided for supervision is inadequate.

2. The amount of time that the circuit rider would be required to spend in the operation of each water or wastewater system.
3. The number of water or wastewater systems a circuit rider can effectively operate.
4. A reduction or increase of the number of daily visits to be required by the circuit rider or the circuit rider's employees.

The Department recognizes that circuit riders provide an important service throughout the Commonwealth in that they allow many water and wastewater systems to meet state regulations requiring a certified operator without the cost of a full-time employee. The general work plan and system specific management plan or relevant contracts help to ensure effective water and wastewater system operations by circuit riders.

Instructions for Circuit Rider General Work Plans and System Specific Management Plan Templates

Title Page:

Fill in the information as requested including the name of the business, address, phone number, FAX number and email address. Also fill in the name and title of the person who prepared the plan and the date the plan was completed.

Signatory Requirements (Page 1):

The person who completed the plan must sign and date the plan. Any other facility/system personnel who reviewed the plan must also sign the plan.

General Work Plan (Pages 2 to 3):

1. Company Profile:

Fill in the information for the circuit rider business as requested including company name, address, telephone number and the business primary contact person.

2. Inventory of Facilities/Systems:

List all systems of responsibility of the circuit rider business. Give the name, NPDES # or PWSID, owner, and class and subclassification of each separate water wastewater system under the responsible-charge-of the circuit rider business. Also, give the name of the certified operators who are employees of the circuit rider with the associated level of certification assigned to each system listed.

3. Facility/System Visits:

Provide a general overview of the number of visits to a system per month including the days of the week and the hours per day the circuit rider or the assigned employee of the circuit rider will spend at each system of responsibility.

System Specific Management Plan (Pages 5 to 11):

A separate management plan must be completed for each system of responsibility of the circuit rider. Each management plan provides an overview of the flow of the daily activities at each system of responsibility and the strategies that support them. There should be enough information to show that the circuit rider understands and has planned for the daily execution of the business of the system. The primary purpose of this plan is to show that the circuit rider is focused on the critical operating factors that will maintain the regulatory compliance of each system.

Facility/System General Information:

Fill in the basic system information as requested.

Work Force:

List all persons including employees of the circuit rider, certified operators (both properly and not properly certified for the system) and uncertified operators who will actually perform work at the system on a part-time or full-time basis. Information should include: name, title, contact information (phone), and certificate class and subclass.

Process Control Plan:

1. Location of Pertinent Information:

Describe the location of the items listed. Place additional items in the blank rows.

2. Design Capacity:

Fill in the average daily and maximum design flow for the facility. For water facilities this would be the average daily production and maximum design production capacity of the facility.

3. Collection/Distribution System Information:

In this part fill in the pump information tables. For water systems, this table applies to groundwater or surface water sources. List each station ID, location and pump information.

4. Treatment Unit Process Information:

List each major unit treatment process from influent/intake to effluent/discharge. Include the level of treatment and associated ancillary equipment.

5. Chemical Treatment Information:

In part A, fill in the requested disinfection information.

In part B and C, fill in the same information for any other type of treatment, such as any corrosion control treatment or chemical coagulant information that may be used.

In part D, describe any other pertinent information about the system that has not already been covered.

6. Biosolids Information:

Provide biosolids information including average amount of biosolids produced per week, type or class, treatment method (digestion, belt filter press etc.) and disposal method (landfill, incineration, land application etc.).

7. NPDES or PWSID Permit Reporting Requirements:

List the type and daily quantitative value of each NPDES or PWSID reporting requirement i.e. SS-30 mg/l. For those with only monthly reporting requirements list the monthly quantitative values.

8. Receiving or Source Water Body Information:

Provide the name, location (when describing the location, try to use landmarks and approximate distances), flow and designated DEP water uses for the receiving water body (for wastewater plants) or the source water body (for water plants).

9. Other Pertinent System Information:

Describe any other important components of your system that have not already been covered. This should be summary information that could be useful for effective operations. For example at water plants describe any finished water holding structures. Fill in the type, location, and capacity of your finished water storage. For the type, describe the construction of the storage (i.e. "Concrete Tank").

10. Operations Strategy:

Provide an overview of the operations strategy that the circuit rider will utilize to ensure a clear understanding of the actual operations and that test reports and results are representative of the actual operational conditions. Fill out the Table including system visits as the days per week and estimated hours spent per visit by the circuit rider. Specify the tasks to be performed during a visit and how the visit will be documented. Include primary method of documentation of every visit to the system and any associated documentation which may be completed during that visit.

DEP realizes that operating a water or wastewater system is a dynamic process. However, the Operations Strategy should characterize normal operations for one month. It is especially important to note daily samples, routine physical tasks, routine operational tasks, routine maintenance tasks and administrative tasks. Be specific in that the tasks should be associated with a particular unit treatment process, laboratory test or particular piece of support equipment. Remember to include a timeframe for wet weather adjustments, upset conditions or other unaccountable operations that would be enumerated by the task "evaluate treatment process (review data, make decision)". Illustrate a clear understanding of the actual operations and that test reports and results are representative of the actual operational conditions of the system.

Specific tasks and subtasks broken down by days of the month could include, but are not limited to, the following:

- Monitor treatment process (check process record data)
- Evaluate treatment process (review data, make decision)
- Adjust treatment process (make correction)

- Chemical addition
 1. diagnose and/or troubleshoot process units
 2. discriminate between normal and abnormal conditions
 3. maintain processes in normal operating condition
 4. evaluate and adjust process units
 5. calibrate equipment
 6. confirm chemical strength
 7. adjust flow patterns
 8. adjust wasting flows
 9. adjust recycle flows
 10. adjust speed of process unit
 11. perform basic math and process control calculations
 12. perform physical measurements
 13. prepare and measure chemicals
 14. adjust chemical feed rates and flow patterns
 15. calculate dosage rates

- Collect samples

- Perform laboratory analysis

- Interpret analysis
 1. calibrate instruments
 2. collect representative samples
 3. operate automatic samplers
 4. perform laboratory calculations

- Operate support equipment

- Evaluate and maintain support equipment

- Perform diagnostic and preventive maintenance

- Perform corrective maintenance
 1. adjust equipment
 2. calibrate equipment
 3. perform preventive maintenance
 4. perform corrective maintenance
 5. discriminate between normal and abnormal conditions
 6. record information and report findings
 7. troubleshoot and perform general maintenance

- Perform administrative duties

- Establish recordkeeping system and record information
 1. transcribe data
 2. determine what information needs to be recorded
 3. evaluate facility performance

4. interpret data
 5. organize information
 6. perform basic math
 7. record information and report findings
- Establish safety programs and perform safety procedures
 - Review safety procedures
 - Establish emergency procedures and respond to emergencies
 - Review emergency procedures
 1. assess likelihood of disaster occurring
 2. coordinate emergency response with organizations
 3. identify potential safety hazards
 4. recognize unsafe work conditions
 5. select and operate safety equipment
 - Establish security programs and perform security procedures
 - Establish security procedures and respond to security breaches
 - Review security procedures
 1. coordinate security response with organizations
 2. conduct Vulnerability Analysis
 - A. assess likelihood of security threat
 - B. recognize unsecured conditions
 - C. identify potential security breaches
 - D. select and operate security equipment

Emergency Response Information (Page 12):

Identify 24/7 title and contact information for the circuit rider for each system of responsibility including name, title and telephone number. Provide an estimate of the maximum emergency response time to each system of responsibility from the central office of the circuit rider and the system located farthest away from the system.



CIRCUIT RIDER

GENERAL WORK PLAN
AND
SYSTEM SPECIFIC MANAGEMENT PLAN

Name of Business
Business Address
Phone Number
FAX Number
Email Address

Plan Prepared By
Name
Title
Completion Date

EXAMPLE TEMPLATE

**Signatory Requirements
Plan Completion and Revisions**

Plan Completion

Plan Prepared by: _____

Date Completed: _____

Plan Reviewed by: _____

Plan Revisions:

Name	Title	Date
Name	Title	Date

EXAMPLE TEMPLATE

Department Plan Review:

Name	Title	Date

EXAMPLE TEMPLATE



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

CIRCUIT RIDER - GENERAL WORK PLANS

1. Company Profile

Company Name: _____

Address: _____

Telephone No.: _____ **Email Address:** _____

Primary Contact Person: _____

2. Inventory of Facilities/Systems

System Name	NPDES # or PWSID	Address	Owner	Class & Subclass of System	Operator-in-charge	Certificate Class & Subclass

EXAMPLE TEMPLATE

3. Facility/System Visits (time physically present at a system; not including travel time)

VISITS/MONTH/FACILITY

Name of Facility	Visits /Month											
	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec

HOURS/WEEK/FACILITY

WEEK 1

Name of Facility	Days on Site						
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
	Hours on Site						

WEEK 2

Name of Facility	Days on Site						
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
	Hours on Site						

EXAMPLE TEMPLATE

WEEK 3

Name of Facility	Days on Site						
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
	Hours on Site						

WEEK 4

Name of Facility	Days on Site						
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
	Hours on Site						

EXAMPLE TEMPLATE



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

CIRCUIT RIDER - SYSTEM SPECIFIC MANAGEMENT PLANS

General Information

WWTP or Water

Plant Name: _____

**WWTP NPDES Permit or
Water ID No.:**

--	--	--	--	--	--	--	--

Address:

Telephone No.: _____

Email Address: _____

Municipality: _____

County: _____

System Type: (Please Check)

- AS TF, RBC P&L CS
 CWS NTNCWS DS

Class & Subclass: _____

EXAMPLE TEMPLATE

Work Force

Name of Operator	Title	Contact Information	Certificate Class & Subclass

Process Control Plan

1. Location of Pertinent Information

Item	Location
Collection System Map	
Facility USGS Map	
Facility Drawing	
Permits	
Technical Manuals	
O&M Plan	
Standard Operating Procedures	
Daily Operation Logs	
Emergency Response Plan	

EXAMPLE TEMPLATE

2. Design Capacity

<i>Average Daily:</i>		<i>MGD</i>
<i>Maximum Design:</i>		<i>MGD</i>

3. Collection/Distribution System Information

A. Main Pump Stations:

Station ID	Location
1.	
2.	
3.	
4.	
5.	
6.	

B. Main Pump Stations Information:

Station ID	Pump Type	Manufacturer	H.P.	Capacity (gpm)	Phase, Voltage

EXAMPLE TEMPLATE

4. Treatment Unit Processes (Influent - Effluent)

Treatment Unit	Operating Range		Level of Treatment	Ancillary Equipment
	Influent	Effluent		

5. Chemical Treatment Information

A. Disinfection:

Chemical(s) Used: _____

Type of Chemical Feed: _____

Location of Disinfection System: _____

Location of Chem. Storage: _____

B. Treatment 1:

Chemical(s) Used: _____

Type of Chemical Feed: _____

Location of Disinfection System: _____

Location of Chem. Storage: _____

EXAMPLE TEMPLATE

C. Treatment 2:

Chemical(s) Used: _____

Type of Chemical Feed: _____

Location of Disinfection System: _____

Location of Chem. Storage: _____

D. Other Chemical Treatment Information:

6. Biosolids Information

Average Amount Produced per Week: _____

Type or Class: _____

Treatment Method: _____

Disposal Method: _____

7. NPDES or Water ID Permit Reporting Requirements

Requirement – Value

Requirement – Value							

EXAMPLE TEMPLATE

8. Receiving or Source Water Body Information

Name: _____

Location: _____ Flow: _____

DEP Designated Water Uses _____

9. Other Pertinent System Information (Operational or System Information of Importance)

EXAMPLE TEMPLATE

10. Operations Strategy

Facility Visits		Tasks	Visit Documentation Method & Other Documentation
Day/Week	Hours/Day		
Mon			
Tue			
Wed			
Thurs			
Fri			
Sat			
Sun			
Mon			
Tue			
Wed			
Thurs			
Fri			
Sat			
Sun			
Mon			
Tue			
Wed			
Thurs			
Fri			
Sat			
Sun			
Mon			
Tue			
Wed			
Thurs			
Fri			
Sat			
Sun			

EXAMPLE TEMPLATE

EMERGENCY RESPONSE INFORMATION

ER Contact Name	Title	Contact information	Response Time - From Central Office	Response Time - From Most Distant Facility

APPENDIX G

Important Wastewater System Information

The following information is being provided as a reference guideline for some of the requirements of every certified wastewater operator in Pennsylvania. This appendix is only meant as a guide; some of the information has been edited for space. Please refer to the rules, regulations or the specific facility's permit if you have further questions.

The Drinking Water and Wastewater Systems Operators' Certification Act provides that:

It shall be the duty of all certified operators to comply with the applicable Federal and State laws, and rules and regulations associated with a water or wastewater system, including, but not limited to:

1. Meeting all the requirements for recertification or renewal of certification, including any continuing education requirements.
2. Reporting to the system owner any known violations or system conditions that may be or are causing violations of any department regulation or permit conditions or requirements.
3. Providing for the suitable operation and maintenance of a water or wastewater system utilizing available resources needed to comply with all applicable laws, rules and regulations and permit conditions or requirements.
4. Reporting to the system owner any action necessary to prevent or eliminate a violation of applicable water or wastewater systems laws, rules and regulations and permit conditions and requirements.
5. Making or implementing appropriate process control decisions or taking or directing actions related to process control decisions for specific water or wastewater systems.

The following language is standard in sewage permits in Pennsylvania. This information has been edited so please read the specific facility's permit.

- Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
- If the permittee monitors any pollutant at monitoring points as designated by this permit, using analytical methods described in PART A III.A.4 of the permit more frequently than the permit requires, the results of this monitoring shall be incorporated, as appropriate, into the calculations used to report self-monitoring data on the Discharge Monitoring Report (DMR).
- Planned Changes - The permittee shall give notice to DEP as soon as possible of any planned physical alterations or additions to the permitted facility.
- The permittee shall give advance notice to DEP of any planned changes in the permitted facility or activity that may result in noncompliance with permit requirements.
- The permittee shall employ an operator(s) certified in compliance with the Water and Wastewater Systems Operators Certification Act.

- The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes, but is not limited to, adequate laboratory controls including appropriate quality assurance procedures. This provision also applies to the operation of backup or auxiliary facilities or similar systems that are installed by the permittee, only when necessary to achieve compliance with the terms and conditions of this permit.
- The permittee shall take all reasonable steps to minimize or prevent any discharge, sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.
- Any person violating Sections 301, 302, 306, 307, 308, 318, or 405 of the Clean Water Act or any permit condition or limitation implementing such sections in a permit issued under Section 402 of the Act is subject to civil, administrative and/or criminal penalties as set forth in 40 C.F.R. §122.41(a)(2).
- Any person or municipality, who violates any provision of this permit; any rule, regulation or order of DEP; or any condition or limitation of any permit issued pursuant to the Clean Streams Law, is subject to criminal and/or civil penalties as set forth in Sections 602, 603, and 605 of the Clean Streams Law.
- Any person who does any of the following:
 1. Falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit, or
 2. Knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit (including monitoring reports or reports of compliance or noncompliance),

Shall, upon conviction, be punished by a fine and/or imprisonment as set forth in 18 Pa.C.S.A. §4904 and 40 C.F.R. §122.41(j)(5) and (k)(2).

The following are excerpts from regulations associated with wastewater systems that can apply to operators:

Pennsylvania Code Title 25, Chapter 91, General Provisions

Section 91.33. Incidents Causing or Threatening Pollution.

(a) If, because of an accident or other activity or incident, a toxic substance or another substance which would endanger downstream users of the waters of this Commonwealth, would otherwise result in pollution or create a danger of pollution of the waters, or would damage property, is discharged into these waters—including sewers, drains, ditches or other channels of conveyance into the waters—or is placed so that it might discharge, flow, be washed or fall into them, it is the responsibility of the person at the time in charge of the substance or owning or in possession of the premises, facility, vehicle or vessel from or on which the substance is discharged or placed

to immediately notify the Department by telephone of the location and nature of the danger and, if reasonably possible to do so, to notify known downstream users of the waters.

(b) In addition to the notices in subsection (a), a person shall immediately take or cause to be taken steps necessary to prevent injury to property and downstream users of the waters from pollution or a danger of pollution and, in addition thereto, within 15 days from the incident, shall remove from the ground and from the affected waters of this Commonwealth to the extent required by this title the residual substances contained thereon or therein.

Section 91.34. Activities utilizing pollutants.

(a) Persons engaged in an activity which includes the impoundment, production, processing, transportation, storage, use, application or disposal of pollutants shall take necessary measures to prevent the substances from directly or indirectly reaching waters of this Commonwealth, through accident, carelessness, maliciousness, hazards of weather or from another cause.

Pennsylvania Code Title 25, Chapter 92a, National Pollutant Discharge Elimination System Permitting, Monitoring and Compliance

Section 92a.41 Standard Conditions in all Permits.

The following items of Section 92a.41, Standard Conditions in all Permits, apply to the operator, in accordance with the requirements of Chapter 302, Subchapter L, §302.1201, Duties of operators. In general, the permittee shall maintain in good working order and operate as efficiently as possible facilities or systems of control installed by the permittee to achieve compliance with the terms and conditions of the permit. As an operator, one must remember that although this Section discusses a permittee (i.e., municipality, corporation, authority, etc.) responsibility or conditions under which a permit is issued, a certified operator is ultimately responsible for and obligated to carrying out the conditions of that permit and should not feel they are immune, as available operators, to being liable for violations they created or caused because they are not the permittee.

§92a.41(a)(1) Duty to comply - The permittee must comply with all of the conditions of their permit. Any noncompliance constitutes a violation and may be grounds for enforcement action, permit termination, revocation and re-issuance, or denial of a permit renewal application.

§92a.41(a)(3) Need to halt or reduce activity is not a defense - It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

§92a.41(a)(4) Duty to mitigate - The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit that has a reasonable likelihood of adversely affecting human health or the environment.

§92a.41(a)(5) Proper operation and maintenance - The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and

related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of the permit. This would also includes adequate laboratory controls and appropriate quality assurance procedures.

§92a.41(a)(8) Duty to provide information - The permittee shall furnish, within a reasonable time, any information which is requested to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit.

§92a.41(a)(9) Inspection and entry - The permittee shall permit an authorized Department representative, upon presentation of that representative's credentials, to:

- (i) Enter upon premises in which an effluent source is located or in which records are required to be kept under terms and conditions of the permit.
- (ii) Have access to and copy records required to be kept under terms and conditions of the permit.
- (iii) Inspect monitoring and control equipment or operations required in the permit.
- (iv) Sample or monitor, for the purposes of assuring permit compliance or as otherwise authorized, any substances or parameters at any location.

§92a.41(a)(10) Monitoring and records - Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. Monitoring results must be conducted according to approved test procedures unless or other test procedures which have been specified in the permit. Records of monitoring information shall include: the date, exact place, and time of sampling or measurements; the individual(s) who performed the sampling or measurements; the date(s) analyses were performed; the individual(s) who performed the analyses; the analytical techniques or methods used; and the results of such analyses.

§92a.41(a)(11) Signature requirements - All applications, reports, or information submitted shall be signed by a responsible corporate officer, by a general partner or proprietor, a principal executive officer or ranking elected official, or an authorized representative.

§92a.41(a)(12) Reporting requirements - Monitoring results shall be reported at the intervals specified in the permit and results must be on a Discharge Monitoring Report (DMR) form or forms provided or specified for reporting results of monitoring.

§92a.41(a)(13) Bypass - "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. The permittee may allow any bypass to occur which does not cause exceedence of effluent limitations, but only if it is for essential maintenance to assure efficient operation. Bypass is prohibited and enforcement action against a permittee may occur for bypass unless the bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, there were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of

untreated wastes, or maintenance during normal periods of equipment downtime, or the permittee obtained prior approval.

§92a.41(c) The discharger may not discharge floating materials, scum, sheen, or substances that result in deposits in the receiving water. Except as provided for in the permit, the discharger may not discharge foam, oil, grease, or substances that produce an observable change in the color, taste, odor or turbidity of the receiving water.

Pennsylvania Code Title 25, Chapter 93, Water Quality Standards

Section 93.6. General Water Quality Criteria

(a) Water may not contain substances attributable to point or nonpoint source discharges in concentration or amounts sufficient to be inimical or harmful to the water uses to be protected or to human, animal, plant or aquatic life.

(b) In addition to other substances listed within or addressed by this chapter, specific substances to be controlled include, but are not limited to, floating materials, oil, grease, scum and substances that produce color, tastes, odors, turbidity or settle to form deposits.

Comment: Effluent limits of the permit are calculated such that a discharge in compliance with effluent limits, will meet in-stream water quality standards.

Pennsylvania Code Title 25, Chapter 94, Municipal Wasteload Management

Section 94.12. Annual Report

This section outlines requirements for an annual report evaluating the existing operational or maintenance problems or a plan for needed additions at the collection system and the treatment plant. A lot of data necessary for the completion of the report is collected by the operators. Working and calibrated flow meters are essential to the Chapter 94 report, as well as accurate and representative sampling. Reporting of sanitary sewer overflows and operational issues are also essential.

Pennsylvania Code Title 25, Chapter 95, Wastewater Treatment Requirements

This chapter is related to industrial wastes. The operator can view this chapter on-line.