Subsurface
NC Water Pollution Control System Operator
Needs-to-Know

Approved - February 9, 2024 - WPCSOCC

I. Ethical and Legal Issues of Operator Certification

A. Understand professional ethics and recognize situations that may jeopardize operator integrity and certification.

B. Understand State regulations for obtaining and maintaining operator certification and recognize the agency that issues those certifications.

C. Distinguish between the duties and responsibilities of the following:

   1. All certified operators;

   2. Operators designated as Operator in Responsible Charge (ORC) or Back-up ORC; and

   3. Contract operators or contract operations firms.

D. Differentiate between the duties and responsibilities of the system owner and system ORC.

E. Recognize when disciplinary action can be taken against a certified operator and/or a system owner and the possible consequences of such action.

F. Understand the state regulations and agencies that address permitting, operation and maintenance, monitoring and reporting requirements for subsurface treatment systems.

G. Understand the Local and County regulations and agencies, where applicable, that address permitting, operation and maintenance, monitoring and reporting requirements for subsurface treatment systems.

H. Understand what an ORC may and may not do without a repair permit.

II. Introduction to Wastewater

A. Explain the different types of wastewater and describe the sources and characteristics of each.

B. Discuss the major constituents that occur in wastewater and their potential impacts on subsurface wastewater systems, public health and the environment.

C. Understand the quantitative measurements and standards used for wastewater constituents.

D. Describe the treatment processes that occur in subsurface systems.

E. Describe design flow, actual flow, adjusted daily design flow, and changes to these over time.

F. Describe Mass balance of materials pre- and post- treatment.

III. Safety

A. List health and safety hazards associated with subsurface system operation and discuss the precautions, procedures, and equipment necessary to minimize those hazards.

B. Identify measures necessary to protect the public from health and safety hazards at a subsurface system.

C. Identify conditions that require the services of a licensed electrician.

D. Identify basic electrical safety concerns.

E. Identify conditions that require the services of a plumber.

IV. Subsurface Wastewater Systems Overview

A. Be familiar with all of the types of subsurface wastewater systems.

B. Understand the circumstances and site conditions that warrant the use of subsurface systems.

C. Understand the circumstances and site conditions that warrant the use of Innovative Approvals.

V. Subsurface System Components

A. Collection and Primary Treatment

1. Evaluate the condition of and be able to operate and maintain collection systems which are not already permitted or deemed permitted by DEQ.

2. Be familiar with tanks used in subsurface systems and the operation and maintenance requirements for them.

3. List the associated components required for different types of tanks and know the purpose, function, and operation and maintenance requirements of these components.

4. Evaluate the condition of existing tanks and discuss the procedures for upgrading and maintaining them.

5. Understand what collection systems are covered under Subsurface wastewater operator responsibility and what systems require a Collections wastewater certificate.

B. Advanced or Secondary Pretreatment

1. Discuss types of advanced pretreatment currently permitted in NC.

2. Define types of treatment. Discussion of what if any other licenses are required.

3. List the treatment processes employed in approved pretreatment units and the appropriate use of each unit.

4. Describe operation, maintenance, sampling, and repair protocols for pretreatment systems and be aware that proprietary products may have unique operation and maintenance requirements specified by the manufacturer.

C. Distribution

1. Describe the types of distribution methods and their use in subsurface systems.

2. Be familiar with the types, properties, and appropriate use of piping, valves, and other components or mechanical devices used in subsurface wastewater treatment systems.

3. Demonstrate flow control using valves and other devices.

4. Name the types of pumps and pump control devices used in subsurface wastewater applications, and discuss the characteristics and appropriate use of each.

5. Explain different types of controls used for demand dosing, timed dosing, multiple field dosing, and other configurations.

D. Dispersal and Soil Treatment

1. What are the types of trenches and dispersal media permitted for use in subsurface wastewater systems in North Carolina?

2. Recognize the effects of weather and human actions on soils and system performance. Apply this information to system management.

3. Discuss the soil properties and hydrologic processes that affect the function of subsurface systems.

4. Explain the purpose and limitations of surface drainage and landscaping on the function of subsurface systems and how they can be managed and maintained.

5. Know the types, purposes and maintenance requirements of vegetative covers.

VI. Monitoring and Sampling

A. Know the sampling requirements and protocols for subsurface systems and be able to interpret results relative to proper system function.

B. Understand which types of subsurface systems require groundwater monitoring and know where to obtain information regarding permitting and monitoring requirements.

C. What other types of monitoring may be required for subsurface systems?

VII. Math for Subsurface System Operators

A. Apply basic mathematical functions to solve simple equations:

B. Calculate and/or evaluate:

1. Tank and pipe volume
2. Flow rates and pumping characteristics (flow and head);
3. Septic system performance data;
4. Time clock and telemetry data.
5. Mass balance

VIII. System Operation and Maintenance

A. Read and understand plans, specifications and permits for subsurface systems and system components and use them to determine operating parameters and inspection needs.

B. Maintain accurate records of inspections and operation checks; use this information in system management.

C. Devise a management plan for an existing system when little or no documentation is available.

D. Describe procedures, equipment and materials necessary to conduct routine, preventative and special system inspections and maintenance.

E. Evaluate system performance and efficiency and recognize circumstances that warrant special maintenance and notification of the system owner and/or local health department.

F. Determine the status of system compliance and what action, if any, is required.

G. Identify situations that require system adjustment, modification, or improvement. Adjust or modify a system as needed and identify possible side effects of any adjustment or modification.

H. Discuss routine operation, maintenance and repair procedures, as well as testing and troubleshooting strategies for all system components.

I. Understand which types of site and system modification require permits, and know from whom the permits are obtained.

IX. Records, Reports, and Contracts

A. Maintain a copy of the system permit and other pertinent documents, be familiar with their contents and discuss the importance of these documents.

B. Explain the importance of the following as required by the system operation permit or the Rules:
    1. Scheduling and performing inspections and sampling, and
    2. Filing of reports in a timely manner.

C. Complete inspection forms to accurately reflect inspection results and indicate status of system compliance.

D. Recognize the importance of properly executing contracts with system owners.

E. Discuss issues that a properly executed contract addresses.