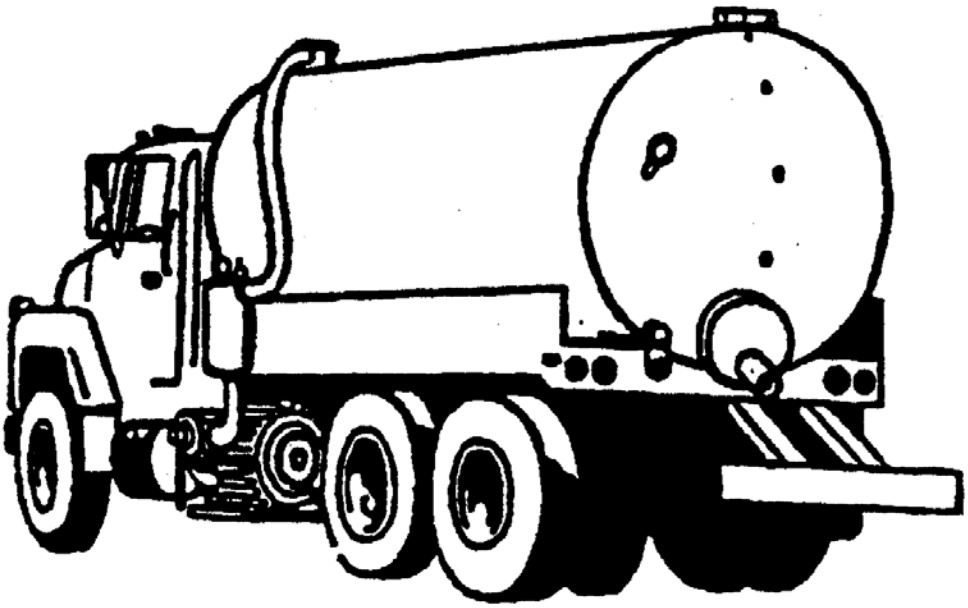
SEPTAGE OPERATOR SERVICING HANDBOOK AND STUDY GUIDE

SEPTAGE SERVICING OPERATOR CERTIFICATION

Grade T & Grade L



Operator Certification Program

Wisconsin Department of Natural Resources

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PREFACE

This HANDBOOK and STUDY GUIDE represent an effort on behalf of the DNR of Natural Resources (DNR) to assist those seeking certification as Septage Servicing Operators. The material contained should be used as a study supplement to Wisconsin Administration Code NR 113.

PURPOSE

This HANDBOOK and STUDY GUIDE contain information an individual would need to study for the septage servicing operator certification exams at the Grade T or Grade L levels. Every certified septage servicing operator shall have sufficient knowledge of sanitation and of the principles underlying the operation, servicing and disposal of septic and holding tanks, dosing chambers, grease interceptors, seepage beds, seepage pits, seepage trenches, privies, and portable restrooms, to safeguard the public health and welfare.

STRUCTURE AND FUNCTION

Septic Tank/Soil Absorption Systems

A septic tank is a large, watertight container sized to fit the expected loading of wastewater. It is designed to hold wastewater while treatment takes place.

Three types of treatment happen while wastewater is being held in the septic tank. The first type of treatment is that some of the solids in the wastewater settle to the bottom of the tank by gravity and form a sludge blanket (sedimentation). The second type of treatment is that some solids float to the top of the tank and form a scum layer (flotation). In addition to these two physical processes, a third type of treatment that of biological reactions, is also taking place. The biological reactions are mainly caused by microorganisms that can live without oxygen. This process is called anaerobic decomposition and results in some of the organic materials in the wastewater being broken down into simpler substances.

Byproducts of anaerobic decomposition can be methane gas, hydrogen sulfide gas, and an absence of oxygen. Because methane and hydrogen sulfide gases are very toxic, it is important to follow strict safety precautions when working around septic tanks.

Septic tanks are designed to accumulate sludge and scum. They must be emptied periodically. As the sludge and scum accumulate, they lower the capacity of the tank to hold wastewater long enough for anaerobic decomposition to occur. If this happens, wastewater is not adequately treated. The frequency of pumping depends on the size of the tank and the loading to it. Typically, a single family residential septic tank should be pumped once every two to three years.

The wastewater that flows out of the septic tank is only partially treated and receives additional treatment as it is released and absorbed into the soil. It is illegal for a septic tank to discharge directly to the land surface or to surface waters.

There are *four common types* of soil absorption systems:

1. *Trench System*

   Many absorption fields consist of a series of trenches. Each trench has a distribution pipe near the bottom surrounded by a bed of gravel. The wastewater flows by gravity through the distribution pipes and into the gravel bed. From the gravel it is absorbed into the soil.

2. *Seepage Bed System*

   A seepage bed is similar to a trench system except instead of trenches the distribution pipes are laid in a bed of gravel in a large square or rectangular area. The bed of gravel is covered with a one to three foot layer of soil. The wastewater seeps through the gravel and is absorbed into the soil.

3. *Pit System*

   A pit system is commonly called a drywell. It consists of a deep excavation with the sides of the

excavation lined with blocks or some type of porous material. The wastewater seeps into the soil on the bottom or sides of the pit. Many of these systems are still in use in Wisconsin, but they are generally not as desirable as the other three types of systems. They are more likely to fail, and they do not provide as much protection to groundwater.

4. *Mound System*

   A mound system is the newest method of soil absorption. It consists of built-up areas of sandy material with the distribution pipes near the base of the mound. They allow septic systems to function on soils that are not suitable for the other three types of absorption systems. Mound systems require a pump to lift the wastewater from the septic tank to the distribution pipes in the mound.

Pumping Systems

The two most common types of pumps used on pumper trucks are vacuum and centrifugal. The vacuum pump system works by having an air pump mounted on the truck's tank to pump air out of the tank. The septage is drawn out of the septic or holding tank by the vacuum in the tank truck. Advantages of the vacuum system are: the liquid does not have to flow through the pump, the system is less likely to freeze in winter, and the operator can use pressure when unloading. A disadvantage is that a vacuum system requires a heavy duty pressure resistant tank. The vacuum pump is the most commonly used system because of less mechanical problems.

The centrifugal pump system works by having a rotor spinning at high speed to move the liquid. It is more likely to clog and is subject to wear or damage by grit. The chance for damage increases because the liquid moves through the pump rather than just through the hose.

Both the vacuum and centrifugal pumps have a maximum suction lift of approximately 27 feet. For higher lifts, a submersible pump is placed directly in the septage to pump into the pumper truck.

OPERATION

Disposal to Wastewater Treatment Plants

Hauling septage to wastewater treatment plants is a preferred option whenever possible. The DNR is working to convince municipal treatment plants to provide excess capacity for septage treatment when possible and to accept septage at reasonable rates for treatment.

Disposal of septage at a wastewater treatment plant is a good environmental protection practice but can cause problems for the plant. Septage is a high strength waste and can overload a treatment plant if too much is discharged in too short a time. This is especially a problem at small treatment plants. To avoid this problem, some plants have holding tanks to allow the septage to be detained and fed into the treatment processes slowly or during periods of low flow. If there is no holding tank, it may be necessary to unload the truck very slowly or during off-peak times.

Septage is usually high in solids and may overload the sludge handling capacity of the plant. It may also be be high in grit which will cause excess wear on pumps and other machinery.

If septage is high in ammonia it may overload the treatment plant and cause a permit violation. If septage contains toxic materials it could kill the microorganisms in the treatment plant and cause a major plant upset. This type of upset can take several days for the wastewater treatment plant to recover and get back to normal treatment efficiencies.

For these reasons, most plants have established fees for septage disposal and have strict rules relating to septage disposal. Some plants refuse to accept any septage, especially if they are already at or over their design loading capacity.

Large holding tanks proposed for development projects, which are designed to hold more than 3000 gallons per day, must have their waste hauled to a wastewater treatment plant. Before the Department of Commerce can review plans for the installation of these systems, the DNR must receive confirmation from a wastewater treatment plant of their ability and willingness to accept the projected volume of waste from the development.

Year-Round Disposal

Licensed haulers can apply to a Publicly Owned Treatment Works (POTW) for permission to discharge septage. In most cases a POTW can refuse to accept it. However, a POTW must accept the septage if it comes from a septic or holding tank located within the sewer service area or the holding tank service area for that POTW.

Vehicles

Administrative Code NR 113 requires that every Septage Servicing Business shall provide or have available: facilities for washing vehicles, tanks, implements, and tools. These facilities should be designed to prevent a nuisance to the general public. Clean and well maintained equipment provides an image of a well-run professional business.

The wastewater from equipment cleaning must be handled in the same manner as septage. This means it must go to an approved land application site or to a wastewater treatment plant. Discharge to a sanitary sewer is acceptable. **Discharges to roadside ditches, storm sewers, or land that is not an approved land application site are not acceptable**.

Log Books and Certification Statement

Each licensed business must keep log books and records of all their servicing and disposal activities. A certification statement is required for all land application activity regarding pathogen and vector control mechanisms. The information required is specified in NR 113.11(3).

Annual Reports

1. Annual Land Application Report (3400-55) - This electronic form must be completed and submitted annually to the DNR if any land application is done. Report the following:

Business name and license number
Method(s) used to satisfy the pathogen and vector attraction reduction requirements
All sites actually used during the year
Total acres used per site
Total volume applied to each field (not the amount applied per acre)

NOTE: Since the computer system tracks municipal sludge and industrial waste, it is necessary to enter an outfall number in one column. Use 990 for septic tank waste, 995 for holding tank waste, or 997 if more than 25% grease trap waste. If more than one waste type was applied on the same field, the information must be entered on separate lines (use a separate line for each outfall number). If there are spring and fall applications to the same field, enter data on two separate lines and distinguish them by the different crop years (ie, spring application for 1998 crop year and fall application for 1999 crop year). Leave the "nitrogen supplied from waste" and "other sources of nitrogen" columns **blank**, unless the site is approved as a "high use" field.

Other Methods of Disposal or Distribution Report (3400-52) - This form is to be completed and submitted annually to the DNR if any waste was hauled to a wastewater treatment plant. Enter the appropriate "end use" code for wastewater treatment plant (end use = A), other facility (end use = A), or out of state (end use = H). Record the permit number of the receiving entity, the outfall number of the hauled waste (990, 995 or 997) and the total volume reported in the units used (i.e., gallons).

* Since this system also tracks Municipal sludge and Industrial waste, it is necessary to enter an outfall number. Enter 990 for septic tank waste, 995 if holding tank waste, or 997 if more than 25% grease trap waste.

Annual report forms can be viewed and downloaded from the DNR website: http://dnr.wi.gov/topic/wastewater/ereporting.html

MONITERING

Sampling

Frequently wastewater treatment plants require that samples be taken from the load during discharge. These samples are used to measure loadings to the plant and to check for toxic or harmful materials if there are problems at the treatment plant.

In order to be useful, the sample should be representative of what the entire load contains. This is not an easy thing to do because septage is high in solids that tend to settle quickly when the truck is stopped.

The best way to get a representative sample from most trucks is to take a sample from the discharge hose as the load is being unloaded. The sample will be most representative if it is taken about midway during the unloading so that it is not influenced by an accumulation of solids on the bottom of the tank or the lower solids portion of the load on the top of the tank. Fill the sample container gradually by taking several small samples as the septage is being discharged.

SAFETY

Septic Tank Malfunctions

Septic tanks can have structural failures, such as cracked or broken walls, which could cause septage leaks into the soil without adequate treatment. Groundwater could seep in and hydraulically overload the system. Septic tank structural failure could also be broken baffles. When the baffles are broken,

the wastewater can flow directly across the surface of the liquid in the tank without being held for treatment. This means inadequately treated wastewater reaches the distribution system and can cause failure of the absorption system. When an outlet baffle is broken, solids are more likely to flow out of the tank and into the absorption area, causing clogging of the soil and early failure of the system.

Although septic tanks malfunction at times, it is usually the distribution system that fails, and not the tank itself. A non-structural type of failure is when a septic tank is not emptied often enough and solids accumulate, filling the tank. When this happens, the wastewater is not held in the tank and inadequately treated wastewater reaches the absorption system. This can lead to early failure of the absorption system.

Onsite sewage installations may require minor repairs. Replacement or repair of manhole risers and covers; replacement or repair of distribution boxes ("D-Box"); and replacement of septic tank baffles are allowable for septic pumpers. All other replacement or repair work must be done by a properly licensed plumber.

The most common type of failure of an absorption system is when the system loses its ability to accept wastewater as fast as it is discharged from the septic tank. This results in ponding in the absorption system, and in severe cases, ponding on the surface or backup of sewers into the house. This kind of hydraulic failure can be caused by either saturated soil conditions or clogging of the soil surface where the treated wastewater is absorbed into the soil.

Confined Space Entry

Septic tanks and holding tanks are both considered confined spaces because they have limited openings for entry and exit. Plus they have little natural ventilation. It is possible for toxic gases to be present in lethal concentrations because of the anaerobic decomposition of wastewater and the lack of natural ventilation. Entry into a confined space should only be done in accordance with procedures that are approved by the DNR of Workforce Development. These include:

A. Continuous monitoring of the air with a tri-gas meter that will simultaneously test for oxygen, hydrogen sulfide and combustible gases and immediately signal when the atmosphere falls outside the air quality limits.
B. Leaving the confined space immediately if the atmosphere falls outside any of the air quality limits.

C. Not substituting forced ventilation in place of monitoring devices.

D. The use of a harness, lifeline, and winch for emergency extraction of personnel.

E. Having someone remain outside the confined space area to assist in case of an emergency.

Hazardous or Toxic Wastes

Certified and master septage servicing operators working for a licensed septage business under NR 113 and NR 114 are authorized to haul septage but not to transport hazardous wastes. Toxic or hazardous wastes that are land applied on a field may contaminate the site. Toxic or hazardous wastes that are disposed at a wastewater treatment plant may cause serious problems at the plant.

Operators should make sure their customers are reliable so they will not contract to haul a waste that is contaminated with any toxic or hazardous materials. Operators should also be particularly careful

about hauling any waste from a site that is known to handle, store, manufacture, or sell any type of materials that are toxic or hazardous. This could include service stations, garages, metal finishing plants, plating plants, facilities that handle pesticides, factories using solvents, or any chemical manufacturing or processing facilities. **If there is any doubt, it is better to refuse the business than to be part of a toxic or hazardous contamination**.

Spills

Any spill of 50 gallons or greater **MUST** be reported to the Department within 24 hours. A written procedure, the Emergency Spill Plan, detailing spill cleanup must be developed by each licensee and a copy of the Emergency Spill Plan must be kept in the cab of each truck at all times.

Care should be taken to avoid septage spills. If a spill accidentally occurs, proper tools to contain it and clean it up should be available to the operator. This means having the proper tools stored on each septage truck. Common hand tools that should be available on each truck are: a shovel or spade, a squeegee with curved ends, flat suction wands for vacuum truck hose, garden hose, boots or waders, and gloves.

For large spills, it is important to have prior arrangements made to call in another truck to help clean up. This can be another truck from the same business or if only one company truck is available there should be a mutual agreement with other haulers in the area to respond in the case of an emergency. The Operator in Charge is responsible for creating the Spill plan, making sure copies are in each truck and training all employees on what to do in the case of a spill.

Personal Health

HAULING SEPTAGE IS NOT CONSIDERED A HIGH RISK OCCUPATION, BUT SEPTAGE DOES CONTAIN DISEASE CAUSING ORGANISMS. IT IS IMPORTANT FOR HAULERS TO FOLLOW CERTAIN PERSONAL SAFETY PRECAUTIONS. PHYSICIANS RECOMMEND BEING IMMUNIZED FOR TETANUS WITH A BOOSTER EVERY TEN YEARS. AFTER FIVE YEARS A BOOSTER IS RECOMMENDED IF A PERSON IS CUT OR WOUNDED. DOCTORS ALSO RECOMMEND BEING IMMUNIZED FOR POLIOMYELITIS.

CALCULATIONS

A. *Gross and Axle Vehicle Weights*

Certain roads and bridges have either permanent or seasonal load limits. These limits may be given as either gross vehicle weights or axle weights. The operator should be able to calculate both if the empty weight of a truck, the capacity, and the number of axles on the truck is known.

Example:

Given: Empty weight = 17,000 Pounds
Capacity = 2,100 Gallons
Number of Axles = 3
(Weight of one gallon = 8 Pounds)

Gross Weight = Empty weight + (Capacity X 8)

= 17,000 + (2,100 X 8)

= 17,000 + 16,800

= 33,800 Pounds

Axle Weights = $\frac{\text{Gross Weight}}{\text{Number of Axles}}$

= $\frac{33,800}{3}$

=11,267 Pounds per Axle

B. Application Rate Limits:

In order to prevent environmental problems, it is necessary to limit septage application rates. Some limits are based on the hydraulic loading rate (gallons per acre). Others are based on the nitrogen loading rate (pounds per acre of nitrogen). The maximum allowable loadings are given in NR 113.09.

The plant crop limits the nitrogen loading rates. For a High Use Field a soil analysis must be done. Legume crops (alfalfa, clover) can receive up to 200 pounds per acre of nitrogen. Soybeans can receive 140 pounds per acre. For a Low Use Field application is limited to 39,000 gallons per acre (13,000 gallons per acre per week), assuming the crop needs at least 100 pounds of nitrogen per acre. If the crop needs less than 100 pounds of nitrogen per acre, reduce the hydraulic loading according to the following calculation:

Example:

Given: Type of Crop = Oats
Nitrogen needed = 80 pounds per acre
EPA Factor = .0026

Gallons per acre applied = $\frac{\text{Pounds of Nitrogen Required}}{.0026}$

= $\frac{80}{.0026}$

= 30,770 gallons

C. Actual Rate of Application:

In order to stay within the maximum hydraulic loading rates, the operator must know at what rates the septage is applied. First, the operator should be able to calculate the application rate from one truckload of septage.

Example:

Given: Capacity = 1,000 Gallons
Spreading Width = 10 Feet
Feet Required To Spread Load = 500 Feet
(One Acre = 43,500 $Ft.^2$)

Area Covered = Spreading Width X Feet Required to Spread Load

= 10 X 500

= 5,000 Ft^2

% Of An Acre = $\frac{\text{Area Covered}}{43{,}500}$ X 100

= $\frac{5{,}000}{43{,}500}$ X 100

= 11.5%

Gallons Spread Per Acre= $\frac{\text{Capacity}}{\text{\% of an acre}}$

= $\frac{1000}{.115}$

= 8,696 gallons

LAND APPLICATION [GRADE L OPERATORS]

Properly applied septage is an environmentally sound method of disposal. Septage adds nutrients and organic matter to the soil, improving plant growth.

Improper land application of septage can cause a number of environmental and public health problems. Therefor land application is carefully regulated under Section 281.48 of State Statutes and Chapter NR 113 of the Wisconsin DNR of Natural Resources Administrative Rules.

Disease causing organisms (pathogens), which may be present in the septage, are a primary concern. Anaerobic decomposition of organic matter found in septage produces the unpleasant odors often associated with land application. Vectors (birds, rodents and insects) are organisms capable of taking pathogens from one location to another. Control mechanisms are required for pathogens. They reduce odors and vectors' attraction to septage. Any one of the following options act as controls for these problems:

1. Adjust the pH of the septage by adding alkali material to elevate the pH to at least 12 for at least 30 minutes. This must be done whenever septage is surface applied.

2. Incorporate the septage into the soil within 6 hours of surface applying it. (pH adjustment is not necessary in this case).

3. Inject the septage directly beneath the soil surface.

Nitrogen and phosphorus are nutrients in septage that can harm both surface and groundwater. Excess nutrients in surface water can cause unwanted growth of algae and other aquatic plants, lowering the value of the water for most uses. Excess nitrogen in groundwater can cause health problems when the groundwater is used for consumption. The restrictions on land application of septage are designed to minimize the impacts to both surface and groundwater from either run-off of septage or leaching of nutrients into the groundwater.

Application on Frozen or Snow Covered Ground

Septic tank waste which has been pumped due to an emergency or waste which has been removed

from a frequently pumped system may be land applied on frozen or snow covered ground. Septic tank waste which is **pumped due to routine maintenance may not be land applied on frozen or snow covered ground**.

The DNR recognizes that emergencies such as freeze-ups or failures occur in parts of the state where disposal into a wastewater treatment plant is not available or feasible (nearest plant may be miles away). Land application during winter months will be allowed as long as more stringent conditions are adhered to during emergencies. In addition, land application of frequently pumped (every 6 months or less) septic systems is also conditionally allowed. Waste from these systems will continue to be considered like holding tank waste for regulatory purposes because it is not as high strength as standard septic tank waste. In both situations mentioned above, the DNR continues to strongly recommend that waste be taken to a publicly owned treatment plant (POTW) during winter months. It should also be noted that any land application on frozen or snow covered ground must be pH adjusted such that the pH is elevated to 12 or higher for at least 30 minutes, as specified on page 10 in #1.

Septic tank waste pumped due to routine servicing (typically occurs every two to three years) during months with frozen or snow covered ground, must be taken to a POTW. Routine pumping should be scheduled in advance to occur at appropriate times of the year. If a county requires pumping to occur in the winter and will not grant an extension, then this may be considered an emergency, and land application may be allowed. Consult with the local DNR representative in these circumstances. NR 113.07(1)(b) has information for septic tank waste disposal while there is frozen or snow covered ground.

Holding tank waste should be taken to a POTW if possible. However, land application of holding tank waste is allowed on frozen or snow covered ground unless it is within a certain distance of a POTW [NR 113.07 (1)(f)]. Restrictions for holding tank waste disposal while there is frozen or snow covered ground can be found in NR 113.07(1)(c).

Soil Compaction

Soil compaction can occur when heavy trucks drive over the soil on a landspreading site. When the soil becomes compacted, the infiltration rate will be lowered, and any rainfall or additional applications of septage may cause ponding or run-off. Soil compaction will lower crop yields and make it more difficult for the landowner to cultivate the land.

Soil compaction can be prevented by not driving on wet fields, staying well within the hydraulic loading rates, not driving on the same areas repeatedly, and by the landowner maintaining a grass or cover crop rather than bare soil.

Nitrogen

Nitrogen is an essential element for plant growth. Farmers buy fertilizer containing nitrogen to improve their crop yields. Much of the purchased nitrogen is used on corn crops that require large amounts. Septage contains nitrogen which is an organic material used by plants in fields where landspreading occurs.

Some plants such as alfalfa, clover and soybeans take nitrogen from the air and convert it into forms they can use. Other plants such as corn, small grains and grasses must rely on nitrogen stored in the soil. Therefore, they remove much more nitrogen from the soil than the plants that can convert nitrogen from

the air.

Loading rates for landspreading of septage are based in part on protecting groundwater from nitrate leaching. Landowners can calculate the amount of nitrogen added by septage and use less amounts of nitrogen fertilizer on landspreading sites.

If there is not enough nitrogen in the soil, crop yields will lower. If there is too much nitrogen in the soil, some of it can leach into the groundwater and cause high levels of nitrate. High levels of nitrate in groundwater can cause problems for both humans and livestock if it is used for drinking water.

GENERAL PREPARATION FOR CERTIFICATION EXAMS

Test-Taking Strategies

The DNR certification exams for these grade levels contain multiple-choice questions that offer four answer choices from which you are to choose the correct, or best, answer. There is only one best answer.

Pace Yourself…

It is important to pace yourself so you will not spend too much time on one question. If you do not readily know the answer, skip the question and return to it later. Applicants have up to 3 hours to take the exam, although most operators have the exam completed within 60 minutes.

Read Each Question Carefully…

It is important that you understand what each question is asking. Some questions may require you to go through more than one step to find the correct answer, while others can be answered quickly on the basis of your acquired knowledge.

Answer the Easy Questions First…

The best strategy for taking the exam is to answer the easy questions and skip the questions you find difficult. After answering all of the easy questions, go back and answer the more difficult questions.

Use Logic in Answering More Difficult Questions…

When you return to the more difficult questions, try to use logic to eliminate incorrect answers to a question. Compare the answer choices to each other and note how they differ. Such differences may provide clues as to what the question requires. Eliminate as many incorrect answers as you can, then make an educated guess from the remaining answers.

Review Your Work…

If there is time left after you have answered every question in an exam, go back and check your work in that exam. Check to be sure that you marked only one answer to each question.

Answer Every Question…

Your score on the exam will be based on the number of questions that you answer correctly. Make sure you answer all the questions – even if you have to guess. A question that is missing an answer is marked wrong and will count against your score.

Preparing For Test Day

Although what you know will determine how well you do on the exam, your attitudes, emotions, and physical state may also influence your performance. The following tips will help you do your best on the exam.

- Be confident in your ability to do well on the exam
- Be prepared to work hard on the exam
- Know what to expect on test day
- Prepare well in advance of the exam
- Get plenty of rest the night before the test
- Plan to arrive one-half hour before test time
- Dress comfortably
- Cellphones are not permitted to be on and may not be used as your calculator
- **Bring to the test center three sharpened soft-lead (No.2) pencils with erasers, and a calculator**

KEY KNOWLEDGE

PRINCIPLE OF SEPTAGE SERVICING

[Grade L]

Define the following:

- Publicly Owned Treatment Works Planning Area
- Publicly Owned Treatment Works Sewer Service Area
- Publicly Owned Treatment Works Holding Tank Service Area
- Agricultural Land
- Approved Site
- Complete Application
- Hydraulic Loading Rate
- Permeability
- Site Management
- Vector Attraction
- Wetlands

[Both Grades T & L]

1. Describe the environmental concerns associated with the disposal of Septage

2. Explain the general requirements for disposal of Septic and Holding Tank waste to a Publicly Owned Treatment Works (POTW)

STRUCTURE AND FUNCTION

[Grade T]

Discuss the following Soil Absorption Systems:

- Seepage Trench System
- Seepage Bed System
- Seepage Pit (Drywell) System
- Mound System

[Grade L]

Define the following:

- High Use Field
- Low Use Field

[Both Grades T & L]

1. Describe two types of pumping systems commonly used on pumper trucks

Define the following:

- Septic Tank
- Holding Tank
- Grease Interceptor
- Dosing Chamber
- Privy
- Portable Restroom

OPERATION

[Grade L]

1. Describe how the pH of Septage is controlled and tested
2. Discuss the special operational restrictions and requirements for land application of Septic Tank and Holding Tank waste on snow covered soil
3. Define surface application and incorporation
4. Discuss the conditions that cause soil compaction and suggest ways to keep it to a minimum
5. Describe the positive and negative impacts on Septic tank waste on land use
6. Define and suggest strategies to avoid ponding
7. Describe ways of landspreading Septic Tank waste on field sites with **greater than** six inches of snow
8. Identify the records which must be kept concerning hauling and disposing of Septic wastes
9. Explain the vector attraction reduction requirements on Septage that is applied to agricultural land, a forest, or reclamation site
10. Explain the pathogen control requirements on Septage that is applied to agricultural land, a forest, or reclamation site
11. Discuss the problems caused by improper application of Septage
12. Describe the most frequent reasons for a Septic Tank malfunction

List the items that must be considered to get site approval for Septage land application for the following:

- » High Use Fields
- » Low Use Fields

List the maximum weekly hydraulic loading applied to an agricultural site in a seven day period for the following:

- » Septic Tank Waste
- » Holding Tank Waste
- » Grease Traps

State the yearly hydraulic loading to a Low Use Agricultural site in gallons for the following:

- » Septic Tank Waste
- » Holding Tank Waste
- » Grease Traps

Explain why nitrogen is a concern in the following:

- » Crop Management
- » Crop Selection
- » Groundwater Protection

List the maximum depth from surface to bedrock/groundwater for the following:

- » Surface Spreading
- » Incorporation
- » Injection

List the maximum allowable slope for Surface Application, Incorporation and Injection:

- » On Unfrozen Land
- » On Frozen or Snow Covered Land

List the minimum allowable distance for Surface application, Incorporation, and Injection, from the following:

- » Community Well
- » Private Well
- » Residence, Business or Recreational Area
- » Stream, River or Pond
- » Dry Run or Property Line

Estimate the permeability in inches/hour for the following:

- » Sandy Loam Soil
- » Silt Loam Soil
- » Clay Loam Soil

*Know the amount of time **after** Septage application that the following crops can be harvested from an agricultural field:*

- » Food crops grown in soil
- » Food or feed crops grown above soil
- » Crops likely to be in contact with soil/Septage mixtures

[Both Grades T & L]

1. Explain what constitutes a spill and the procedures and tools necessary for clean-up in the event of a spill

2. Discuss when and how Septage is best discharged to a wastewater treatment plant

3. List some problems wastewater treatment plants have with the treatment of Septage

4. Discuss the impact of shock loads and toxic dumps on wastewater treatment plants

5. State the starting and ending dates for winter Septage disposal to a wastewater treatment plant and know the application deadline for applying to the POTW for permission to dispose of septage during winter

6. Explain the procedure and exceptions to making application to a wastewater treatment plant for winter Septage disposal

7. Describe in what situations a wastewater treatment plant is required to accept Septage on a year-round basis

8. Discuss size limitations and restrictions on Septage Storage Facilities

9. Describe the official business documentation that must be carried in each Septage Servicing Vehicle

10. Outline a vehicle maintenance and inspection plan

11. Discuss proper truck cleaning procedures

12. Discuss the kinds of repairs that may be required for a malfunctioning Septic and Holding Tank system, and state who may perform these tasks

MONITERING

[Both Grades T & L]

1. Discuss what a representative sample is
2. Describe the procedures for taking a representative sample

SAFETY

[Both Grades T & L]

1. Understand the Confined Space Entry procedures and requirements
2. Describe the recommended immunizations for Septage haulers

CALCULATION

[Grade L]

1. Calculate appropriate Septic Tank waste application rates
2. Determine vehicle spreading rates when applying Septage
3. Calculate the Available Water Holding Capacity of a soil sample
4. Describe and illustrate an example of how to determine the Annual Agronomic Rate

[Both Grades T & L]

1. Given a truck with known capacity, estimate the maximum total and axle weights

ADDITIONAL RESOURCES

» Administrative Code NR 113 & NR114

» Septage Servicing Handbook

Copies may be downloaded from the DNR website:
http://dnr.wi.gov/regulations/opcert/septage.html