Registration Form

Onsite 303 CEU Training Course

48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL $50.00

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You will have 90 days from this date in order to complete this course

List number of hours worked on assignment must match State Requirement. _____

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Class/Grade_____

Please circle/check which certification you are applying the course CEU's.
Wastewater Collection____ Wastewater Treatment____ Onsite Installer ____

Other _____

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You can obtain a printed version of the course manual from TLC for an additional $169.95 plus shipping charges.

AFFIDAVIT OF EXAM COMPLETION

I affirm that I personally completed the entire text of the course. I also affirm that I completed the exam without assistance from any outside source. I understand that it is my responsibility to file or maintain my certificate of completion as required by the state or by the designation organization.

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In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

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Onsite 303 Answer Key

Name _____ Phone_____

Did you check with your State agency to ensure this course is accepted for credit?

Method of Course acceptance confirmation. Please fill this section

Website __ Telephone Call___ Email____ Spoke to_____

Did you receive the approval number, if applicable? _____

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You are responsible to ensure that TLC receives the Assignment and Registration Key. Please call us to ensure that we received it.

Please circle, underline, bold or X only one correct answer

Please Circle, Bold, Underline or X, one answer per question. A **felt tipped pen** works best.

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ONSITE 303 CEU TRAINING COURSE

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Please write down any questions you were not able to find the answers or that have errors.

When Finished with Your Assignment...

REQUIRED DOCUMENTS
Please scan the **Registration Page, Answer Key, Survey and Driver's License** and email these documents to info@TLCH2O.com.

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If you are unable to scan, take a photo of these documents with your **iPhone** and send these photos to TLC, info@TLCH2O.com.

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ONSITE 303 CEU Training Assignment

You will have 90 days from the start of this assignment to finish it. Only one answer per question. Please utilize the Answer Key. Please fax or e-mail your completed answer key and registration form to TLC.

You are expected to circle or mark the correct answer on the enclosed answer key. Please include your name and address on your exam. The answer key is in the front. There are no intentional trick questions. (s) means the answer may be plural or singular in nature.

You can e-mail or fax your Answer Key along with the Registration Form to TLC.

Please write down any questions you were not able to find the answers or that have errors.

ONSITE SEWAGE FACILITIES (OSSF) ONSITE SYSTEMS SECTION

1. If a septic system is not functioning properly, clean water is not returned to our groundwater systems. Our goal is to ensure that you can treat your wastewater while protecting human and environmental health in a _____ manner.

A. Environmental
B. Cost-effective
C. Best possible
D. None of the above

Onsite Sewage Facilities (OSSF)

2. Onsite/decentralized wastewater treatment systems, normally called septic system(s), treat sewage from homes and businesses that are not connected to a_____.

A. Decentralized sewer system(s)
B. Municipal wastewater treatment
C. Centralized wastewater treatment plant
D. None of the above

3. Which of the following include individual onsite septic systems, cluster systems, and alternative wastewater treatment technologies like constructed wetlands, recirculating sand filters, mound systems, and ozone disinfection systems?

A. Decentralized treatment systems
B. Municipal wastewater treatment
C. Centralized wastewater treatment plant
D. None of the above

4. A septic tank and drainfield combination is the oldest and most common type of OSSF, although newer aerobic and biofilter units exist which represent scaled down versions of_____.

A. Groundwater system(s)
B. Municipal sewage treatments
C. Collection system
D. None of the above

5. OSSFs account for about _____% of all domestic wastewater treatment in the United States.

A. 25
B. 15
C. 50
D. None of the above

(s) means the answer may be plural or singular in nature.

Types of Sewer Systems

6. Centralized sewer systems are usually broken out into three different categories: sanitary sewers, storm sewers, and_____.

A. Septic system(s)
B. Combined sewers
C. Onsite wastewater management program(s)
D. None of the above

7. Which of the following are designed to get rainwater off the streets during rain events?

A. Septic system(s)
B. Combined sewers
C. Storm sewers
D. None of the above

8. Most _____do not connect with a treatment plant, but instead drain directly into nearby rivers, lakes, or oceans.

A. Septic system(s)
B. Combined sewers
C. Storm sewers
D. None of the above

Key Terms

9. Which of following the means a sewage treatment plant that incorporates a means of introducing air and oxygen into the sewage to provide aerobic biochemical stabilization during a detention period?

A. Alternative System
B. Aerobic System
C. Aerobic Sewage Treatment Facility
D. None of the above

10. Which of following the means an alternative system that incorporates a septic tank or other treatment facility, an aerobic sewage treatment facility, and an absorption facility to provide treatment before dispersal?

A. Alternative System
B. Aerobic System
C. Aerobic Sewage Treatment Facility
D. None of the above

11. Which of following the means any onsite wastewater treatment system DEQ or the Commission approves for use in lieu of the standard subsurface system?

A. Alternative System
B. Aerobic System
C. Aerobic Sewage Treatment Facility
D. None of the above

12. Which of following the means may include anaerobic processes as part of the treatment system?

A. Alternative System
B. Aerobic System
C. Aerobic Sewage Treatment Facility
D. None of the above

Onsite Treatment Processes Options

13. The high cost of _____ and the advances made in individual and cluster (decentralized) system technologies have expanded the array of available treatment options and supported development of a more tailored approach to wastewater management services.

A. Sewage
B. Collection system
C. Centralized wastewater treatment plants
D. None of the above

14. Options now exist that span the full spectrum of treatment facilities, from large centralized plants, to_____, to individual treatment systems providing conventional or enhanced service.

A. Large and small soil-discharging clustered facilities
B. Centralized wastewater treatment plants
C. Collection system
D. None of the above

Basic Onsite Treatment Processes

15. Which of the following are designed to accomplish the same thing—the treatment of wastewater—but how this is accomplished is based on the type of treatment technology used?

A. Individual and clustered wastewater systems
B. Centralized wastewater system(s)
C. Collection system(s)
D. None of the above

Primary Treatment

16. Physical treatment processes involving capture of solids and fats/oils/grease in an enclosed vessel, typically by settling and flotation, such as provided in a septic tank or grease interceptor tank. This process also includes trapping of solids via _____or screens prior to discharge of the tank effluent.

A. Conventional system(s)
B. The tank effluent
C. Septic tank effluent filters
D. None of the above

Secondary Treatment

17. Which of the following designed to remove organic matter, mostly through digestion and decomposition, often aided by introduction of or exposure to atmospheric oxygen?

A. Wastewater
B. Onsite sewage treatment
C. Biological and chemical processes
D. None of the above

Key Septic Terms

Identify the missing term.

18. Means the distribution of effluent to a set of absorption trenches in which each trench receives effluent in equivalent or proportional volumes.

A. Equal Distribution
B. Holding Tank System
C. Intermittent Sand Filter
D. None of the above

19. Means a structure used for disposal of human waste without the aid of water. It consists of a shelter built above a pit or vault in the ground into which human waste falls.

A. Septic tank
B. Cesspool
C. Privy
D. None of the above

20. Means a lined pit that receives raw sewage, allows separation of solids and liquids, retains the solids, and allows liquids to seep into the surrounding soil through perforations in the lining.

A. Black Waste
B. Cesspool
C. Swamp
D. None of the above

21. Means the sidewall area within an absorption trench or a seepage trench from the bottom of the trench to a level 2 inches above the distribution pipes, the sidewall area of any cesspool, seepage pit, unsealed earth pit privy, graywater waste absorption sump seepage chamber, or trench with drain media substitute, or the bottom area of a pressurized soil absorption facility installed in soil.

A. Alternative System
B. Cesspool
C. Effective Seepage Area
D. None of the above

22. Means a conventional sand filter.

A. Fast sand filter
B. Slow sand filter
C. Intermittent Sand Filter
D. None of the above

23. Means an alternative system consisting of the combination of a holding tank, service riser, and level indicator (alarm), designed to receive and store sewage for intermittent removal for treatment at another location.
A. Septic tank C. Intermittent septic tank
B. Holding Tank System D. None of the above

Septic System Basics Described
24. Most tanks are split into two compartments and have pipe baffles and an outlet filter to ensure the _____ stay in the tank.
A. Solids C. Biologic process
B. Liquids D. None of the above

25. The _____ process begins in the tank where the effluent separates into layers and begins the process of decomposition.
A. Physical C. Biologic
B. Natural D. None of the above

26. Bacteria, which are naturally present in all septic systems, begin to digest the solids that have settled to the bottom of the tank, transforming a large percentage of these solids into liquids and_____.
A. Solids C. Gases
B. Liquids D. None of the above

27. When _____ within the tank rise to the level of the outflow pipe, they enter the next part of the treatment system (pre-treatment device, distribution box, pump chamber, etc., depending on the type of system).
A. Solids C. Gases
B. Liquids D. None of the above

Types of Systems – General
28. Standard gravity systems require _____ feet of "good" soil under the trenches while pressure distribution systems only require _____ feet.
A. 3 & 3 C. 3 & 2
B. 2 & 3 D. None of the above

29. Advanced Treatment systems are more complicated and treat the wastewater to a fairly high level before allowing it to reach the soil. Because of this treatment, they can be used where there is only _____ foot of "good" dirt beneath the trench bottom.
A. 1 C. 3
B. 2 D. None of the above

Conventional Septic Systems Typically have three Main Components.
30. Which of the following separates the solids from the liquids, and serves a storage area for the solids to decompose and if properly maintained will decompose the solids faster then they build up?
A. A gravity system C. A pressure distribution system
B. A septic tank D. None of the above

31. Which of the following allows the separated water to drain out of the system and to absorb into the leach field?
A. A gravity system C. A pressure distribution system
B. A drain field D. None of the above

Pressure Distribution

32. Pressure distribution systems are usually required when there is less than optimal soil depth available for complete treatment of the effluent by _____.

A. A gravity system
B. Septic system design
C. A pressure distribution system
D. None of the above

33. A minimum of _____ feet of properly drained soil is required under the trenches.

A. Three
B. Two
C. Five
D. None of the above

34. Which of the following are normally the same as a standard gravity system, but the method by which the effluent is distributed to the soil is different?

A. A gravity system
B. The tank and drainfield size
C. A pressure distribution system
D. None of the above

35. A pump is used to pressurize the effluent into a small underground pvc pipe which transports it to the_____.

A. A gravity system
B. Septic system design
C. Drainfield
D. None of the above

Basic Onsite Wastewater Treatment Systems and Components

36. Building sewers and other sewer lines: watertight pipes, which deliver waste by _____ from a building to the onsite system or carry effluent by gravity from sewage tanks to other system components.

A. Gravity
B. Pressure manifolds
C. Lateral trenches
D. None of the above

Septic Tanks

37. The septic tank's function is to separate solids from liquid, digest organic matter, store liquids through a period of detention and allow the _____to discharge to other components of an onsite system.

A. Biological processes
B. Clarified liquids
C. Organic matter
D. None of the above

38. Which of the following are stored and periodically need to be pumped out and hauled to a point for further treatment?

A. Gases
B. Liquids
C. Solids
D. None of the above

Septic/Sewage Tank Removal

39. _____need to be correctly abandoned to prevent them from becoming a safety hazard.

A. Unused sewage tanks
B. Pressure manifolds
C. Lateral trenches
D. None of the above

Septic Treatment

40. A septic tank removes many of the settleable solids, oils, greases, and floating debris in the raw wastewater, achieving _____ percent removal.

A. 50 to 80
B. 60 to 80
C. 60 to 90
D. None of the above

41. Which of the following removed are stored in sludge and scum layers, where they undergo liquefaction?
A. Gases C. Solids
B. Liquids D. None of the above

42. During liquefaction, the first step in the digestion process, acid forming bacteria partially digest the solids by hydrolyzing the proteins and converting them to _____, most of which are dissolved in the water phase.
A. Organic suspended solid(s) C. BOD
B. Volatile fatty acid(s) D. None of the above

43. The volatile fatty acids still exert much of the biochemical oxygen demand that was originally in the organic suspended solids. Because these acids are in the dissolved form, they are able to pass from the tank in the effluent stream, reducing the _____ removal efficiency of septic tanks compared to primary sedimentation.
A. Organic suspended solid(s) C. BOD
B. Volatile fatty acid(s) D. None of the above

44. Complete digestion, in which the volatile fatty acids are converted to methane, could reduce the amount of _____ released by the tank, but it usually does not occur to a significant extent because wastewater temperatures in septic tanks are typically well below the optimum temperature for methane producing bacteria.
A. Organic suspended solid(s) C. BOD
B. Volatile fatty acid(s) D. None of the above

45. Gases that form from the microbial action in the tank rise in the wastewater column. The rising gas bubbles disturb the_____, which can reduce the settling efficiency of the tank.
A. Organic suspended solid(s) C. Quiescent wastewater column
B. Volatile fatty acid(s) D. None of the above

46. Gases dislodge _____in the sludge blanket so they can escape in the water column.
A. Organic suspended solid(s) C. BOD
B. Colloidal particles D. None of the above

47. At the same time, however, they can carry active anaerobic and facultative microorganisms that might help to treat _____present in the wastewater column.
A. Organic suspended solid(s) C. Colloidal and dissolved solids
B. Volatile fatty acid(s) D. None of the above

Typical SWIS Performance

48. Results from numerous studies have shown that septic tanks (SWISs) achieve high removal rates of many pollutants of concerns with the notable exception of _____.
A. Nitrogen C. Phosphorous and metals
B. Nitrate(s) D. None of the above

49. Biochemical oxygen demand (BOD), suspended solids, fecal bacteria indicators and surfactants are effectively removed within _____ feet of unsaturated, aerobic soil.
A. 2-5 C. 2-6
B. 1-4 D. None of the above

50. Which of the following and metals are removed by adsorption, ion exchange and precipitation?
A. Nitrogen C. Phosphorous
B. Nitrate(s) D. None of the above

Septic Pretreatment Components

51. Which of the following remove many of the contaminants from the wastewater to prepare the effluent for final treatment and dispersal into the environment? The level of treatment is selected to match the receiving environment and the intended use.
A. Pretreatment components C. Gravity flow systems
B. Advanced systems D. None of the above

52. Which of the following is reduced to a level the soil can accept and treat? Many options exist for treatment prior to release into the receiving environment.
A. Advanced system(s) C. The quantity of contaminants
B. Septic tank effluent D. None of the above

Cluster System Applications

53. A cluster system is designed to collect wastewater from _____ homes.
A. Three to fifty C. Two to several hundred
B. Two to one hundred D. None of the above

54. The Cluster Wastewater Systems Planning Handbook lists a number of potential wastewater collection technologies for small and large cluster systems, including: grinder pump systems, which transport all sewage; effluent sewers, such as the_____; the septic tank effluent gravity (STEG) collection system; and vacuum systems.
A. Septic tank effluent pump (STEP) C. Infiltration area protection
B. Individual and clustered systems D. None of the above

55. Treatment facilities serving clustered buildings may range from a communal septic tank and _____ to a more advanced treatment system.
A. Soil dispersal system C. Individual and clustered systems
B. Infiltration area protection D. None of the above

Septic System Failures

56. Which of the following failures are a major source of groundwater pollution?
A. Soil dispersal system C. Individual and clustered systems
B. Septic system D. None of the above

57. Layers of soil act as a natural filter, removing microbes and other particles as water seeps through. Improperly treated water can carry _____that can cause gastroenteritis, fever, common cold, respiratory infections and hepatitis.
A. All sewage C. Waterborne pollution
B. Bacteria and viruses D. None of the above

58. Which of the following are effective, cost efficient, and easy to maintain?
A. Septic tank effluent pump (STEP) C. Septic systems
B. Individual and clustered systems D. None of the above

59. Failing systems are a major source of groundwater pollution, cause _____, such as dysentery and hepatitis, and are expensive for homeowners to replace. There are many different types of wastewater collection and treatment technologies.
A. Aerobic microsite(s) C. Chemical diseases
B. Waterborne illnesses D. None of the above

60. Which of the following for clustered facilities can work by gravity or operate via vacuum or pressure pump?
A. Septic system(s) C. Collection systems
B. Cluster system(s) D. None of the above

Advanced (Tertiary) Systems Introduction
61. Advanced systems can be designed and built on-site or can consist of prefabricated units designed to overcome some site and soil limitations including:
When the aerated (unsaturated) soil depth below the infiltrative surface in the drainfield is less than the minimum required, advanced treatment processes or components (e.g.,_____) can be added to increase pollutant removal prior to soil discharge.
A. Fixed film treatment units C. Infiltrative surface
B. Septic tank effluent D. None of the above

62. Wastewater with high organic strength (e.g., from a restaurant) can employ _____to improve aeration, biological decomposition, and treatment of organic wastes.
A. Gravity flow systems C. Advanced treatment units/processes
B. Septic tank effluent D. None of the above

63. Which of the following provide timed dosing of septic tank or treatment unit effluent to the soil can sometimes be used where soil infiltration areas are limited, except in cases of high-clay content soils?
A. Advanced system(s) C. Pressurized distribution methods
B. The dose/rest cycle D. None of the above

64. Advanced systems employ _____can reduce bacteria and nutrient loading to groundwater by applying wastewater high in the soil profile, improving bacteria predation and uptake of nutrients by plants and providing a carbon source for denitrification.
A. Nutrient loading C. Pressure drip dispersal of the effluent
B. Modified dispersal area D. None of the above

Advanced Onsite Wastewater Treatment Systems and Components
Elevated (Mound or At-Grade) Systems
65. Effluent flows from the tank or treatment unit to a pump tank and periodically dosed to the_____, which is typically constructed of a layer of clean, uniformly graded sand on a plowed or roughened natural soil surface.
A. At-grade systems C. Modified dispersal area
B. Sand dispersal field D. None of the above

66. The tank effluent is uniformly dosed onto the _____within the mound, which may be 1-4 ft. above the natural grade. Sand within the mound compensates for shallow unsaturated soil conditions below the natural grade.
A. Media filter(s) C. Infiltrative surface
B. ATU(s) D. None of the above

Mound Systems

67. Mound systems are appropriate for areas with a high water table or shallow, fractured bedrock. After treatment through the_____, the effluent percolates directly into the soil under the mound.

A. Effluent dispersal piping C. Sand
B. Aerobic treatment units (ATUs) D. None of the above

68. _____feature effluent dispersal piping placed at natural grade, with the mound consisting mostly of cover soil for the piping.

A. At-grade systems C. Effluent flows from the tank
B. Aerobic treatment units (ATUs) D. None of the above

69. The mound should have inspection ports, so wastewater distribution across the infiltration area can be monitored. _____ should have cleanouts so they can be flushed at least twice a year.

A. Media filter(s) C. Distribution lines
B. ATU(s) D. None of the above

Aerobic Treatment Units

70. _____) consist of prefabricated units featuring consecutive or compartmentalized tanks, pumps, blowers, and internal piping, and are designed to treat wastewater via suspended or attached growth decomposition in an oxygen rich environment.

A. Effluent dispersal piping C. Effluent flows from the tank
B. Aerobic treatment units (ATUs) D. None of the above

71. When _____ is supplied, the rate of microbial activity and related treatment processes accelerates.

A. Nitrogen C. Hydrogen
B. Oxygen D. None of the above

72. Three processes are involved in most_____: physical separation (mostly settling), aerobic treatment (aeration and mixing), and clarification (final settling).

A. Media filter(s) C. Aerobic systems
B. Anaerobic systems D. None of the above

73. _____ vary in design and can consist of simple activated sludge variations, sequencing batch reactors, trickling filters, and combinations of two or more of these unit processes.

A. Media filter(s) C. Septic tank effluent
B. ATU(s) D. None of the above

Media Filters

74. _____can be applied to a layer of sand or gravel, a tank containing peat or plastic media, or compartments of hanging textile or other material to improve oxygen access and enhance biochemical treatment processes.

A. Media filter(s) C. Septic tank effluent
B. ATU(s) D. None of the above

75. A number of these so-called "_____" are available to treat wastewater.

A. Media filter(s) C. Septic tank effluent
B. ATU(s) D. None of the above

76. Sand is the most commonly used _____, but clean gravel, crushed glass, textile strips, peat, and tire crumbs are also used, depending on site restrictions and state/local regulations.
A. Media C. Soil dispersal field
B. Septic tank effluent D. None of the above

77. In single-pass or intermittent filter (ISF) design, _____is pump-dosed uniformly onto the media at regular intervals 12 to 48 times per day.
A. Media C. Sand
B. Septic tank effluent D. None of the above

ONSITE OPERATION AND MAINTENANCE SECTION

System Operation and Maintenance Requirements

78. When _____exist, adjustments to the upstream treatment train may be needed to reduce biochemical oxygen demand, total suspended solids, bacteria levels, nutrients, or other pollutants.
A. Groundwater pollution C. Soil limitations
B. Hydraulic failures D. None of the above

79. Adjustments could involve reducing _____at the source (e.g., better plate and pot scraping prior to dishwashing in restaurant kitchens, adding grease trap tanks, etc.), applying the effluent at lower soil loading rates, or inserting a fixed film or suspended growth treatment unit between the septic tank and drainfield.
A. Septic system maintenance C. Pollutant inputs
B. Failure(s) D. None of the above

Septic System Failures

80. Septic system failures are a major source of _____.
A. Groundwater pollution C. Failure(s)
B. Hydraulic failures D. None of the above

81. _____ is like automobile maintenance; a little effort on a regular basis can save you a lot of money and significantly prolong the life of the system.
A. Septic system maintenance C. Suspended growth treatment unit
B. Failure(s) D. None of the above

82. Some soil-based systems (those with a drain field) are installed at sites with inadequate or inappropriate soils, excessive slopes, or high ground water tables. These conditions can cause hydraulic failures and_____.
A. Groundwater pollution C. Upstream treatment train
B. Contamination of nearby water sources D. None of the above

83. Failure to perform routine maintenance, such as pumping the septic tank generally at least every _____ years, can cause solids in the tank to migrate into the drain field and clog the system.
A. 1 to 2 C. 3 to 4
B. 3 to 5 D. None of the above

Regular Maintenance

84. Verification of _____ contracts, operator expertise, and reporting requirements for system maintenance such as tank pumping and repairs should be included in the approval process.

A. Drainage features
B. Installation specifications
C. System maintenance
D. None of the above

These records should reflect:

85. If properly designed, installed, and maintained, a septic system can effectively treat household wastewater for up to _____ years or more. Look to see if the house has a system that is near the end of its life-span.

A. 50
B. 30
C. 20
D. None of the above

86. Size is important because graywater (laundry water, sink water) and blackwater (toilet water) need to be retained in the tank for at least a _____ to allow solids to separate from the liquids and begin breaking down. If wastewater is pushed through without proper settling, the solids can clog the drainfield, stressing and possibly damaging the system.

A. Day or more
B. 12 hours or more
C. Week or more
D. None of the above

Individual Wastewater Systems

87. Mechanical systems, such as activated sludge-based units, require servicing three to four times a year, while conventional systems need service or pumping every _____ years, depending on occupancy and use.

A. 1 to 5
B. 3 to 5
C. 5 to 10
D. None of the above

Septic System Evaluation Guideline
Enhanced Treatment Systems

88. _____have proven to be effective in situations where conventional systems are not appropriate.

A. Treatment performance
B. Several wastewater alternative technologies
C. Wastewater treatment system(s)
D. None of the above

Enhanced Wastewater Treatment

89. Advanced or innovative technologies that provide a _____beyond conventional systems. Generally, these systems have mechanical or moving parts that require periodic operation and maintenance, inspections, and eventual replacement.

A. Clustered system(s)
B. O&M requirement(s)
C. Higher level of treatment
D. None of the above

90. Enhanced wastewater treatment systems are more complex than _____and require greater oversight to keep all aspects of the treatment process in balance.

A. Treatment performance
B. O&M requirement(s)
C. Conventional systems
D. None of the above

Perforated Pipe

91. Perforated pipe is laid in the bottom of upslope trenches excavated into the restrictive horizon. A durable, porous medium is placed around the piping and up to a level above the estimated _____.

A. Low-saturated zone
B. An outfall for the drain
C. Seasonally high-saturated zone
D. None of the above

92. If the saturated hydraulic conductivity is low and the drainable porosity (the percentage of pore space drained when the soil is at field capacity) is small, even _____might have limited effect on soil wetness conditions.

A. SWIS
B. Outlet locations
C. Effectively designed curtain drains
D. None of the above

Inspections and Maintenance Requirements

93. A four-bedroom home might have a daily flow of 480 gallons per day (assuming 120 gallons per bedroom per day). In a 1,000-gallon tank, this provides _____ days for solids to settle.

A. 2
B. 3
C. 4
D. None of the above

94. Nevertheless, as the solids build up, there is less room in the tank for the liquid and thus less settling time. The accepted maximum level of solids in the tank is _____ of the liquid depth. Any more than this and the tank is overdue for pumping. Having these solids removed, is a critical component of how well the septic system, as a whole, will function.

A. 1/2
B. 1/3
C. 1/4
D. None of the above

SWIS Designs

95. There are several different designs for_____. They include trenches, beds, seepage pits, at grade systems, and mounds.

A. Seepage pits
B. SWISs
C. Secondary infiltrative surface
D. None of the above

96. An important difference between infiltration surfaces constructed in natural soil and those constructed in fill material is that a secondary infiltrative surface (which must be considered in design) is created at the_____.

A. Fill/natural soil interface
B. Infiltration surface
C. Secondary infiltrative surface
D. None of the above

Maintenance Inspections

97. Maintenance inspections are gaining appeal as a management tool to assess the condition of systems and determine pumping or_____.

A. Other O&M needs
B. Advances in technology
C. Alternative and enhanced wastewater technologies
D. None of the above

98. Some local agencies have adopted a sewage management program that requires the annual inspection of systems with newly issued or modified permits and proof of _____ for all systems (old and new).

A. Septic tank pumping
B. Advances in technology
C. Operation and maintenance inspection programs
D. None of the above

99. _____ are usually coupled with a mandatory septic tank pumping program. The local agency notifies the system owner when pumping is due. Verification of pumping is provided to the regulating agency.
A. Septic tank pumping C. Operation and maintenance inspection programs
B. Advances in technology D. None of the above

100. Typical pumping requirements vary from three to five years or more based on the _____and individual household wastewater characteristics.
A. Typical pumping requirement(s) C. Daily sewage flow
B. Enhanced system(s) D. None of the above

Standard Leach Field Septic System Inspection

101. As the septic system is used, there is an accumulation of solids in the tank, which is sometime referred to as _____.
A. Slime C. Long-term biochemical oxygen demand
B. Sludge D. None of the above

102. The septic tank removes solids by holding wastewater in the tank for at least 24 hours, allowing the _____ to settle and _____ to rise to the top. This is accomplished by a series of baffles inside the tank.
A. Scum - Solids C. Solids - Scum
B. Sludge - Scum D. None of the above

103. Up to _____% of the solids retained in the tank will decompose over time.
A. 25 C. 40
B. 50 D. None of the above

104. Effluent water discharges from the tank to perforated drain pipes. From there, it drains to a _____
A. Constructed absorption or leach field C. A septic tank, the septic drain field
B. Leach fields or leach drains D. None of the above

105. Septic drain fields, also called leach fields or leach drains are used to remove contaminants and impurities from the liquid that emerges from_____.
A. Effluent water discharges C. The septic tank
B. Leach fields or leach drains D. None of the above

106. A septic tank, the septic drain field, and the associated piping compose_____.
A. Effluent water discharges C. A complete septic system
B. Leach fields or leach drains D. None of the above

107. _____is effective for disposal of organic materials readily catabolized by a microbial ecosystem.
A. Effluent water discharges C. The septic drain field
B. Leach fields or leach drains D. None of the above

108. _____typically consists of an arrangement of trenches containing perforated pipes and porous material (often gravel) covered by a layer of soil to prevent animals and surface runoff from reaching the wastewater distributed within those trenches.
A. Effluent water discharges C. A trench
B. The drain field D. None of the above

109. Primary design considerations are hydraulic for the _____requiring disposal and catabolic for the long-term biochemical oxygen demand of that wastewater.
A. Septic tank effluent C. Insoluble particles small enough
B. Volume of wastewater D. None of the above

110. Microbial colonies catabolizing _____from the septic tank effluent will adhere to soil particles and reduce the interstitial area available for water flow between soil particles. These colonies tend to form a low-permeability biofilm of gelatinous slime at the soil interface of the disposal trench
A. Soluble organic compounds C. Insoluble particles small enough
B. Wastewater D. None of the above

Biomat
111. A properly functioning _____will have wastewater ponded in the distribution media while the soil a few inches outside of and below the distribution media will be unsaturated.
A. Gravity-fed system C. Unsaturated flow
B. Soil system D. None of the above

112. Unsaturated soil has pores containing both air and water so aerobic microorganisms living in the soil can effectively treat the wastewater as it travels through the_____.
A. Gravity-fed system C. Unsaturated flow
B. Soil system D. None of the above

113. In unsaturated soil under a biomat, _____is restricted.
A. Water movement C. Unsaturated flow
B. Bacteria D. None of the above

Sewage Treatment Utilizing Soil
114. A developed biomat reaches _____ over time, remaining at about the same thickness and the same permeability if effluent quality is maintained.
A. Equilibrium C. Permeability of the biomat
B. Quality of the effluent D. None of the above

115. For equilibrium to be maintained, the biomat and the effluent ponded within the trench must be in_____, the organic materials in the wastewater feed the anaerobic microorganisms, which grow and multiply, increasing the thickness and decreasing the permeability of the biomat.
A. Equilibrium C. Permeability of the biomat
B. Anaerobic conditions D. None of the above

Site Evaluations
116. Site evaluations are a key driver of treatment system design. The success of any soil-discharging wastewater treatment system depends on the appropriate match between_____, the treatment system design, and the site that receives effluent from the system.
A. Site-specific C. Wastewater flow/strength
B. Quality of the effluent D. None of the above

Assure System Performance

117. The subsurface "ponding" and slow release of effluent to the soil through the biomat facilitates treatment via chemical, physical, and biological processes such as_____, adsorption of potential pollutants (e.g., phosphorus), filtration of solids, and decomposition of organic constituents.

A. Clustered wastewater system(s) C. Aerobic nitrification of ammonia
B. Equilibrium D. None of the above

118. Predicting the _____and overall treatment efficacy of the soil component of the system requires a fairly comprehensive understanding of how these processes work, how they are enhanced or impeded, and how the upstream processes in the treatment train can be adjusted or adapted to ensure that the soil can handle the flow and pollutant load delivered.

A. Final treatment of effluent C. Pollutant removal
B. Wastewater flow/strength D. None of the above

Improving OSSF Treatment through Performance Requirements

119. Most onsite wastewater treatment systems are of the conventional type, consisting of a septic tank and a_____.

A. Regular maintenance C. Subsurface wastewater infiltration system (SWIS)
B. Site limitations D. None of the above

120. _____ can be expressed as numeric criteria (e.g., pollutant concentration or mass loading limits) or narrative criteria (e.g., no odors or visible sheen) and are based on the assimilative capacity of regional ground water or surface waters, water quality objectives, and public health goals.

A. Performance requirements C. Primary and secondary processes
B. Water resources D. None of the above

121. _____ help define system design and size and can be estimated by comparing the size and type of facility with measured effluent outputs from similar, existing facilities.

A. Existing technologies C. Wastewater characteristics and site conditions
B. Wastewater flow and pollutant content D. None of the above

122. _____applied today treat wastes after they exit the septic tank; the tank retains settleable solids, grease, and oils and provides an environment for partial digestion of settled organic wastes.

A. Regular maintenance C. Most of the alternative treatment technologies
B. Septic system D. None of the above

123. Post-tank treatment can include aerobic (with oxygen) or anaerobic (with no or low oxygen) biological treatment in suspended or fixed-film reactors, physical/chemical treatment, soil infiltration,_____.

A. Fixed-media filtration, and/or disinfection C. Primary and secondary processes
B. Water resources D. None of the above

Performance-Based Standards

124. The move toward site-appropriate, risk-based system design and the growing interest in _____has increased the need for performance-based design guidance.

A. Performance requirements C. Primary and secondary processes
B. Clustered facilities D. None of the above

System Design Considerations

125. One of the more common reasons why some individual or cluster systems do not perform properly is inappropriate _____ selection.

A. System/technology C. System compatibility
B. Subsurface drainfield(s) D. None of the above

126. A wastewater system should be matched to the volume and_____, and the site, soil, and groundwater/surface water conditions must be known in detail in order to develop an appropriate system design.

A. Alternative treatment technologies C. Pollutant profile of wastewater
B. Wastewater flow and pollutant content D. None of the above

127. _____permitting programs are expanding the options available for providing treatment services, especially for sites with limiting soil conditions and those with threatened or impaired water resources nearby.

A. Regular maintenance C. State and local wastewater system
B. Septic system D. None of the above

Management Considerations

128. All _____systems require management. Management services can be provided by an outside contractor or responsible management entity.

A. System/technology C. Wastewater treatment
B. Subsurface drainfield(s) D. None of the above

129. In general, _____with septic tanks and subsurface drainfields require less management attention; clustered facilities with collection system pumps, mechanized treatment units, and time or demand-dosed infiltration areas require much more.

A. System/technology C. Individual gravity flow systems
B. Subsurface drainfield(s) D. None of the above

130. Factors that influence system management include:
_____, such as very cold or wet climates.

A. Complexity of service C. Operation in extreme conditions
B. All system components D. None of the above

131. _____ and access to repair parts.

A. Soil condition(s) C. Life of system components
B. Subsurface drainfield(s) D. None of the above

132. Maintenance needs, including frequency and _____.

A. Complexity of service C. Very cold or wet climates
B. Final design components D. None of the above

Permitting and Approval Process

133. It is important that the application include_____, narratives, forms, calculations, catalog cuts, photos, and other data, including detailed equipment and installation specifications to make siting the system components easier.

A. System drawings C. System maintenance
B. Installation specifications D. None of the above

134. If the site has been developed, all structures, utilities, and _____should be identified.
A. Regular maintenance C. Ingress and egress pathways
B. Septic system D. None of the above

135. The source of potable water and distribution lines should be identified as well. If there is an existing wastewater treatment system, the condition of all components, including the reserve area, should be recorded and_____.
A. System location and features C. Minimum setbacks met
B. Installation specifications D. None of the above

Summary
OSSF Maintenance
136. _____ can add years to an older system. Even well-designed and properly installed septic systems can fail earlier than expected if previous homeowners did not perform routine maintenance.
A. Proper maintenance C. Septic tank or ATU
B. Necessary pumping frequency D. None of the above

137. Try to determine how frequently the tank has been pumped from the realty agent or owner. Ask to see maintenance records. Keep in mind the necessary pumping frequency depends on the size of the household and the size of the _____.
A. Sand/media filter(s) C. Onsite system
B. Tank D. None of the above

138. For example, a four-bedroom home with a 1,250 gallon tank should be pumped approximately every _____ years. Modern conveniences such as garbage disposals, hot tubs, or whirlpools will increase the necessary pumping frequency.
A. 3 C. 2.6
B. 4.5 D. None of the above

Permit
139. Several factors should be considered when choosing the type of onsite system for a site including: soil/site limitations, available space, operation and maintenance (O & M) requirements, initial costs as well as_____, landscape disturbance, and the owners' preferences and ability to manage the system.
A. Soil resource C. O & M costs
B. Type of human sewage D. None of the above

140. Of these considerations, often the most limiting is the _____or site and space limitations.
A. Soil resource C. O & M costs
B. Type of human sewage D. None of the above

(s) means the answer may be plural or singular in nature.

SUBSURFACE WASTEWATER INFILTRATION CONSTRUCTION SECTION

Construction Section

141. Correct wastewater treatment system construction and/or installation practices are critical to the performance of individual and _____.

A. Pressure distribution C. Clustered systems
B. Declustered systems D. None of the above

142. Construction actions can affect short-term and long-term system performance by failing to adhere to _____, neglecting proper pipe slope requirements, inadvertently switching tank inlet/outlet orientation, or failing to protect infiltration area soils from equipment compaction.

A. Inlet/outlet orientation C. Uphill dispersal piping
B. Material specifications D. None of the above

143. Which of the following is a key component of good system installation practice, should be carefully considered during site preparation, construction equipment selection and use, and before and during construction?

A. Pressure distribution C. Individual and declustered systems
B. Infiltration area protection D. None of the above

145. The development of a final design plan that includes drawings, narratives, forms, calculations, photos, and other data, including_____, will help ensure a successful outcome.

A. Infiltration area C. Detailed equipment and installation specifications
B. Inlet/outlet orientation D. None of the above

144. This information must be assembled into a cohesive document to allow the proper installation of the design without the need for any assumptions.

A. True B. False

Background and Use of Onsite Wastewater Treatment Systems

146. Only about _____ of the land area in the United States has soils suited for conventional subsurface soil absorption fields.

A. 10 percent C. 1/4
B. 1/3 D. None of the above

147. Which of the following discharged into surface waters directly or through subsurface flows can spur algal growth and lead to eutrophication and low dissolved oxygen in lakes, rivers, and coastal areas?

A. Nitrates and phosphorus C. Contaminants
B. Phosphorus compounds D. None of the above

Septic Site Preparation and Excavation Practices

148. Overhead power lines, steep slopes, and excavations at the installation site can all present serious _____.

A. Safety hazard(s) C. Excavation(s)
B. Disturbance(s) D. None of the above

149. A brief preconstruction meeting can ensure that _____ and practices to eliminate, minimize, or respond to them are identified.

A. Safety hazard(s) C. Excavation(s)
B. Disturbance D. None of the above

150. Site preparation requires a number of activities including clearing and surface preparation for filling. Use of lightweight tracked equipment will minimize soil _____.
A. Compaction C. Excavation
B Infiltration D. None of the above

151. Soil _____ should be determined to ensure that it is dry, and care should be taken to avoid soil disturbance as much as possible.
A. Compaction C. Excavation
B. Moisture D. None of the above

152. To avoid potential soil damage during construction, the soil below the proposed infiltration surface elevation must be below its _____ during construction (i.e., it must lack the moisture required to make it moldable into stable shapes). This should be tested before excavation begins.
A. Compaction C. Excavation
B. Plastic limit D. None of the above

153. Site _____ is conducted only when the infiltration surface can be covered the same day to avoid loss of soil permeability from wind-blown silt or raindrop impact.
A. Compaction C. Excavation
B. Plastic limit D. None of the above

154. _____ and areas for traffic lanes, material stockpiling, and equipment parking should be designated on the drawings for the contractor.
A. Site access points C. Excavation
B. Disturbance D. None of the above

155. Flagging off the _____ area as early as possible is critical to ensure long-term function of the system.
A. Compaction C. Excavation
B. Infiltration D. None of the above

156. Grubbing of the site (mechanically raking away roots) should be avoided. If the site is to be filled, the surface should be moldboard- or chisel-plowed parallel to the contour (usually to a depth of seven to ten inches) when the soil is sufficiently dry to ensure maximum vertical_____.
A. Compaction C. Permeability
B. Infiltration D. None of the above

157. The organic layer should not be removed. Scarifying the surface with the teeth of a backhoe bucket is not sufficient. All efforts should be made to avoid any disturbance to the exposed _____ surface.
A. Moisture C. Infiltration
B. Disturbance D. None of the above

Field Construction Practices

158. Changes in construction practices over the past 25 years have led to improvements in the performance of _____.
A. Individual wastewater system(s) C. Long-term system performance
B. System design D. None of the above

159. _____in infiltration trenches should be scarified and the surface gently raked prior to installing the gravel or gravel-less piping/chambers.
A. Compaction C. Excavation
B. Smeared soil surfaces D. None of the above

160. If gravel or crushed rock is to be used for the system medium, the rock should be placed in the trench by using the backhoe bucket to_____.
A. Individual wastewater system(s) C. Long-term system performance
B. System design D. None of the above

Project Execution
161. Ensure that _____effluent dispersal holes go on the bottom.
A. Site component location(s) C. Distribution pipe
B. Gravity flow system(s) D. None of the above

162. Extend _____piping stubs below tank access ports, but do not block ports to ensure access for pumping and inspection. Use rubber boots or grout to completely seal around pipes and risers.
A. Inlet/outlet C. Uphill dispersal piping
B. Distribution pipe effluent D. None of the above

163. Install access _____to the surface, install outlet filters/screens, and complete installation of pumps, wiring, control panels, and other components.
A. Port risers C. Gravity flow pipe(s)
B. Gravity flow system(s) D. None of the above

164. Install _____in key locations (near building sewer, D-box, etc.); this aids in operation/maintenance later on.
A. Infiltration area C. Cleanouts and inspection ports
B. Inlet/outlet orientation D. None of the above

Soil Texture
Identify the missing term.

165. When moist, a thin ribbon or 1/8 inch or smaller wire formed between thumb and finger will withstand considerable movement and deformation.
A. Sand C. Silty Clay
B. Loamy Sand D. None of the above

166. Consists of large amounts of clay and moderate to small amounts of sand and silt. It breaks into very hard clods or lumps when dry. When moist, a thin, long ribbon or 1/16-inch wire can be molded with ease. Fingerprints will show on the soil, and a dull to bright polish is made on the soil by a shovel.
A. Silt Loam C. Loam
B. Clay D. None of the above

167. Consists of an even mixture of the different sizes of sand and of silt and clay. It is easily crumbled when dry and has a slightly gritty, yet fairly smooth feel. It is slightly plastic.
A. Silt Loam C. Loam
B. Clay D. None of the above

168. Consists of a moderate amount of fine grades of sand, a small amount of clay, and a large quantity of silt particles. Lumps in a dry, undisturbed state appear quite cloddy, but they can be pulverized readily; the soil then feels soft and floury.
A. Silt Loam C. Loam
B. Clay D. None of the above

169. When wet, _____ runs together in puddles. Either dry or moist, casts can be handled freely without breaking. When a ball of moist soil is passing between thumb and finger, it will not press out into a smooth, unbroken ribbon but will have a broken appearance.
A. Silt Loam C. Loam
B. Clay D. None of the above

170. Consists of an even mixture of sand, silt, and clay that breaks into clods or lumps when dry. When a ball of moist soil is pressed between the thumb and finger, it will form a thin ribbon that will readily break, barely sustaining its own weight. The moist soil is plastic and will form a cast that will withstand considerable handling.
A. Clay Loam C. Loam
B. Clay D. None of the above

171. Consists of even amounts of silt and clay and very small amounts of sand. It breaks into hard clods or lumps when dry.
A. Sand C. Silty Clay
B. Loamy Sand D. None of the above

172. Squeezed in the hand when dry, it will form a cast that will withstand careful handling. The cast formed of moist soil can be handled freely without breaking.
A. Silt Loam C. Loam
B. Clay D. None of the above

Percolation Tests
173. A percolation test consists of digging one or more holes in the soil of the proposed dispersal field to a specified depth, presoaking the holes by maintaining a high water level in the holes, then completing the test by filling the holes to a specific level and timing and _____as the water percolates into the surrounding soil.
A. Allowable hydraulic loading rates C. An inappropriately high loading rate
B. Measuring the water level drop D. None of the above

174. A percolation test has limitations. The test does not reveal limiting conditions in the soil profile and can provide_____, leading to an inappropriately high loading rate.
A. Allowable hydraulic loading rates C. False readings during dry conditions
B. Specific level and timing D. None of the above

175. States and communities once relied solely on these tests to determine _____.
A. Critical factors C. Effluent application rate(s)
B. Percolation test(s) D. None of the above

(s) means the answer may be plural or singular in nature.

Perc Condition Terms Associated with Saturation

176. The stripped areas and trans-located oxides or organic matter form a diffuse splotchy pattern of two or more colors.
A. Dark Colored Shrink-Swell Soils
B. Salt-Affected Soils
C. Iron Stripping and Staining in Sandy Soils
D. None of the above

177. Soils in arid and semi-arid areas that have visible accumulations of soluble salts at or near the ground surface.
A. Dark Colored Shrink-Swell Soils
B. Salt-Affected Soils
C. Iron Stripping and Staining in Sandy Soils
D. None of the above

178. Vertisols whose colors have values of 3 or less and chromas of 1 or less. Iron concentrations may be present but are not diagnostic of conditions associated with saturation.
A. Dark Colored Shrink-Swell Soils
B. Salt-Affected Soils
C. Iron Stripping and Staining in Sandy Soils
D. None of the above

179. Means soil morphological properties that may indicate the presence of a water table that persists long enough to impair system function and create a potential health hazard.
A. Conditions Associated with Saturation
B. Dark Colored Soils with Organic Matter Accumulation
C. Depleted Matrix without Iron Concentrations
D. None of the above

180. Soil horizons whose matrix chroma is 3 or more in which there are some visible iron depletions having a value 4 or more and a chroma of 2 or less. Iron-manganese concentrations as soft masses or pore linings may be present but are not diagnostic of conditions associated with saturation.
A. High Chroma Matrix with Iron Depletions
B. Depleted Matrix with Iron Concentrations
C. Depleted Matrix without Iron Concentrations
D. None of the above

181. Soil horizons whose color has a value of 4 or more and a chroma of 2 or less with hues that are often, but not exclusively, on the grey pages of the Munsell Color Book. On exposure to air, yellow colors form within 24 hours as some of the ferrous iron oxidizes.
A. Dark Colored Shrink-Swell Soils
B. Salt-Affected Soils
C. Reduced Matrix
D. None of the above

182. The upper surface layer has a dark color with a value of 3 or less and a chroma of 1 or less immediately underlain by a layer with a chroma of 2 or less.
A. Dark Colored Shrink-Swell Soils
B. Salt-Affected Soils
C. Soils with a Dark Surface
D. None of the above

183. Soil horizons in which iron/manganese oxides or organic matter or both have been stripped from the matrix, exposing the primary base color of soil materials.
A. Dark Colored Shrink-Swell Soils
B. Salt-Affected Soils
C. Iron Stripping and Staining in Sandy Soils
D. None of the above

Septic Tank Construction Considerations
184. Important construction considerations include tank location, bedding and backfilling, watertightness, and_____, especially with non-concrete tanks.
A. Wicking C. Flotation prevention
B. Watertightness D. None of the above

Construction Materials
185. Septic tanks smaller than _____ gallons are typically pre-manufactured; larger tanks are constructed in place.
A. 6,000 C. 10,000
B. 12,000 D. None of the above

186. Tanks constructed of fiberglass/reinforced polyester (FRP) usually have a wall thickness of about 1/4 inch (6 millimeters). Most are gel or resin coated to provide a smooth finish and prevent glass fibers from becoming exposed, which can cause _____.
A. Wicking C. Cracking or collapsing
B. Watertightness D. None of the above

187. Polyethylene tanks are more flexible than FRP tanks and can _____if not properly designed.
A. Deform to a shape of structural weakness C. Deform to cracking or collapsing
B. Deform to watertightness D. None of the above

188. Some plastics (e.g., polyvinyl chloride, polyethylene, but not nylon) are virtually unaffected by_____.
A. Acids and hydrogen sulfide C. Cracking or collapsing
B. Watertightness D. None of the above

189. Tanks must be properly designed, reinforced, and constructed of the proper mix of materials so they can meet_____.
A. Wicking C. Anticipated loads without cracking or collapsing
B. Watertightness D. None of the above

190. All joints must be _____to accommodate soil conditions. For concrete tank manufacturing, a "best practices manual" can be purchased from the National Pre-Cast Concrete Association (NPCA,1998).
A. Sealed properly C. Watertight and flexible
B. Clean and dry D. None of the above

(s) means the answer may be plural or singular in nature.

Watertightness

191. Leaks, whether exfiltrating or infiltrating, are serious. _____of clear water to the tank from the building storm sewer or ground water adds to the hydraulic load of the system and can upset subsequent treatment processes.

A. Exfiltration
B. Watertightness
C. Infiltration
D. None of the above

Location

192. The tank should be located where it can be accessed easily for septage removal and sited away from _____ where water can collect. Local codes must be consulted regarding minimum horizontal setback distances from buildings, property boundaries, wells, water lines, and the like.

A. Imported granular material
B. High organic content
C. Drainage swales or depressions
D. None of the above

Bedding and Backfilling

193. The tank should rest on_____. It is good practice to provide a level, granular base for the tank. The underlying soils must be capable of bearing the weight of the tank and its contents.

A. Tank and its contents
B. A uniform bearing surface
C. Shape and material of the tank
D. None of the above

194. The backfill material should be free-flowing and free of stones larger than _____ inches in diameter, debris, ice, or snow. It should be added in lifts and each lift compacted.

A. 2
B. 3
C. 4
D. None of the above

Flotation Prevention

195. If the tank is set where the soil can be saturated, tank flotation may occur, particularly when the tank is empty (e.g., recently pumped dose tanks or septic tank after septage removal). Tank manufacturers should be consulted for_____.

A. Tank and its contents
B. Appropriate anti-flotation devices
C. Shape and material of the tank
D. None of the above

Placement of the Infiltration Surface

196. Placement of a SWIS infiltration surface may be below, at, or _____ (in an in-ground trench, at grade, or elevated in a mound system).

A. Original soil profile
B. SWIS infiltration surface
C. Above the existing ground surface
D. None of the above

Separation Distance from a Limiting Condition

197. Placement of the infiltration surface in the soil profile is determined by _____.

A. Infiltration surface in the soil profile
B. Treatment and hydraulic performance requirements
C. An adequate hydraulic gradient across the infiltration zone
D. None of the above

198. Most current onsite wastewater system codes require minimum separation distances of at least _____inches from the seasonally high water table or saturated zone irrespective of soil characteristics.
A. 18 C. 12 to 14
B. 12 to 24 D. None of the above

199. Generally, _____ foot separation distances have proven to be adequate in removing most fecal coliforms in septic tank effluent.
A. 8 -12 C. 2 to 4
B. 2 to 8 D. None of the above

200. A few studies have shown that separation distances of _____inches are sufficient to achieve good fecal coliform removal if the wastewater receives additional pretreatment prior to soil application.
A. 12 to 18 C. 12 to 14
B. 12 to 24 D. None of the above

Controlling Fats, Oils, and Grease Discharges from Food Service Establishments
201. Commercial food preparation establishments with inadequate grease controls is the chief method that FOG gets into our sewer collection system.
A. True B. False

202. Sewer backups and overflows will occur on streets, properties and even in customers' homes and/or businesses are caused because of improper disposal of fats, oils and grease.
A. True B. False

203. Ponds, streams or rivers will be contaminated due to _____ and will also impact the environment negatively.
A. Sewer backup(s) C. Management Practices (MPs)
B. Overflow(s) D. None of the above

Food Service Establishments (FSEs)
204. Because of the amount of grease used in cooking, _____are a significant source of fats, oil and grease (FOG).
A. Sewer system infiltration C. Food Service Establishments (FSEs)
B. Customer(s) Inflow D. None of the above

205. To assist improper handling and disposal of FOG _____ are generally developed to assist restaurants and other FSEs with instruction and compliance.
A. CSO/SSO C. POTW Commercial FOG Program
B. POTWs D. None of the above

206. Through implementation of Best Management Practices (BMPs), establishments should be able to significantly reduce the amount of FOG that goes down their drains. Best Management Practices (BMPs) will minimize back-ups and help business owners comply with the POTW's requirements.
A. True B. False

(S) means the answer may be plural or singular in nature.

207. According to the text, the _____ can handle properly disposed wastes, but to work effectively, sewer systems need to be properly maintained, from the drain to the treatment plant.
A. Vactor
B. Honey pumpers
C. POTW's sewer system
D. None of the above

208. Because our sewer system is fragile, the sewer system cannot handle liquid waste, and therefore should not be put down the drain.
A. True
B. False

209. Proper sewer disposal by commercial establishments is required by _____.
A. Law
B. Best management advice (BMAs)
C. POTW's recommendations
D. None of the above

Environmental problem with FOG sewers

210. Grease balls are formed by various solids that enters the sewer system eventually solidifies. The various sizes of these grease balls can range in size from molecules to grapes and must be removed periodically.
A. True
B. False

211. Customer(s) complaints about the maintenance of the collection systems and/or treatment plants is the best method handle or treat FOG effectively.
A. True
B. False

212. The repair or replacement of their damaged property caused by FOG creating _____ can also cost customers thousands of dollars for the repair or replacement of their damaged property.
A. Infiltration
B. Sewer backup(s)
C. Exfiltration
D. None of the above

Controlling FOG discharges

213. According to the text, FOG wastes are generated at _____ as byproducts from food preparation activities.
A. FSEs
B. POTWs
C. Customer service
D. None of the above

214. There are generally two FOG captured on-site broad categories:
A. Yellow grease and grease trap waste
B. White grease and grease waste
C. Soft and Hard
D. None of the above

215. Food service establishments can adopt a variety of _____or install interceptor/collector devices to control and capture the FOG material before discharge to the collection system.
A. Customer service
B. POTWs Rules
C. Best management practices
D. None of the above

216. Instead of discharging yellow grease to POTWs, food service establishments usually accumulate this grease for pick up by consolidation service companies for re-sale or re-use in the manufacture of tallow, animal feed supplements, bio-fuels, or other products.
A. True
B. False

217. The POTW collection system may require that certain food service establishments install interceptor/collector devices in order to accumulate grease onsite and prevent it from entering the POTW collection system.
A. True B. False

Keeping Fats, Oils, and Grease out of the Sewer System
218. Manholes can overflow into parks, yards, streets, and storm drains, allowing FOG to contaminate local waters, including drinking water. Exposure to untreated wastewater is a public-health hazard and is an_____.
A. EPA violation C. EPA NOV recommendation
B. OSHA violation D. None of the above

219. As the FOG builds up, it restricts the flow in the pipe and can cause_____.
A. Infiltration C. Exfiltration
B. Overflow and clogging D. None of the above

POTWs control methods for FOG discharges from FSEs
220. There are many different devices, methods and procedures i.e., proper design, installation, and maintenance procedures are _____for these devices to Control and capture the FOG.
A. Suggested C. Critical
B. Normal D. None of the above

221. It is best that FOG does not separate in a turbulent environment.
A. True B. False

222. Grease interceptor/ collector devices shall be serviced at regular intervals and _____ must be diligent in providing proper maintenance and records.
A. BMPs C. Honey Pumpers
B. FSE D. None of the above

Best Management Practices (BMPs)
223. Reducing the FOG discharged into its sanitary sewer system is dependent upon the required maintenance frequency for interceptor/collector devices and the amount of FOG the facility generates as well as any best management practices (BMPs) that the establishment implements.
A. True B. False

224. Because of required grease interceptor and trap maintenance frequency, an establishment that implements BMPs will realize a _____benefit.
A. Financial C. Interceptor/collector device(s)
B. Odor reduction D. None of the above

Residential and Commercial Guidelines
225. The minor concern for Capacity, Management, Operations, and Maintenance (CMOM) is the improper disposal of fats, oil and grease (FOG).
A. True B. False

(S) means the answer may be plural or singular in nature.

226. To remediate the FOG problem, control authorities have developed _____program aimed at eliminating FOG from the sewer system. FOG buildup in sewer lines has many harmful and costly effects.
A. CSI C. An outreach
B. Negligence D. None of the above

227. _____into homes create a health hazard as well as an unpleasant mess that can cost hundreds and sometimes thousands of dollars to clean up.
A. Sewage backflow C. Sewer backups
B. Trash and debris D. None of the above

228. According to the text, serious environmental and health conditions are created and can enter certain parts of the POTW, _____can enter storm drains and flow directly into water bodies and onto beaches creating problems.
A. Sewage backups C. FOG
B. Trash and debris D. None of the above

229. Water and petroleum-based oils can also cause sewer-related problems
A. True B. False

230. Storm sewers need to be kept clean and car washing can often results in _____ entering the storm sewers.
A. Sewage backups C. Soap and oil residue(s)
B. Health hazard(s) D. None of the above

231. _____ enters into storm sewers from run-off from your sprinkler, watering hose, or from the rain can carry yard waste.
A. Fertilizer C. Petroleum-based oil(s)
B. Negligence D. None of the above

232. Littering can cause _____ to clog catch basins and storm drains.
A. Sewage backups C. Trash and debris
B. Health hazard(s)) D. None of the above

233. One million gallons of water can be easily contaminated by simply poring _____ down a storm drain could contaminate up to
A. A gallon of oil C. Dye
B. FOG D. None of the above

Using best management practices can:
234. Expensive bills for plumbing and property repairs and losing revenue to emergency shutdowns caused by sewage backups and expensive bills for plumbing and property repairs can be lessened by proper sewer maintenance and compliance.
A. True B. False

235. _____ is the primary cause of sewer problems; this in turn causes the likelihood of lawsuits by nearby businesses over sewer problems.
A. Backup C. FOG Violation(s)
B. Negligence D. None of the above

236. Workers or the public can be exposed to _____during a problem, it is best to reduce exposure, thus limiting some lawsuits.
A. Backup C. Raw sewage
B. FOG buildup D. None of the above

237. It is best that the customer increases the number of times they pump and clean their grease interceptors or traps if they are likely to present the system a problem.
A. True B. False

238. In order to lessen the likelihood of surcharges from the sewer authority, or chargebacks for repairs to sewer pipes are most likely attributable to customer's _____.
A. Health hazard(s) C. FOG
B. Soap and oil residue(s D. None of the above

Industrial Uses (Fats, Oils, and Grease)
Proper Disposal Methods:
Ways in which a customer can reduce the amounts of FOG that enters the sewer system is by doing the following:

239. Properly maintained and regularly cleaned_____, on a regular basis. (Usually every 6 months they should be pumped out).
A. Grease interceptors or traps C. Tallow bins
B. Infiltration row D. None of the above

240. It is best to _____from dishes and pans into a garbage bag before placing them into your dishwasher or sink.
A. First freeze the grease C. Scrape grease and food residue
B. Wipe small amounts D. None of the above

241. Only dispose of fat and grease in an approved container or by an approved method.
A. True B. False

242. _____ or motor oil at a recycling center.
A. Pouring oil(s) C. Recycle used cooking
B. Pour household grease D. None of the above

243. It is best to throw the hardened oil away on trash day by storing the oil in the original container.
A. True B. False

244. Mix oils with unscented kitty litter, sawdust or sand to solidify the oil (Avoid scented or disinfectant types of kitty litter as they can react with the oil and cause a fire).
A. True B. False

245. Use a paper towel to wipe small amounts of cooking oil, such as meat drippings, and throw the paper towel in the grease interceptor.
A. True B. False

246. Install "No Grease" signs around sinks to remind employees to avoid dumping fry grease and other fat products down the drain when the POTW is watching.
A. True B. False

247. After cooling and straining for foreign materials carefully try to pour the oil poured back and it is best to store oil in the original container.
A. True B. False

Inspection Checklists
248. Pretreatment programs are developing and using inspection checklists for both food service establishments and _____to control FOG discharges.
A. Customer service C. Pretreatment programs
B. Municipal pretreatment inspectors D. None of the above

249. EPA expects that blockages from FOG discharges will decrease as _____incorporate FOG reduction activities into their Capacity, Management, Operations, and Maintenance (CMOM) program and daily practices.
A. Customer service C. POTWs
B. EPA D. None of the above

250. _____are comprehensive, dynamic, utility specific programs for better managing, operating and maintaining sanitary sewer collection systems, investigating capacity constrained areas of the collection system, and responding to SSOs.
A. POTWs C. Pretreatment Program regulations
B. CMOM programs D. None of the above

When Finished with Your Assignment...

REQUIRED DOCUMENTS
Please scan the **Registration Page, Answer Key, Survey and Driver's License** and email these documents to info@TLCH2O.com.

IPhone Scanning Instructions
If you are unable to scan, take a photo of these documents with your **iPhone** and send these photos to TLC, info@TLCH2O.com.

FAX
If you are unable to scan and email, please fax these documents to TLC, if you fax, call to confirm that we received your paperwork. **(928) 468-0675**