New NOWRA Educational Resources

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NOWRA
National Onsite Wastewater Recycling Association



Overview of Materials Available & Under Development

- Homeowner education and training materials
- Completed training materials
  - O&M curriculum
  - Solutions for Difficult Sites curriculum
  - Resolving Challenges in Small Communities
- Future educational and training resources under development

Resource #1: Homeowner Education Materials

- EPA grant - This project was funded under an EPA Training and Technical Assistance for Wastewater Treatment Works for the Prevention, Reduction and Elimination of Pollution
- Sub-award through RCAP
- Homeowner Education Program



Program: Homeowner

Homeowner Education Program
Learning Objectives

As a result of this training, participants will be able to:

- Explain how an onsite wastewater treatment system (OWTS) processes wastewater
- Describe the needed maintenance with typical onsite systems
- Implement changes in their home to reduce the load to their OWTS
- Solve basic problems homeowners may have with their system and/or identify resources to help solve problems

Training Materials Available

- Materials are to be modified to fit the amount of time and systems in the community
  - Editable training modules (PPT) with extensive speaker notes
  - Integrated EPA videos and diagrams
    - Overview of types of septic systems
    - Overview of management
    - Home management tips
    - Identifying and troubleshooting problems
- Training course overview and outline
- Pre/post test - evaluation
- Videos and drone photos to show construction and for troubleshooting
- Available at: https://www.nowra.org/resources/rcap-projects/homeowner/

Program: Homeowner

User Guide Available in English and Spanish

PDF document that can be printed, posted or emailed





Program: Homeowner

Table of Contents and Section Example

3	**Chapter 1** Importance of Sewage Treatment
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Typical Onsite Wastewater Treatment Systems Features

Fixtures and Plumbing

Approximately 80% of the water we consume becomes wastewater. All water containing human waste, nutrients, dirt, and other contaminants must be collected and delivered to the septic tank for pretreatment and then to the soil treatment area for final treatment and dispersal. In some older homes, the drain from the laundry may have been plumbed to bypass the septic tank; however, this can cause damage by allowing too many solids to enter the soil treatment area. In addition, some drains from laundry discharge to the surface, resulting in a risk to public health and the environment due to the contaminants. In contrast, water from roof drains, basement drainage sump pumps, hot tubs, swimming pools, and air conditioning condensate are not considered wastewater, and should not be put into the OWTS. The discharge from water treatment systems (such as a water softener or reverse osmosis) could be handled separately from the OWTS because the large water volume needed to regenerate these devices could overload the system.

Original and remodeled plumbing systems must be correctly designed and installed to allow trouble-free operation. **Before remodeling, consider the**

Every home has a wastewater piping system that collects wastewater from the source and transports the wastewater to the OWTS. This plumbing is called the drain, waste, and vent (DWV) system, because it is used to drain wastewater from the home and to allow air to vent. You may have noticed pipes protruding from your roof— these pipes allow air to enter the DWV system as water moves through the plumbing system. Air is displaced as water moves through the piping, and this air must be allowed to vent. Likewise, after the water moves through, air must be allowed to enter the piping, or a vacuum will form. This vacuum can pull the water out of the toilet bowl and other gas traps, which will allow sewer gases to enter the home.



Program: Homeowner

CHAPTER TEN

Troubleshooting

Finding an Existing System

Finding the OWTS may not be an easy task but is necessary for proper maintenance of the septic tank and distribution system, for troubleshooting problems, and for making future plans for the property. Many counties and cities with permit and inspection programs for OWTSs will have this information on file. Be sure to verify the accuracy of the records at the site. If no plans or drawings exist, the following steps can be taken.

First, locate the septic tank. If the access manhole or inspection pipes are at ground level, they will be easy to find. Unfortunately, they are often buried several inches, or even several feet, below the ground surface. To locate the tank, go into the basement or crawlspace and determine the direction the sewer pipe goes out through the wall or floor. The sewer pipe should be easy to find. It is usually the largest diameter pipe made of plastic or cast iron with a cleanout access.

Once the sewer pipe is located, determine the direction it leaves the house. With a metal rod as a probe, start carefully poking around in the soil 10 to 15 feet from the foundation of the house in the same direction as the pipe was headed out from the basement. A metal detector may be of assistance in finding the tank, since most concrete septic tanks contain metal reinforcing rods. NOTE: Prior to probing with a metal or fiberglass rod, contact your locally required utility locates for any underground utilities.



Collecting a wastewater sample.

Next, locate the STA. Above-grade systems are easy to find, but a below-ground system may be more difficult. Try looking around the yard in the general direction where the sewer pipe left the house. These clues may help locate the system:

- An area where the grass isn't growing well, or where the grass is greener or grows faster.
- An area where there is a slight rise or depression.
- An area where the soil is soggy when the rest of the yard is dry.

Often, a licensed contractor or inspector has tools to locate the STA. Once the STA is located, be sure to make a map of its location. If the STA cannot be found, there may not be one or it may be discharging into ground or surface water. If the STA is located but not the septic tank, work backwards toward the house, probing for the tank.

CHAPTER ELEVEN

Common Problems

The three most common causes of OWTS failure are:

1. The system is not properly designed or installed.
This could be the result of bad choices and mistakes made by designers, installers and inspectors, or homeowners who have increased their water usage without making appropriate adjustments to their OWTS.

2. Over-use of the system
Too much water or high strength wastewater, abnormally high water use, leaks, or short periods of very high water use can all cause failure. Wastewater containing high levels of organic material, solids, or cleaners could overload the system.

3. Improper maintenance
When too many solids are allowed to accumulate in the septic tank or other pretreatment component, the treatment volume is reduced and the solids will be carried out into the STA and can plug it. Most frequently, this is just because the owner did not have the septic tank cleaned (pumped) periodically.



Installation of septic tanks.

Program: Homeowner

CHAPTER TWELVE

OWTS Troubleshooting Guide for Homeowners

The system is failing if it is not effectively treating the sewage. **Diagnosing the specific causes of failure may be difficult for the owner and often requires the skills of a professional.** The following chart shows common problems, possible causes, and remedies.

PROBLEM	RISK	CAUSES	REMEDIES
Alarm going off	Effluent may back up into home or surface in yard.	• Pump failed or undersized • Fuse breaker tripped • Pump plugged • Controls malfunctioning • Water infiltration • Excessive water use • Frozen or blocked pipe • Stuck toilet valve	• Control water use • Check breaker & plugs • Check controls & pump • Make sure a professional replaces pump with proper size unit • Fix leaks in plumbing, tank, or piping • Hire a professional to thaw the system
Freezing	Effluent may back up into home or surface in yard.	• Extreme cold temperatures • Improper drainage of pipes and components • Lack of proper soil cover • Lack of snow cover • Leaks or other low use	• Control water use • Thaw line and determine where and why it froze • Fix leaks • Insulate components • Confirm no components were damaged
Fire over system	System components above the ground and shallowly buried may have been damaged.	• Grass or forest fire over system	• Evaluate safety concerns due to exposed/ damaged components • Hire a professional to evaluate the system • Repair damaged components prior to use

PROBLEM	RISK	CAUSES	REMEDIES
Flooding over system	Effluent may back up into home or surface in yard.	• Large rainfall events • System in a floodplain • Improper grading	• Do not use system when flooded • After flood water recedes, clean out the tanks/pretreatment components to remove sediment and debris • Keep traffic off the system to limit compaction • Have a professional evaluate your system • Repair/replace damaged components
Sewage on surface or backing up in home	Human contact with sewage is a serious public health risk. Many waterborne diseases exist in household sewage.	• Excess water entering system • Improper plumbing • Blockage in plumbing • Improper operation • Pump/control panel failure • Improper system design • Roots clogging pipes • Improper venting • A portion of the system is frozen or flooded • Stuck toilet valve	• Fence off area or operate as a holding tank until fixed • Fix leaks/vents • Install water-saving fixtures • Stop using garbage disposal • Pump septic tank and check pump(s) • Replace broken or cracked pipes and remove roots • Avoid planting water -loving trees • Seal pipe connections • Hire a professional to thaw the system
Sewage odors inside or outside the house	Toxic gases can cause discomfort or illness.	• Improper plumbing • Sewage surfacing in yard • Sewage backup in house • Unsealed basement/ crawl space sewage pump • Roof vent pipe frozen shut or blocked • Dry trap in underused fixture or floor drain	• Repair plumbing • Pump septic tank and check pump(s) • Add water to drain traps in the house • Tighten seals on pump(s) and cleanout(s) • Thaw or clear roof vent • Add water to fill the dry trap

Program: Homeowner

Online Free Self Paced Module
https://www.pathlms.com/nowra/



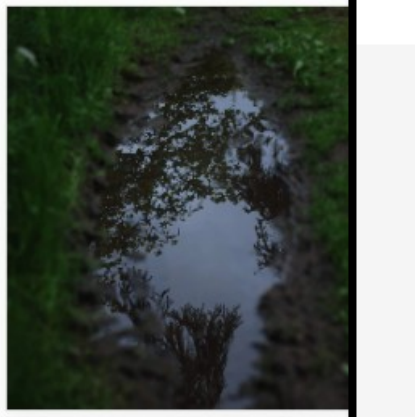
Program: Homeowner

Course Highlights

Safety – rules to protect your family and pets

Select each flashcard to view some important safety practices to consider when performing maintenance on your OWTS.








What can go into your OWTS?

Sort the following items by dragging each card to the correct category.

Human waste

Allowed in your OWTS

Not allowed in your OWTS

Program: Homeowner

Common Problems & Causes

Listed below is a list of common problems and their causes. For detailed troubleshooting information, please refer to the NOWRA User Guide. It is important to contact a septic system professional. To find one in your area, please use our locator.

1

Problem: Alarm Going Off



Course Highlights

Risks:

Effluent may back up into the home or surface in the yard.

Causes:

- Pump or pump control (float) malfunction
- Water infiltration/excess water usage
- Advanced pretreatment malfunction
- Plugged effluent screen/Lack of maintenance
- Freezing

Remedies:

- Call a professional
- Control water use
- Check breaker & plugs
- Check controls & pump
- Fix leaks in plumbing, tank, or
- Clean screens
- Pump tank
- Thaw the system/insulate in the

Program: Homeowner

NOWRA’s First Septic Smart Week Webinar

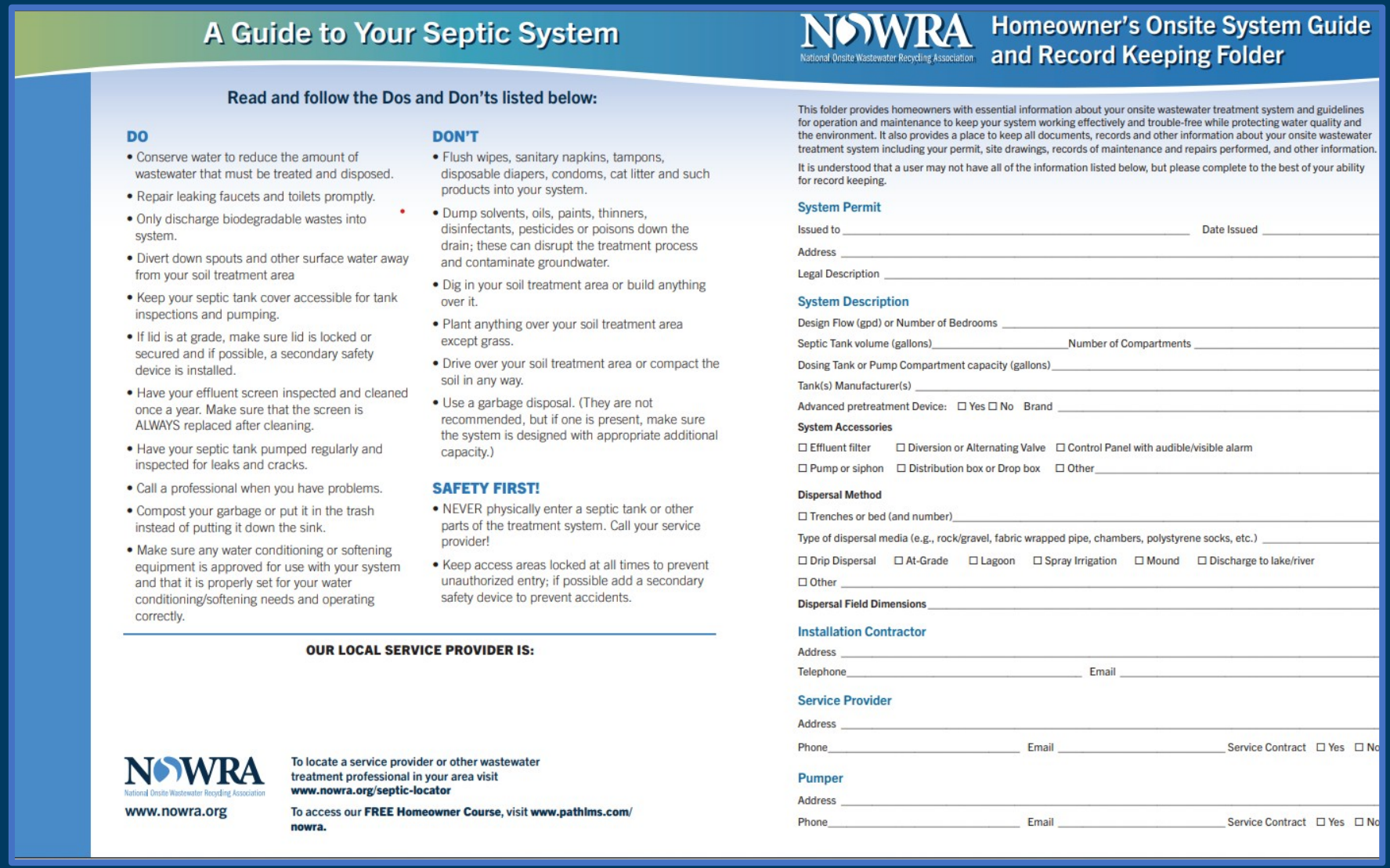
Course was recorded and available for free to take at anytime



https://www.pathlms.com/nowra/courses/292831

Program: Homeowner

Updated NOWRA Homeowner Folder



A Guide to Your Septic System

Read and follow the Dos and Don'ts listed below:

DO

- Conserve water to reduce the amount of wastewater that must be treated and disposed.
- Repair leaking faucets and toilets promptly.
- Only discharge biodegradable wastes into system.
- Divert down spouts and other surface water away from your soil treatment area
- Keep your septic tank cover accessible for tank inspections and pumping.
- If lid is at grade, make sure lid is locked or secured and if possible, a secondary safety device is installed.
- Have your effluent screen inspected and cleaned once a year. Make sure that the screen is ALWAYS replaced after cleaning.
- Have your septic tank pumped regularly and inspected for leaks and cracks.
- Call a professional when you have problems.
- Compost your garbage or put it in the trash instead of putting it down the sink.
- Make sure any water conditioning or softening equipment is approved for use with your system and that it is properly set for your water conditioning/softening needs and operating correctly.

DON'T

- Flush wipes, sanitary napkins, tampons, disposable diapers, condoms, cat litter and such products into your system.
- Dump solvents, oils, paints, thinners, disinfectants, pesticides or poisons down the drain; these can disrupt the treatment process and contaminate groundwater.
- Dig in your soil treatment area or build anything over it.
- Plant anything over your soil treatment area except grass.
- Drive over your soil treatment area or compact the soil in any way.
- Use a garbage disposal. (They are not recommended, but if one is present, make sure the system is designed with appropriate additional capacity.)

SAFETY FIRST!

- NEVER physically enter a septic tank or other parts of the treatment system. Call your service provider!
- Keep access areas locked at all times to prevent unauthorized entry; if possible add a secondary safety device to prevent accidents.

OUR LOCAL SERVICE PROVIDER IS:

NOWRA National Onsite Wastewater Recycling Association
www.nowra.org

To locate a service provider or other wastewater treatment professional in your area visit **www.nowra.org/septic-locator**

To access our **FREE Homeowner Course**, visit **www.pathlms.com/nowra.**

NOWRA National Onsite Wastewater Recycling Association — Homeowner's Onsite System Guide and Record Keeping Folder

This folder provides homeowners with essential information about your onsite wastewater treatment system and guidelines for operation and maintenance to keep your system working effectively and trouble-free while protecting water quality and the environment. It also provides a place to keep all documents, records and other information about your onsite wastewater treatment system including your permit, site drawings, records of maintenance and repairs performed, and other information.

It is understood that a user may not have all of the information listed below, but please complete to the best of your ability for record keeping.

System Permit

Issued to _____ Date Issued _____

Address _____

Legal Description _____

System Description

Design Flow (gpd) or Number of Bedrooms _____

Septic Tank volume (gallons)_____ Number of Compartments _____

Dosing Tank or Pump Compartment capacity (gallons)_____

Tank(s) Manufacturer(s) _____

Advanced pretreatment Device: ☐ Yes ☐ No Brand _____

System Accessories

☐ Effluent filter ☐ Diversion or Alternating Valve ☐ Control Panel with audible/visible alarm

☐ Pump or siphon ☐ Distribution box or Drop box ☐ Other_____

Dispersal Method

☐ Trenches or bed (and number)_____

Type of dispersal media (e.g., rock/gravel, fabric wrapped pipe, chambers, polystyrene socks, etc.) _____

☐ Drip Dispersal ☐ At-Grade ☐ Lagoon ☐ Spray Irrigation ☐ Mound ☐ Discharge to lake/river

☐ Other _____

Dispersal Field Dimensions _____

Installation Contractor

Address _____

Telephone_____ Email _____

Service Provider

Address _____

Phone_____ Email _____ Service Contract ☐ Yes ☐ No

Pumper

Address _____

Phone_____ Email _____ Service Contract ☐ Yes ☐ No

https://tinyurl.com/NOWRA-Homeowner-Folder

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YOUR ONSITE WASTEWATER TREATMENT SYSTEM

You are the owner (and operator!) of an onsite wastewater treatment system (a.k.a. septic system) that is designed to be environmentally safe and to protect public health. A properly installed and operated system treats wastewater from your home and returns it to the groundwater. Successfully used for over 100 years, nearly one-fourth of the United States population uses this method of wastewater treatment. For more resources, please see the Homeowner Course and User Guide on NOWRA's website (www.nowra.org).

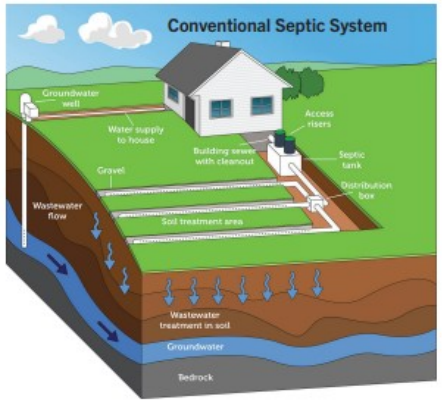
SYSTEM DESCRIPTION

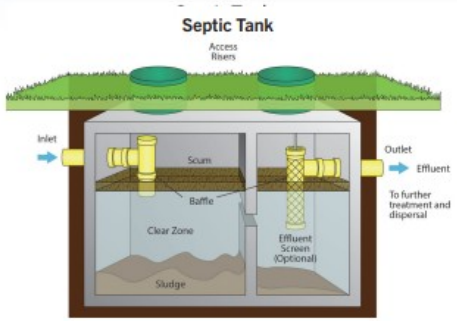
The first component in the system is a septic tank that uses natural processes to treat the wastewater generated in your home. The second component is a soil treatment area (also called a drainfield) where the wastewater is dispersed back into the groundwater after it is treated. The system accepts both "blackwater" (toilet wastes) and "graywater" (wastes from the kitchen sink, bath and showers, laundry, etc.).

Note that wastes from food preparation and laundry do contain harmful bacteria and other pollutants that still require treatment. Water from foundation or footing drains, roof gutters, and condensate from air conditioners or ice machines (so-called "clear" water) should never be discharged to the system.

THE SEPTIC TANK

The septic tank provides the first step in treatment by removing solids. Its primary purpose is to protect the soil treatment area or other system components from becoming clogged by solids that are suspended in the wastewater. The wastewater discharged from the home goes into the tank where it is retained for a day or more. During the time it is in the tank, the heavier solids settle to the bottom to form a sludge layer. The lighter solids, greases and oils float to the top to form a scum layer.





In addition to acting as a sedimentation chamber and providing storage for the sludge and scum, bacteria in the septic tank also digests or breaks down the waste solids. Micro-organisms that thrive without oxygen feed on the solids to reduce the volume of sludge and scum. In the process, carbon dioxide, hydrogen sulfide and other gases are produced which are vented from the tank through the plumbing vent on the roof of the building that the tank services. Only about 40% of the sludge and scum volume can be reduced in this manner, so the tank must be pumped regularly to remove the accumulated solids. If not inspected periodically and pumped when needed, the tank will fill with sludge and the solids will be washed out into the soil treatment area where they will quickly clog the soil. Newer systems may include an effluent screen near the outlet of the tank. The screen helps remove additional solids and can extend the life of the system. The screen also must be routinely inspected and cleaned when needed. Removal of the screen can cause premature failure.

THE SOIL TREATMENT AREA

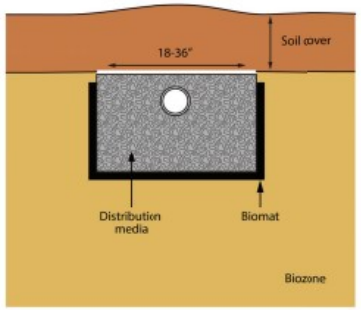
The soil treatment area, often called a drainfield, provides final treatment of the wastewater and returns the treated water to the groundwater. The total area required for adequate soil treatment is determined by the expected peak flow of wastewater from the home and the characteristics of the soil in the treatment area. The soil treatment area is typically built as a series of trenches or as one larger bed, and is typically kept at a shallow depth. The soil treatment area must be constructed in permeable soils and be two or more feet above the seasonal high groundwater table. While there are many types of soil treatment area systems the following describes a typical washed rock trench system.

The treatment area is excavated to a depth that maintains the required distance above the seasonal high water table or a restrictive zone of soil. The excavated trench or bed is filled with six to twelve inches of washed rock. A perforated pipe is installed within the gravel to distribute the partially treated liquid (effluent) from the septic tank. The washed rock and pipe is covered with synthetic fabric or other permeable barrier material to help keep soil particles out of the system. The area is backfilled with soil that will support a vegetative cover. The vegetation helps to stabilize the surface and also takes up some of the moisture and nutrients from the effluent.

The septic tank effluent either flows to the soil treatment area by gravity or is dosed by pump or siphon. The effluent enters the soil and is treated as it percolates to the groundwater. The soil acts as biological filter to remove any remaining harmful substances including disease causing bacteria and other undesirable wastewater constituents in the septic tank effluent.

Soil treatment areas can include at-grades, mounds or drip distribution. There are also several varieties of trench media that can be used such as washed rock. If you have any of these alternatives contact your local service provider or NOWRA for more information.

Typical Washed Rock Trench
Conventional Trench



TAKING CARE OF YOUR ONSITE SYSTEM

Your onsite treatment system represents a significant investment which you will want to protect. "An ounce of prevention is worth a pound of cure" was never truer than it is with onsite system care. With proper operation and regular maintenance, your system will function better and last longer.

Have your septic tank inspected every 3 to 4 years and pump it if the sludge fills the bottom third of your tank or if you see the scum layer near the top of the outlet baffle. The frequency of pumping depends on a number of factors and can vary substantially between homes from once or more a year to 10 years or more.

Use this folder to keep records of each tank pumping including the date and estimated sludge depth and scum thickness. Over time, these records will help you anticipate when tank pumping might be necessary. Committing a little attention to the care of your system is the best way to avoid the problem of a failing system. For more resources, please see the Homeowner Course and User Guide on NOWRA's website (www.nowra.org).

System Maintenance Record

Date	Description

NOWRA National Onsite Wastewater Recycling Association

A HOMEOWNER'S RECORD KEEPING FOLDER AND SYSTEM GUIDE

Program: Homeowner

Professional Training Program

- Subaward through RCAP
- Project #1: Operation and Maintenance
- Project #2: Solutions for Difficult Sites
- Project #3: Resolving Challenges in Small Communities
- Training development team: Nancy Deal, Marcia Degen, Gary Hawkins, Sara Heger, Andy Lazur, Bruce Lesikar, and Mary Lusk
- Stakeholder review group – each project had 40-60 professionals reviewing and commenting on the materials

#1 - O&M Training Materials



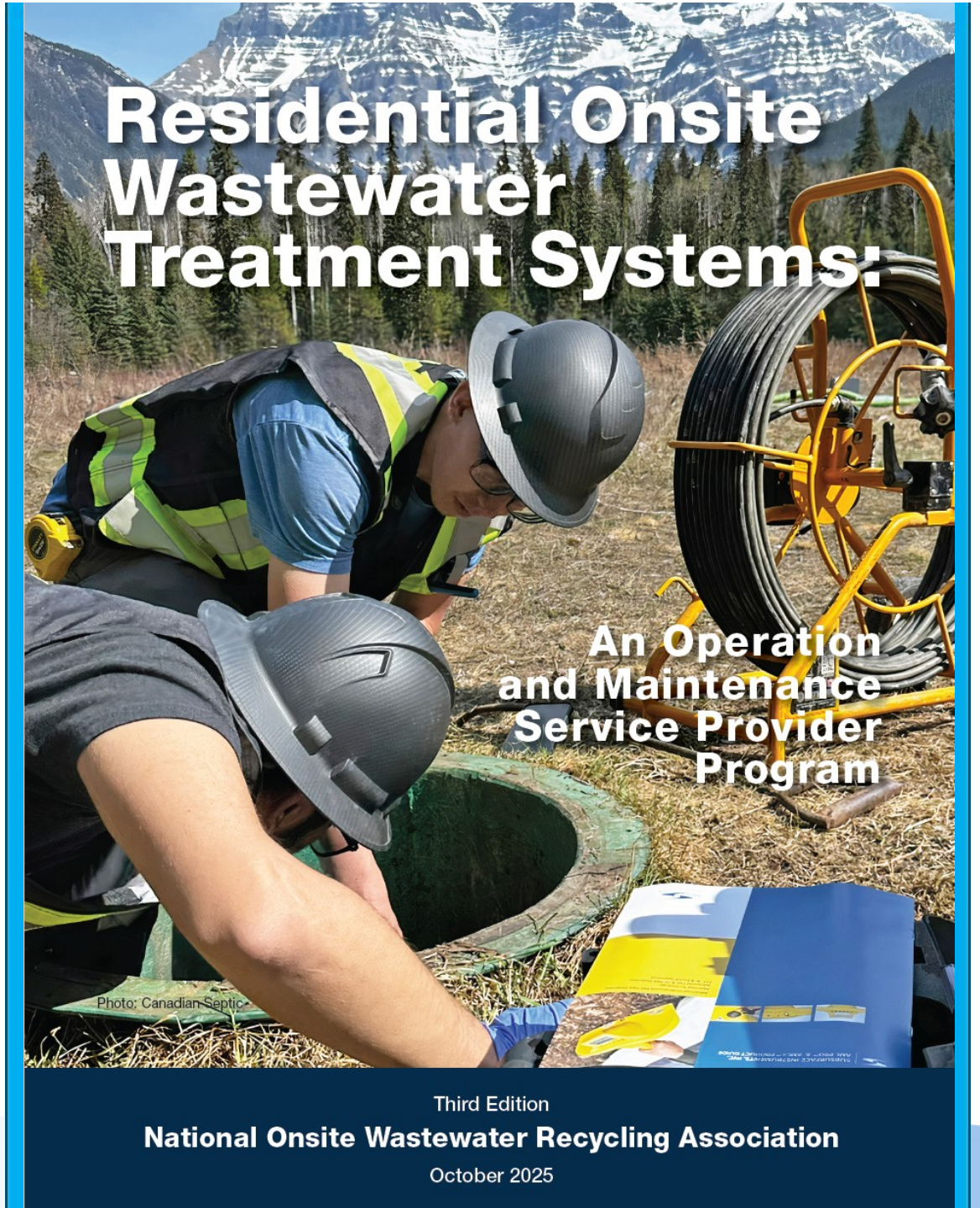
Objective - Workforce development related to O&M of OWTS



Audience – OWTS professionals



Approach – Checklist as tools with presentations and activities related to various components



OWTS Operation and Maintenance Training Materials

- Initially developed in 2008
- Updating of materials to reflect new technologies, approaches and troubleshooting
- Past manual available through Iowa State, updated version is now be available online in PDF format and will be printed again from Iowa State (timeline TBD)

O&M Courses Includes

- Training guide
- Agendas
- 30 editable presentations with detailed speaker notes
- Evaluation questions
- Homework
- Manual with O&M checklists



Program: Professional O&M

O&M Technical Content

- Introduction to O&M
  - Wastewater
  - Treatment overview
- Safety
- Business practices
- Site Assessment
- Pretreatment tanks
- Dosing systems
- Advanced treatment
- Final treatment and dispersal
- Troubleshooting
  - Sampling
- Math review
- Forms and tools

Program: Professional O&M

#2 - Solutions for Difficult Sites Training Materials

Objective - Identification of what makes difficult site and offer viable onsite solutions

Audience - design professionals and regulators

Approach - Course materials provided an assessment of the challenges and then provides a range of solutions

Program: Professional Difficult Sites

Difficult Sites Assessment and Solution Topics

- Presentations, training guide, activities
- Assessment:
  - Wastewater
  - Soil treatment area (STA)
  - Climate
  - Regulatory
  - Construction
- Solutions:
  - Flow and load equalization
  - Source water
  - Limited
    - STA area
    - STA length on the slope
    - STA soil depth
  - Climate
  - Regulatory
  - Construction

Program: Professional Difficult Sites

#3 – Resolving Wastewater Challenges in Small Communities

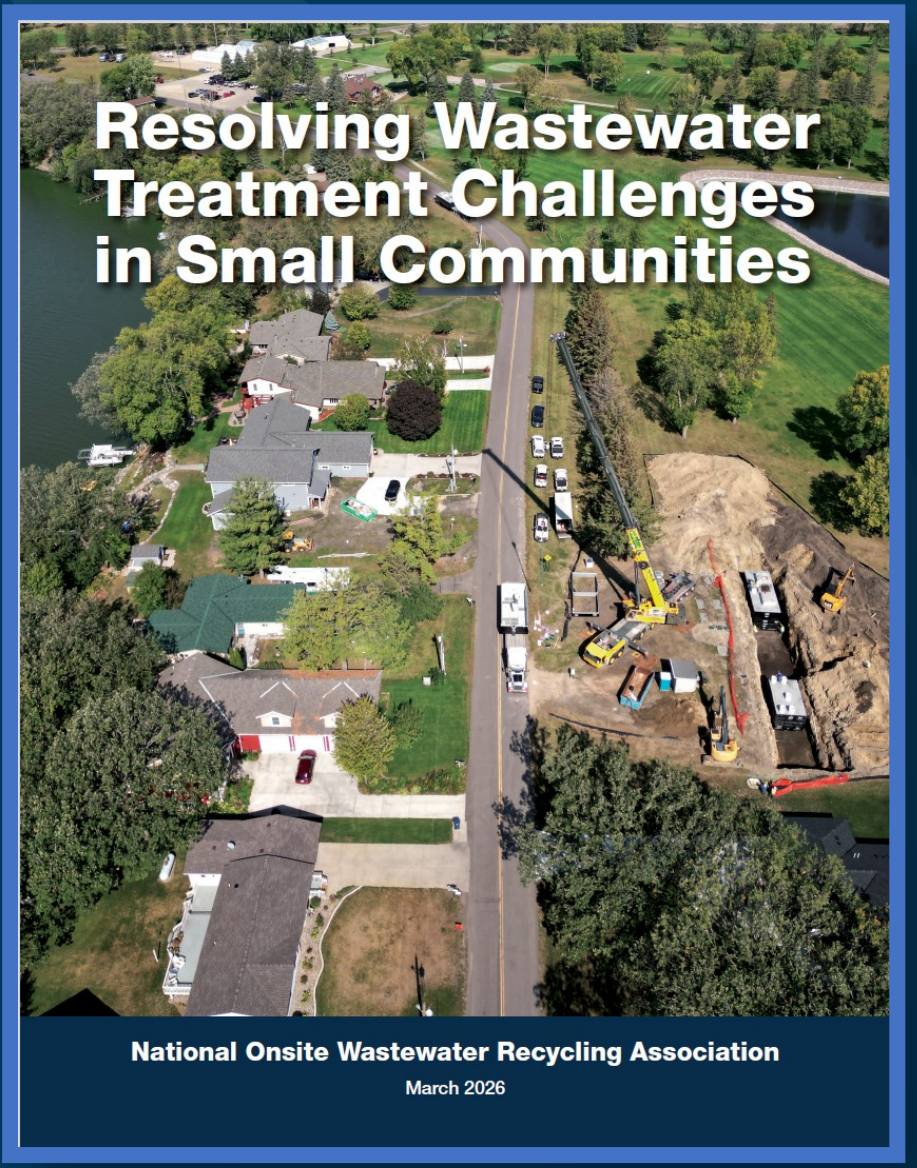
Objective – assist communities in an effective processes to solve their wastewater needs

Audience – small communities with a wastewater challenge along with the consultants who assist them through the process

Approach: 13 modules from the Basics of WW treatment to Implementation of Presentations, manual, training guide, activities

Small Community Technical Content

- Overview of decentralize WW treatment
- Data needs and working with consultants
- Treatment options
- Management and Structure options
- Financing options
- Selection and Implementation
- Case studies



Program: Small Communities

Access to the Materials

Sign up via Google Form
https://z.umn.edu/nowramaterials



Online Training

All three programs will be available on NOWRA's Learning Management System: www.pathlms.com/nowra/



Program: Professional and Small Community

Future Educational and Training Resources Under Development

NOWRA
National Onsite Wastewater Recycling Association



Current Projects

- Subaward through RCAP from EPA
- Time period 2025 – 2028
- Development of training materials and providing training and technical assistance (TA)
- Training development team: Allison Blodig, Chuck Cousino Nancy Deal, Gary Hawkins, Sara Heger, Andy Lazur, Bruce Lesikar, Mary Lusk, Jillian Maxy-Brown
- Stakeholder review group – each project has 40-60 professionals reviewing and commenting on the materials

College Curriculum Activities

- **Goal: Link decentralized system design, regulation, installation, and management to fundamental engineering, soil science, biology, and water quality concepts**
- Outline based on a 15-week semester
- For undergraduate students in environmental science, engineering, soils and public health
- Development of lectures, activities, homework, quizzes, term paper/project and exams
- Piloted in person/online at Auburn University in the Fall of 2027

Updated Decentralized Glossary



Goal: Modernize and update 2009 CIDWT glossary



Definitions moved into an online searchable database of definitions, images, pictures and videos



Will be updated, added too, more images developed

Program: Decentralized Glossary

Glossary - nowra.org/glossary

nowra.org/glossary/?s=septic+tank

Search: septic tank

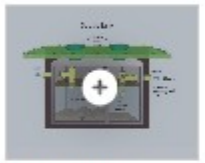
NOWRA

EDUCATION CONFERENCE ADVOCACY RESOURCES

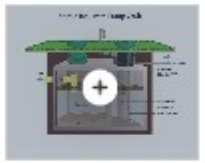
septic tank

Water-tight, covered receptacle for treatment of sewage; recei
floating solids from the liquid, digests organic matter by anaerc
allows clarified liquids to discharge for additional treatment an

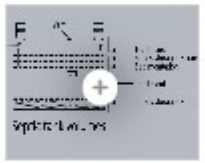
Images\Graphics:



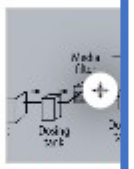
Septic Tank



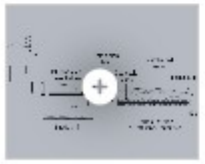
Septic tank pump vault, pump demand dosing



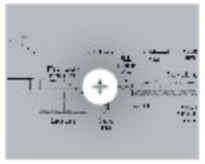
Septic tank volumes



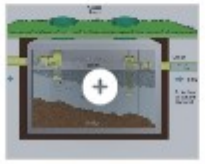
Example OW SP media fi LPD distribu



Gravity distribution system



Low pressure distribution STA

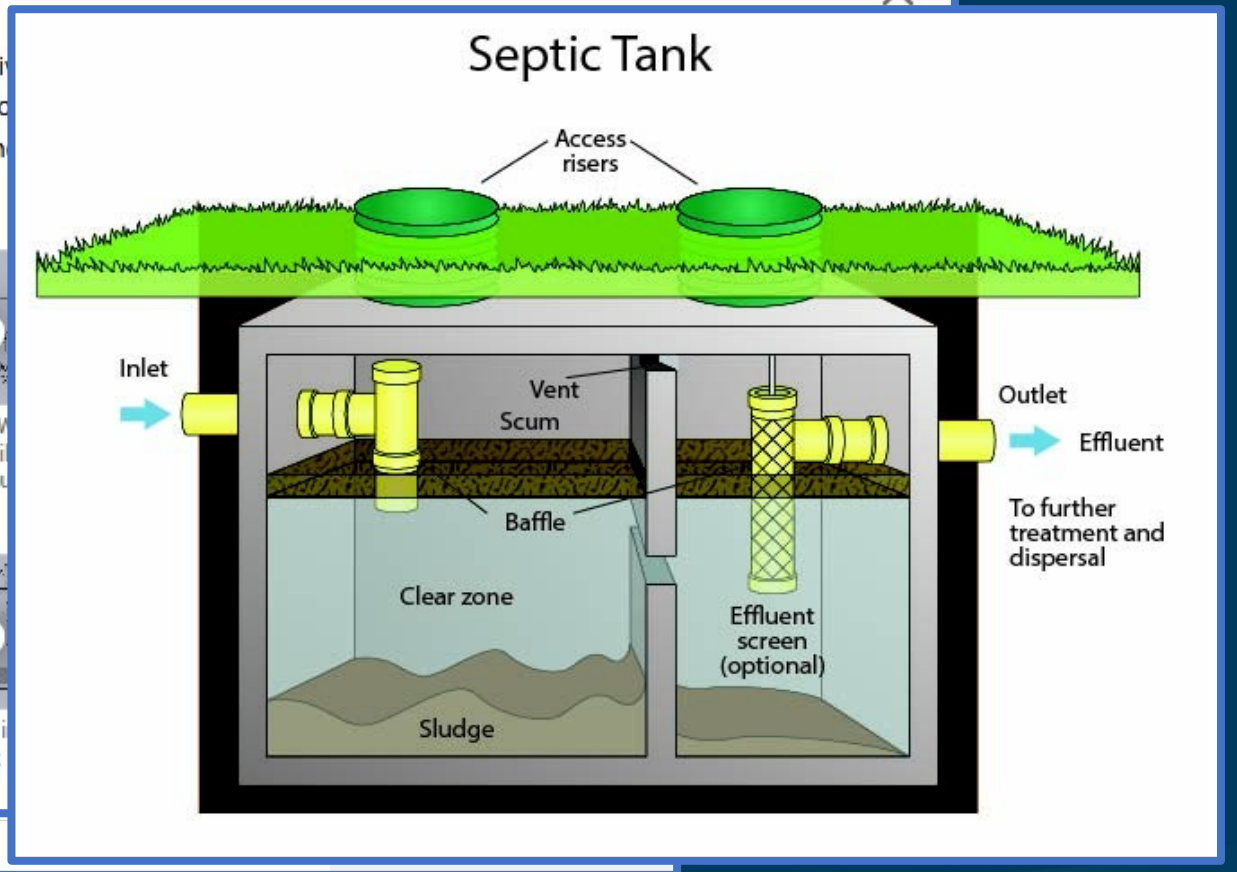


Septic tank with solids at maximum capacity



Clear zone i septic tank

anoxic



Program: Decentralized Glossary

Performance Monitoring and Troubleshooting



Goal: Development of advanced training materials for service providers



Support effective life-cycle management through advanced monitoring and troubleshooting via a manual and training



Training program, manual and pilot events

: Troubleshooting Training Program: Troubleshooting

RME Training



Goal: Development of training materials related to establishing Responsible Management Entities (RMEs) for decentralized systems



Approach: Interviewing modern RME examples to determine tools and lessons learned to be shared



3 webinars will be held to high case studies

Regulatory Professional Training Program



Goal: Develop training materials focused on the role of regulatory officials in the decentralized systems industry



In partnership with NEHA



Training program, manual and pilot events

Technical Assistance Projects



Tribal Wastewater Training - develop training materials to improve the knowledge and skills of the **Tribal** decentralized wastewater treatment system workforce



Training and Technical Assistance - deliver training materials to improve the knowledge and skills of decentralized personnel targeting solutions with identified **cesspool** impacts

Training Summary

- Free pilot events in 2027/2028
  - Troubleshooting: 1 in person and webinar series
  - Regulatory: 2 in person events and a webinar series
- RME: 3 webinars
- Tribal: 4 in person training/technical assistance
- Cesspool: 3 in person events/technical assistance
- Interested in hosting – reach out to Sara at sheger@nowra.org

Join our Stakeholder Groups!

- Stakeholders will guide the development and refinement of these materials
- If you're interested in volunteering your expertise for one or more of the projects, please complete our interest form
- https://z.umn.edu/NOWRAgrant



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NOWRA
National Onsite Wastewater Recycling Association

