

Need-2-Know		Primary Purpose of the Position	Measure scum & sludge depths for the accumulation of solids & removing these deposits; remove solids & liquids from toilet waste treatment devices; haul septage; land apply septage or disposal in a Approved Sewage Treatment Works; identify problems related to sewage tanks, baffles, maintenance hole covers, extensions, and pumps, & make these repairs; evaluate sewage tanks, dosing chambers, distribution devices, valve boxes, or drop boxes for leakage; identify cesspools, seepage pits, leaching pits, and drywells; and clean supply pipes & distribution pipes for all SSTS
Date	5/23/2006		
Position	Maintainer		
Duties	I. Prepare for Operation II. Pump Septage from Tank(s) III. Distribute Septage IV. Complete Records & Submit		

<ul style="list-style-type: none"> I Prepare for Operation <ul style="list-style-type: none"> A Contact Local Unit of Government B Alert Gopher State One Call C Establish Septage Distribution Site <ul style="list-style-type: none"> 1 Approved Sewage Treatment Works 2 Land Application <ul style="list-style-type: none"> a Establish Application Site Boundaries b Determine Method of Pathogen Control & Record c Determine Method of Vector Attraction Reduction & Record d Calculate MANA Rate Limit & Record
<ul style="list-style-type: none"> II Pump Septage from Tank(s) <ul style="list-style-type: none"> A Open Tank(s) <ul style="list-style-type: none"> 1 Locate Maintenance Hole(s) from Surface 2 Expose Maintenance Hole Cover(s) 3 Remove Maintenance Hole Cover(s) 4 Install Maintenance Hole(s) B Inspect Contents <ul style="list-style-type: none"> 1 Evaluate Liquid Levels 2 Evaluate Stratification C Remove All Tank Contents through Maintenance Hole <ul style="list-style-type: none"> 1 Break Apart Scum Layer 2 Evacuate Septage 3 Backflush Septage D Inspect Tank(s) & System Features for Structural Soundness & Watertightness <ul style="list-style-type: none"> 1 Evaluate Tank Inspection Pipe(s) 2 Fix/Replace Tank Inspection Pipe(s) 3 Evaluate Tank(s) 4 Identify Cesspools, Seepage Pits, Leaching Pits, and Drywells 5 Evaluate Dosing Chamber(s) 6 Evaluate Baffles 7 Fix/Replace Baffles 8 Evaluate Pump(s) 9 Fix/Replace Pump(s)

	<ul style="list-style-type: none"> 10 Evaluate Siphon(s) 11 Fix/Replace Siphon(s) 12 Evaluate Filter(s) 13 Clean Filter(s) 14 Fix/Replace Filter(s) 14 Evaluate Supply Pipe(s) 15 Clean Supply Pipe(s) 16 Evaluate Valve Boxes 17 Fix Valve Box(es) 18 Evaluate Drop Boxes 19 Fix Drop Box(es) 20 Evaluate Distribution Boxes 21 Fix Distribution Box(es) 22 Evaluate Maintenance Hole Cover(s) 23 Fix/Replace Maintenance Hole Cover(s) 24 Evaluate Maintenance Hole Riser(s) 25 Fix/Replace/Add Maintenance Hole Riser(s) 26 Evaluate Distribution Pipe(s) 27 Clean Distribution Pipe(s) E Close Tank(s) F Abandon Tank(s) G Remove Solids & Liquids from Toilet Waste Treatment Devices H Restore Property
III	<ul style="list-style-type: none"> Distribute Septage <ul style="list-style-type: none"> A Distribute Septage to Approved Sewage Treatment Works B Distribute Septage by Land Application <ul style="list-style-type: none"> 1 Stabilize Septage with Lime & Record 2 Land Apply & Incorporate 3 Land Apply by Injection 4 Protect Site
IV	<ul style="list-style-type: none"> Complete Records & Submit <ul style="list-style-type: none"> A Complete Daily Hauling Record B Complete Site Specific Record

I. Prepare for Operation

A. Foundation Facts, Concepts & Theories (Knowledge)

- a. Maintenance
 - i. Purpose of maintenance
 - ii. Maintenance programs
 - iii. Individual Maintenance plans
 - ONE Pumping frequency
 - TWO System monitoring
- b. Septage system overview
 - i. Individual
 - ONE Standard Systems
 - Pump
 - First Basement sump
 - Second Grinder pump
 - Third Effluent pump
 - Building sewer
 - Tank
 - First Holding
 - Second Septic
 - Third Aerobic Treatment Unit
 - Fourth Media Filters
 - Constructed Wetland Systems
 - In-ground system
 - First Trenches
 - Second Seepage beds
 - Third Filter media
 - Above-ground system
 - First At-grades
 - Second Mounds
 - Third Filter media
 - ii. Cluster

B. Contact Local Unit of Government to Obtain Local Ordinances & Resources

1. Foundation Facts, Concepts & Theories (Knowledge)

- a. Governing body hierarchy
 - i. Federal rules override State requirements
 - ii. Federal rules override Local ordinances
 - iii. Local ordinances override State requirements
 - ONE Local ordinances may be composed of both more restrictive standards and/or less restrictive (alternative) standards than State requirements
 - TWO City and Town ordinances must be as restrictive as County ordinances
 - THREE If no Local ordinances exist, default to State requirements
- b. Governing body requirements
 - i. *Individual sewage treatment systems* serving establishments licensed or otherwise regulated by Minnesota shall conform to the requirements of this chapter. Use of systems designed under [7080.0172, 7080.0178 or 7080.0179] for *new construction* or *replacement* of systems that serve establishments licensed or otherwise regulated by the Minnesota Department of Health are allowed only in areas where a *standard system* cannot be installed or is not the most suitable treatment and only where allowed and enforced under ordinance and *permit* of the *local unit of government*. Any *individual sewage treatment systems* requiring approval by the state shall also comply with applicable local codes and ordinances. Plans and specifications must receive the appropriate state and local approval before construction is initiated. [7080.0030 Subp.4]

2. How to Contact Local Unit of Government to Obtain Local Ordinances & Resources (Skill/Procedure)
 3. Essential Behavior (Attitude)
- C. **Alert Gopher State One Call**
1. Foundation Facts, Concepts & Theories (Knowledge)
 - a. Excavation notification statutes
 - i. See Appendix A [216D.03 – 216D.07]
 2. How to Alert Gopher State One Call (Skill/Procedure)
 - a. Contact information
 - i. Metro: 651-454-0002
 - ii. Statewide: 800-252-1166
 - iii. Webpage: www.gopherstateonecall.org
 3. Essential Behavior (Attitude)
- D. **Establish Septage Distribution Site**
1. **Approved Sewage Treatment Works**
 - a. Foundation Facts, Concepts & Theories (Knowledge)
 - i. Governing body requirements

ONE Septage shall be disposed of in accordance with state, federal, or local requirements. If *septage* is disposed of into a municipal *sewage* treatment facility, a written agreement must be provided between the accepting facility and the *septage* disposal firm. [7080.0175 Subp.6]
 - b. How to Establish Septage Distribution Site (Skill/Procedure)
 - c. Essential Behavior (Attitude)
 - i. Respect Approved Sewage Treatment Works Perspective
 2. **Land Application**
 - i. Foundation Facts, Concepts & Theories (Knowledge)

ONE Governing body requirements

 - *Septage* shall be disposed of in accordance with state, federal, or local requirements. If *septage* is disposed of into a municipal *sewage* treatment facility, a written agreement must be provided between the accepting facility and the *septage* disposal firm. [7080.0175 Subp.6]
 - a. **Obtain Soil Survey**
 - i. Foundation Facts, Concepts & Theories (Knowledge)
 - ii. How to Obtain Soil Survey (Skill/Procedure)

ONE Where to obtain

 - Permit file at Local Unit of Government
 - USGS
 - iii. Essential Behavior (Attitude)
 - b. **Establish Application Site Boundaries**
 - i. Foundation Facts, Concepts and Theories (Knowledge)

ONE Soil

 - Characteristics
 - First Texture
 - Second Structure
 - Bedrock
 - Third Consistency
 - Fourth Permeability
 - Pores
 - Limiting layer
 - Water Table
 - Treatment
 - First Unsaturated flow
 - Second Surface area/negative charges
 - Third Oxygen
 - Fourth Soil bacteria
 - Fifth Pathogen removal

- Sixth Nutrient removal
 - Seventh Chemical removal
- TWO** Landscape
 - Flooding potential
 - Slope
 - Morphology
 - Topography
- THREE** Soil Survey
 - Information contained
 - How to find a specific location in soil survey
 - How to evaluate soil series for suitability
- FOUR** Site boundary & restriction recommendations
 - The boundary of a *land application* site must be identified and marked during *septage* application unless apparent boundaries, such as fence-rows, roads, tree lines, type of vegetation, or steep *slopes*, exist. [0000.0090 Subp1.A]
 - *Septage* must not be applied on any land without the permission of the owner. [0000.0090 Subp.1.B]
 - Pumpers must inform the landowner and land user of site restrictions contained in this chapter [0000.0090 Subp1.J.(1)]
 - *Septage* must not be applied on areas ponded with water or *septage*. [0000.0090 Subp.1.D]
 - The site may be completely covered once when soils on the site are frozen or snow covered. The application rate is limited to 10,000 gallons/acre or less, and only on *slopes* of 2 percent or less. Subsequent applications are not allowed until the applied *septage* has infiltrated into the soil. [0000.0090 Subp.1.F]
 - *Septage* cannot be applied by spraying from public roads or across road right of ways. [0000.0090 Subp.1.H]
 - Soils suitable for *septage* application must meet the requirements of A through D. [0000.0070 Subp.2]
 - First The *soil texture* at the zone of *septage* application must be *fine sand*, loamy sand, sandy loam, loam, silt, silt loam, sandy clay loam, clay loam, sandy clay, silty clay loam, silty clay, or clay. [0000.0070 Subp.2.A]
 - Second *Septage* may not be applied to soil with a seasonally high water table or *bedrock* of less than 3 feet from the zone of application. *Septage* may not be applied to soil with a seasonally high watertable or *bedrock* of less than 5 feet soils from the zone of application if the soil is rated as highly permeable by the Natural Resource Conservation Service. For seasonally high watertable soils, this separation distance can be gained by a drainage system designed according to or equivalent to Natural Resources Conservation Service engineering criteria. [0000.0070 Subp.2.B]
 - Third *Septage* may not be applied to soil with a NRCS flooding frequency of occasional, frequent or very frequent, or *floodways* as designated by the Department of Natural Resources. [0000.0070 Subp.2.C]
 - Fourth *Septage* must be incorporated within 48 hours or injected if the permeability of the surface layer of the soil is less than or equal to 0.2 inches/hour. [0000.0070 Subp.2.D]
 - The *slope* restrictions in Table 1 shall be maintained. [0000.0070 Subp.3]
 - *Septage* shall not be land applied closer than the *setback* distances listed in Table 2. [0000.0070 Subp.4]

- ii. **How to Establish Application Site Boundaries (Skill/Procedure)**
ONE How to determine suitable soil
- iii. **Essential Behavior (Attitude)**

Table 1		
Slope (percent)	Surface Application	Injection or Incorporation within 48 hrs
0-6	Allowed	Allowed
6-12	Not Allowed	Allowed
>12	Not Allowed	Not Allowed
<i>Septage may only be applied on areas with a slope of 2% or less when the soil is snow covered or frozen.</i>		

Table 2				
Feature		Separation Distances in Feet		
		Surface Applied	Incorporated within 48 hours	Injected
Private drinking water supply wells		200	200	200
Public drinking water supply wells ¹		1000	1000	1000
Irrigation wells		50	25	25
Residences		200	200	100
Residential developments		600	600	300
<i>Public contact sites</i>		600	600	300
Down gradient lakes, rivers, streams, wetlands, intermittent streams, or tile inlets connected to these surface water features ² , and sinkholes	0% < Slope < 6%	200	50	50
	6% < Slope < 12%	Not Allowed	100	100
	Winter (Slope < 2%)	600	Not Applicable	Not Applicable
Grassed waterways ³	0% < Slope < 6%	100	33	33
	6% < Slope < 12%	Not Allowed	33	33
¹ There may be special requirements if the <i>land application</i> site is within the boundaries of a <i>wellhead protection area</i> . Check with the Minnesota Department of Health or <i>local unit of government</i> . ² Intermittent stream means a drainage channel with definable banks that provides for runoff flow to any of the surface waters listed in the above table during snow melt or rainfall events. ³ Grassed waterways are natural or constructed and seeded to grass as protection against erosion. Separation distances are from the centerline of grassed waterways. For a grassed waterway which is wider than the separation distances required, application is allowed to the edge of the grass strip.				
[Table 6. Minimum separation distances from the land application site, MPCA <i>Septage</i> and Restaurant Grease Trap Waste Management Guidelines, 8/2002]				

c. **Determine Method of Pathogen Control & Record**

i. **Foundation Facts, Concepts & Theories (Knowledge)**

ONE Pathogen control rules

- The requirements in either [503.32(c)(1) or (c)(2)] shall be met when *domestic septage* is applied to agricultural land, *forest*, or a *reclamation* site. [503.15(b)]
- The site restrictions in [503.32(b)(5)] shall be met when *domestic septage* is applied to agricultural land, *forest*, or a *reclamation* site; or [503.32(c)(1)]*
- The *pH* of *domestic septage* applied to agricultural land, *forest*, or a *reclamation* site shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes and the site restrictions in [503.32 (b)(5)(i) through (b)(5)(iv)] shall be met. [503.32(c)(2)]*
- If either the pathogen requirements in [503.32(c)(2)] or the *vector attraction* reduction requirements in [503.33(b)(12)] are met when *domestic septage* is applied to agricultural land, *forest*, or a *reclamation* site, each container of *domestic septage* applied to the land shall be monitored for compliance with those requirements. [503.16(b)]

TWO Site restrictions rules

- *Food crops* with harvested parts that touch the *sewage* sludge/soil mixture and are totally above the land surface shall not be harvested for 14 months after application of *sewage* sludge. [503.32(b)(5)(i)]*
- *Food crops* with harvested parts below the surface of the land shall not be harvested for 20 months after application of *sewage* sludge when the *sewage* sludge remains on the land surface for four months or longer prior to incorporation into the soil[503.32(b)(5)(ii)]*
- *Food crops* with harvested parts below the surface of the land shall not be harvested for 38 months after application of *sewage* sludge when the *sewage* sludge remains on the land surface for less than four months prior to incorporation into the soil. [503.32(b)(5)(iii)]*
- *Food crops*, *feed crops*, and *fiber crops* shall not be harvested for 30 days after application of *sewage* sludge. [503.32(b)(5)(iv)]*
- Animals shall not be grazed on the land for 30 days after application of *sewage* sludge. [503.32(b)(5)(v)]*
- Turf grown on land where *sewage* sludge is applied shall not be harvested for one year after application of the *sewage* sludge when the harvested turf is placed on either *land with a high potential for public exposure* or a lawn, unless otherwise specified by the permitting authority. [503.32(b)(5)(vi)]*
- Public access to *land with a high potential for public exposure* shall be restricted for one year after application of *sewage* sludge. [503.32(b)(5)(vii)]*
- Public access to *land with a low potential for public exposure* shall be restricted for 30 days after application of *sewage* sludge. [503.32(b)(5)(viii)]*

ii. **How to Determine Method of Pathogen Control & Record (Skill/Procedure)**

iii. **Essential Behavior (Attitude)**

d. **Determine Method of Vector Attraction Reduction & Record**

i. **Foundation Facts, Concepts & Theories (Knowledge)**

ONE *Vector attraction* rules

- The *vector attraction* reduction requirements in [503.33(b)(9), (b)(10), or (b)(12)] shall be met when *domestic septage* is applied to agricultural land, *forest*, or a *reclamation* site. [503.15(d)]

- If either the pathogen requirements in [503.32(c)(2)] or the *vector attraction* reduction requirements in [503.33(b)(12)] are met when *domestic septage* is applied to *agricultural land, forest, or a reclamation* site, each container of *domestic septage* applied to the land shall be monitored for compliance with those requirements. [503.16(b)]

TWO Injection rules

- *Sewage* sludge shall be injected below the surface of the land. [503.33(b)(9)(i)]*
- No significant amount of the *sewage* sludge shall be present on the land surface within one hour after the *sewage* sludge is injected. [503.33(b)(9)(ii)]*
- When the *sewage* sludge that is injected below the surface of the land is Class A with respect to pathogens, the *sewage* sludge shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process [503.33(b)(9)(iii)]*

THREE Incorporation rules

- *Sewage* sludge applied to the land surface or placed on an active *sewage* sludge unit shall be incorporated into the soil within six hours after application to or placement on the land, unless otherwise specified by the permitting authority. [503.33(b)(10)(i)]*
- When *sewage* sludge that is incorporated into the soil is Class A with respect to pathogens, the *sewage* sludge shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process. [503.33(b)(10)(ii)]*

FOUR Lime stabilization rules

- The pH of *domestic septage* shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes. [503.33(b)(12)]*

ii. **How to Determine Method of Vector Attraction Reduction & Record (Skill/Procedure)**

iii. **Essential Behavior (Attitude)**

e. **Calculate MANA Rate Limit & Record**

i. **Foundation Facts, Concepts & Theories (Knowledge)**

ONE Annual application rate rules

- The annual application rate for *domestic septage* applied to *agricultural land, forest, or a reclamation* site shall not exceed the annual application rate calculated using equation (1). $AAR = N / 0.0026$ [503.13(c)]*

First AAR=Annual application rate in gallons per acre per 365 day period.

Second N=Amount of nitrogen in pounds per acre per 365 day period needed by the crop or vegetation grown on the land.

- No person shall apply *domestic septage* to *agricultural land, forest, or a reclamation* site during a 365 day period if the annual application rate in [503.13(c)] has been reached during that period. [503.12(c)]

TWO Annual application rate recommendations

- *Septage* application rates, combined with other known sources of nitrogen, plus carry-over nitrogen from previous cropping years, must supply no more available nitrogen, in a cropping year, than the rates as recommended by the University of Minnesota Extension Service, or items [A. through C]. [0000.0080 Subp.1]

First Alfalfa and clovers that do not have recommended nitrogen application rates shall conform to [(1) or (2)]:

- The maximum available nitrogen application rate for alfalfa or clover hay must not exceed 150 pounds per acre per year and for clover hay 100 pounds per acre per year. The available nitrogen applied after the second cutting of a hay crop must be no more than 50 percent of the maximum available nitrogen

application rate for the current cropping year. [0000.0080 Subp.1.A(1)]

- The maximum available nitrogen application rates may be calculated based on realistic yield goals and measured yields in tons per acre multiplied by 50 pounds of nitrogen per ton. [0000.0080 Subp.1.A(2)]

Second The maximum available nitrogen application rate for soybeans shall be calculated by multiplying the realistic yield goal in bushels per acre by 3.5 pounds of nitrogen per bushel. [0000.0080 Subp.1.B]

Third The maximum available nitrogen application rate for *cover crops* or non-cropped areas must not exceed 50 pounds per acre per year. [0000.0080 Subp.1.C]

- The maximum available nitrogen application rates shall be calculated using realistic yield goals, soil organic matter content, carry over nitrogen, other nitrogen sources and previously grown crops. Nitrogen concentrations of *septage* to be used to determine application rates shall be 0.0026 pounds per gallon or as determined by laboratory analysis. [0000.0080 Subp.2]
- *Septage* shall not be landspread in a cropping year in which no crop or vegetation will be grown on the site. [0000.0080 Subp.3]
- Pumpers must inform the landowner and land user of the pounds per acre of nitrogen applied per cropping year [0000.0090 Subp1.J.(2)]

THREE Maximum allowable nitrogen application (MANA)

ii. **How to Calculate MANA Rate Limit & Record (Skill/Procedure)**

ONE How/Where to obtain resources for crop Nitrogen usage estimates

TWO How to credit septage Nitrogen contribution for annual crop requirements

THREE Tools

- Minnesota Extension Service Bulletin BU-6240-E

iii. **Essential Behavior (Attitude)**

ONE Accurate record keeping for responsible nutrient management

Crop	Option 1 MANA Rate (pounds nitrogen/acre/year)	Option 2 MANA Rate (pounds nitrogen/acre/year)
Non-harvested vegetation or <i>cover crops</i>	50 [20,000 gal/acre]	50
Soybeans	120 [45,000 gal/acre]	3.5 lb Nitrogen X Bushel/acre yield goal
Alfalfa	150 [60,000 gal/acre]	50 lb Nitrogen X Tons/acre yield goal
Clover, alfalfa-grass, clover-grass mixtures, or other legumes	100 [40,000 gal/acre]	50 lb Nitrogen X Tons/acre yield goal
All other crops (e.g. corn, oats, wheat, <i>pasture</i> , etc.)	50 [20,000 gal/acre]	University of Minnesota Publication – Recommendations for Agronomic Crops in Minnesota (BU-6240-GO and its updates)
[Table 7. Maximum Allowable Nitrogen Application Rates (MANA Rates), MPCA, <i>Septage</i> and Restaurant Grease Trap Waste Management Guidelines, 8/2002]		

II. Pump Septage from Tank

A. Open Tank

1. Locate Maintenance Hole(s) from Surface

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Maintenance hole requirements

ONE Shall be one or more maintenance holes at least 20 inches (least dimension), and placed so access can be gained within six feet of all walls. All maintenance holes shall extend through the cover to a point within 12 inches of finished grade. If maintenance holes are covered by less than six inches of soil, the cover must be secured to prevent unauthorized access [7080.0130 Subp.2.M(1)]*

TWO Shall be one or more maintenance holes, at least 20 inches in least dimension and located directly above the *dosing device*. The maintenance holes shall extend through the *dosing chamber* cover to final grade and shall be constructed to prevent unauthorized entry [7080.0160 Subp.1a.B]

ii. Excavation statutes

ONE The *excavator* or land surveyor shall determine the precise location of the *underground facility*, without *damage*, before excavating within two feet on either side of the marked location of the *underground facility*. [216D.04 Subd.4(a)]

TWO An *excavator* shall use white markings for proposed *excavations* except where it can be shown that it is not practical [216D.05(2)]

iii. Color code for marked underground utilities

(<http://www.gopherstateonecall.org/colorcodechart.asp>)

ONE Electric-Red

TWO Gas/Oil/Steam-Yellow

THREE Communication/CATV-Orange

FOUR Water-Blue

FIVE Reclaimed water/Irrigation-Purple

SIX Sewer-Green

SEVEN Temporary survey markings-Pink

EIGHT Proposed excavation- White

b. How to Open Tank (Skill/Procedure)

i. Cues to Locating Tank

ONE Water flows downhill from house

TWO Sewer service may signal direction

THREE Inspection pipes

FOUR Low spot

FIVE Dead grass

SIX Early snow melt

SEVEN Landscaping

ii. Significant Hazards

ONE Interference with underground utilities

TWO Probe piercing plastic tank

iii. Hazard Control

ONE Excavation protocol

TWO Gopher State One Call

THREE On-site Gear

iv. Tools

ONE System location resources

➤ Site map

➤ As-built

➤ Local Unit of Government

➤ Homeowner Records

➤ Landscape cues

➤ Sonic detector

- Probe
 - Plumber's snake
 - Witching
- c. **Essential Behavior (Attitude)**
2. **Expose Maintenance Hole Cover(s)**
- a. **Foundation Facts, Concepts & Theories (Knowledge)**
- i. Excavation statutes
ONE See Appendix A [216D.03- 216D.07]
- b. **How to Expose Maintenance Hole Cover(s) (Skill/Procedure)**
- i. Alternatives
ONE Cover flush with service
TWO Ask owner or hire contractor to expose maintenance hole
- ii. ?
ONE Protect landscape, current and additional soil treatment areas
- iii. Significant Hazards
ONE Interference with underground utilities
TWO Confined space entry
THREE Soil topple
- iv. Hazard Control
ONE Excavation Protocol
TWO Confined Space Entry Protocol
- v. Tools
ONE Digging or Excavation tools appropriate for estimated depth
- vi. Environmental Conditions
ONE Site in full view
- c. **Essential Behavior (Attitude)**
3. **Remove Maintenance Hole Cover(s)**
- a. **Foundation Facts, Concepts & Theories (Knowledge)**
- b. **How to Remove Maintenance Hole Cover(s) (Skill/Procedure)**
- i. ?
ONE Protect landscape, current and additional soil treatment areas
- ii. Varieties
ONE Concrete lid
 - With loops
 - Without loops**TWO** Plastic lid
- iii. Significant Hazards
ONE Poisonous gases
TWO Explosive gases
THREE Chemicals
FOUR Needles
FIVE Pathogens
SIX Back strain
- iv. Hazard Control
ONE Never leave maintenance hold exposed & unattended
TWO Lift maintenance hole using appropriate equipment & technique
- v. Tools
ONE Equipment appropriate for lifting all varieties of covers
- vi. Alternatives
ONE Possible to evaluate liquid levels through inspection hole prior to removing maintenance hole cover
- c. **Essential Behavior (Attitude)**

4. Install Maintenance Hole(s)

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Maintenance hole requirements

ONE If no maintenance hole exists on a *sewage tank*, the *owner* or the *owner's* agent shall install maintenance holes in *sewage tanks* in accordance with [7080.0130 Subp.2.M(1)] to allow for maintenance to take place through the maintenance hole. If the *owner* or *owner's* agent refuses to allow the removal through a maintenance hole, the licensed pumper must obtain a signed statement from the *owner* or *owner's* agent that the *owner* or agent was informed of correct procedures and the reason for refusal. [7080.0175 Subp.3.C]

b. How to Install Maintenance Hole(s) (Skill/Procedure)

i. ?

ONE Protect landscape, current and additional soil treatment areas

TWO As scope expands, obtain owner's permission

ii. Alternatives

ONE Replace tank

TWO Replace tank cover

iii. Tools

ONE K-saw

iv. Environmental Conditions

ONE Installation must not occur in wet soils

c. Essential Behavior (Attitude)

B. Inspect Contents

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Wastewater sources

ONE Domestic

➤ Dwelling

First Sources

- Sewage

- Non sewage sources

+ Treatment devices

■ Water softener

■ Iron filter

■ Reverse osmosis

+ Condensation lines from high efficiency furnaces

+ Drain tile

TWO Non-domestic

➤ Other establishment

First Average

Second Maximum

Third Methods

ii. Characteristics of septage

ONE Chemical characteristics

➤ Waste strength components

First Biochemical oxygen demand (BOD)

- Measurement

- Typical values

- System impact

Second Total suspended solids (TSS)

- Measurement

- Typical values

- System impact

- Third Fats, Oils, Grease (FOG)
 - Measurement
 - Typical values
 - System impact
 - Nitrogen
 - First Treatment
 - Ammonia
 - Nitrate
 - Phosphorus
 - First Treatment
 - Aberrant chemicals
 - First Additives
 - Second Pharmaceuticals
 - Third Household chemicals
 - Fourth Hazardous waste
 - Illegal drug production
 - TWO** Biological characteristics
 - Bacteria and viruses
 - First Fecal coliform
 - THREE** Grease trap waste
 - FOUR** Mixed waste
- iii. Septage production
 - ONE** Per household
 - TWO** Accumulation rate in tank
 - Design flow
 - First Estimated amounts
 - Second Bedroom identification
 - Third Home size
 - Fourth Appliances
 - Measured flow
 - THREE** Statewide production
- iv. System performance
 - ONE** Treatment
 - Waste reduction
 - Separation
 - First Settling
 - Sludge
 - Clear zone
 - Second Floating
 - Scum
 - Screening
 - Filtration
 - TWO** Acceptance
 - Soil treatment
 - First Unsaturated flow
 - Second Surface area/negative charges
 - Third Oxygen
 - Fourth Soil bacteria
 - Fifth Pathogen removal
 - Sixth Nutrient removal
 - Seventh Chemical removal
 - THREE** Treatment vs just getting rid of the sewage

1. Evaluate Liquid Levels

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Liquid level requirements

ONE *Septage* shall be removed by pumping of *septage* from all tanks or compartments in which the top of the sludge layer is less than 12 inches below the bottom of the outlet *baffle* or whenever the bottom of the scum layer is less than three inches above the bottom of the outlet *baffle*.
[7080.0175 Subp.3.B]

ii. Hazardous waste statutes

ONE Hazardous waste response

b. How to Evaluate Liquid Levels

i. Possible results

ONE Normal sewage

TWO Abnormal sewage

- Liquid level above *invert* of outlet
- Liquid level above air space, into riser or surfacing
- Hazardous waste

c. Essential Behavior (Attitude)

Evaluation	Cause	ID Method	Remedy
Low levels of liquid	Crack		
High levels of liquid	High peak instantaneous flow		
	Blocked outlet <i>baffle</i>		
	<i>Baffle</i> no longer in place		
	Scum levels too thick		
	Blocked supply pipe - Solids		
	Blocked supply pipe – Grease		
	Blocked supply pipe – Frozen		
	<i>Supply pipe</i> sloped in wrong direction		
	Tank installed backwards		
	Tank outlet higher than inlet		
	Pump not operating		
	Drainfield ponded & draining back to tank		
Hazardous waste			

2. Evaluate Stratification

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Evaluation requirements

ONE The *owner* of an *individual sewage treatment system* or the *owner's* agent shall regularly, but in no case less frequently than every three years assess measure or remove the accumulations of scum, which includes grease and other floating materials at the top of each *septic tank* and compartment along with the sludge, which includes the solids denser than water [7080.0175 Subp.2.B]

b. How to Evaluate Stratification (Skill/Procedure)

i. Possible results

ONE Normal

TWO Abnormal

- No stratification

ii. Alternatives

ONE Visual evidence of scum layer suggests adequate stratification

- iii. Significant Hazards
 - ONE** Poisonous gases
 - TWO** Explosive gases
 - THREE** Chemicals
 - FOUR** Needles
 - FIVE** Pathogens
 - SIX** Hazardous waste
- iv. Hazard Control
 - ONE** Hazardous waste response
- v. Tools
 - ONE** Sludge judge or equivalent
- c. **Essential Behavior (Attitude)**

Evaluation	Cause	ID Method	Remedy
No stratification	Toxic substances		
	Medicine		
	Recently pumped		
	Leaks		
	Peak flow flushing		
	No <i>baffles</i>		
	Water softener		
	Turbulence from pump		
	Hot water discharge		
Too much scum	Excess soap/detergent		
	Excess FOG		
	Garbage disposal		
	User variable		

C. Remove All Tank Contents through Maintenance Hole

- a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. Axle weight and road restrictions
 - 1. Definition
 - 2. Function
 - 3. Affected roads
 - 4. Typical limits
 - 5. Typical dates
 - b. **Essential Behavior (Attitude)**
 - i. Recognize significance of complete septage removal
1. **Break Apart Scum Layer**
- a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - b. **How to Break Apart Scum Layer (Skill/Procedure)**
 - i. Goal
 - ONE** Small enough to allow for total evacuation
 - ii. Significant Hazards
 - ONE** Poisonous gases
 - TWO** Explosive gases
 - THREE** Chemicals
 - FOUR** Needles
 - FIVE** Pathogens
 - SIX** Hazardous waste
 - iii. Hazard Control
 - ONE** Hazardous waste response
 - iv. Tools
 - ONE** Sludge buster or equivalent
 - TWO** Plastic gloves
 - c. **Essential Behavior (Attitude)**

2. Evacuate Septage

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Maintenance access requirements

ONE Activities on the *soil treatment system* or the additional *soil treatment area* as specified in part [7080.0305 Subp.4.F], that may impair the treatment abilities or hydraulic performance of the *soil treatment system* are prohibited. [7080.0175 Subp.7]

TWO A provision that requires all *lots* created after January 23, 1996, to have a minimum of one additional *soil treatment area* that can support a *standard system*. [7080.0305 Subp.4.F]*

ii. Removal requirements

ONE The *owner* of an *individual sewage treatment system* or the *owner's* agent shall regularly, but in no case less frequently than every three years assess measure or remove the accumulations of scum, which includes grease and other floating materials at the top of each *septic tank* and compartment along with the sludge, which includes the solids denser than water. [7080.0175 Subp.2.B]

TWO *Septage* shall be removed by pumping of *septage* from all tanks or compartments in which the top of the sludge layer is less than 12 inches below the bottom of the outlet *baffle* or whenever the bottom of the scum layer is less than three inches above the bottom of the outlet *baffle*. [7080.0175 Subp.3.A]

THREE Removal of accumulated sludge, scum, and liquids must be through the maintenance hole. [7080.0175 Subp.3.B]

iii. Additive requirements

ONE *Individual sewage treatment system additives* must not be used as a means to reduce the frequency of proper maintenance and removal of *septage* from the *septic tank* as specified in this part. *Individual sewage treatment system additives* that contain hazardous substances must not be used *individual sewage treatment systems*. [7080.0175 Subp.5.]

b. How to Evacuate Septage (Skill/Procedure)

i. Goal

ONE Completely evacuate tank

ii. ?

ONE Repeat after backflush

TWO Protect landscape, current and additional soil treatment areas

THREE Access to tank must not impair the current or additional soil treatment area

iii. How to calculate axle weight of truck

iv. Alternatives

ONE Dewater and return filtered liquid to tank

v. Significant Hazards

ONE Poisonous gases

TWO Explosive gases

THREE Chemicals

FOUR Needles

FIVE Pathogens

SIX Hazardous waste

vi. Hazard Control

ONE Hazardous waste response

vii. Tools

ONE Suction/Lift truck able to approach tank

➤ Backwash capability

➤ Lift distance

➤ Axle weight

TWO Plastic gloves

c. Essential Behavior (Attitude)

3. Backflush Septage

- a. Foundation Facts, Concepts & Theories (Knowledge)
- b. How to Backflush Septage (Skill/Procedure)

- i. ?
 - ONE** Return about 1/3 of contents back to tank
- ii. Significant Hazards
 - ONE** Poisonous gases
 - TWO** Explosive gases
 - THREE** Chemicals
 - FOUR** Needles
 - FIVE** Pathogens
 - SIX** Hazardous waste
- iii. Hazard Control
 - ONE** Hazardous waste response
- iv. Tools
 - ONE** Suction/Lift truck able to approach tank
 - Backwash capability
 - Lift distance
 - Axle weight
 - TWO** Plastic gloves

- c. Essential Behavior (Attitude)

D. Inspect Tank(s) & System Features for Structural Soundness & Watertightness

- a. Foundation Facts, Concepts & Theories (Knowledge)

- i. Maintenance requirements

ONE The owner of an *individual sewage treatment system* or the owner's agent shall regularly, but in no case less frequently than every three years assess whether the *sewage tank* leaks below the designed operating depth and whether *sewage tank* tops, riser joints, and riser connections leak through visual evidence of major defects [7080.0175 Subp.2.A]

TWO Any maintenance activity used to increase the acceptance of effluent to a *soil treatment system* must

- not be used on *failing systems*, unless the activity meets the requirements of [7080.0179][7080.0175 Subp.8.A]
- not decrease the required *vertical separation* [7080.0175 Subp.8.B]
- not cause preferential flow from the system bottom to the *saturated soil* or *bedrock* [7080.0175 Sup.8.C]
- be conducted by an appropriately registered *qualified employee* or an appropriately licensed *ISTS professional* [7080.0175 Sup.8.D]

- ii. Compliance criteria

ONE Compliance inspection

- Compliant
- Non-compliant

First Failing

Second Imminent public health threat

Third Upgrade or repair time periods

- Certificate of compliance/Notice of non-compliance
- Administrative requirements
- Reporting

TWO Disclosure

- State requirements at property transfer

1. Evaluate Tank Inspection Pipe(s)

- a. Foundation Facts, Concepts & Theories (Knowledge)

- i. Inspection pipe requirements

ONE There shall be an inspection pipe of at least four inches in diameter over both the inlet and outlet *baffles*. The inspection pipe shall extend through the tank cover or the maintenance hole cover, be secured and be capped flush with or above finished grade. A downward projection of the center line of the

inspection pipe shall be directly in line with the center line of the inlet or outlet device [7080.0130 Subp.2.M(2)]

TWO An inspection pipe at last four inches in diameter must be located between the inlet and outlet *baffles* for the purpose of evaluating scum and scum accumulations. The inspection pipe must extend through either the tank cover or maintenance hole cover and must be capped flush with or above finished grade [7080.0130 Subp.2.M(3)]

- b. **How to Evaluate Tank Inspection Pipe(s) (Skill/Procedure)**
 - i. Cues to action
 - ONE** Leaking through visual evidence of major defects
 - TWO** Missing or insecure cap
 - THREE** Glued or permanently secured cap
 - FOUR** Mistakenly sheared flush to surface
 - ii. Tools
 - ONE** Plastic gloves
 - iii. Alternatives
 - ONE** Flush with or above grade with maintenance holes at any of these positions may be considered inspection pipe
 - c. **Essential Behavior (Attitude)**
2. **Fix/Replace Tank Inspection Pipe(s)**
- a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - b. **How to Fix/Replace Tank Inspection Pipe(s) (Skill/Procedure)**
 - i. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**
3. **Evaluate Tank(s)**
- a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. Tank requirements
 - ONE** Shall be *watertight* [7080.0130 Subp.1.A]
 - TWO** Shall be designed and constructed to withstand all lateral earth pressures under *saturated soil* conditions when empty [7080.0130 Subp.1.B]
 - THREE** Shall be designed and constructed with adequate tensile and compressive strength to withstand a minimum of seven feet of saturated earth cover above the tank top [7080.0130 Subp.1.C]
 - FOUR** Shall not be subject to corrosion or decay [7080.0130 Subp.1.D]
 - FIVE** Shall be protected against flotation under high water table conditions [7080.0130 Subp.1.G]
 - SIX** Shall not be constructed out of blocks, bricks, or similar materials that do not create a *watertight* tank [7080.0130 Subp.1.I]
 - ii. Inlet and outlet device requirements
 - ONE** In a single compartmented tank, the inlet *invert* shall be at least two inches above the outlet *invert* [7080.0130 Subp.2.J]
 - TWO** Outlet pipe extending from the *septic tank* to undisturbed soil beyond the tank shall meet the strength requirements of ASTM, schedule 40 plastic pipe [7080.0130 Subp.2.O(2)]
 - b. **How to Evaluate Tank (Skill/Procedure)**
 - i. Cues to action
 - ONE** Leaking below designed operating depth
 - TWO** Leaking through visual evidence of major defects
 - THREE** Waterstaining on walls
 - FOUR** Corrosion or decay
 - FIVE** Earth pressures damage
 - SIX** Flotation under high water table conditions
 - SEVEN** Root penetration

- ii. Where to examine
 - ONE** Seams
 - Mid-wall seams
 - Tongue and groove joints
 - TWO** Corners
 - Where covers and walls meet
 - Joint and seal
 - THREE** Floors
- iii. Tools
 - ONE** Plastic gloves
- c. **Essential Behavior (Attitude)**
- 4. **Identify Cesspools, Seepage Pits, Leaching Pits and Drywells**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. *Seepage pits, leaching pits and drywells* requirements
 - ONE** This part is to be used when conducting existing system compliance inspections to determine if a system meets the requirements of a *seepage pit, drywell, or leaching pit*. *Seepage pits, drywells, and leaching pits* do not comply with [7080.0060] and are considered *failing systems* unless the *local unit of government* with jurisdiction over the system has adopted *alternative local standards* for these types of systems under [7080.0305 Subp.6] [7080.0950 Subp.1]
 - TWO** A *seepage pit, drywell or leaching pit* is a system which
 - Has a *sewage tank* that does not obviously leak below the designed *liquid capacity* preceding the pit [7080.0950 Subp.2.A]
 - Has a pit which is not located in a geologic formation that is used as a source of drinking water [7080.0950 Subp.2.B]
 - Has at least three feet of *vertical separation* from the bottom of the pit to the seasonally *saturated soil or bedrock* [7080.0170 Subp.2.C]
 - Has an *absorption area* which has been determined by multiplying the average design flow (under [7080.0125 Subp.2 Table I] or under [7080.0170 Subp.2.C Table V or Va]) based on the weighted average of each vertical stratum penetrated by the *seepage pit, drywell, or leaching pit* [7080.0950 Subp.2.D]
 - Has a pit that has not been placed in soils where the *percolation rate* of any stratum is faster than one-tenth minute per inch or in coarse sand [7080.0950 Subp.2.E]
 - Has a pit with a minimum inside diameter of five feet [7080.0950 Subp.2.F]
 - Meets all *setback* requirements [7080.0950 Subp.2.G]
 - b. **How to Identify Cesspools, Seepage Pits, Leaching Pits & Drywells (Skill/Procedure)**
 - c. **Essential Behavior (Attitude)**
 - 5. **Evaluate Dosing Chamber(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. *Dosing chamber* requirements
 - ONE** Where a *dosing device* is employed, a pump or siphon shall deliver the dose to the *soil treatment system* [7080.0160 Subp.1.A]
 - TWO** See Tank requirements
 - b. **How to Evaluate Dosing Chamber(s) (Skill/Procedure)**
 - i. Cues to action
 - ONE** Leaking below designed operating depth
 - TWO** Leaking through visual evidence of major defects
 - THREE** Waterstaining on wall
 - FOUR** Corrosion or decay
 - FIVE** Earth pressures damage
 - SIX** Flotation under high water table conditions
 - SEVEN** Water draining back from distribution pipes
 - EIGHT** Root intrusion

- b. How to Fix/Replace Baffles
 - i. Tools
 - ONE** Plastic gloves
 - c. Essential Behavior (Attitude)
8. Evaluate Pump(s)
- a. Foundation Facts, Concepts & Theories (Knowledge)
 - i. Pump curves
 - ii. Pump selection
 - iii. Sizing
 - iv. Controls and panels
 - v. Dose volume
 - ONE** Setting floats
 - TWO** Dosing frequency
 - vi. General pump requirements
 - ONE** A *dosing device* must employ an *alarm device* to warn of failure [7080.0160 Subp.1a.D]
 - TWO** Inlet of pumps shall be elevated at least four inches from bottom of the *dosing chamber* or be protected in some other manner to prevent the pump from drawing excessive settled solids. The Pump, pump controls, and pump discharge line shall be installed to allow access for servicing without entering the *dosing chamber*. [7080.0160 Subp.1a.E]
 - THREE** Electrical installations shall comply with applicable laws and ordinances including the latest codes, rule, and regulations of public authorities having jurisdiction and with [1315.0200], which incorporates the National Electrical Code [7080.0160 Subp.1a.F]
 - FOUR** Where a *dosing device* is employed, a pump or siphon shall deliver the dose to the *soil treatment system* [7080.0160 Subp.1.A]
 - vii. Gravity distribution pump requirements
 - ONE** Constructed and fitted with sound, durable, and corrosion-resistant materials [7080.0160 Subp.2.D]
 - viii. Pressure distribution pump requirements
 - ONE** Shall be constructed and fitted with sound, durable and corrosion-resistant materials [7080.0160 Subp.3.A]
 - b. How to Evaluate Pump(s) (Skill/Procedure)
 - i. Cues to action
 - ONE** Continuous running
 - TWO** Event Counter
 - THREE** Timer
 - FOUR** Floats vs dosing
 - FIVE** Alarm
 - SIX** Less than 4" of elevation from tank bottom
 - SEVEN** Electrical tape
 - EIGHT** Electrical code
 - NINE** Sparking
 - TEN** Properly plugged in
 - ELEVEN** Switch operation
 - ii. How to measure pressure head and adjust
 - iii. Significant Hazards
 - ONE** Electrical
 - iv. Hazard Control
 - ONE** Use remote shut-off for pump before inspecting
 - v. Tools
 - ONE** Plastic gloves
 - c. Essential Behavior (Attitude)

9. **Fix/Replace Pump(s)**

a. **Foundation Facts, Concepts & Theories (Knowledge)**

- i. Gravity distribution pump requirements
 - ONE** Shall discharge at least ten gallons per minute but no more than 45 gallons per minute [7080.0160 Subp.2.B]
 - TWO** If *soil treatment system* is at a higher elevation than the pump, sufficient dynamic head shall be provided for both the elevation difference and friction loss [7080.0160 Subp.2.E]
- ii. Pressure distribution pump requirements
 - ONE** Pump discharge capacity shall be based upon perforation discharges for a minimum average head of 1.0 foot [7080.0160 Subp.3.B]
 - Perforation discharge formula: $Q = 19.65 cd2h^{1/2}$
 - Q = discharge in gallons per minute
 - c = coefficient of discharge = 0.60
 - d = perforation diameter in inches
 - h = head in feet
 - TWO** The pump discharge head shall be at least five feet greater than the head required to overcome pipe friction losses and the elevation difference between the pump and the *distribution device* [7080.0160 Subp.3.C]
 - THREE** The quantity of effluent delivered for each pump cycle shall be no greater than 25 percent of the average design flow [7080.0160 Subp.3.D]

b. **How to Fix/Replace Pump(s) (Skill/Procedure)**

- i. Tools
 - ONE** Plastic gloves
- ii. ?
 - ONE** Cost effective? ½ hp
 - TWO** Fix – reposition
 - THREE** Load & Voltage – testing
 - FOUR** Pull & test outside
 - FIVE** Make & model
 - SIX** Design minimum

c. **Essential Behavior (Attitude)**

10. **Evaluate Siphon(s)**

a. **Foundation Facts, Concepts & Theories (Knowledge)**

- i. Gravity distribution siphon requirements
 - ONE** Shall be maintained in proper operating condition and shall be inspected every six months by *owner* or *owner's agent* [7080.0160 Subp.2.C]
 - TWO** Not allowed as a *dosing device* to pressurize a system [7080.0160 Subp.3.E]
 - THREE** Where a *dosing device* is employed, a pump or siphon shall deliver the dose to the *soil treatment system* [7080.0160 Subp.1.A]

b. **How to Evaluate Siphon (Skill/Procedure)**

- i. Cues to action
 - ONE** Leaking below designed operating depth
 - TWO** Leaking through visual evidence of major defects
 - THREE** Above mark waterstaining on sidewalls
 - FOUR** Corrosion or decay
 - FIVE** Earth pressures damage
 - SIX** Water draining back from distribution pipes
 - SEVEN** Direction down
 - EIGHT** Gravity dosing system
 - NINE** Intact
 - TEN** Standing water
- ii. Frequency
 - ONE** Every 6 months
- iii. Tools
 - ONE** Plastic gloves

c. **Essential Behavior (Attitude)**

11. **Fix/Replace Siphon(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. Gravity distribution siphon requirements
 - ONE** Shall discharge at least ten gallons per minute but no more than 45 gallons per minute [7080.0160 Subp.2.B]
 - b. **How to Fix/Replace Siphon(s) (Skill/Procedure)**
 - i. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**
12. **Evaluate Filter(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - b. **How to Evaluate Filter(s) (Skill/Procedure)**
 - c. **Essential Behavior (Attitude)**
13. **Clean Filter(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - b. **How to Clean Filter(s) (Skill/Procedure)**
 - i. ?
 - ONE** Over manhole
 - TWO** Pay attention to bottom gasket
 - ii. Tools
 - ONE** Garden hose
 - TWO** Pressure washer
 - c. **Essential Behavior (Attitude)**
14. **Fix/Replace Filter(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - b. **How to Fix/Replace Filter(s) (Skill/Procedure)**
 - c. **Essential Behavior (Attitude)**
15. **Evaluate Supply Pipe(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. Supply pipes
 - ONE** Description
 - TWO** Techniques to prevent freezing
 - Pipe selection
 - Length of pipe
 - Pipe support
 - THREE** Purpose
 - FOUR** Design basis
 - FIVE** Operational theory
 - SIX** Management
 - SEVEN** Setbacks
 - ii. Pressure distribution
 - ONE** Description
 - TWO** Laterals
 - THREE** Purpose
 - FOUR** Design basis
 - FIVE** Operational theory
 - SIX** Management
 - SEVEN** Slope restrictions
 - iii. *Supply pipe* requirements
 - ONE** Must be designed, installed and protected so that effluent will not freeze in the pipe [7080.0150 Subp.1.A]
 - TWO** Must be supported in a manner so that there is no deflection or longitudinal bending during the backfilling and subsequent settling of the soil [7080.0150 Subp.1.B]

- b. **How to Evaluate Supply Pipe(s) (Skill/Procedure)**
 - i. Cues to action
 - ONE** Leaking below designed operating depth
 - TWO** Leaking through visual evidence of major defects
 - THREE** Corrosion or decay
 - FOUR** Root intrusion
 - FIVE** Earth pressure damage
 - SIX** Water draining back from distribution pipes
 - SEVEN** Evidence of freezing
 - EIGHT** Deflection or longitudinal bending
 - NINE** Partial or complete obstructions
 - TEN** Standing water
 - ii. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**
16. **Clean Supply Pipe(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - b. **How to Clean Supply Pipes (Skill/Procedure)**
 - i. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**
17. **Evaluate Valve Boxes**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. Distribution of effluent
 - ONE** Gravity distribution
 - Description
 - Purpose
 - Design basis
 - Operational theory
 - Management
 - Dual field
 - First Valve boxes
 - Description
 - ii. *Valve box* requirements
 - ONE** Shall be *watertight* and constructed of durable materials not subject to corrosion or decay [7080.0150 Subp.2.C(1)]
 - TWO** Shall be covered by a minimum of six inches of soil. If the top of the box is deeper, access must be provided above, at, or within six inches of finished grade [7080.0150 Subp.2.C(4)]
 - b. **How to Evaluate Valve Boxes (Skill/Procedure)**
 - i. Cues to action
 - ONE** Leaking below designed operating depth
 - TWO** Leaking through visual & auditory evidence
 - THREE** Major defects
 - FOUR** Above mark waterstaining
 - FIVE** Corrosion or decay
 - SIX** Earth pressures damage
 - SEVEN** Water draining back from distribution pipes
 - EIGHT** Effluent ponding
 - NINE** Cap broken
 - TEN** Side seepage
 - ELEVEN** Sewage odor
 - TWELVE** Damp and mushy ground
 - ii. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**

18. **Fix Valve Box(es)**

a. **Foundation Facts, Concepts & Theories (Knowledge)**

i. *Valve box* requirements

ONE When effluent is delivered by a pump, the pump discharge shall be directed against a *baffle* wall or may be directed against a wall, side of the box on which there is no outlet, or against a deflection wall, *baffle* or other energy dissipater. The *baffle* must be secured to the box and must extend at least one inch above the crown of the inlet pipe. [7080.0150 Subp.2.C(3)]

b. **How to Fix Valve Boxes (Skill/Procedural)**

i. Tools

ONE Plastic gloves

c. **Essential Behavior (Attitude)**

19. **Evaluate Drop Boxes**

a. **Foundation Facts, Concepts & Theories (Knowledge)**

i. Distribution of effluent

ONE Gravity distribution

➤ Serial

First Drop boxes

- Description

ii. *Drop box* requirements

ONE Shall be *watertight* and constructed of durable materials not subject to corrosion or decay [7080.0150 Subp.2.B(1)]

TWO Shall be covered by a minimum of six inches of soil. If the top of the box is deeper, access must be provided above, at, or within six inches of finished grade [7080.0150 Subp.2.B(5)]

b. **How to Evaluate Drop Boxes (Skill/Procedure)**

i. Cues to action

ONE Leaking below designed operating depth

TWO Leaking through visual & auditory evidence

THREE Major defects

FOUR Above mark waterstaining

FIVE Corrosion or decay

SIX Earth pressures damage

SEVEN Water draining back from distribution pipes

EIGHT Effluent ponding

NINE Cap broken

TEN Side seepage

ELEVEN Sewage odor

TWELVE Damp and mushy ground

ii. Tools

ONE Plastic gloves

c. **Essential Behavior (Attitude)**

20. **Fix Drop Box(es)**

a. **Foundation Facts, Concepts & Theories (Knowledge)**

i. *Drop box* requirements

ONE *Invert* of the inlet pipe shall be at least one inch higher than the *invert* of the outlet pipe to the next *drop box* [7080.0150 Subp.2.B(2)]

TWO *Invert* of the outlet pipe to the next *drop box* shall be no greater than two inches higher than the crown of the outlet pipe of the *trench* in which the box is located [7080.0150 Subp.2.B(3)]

THREE When effluent is delivered by a pump, the pump discharge shall be directed against a wall or side of the box on which there is no outlet or may be directed against a deflection wall, *baffle*, or other energy dissipater [7080.0150 Subp.2.B(4)]

b. **How to Fix Drop Boxes (Skill/Procedural)**

i. Tools

ONE Plastic gloves

- c. Essential Behavior (Attitude)
- 21. Evaluate Distribution Boxes
 - a. Foundation Facts, Concepts & Theories (Knowledge)
 - i. Distribution of effluent
 - ONE** Gravity distribution
 - Parallel
 - First Distribution boxes
 - Description
 - ii. Distribution box requirements
 - ONE** Box must be *watertight* and must be constructed of durable materials not subject to corrosion or decay [7080.0150 Subp.2.D(1)]
 - TWO** Shall be covered by a minimum of six inches of soil. If top of the box is deeper, access must be provided above, or within six inches of finished grade. [7080.0150 Subp.2.D(2)]
 - b. How to Evaluate Distribution Boxes (Skill/Procedural)
 - i. Cues to action
 - ONE** Leaking below designed operating depth
 - TWO** Leaking through visual & auditory evidence
 - THREE** Major defects
 - FOUR** Above mark waterstaining
 - FIVE** Corrosion or decay
 - SIX** Earth pressures damage
 - SEVEN** Water draining back from distribution pipes
 - EIGHT** Effluent ponding
 - NINE** Cap broken
 - TEN** Side seepage
 - ELEVEN** Sewage odor
 - TWELVE** Damp and mushy ground
 - ii. Tools
 - ONE** Plastic gloves
 - c. Essential Behavior (Attitude)
- 22. Fix Distribution Box(es)
 - a. Foundation Facts, Concepts & Theories (Knowledge)
 - i. Distribution box requirements
 - ONE** *Inverts* of all outlets must be set and maintained at the same elevation [7080.0150 Subp.2.D(3)]
 - TWO** Inlet *invert* must be either at least one inch above the outlet *inverts* or *sloped* at such an equivalent elevation above the outlet *invert* is obtained within the last eight feet of the inlet pipe [7080.0150 Subp.2.D(4)]
 - THREE** When effluent is delivered by a pump, the pump discharge shall be directed against a *baffle* wall or may be directed against a wall, side of the box on which there is no outlet, or against a deflection wall, *baffle* or other energy dissipater. *Baffle* must be secured to the box and must extend at least one inch above the crown of the inlet pipe. [7080.0150 Subp.2.D(6)]
 - b. How to Fix Distribution Boxes (Skill/Procedure)
 - i. Tools
 - ONE** Plastic gloves
 - c. Essential Behavior (Attitude)
 - 23. Evaluate Distribution Pipe(s)
 - a. Foundation Facts, Concepts & Theories (Knowledge)
 - i. Pressure distribution
 - ONE** Description
 - TWO** Laterals
 - THREE** Purpose
 - FOUR** Design basis
 - FIVE** Operational theory
 - SIX** Management

- FOUR** Shall not be constructed out of blocks, bricks or similar materials that do not create a *watertight* tank [7080.0130 Subp.1.I]
 - b. **How to Evaluate Maintenance Hole Covers (Skill/Procedure)**
 - i. Cues to action
 - ONE** Leaking through visual & acoustic evidence
 - TWO** Corrosion or decay
 - THREE** Major defects
 - FOUR** Earth pressures damage
 - FIVE** Written and graphic label warning of tank's hazardous conditions
 - SIX** Elevation greater than 6-12" below the surface
 - ii. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**
26. **Fix/Replace Maintenance Hole Cover(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - b. **How to Fix/Replace Maintenance Hole Cover(s)**
 - c. **Essential Behavior (Attitude)**
27. **Evaluate Maintenance Hole Riser(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. Maintenance hole riser requirements
 - ONE** Shall be *watertight* [7080.0130 Subp.1.A]
 - TWO** Shall be designed and constructed to withstand all lateral earth pressures under *saturated soil* conditions when empty [7080.0130 Subp.1.B]
 - THREE** Shall not be subject to corrosion or decay [7080.0130 Subp.1.D]
 - FOUR** Shall not be constructed out of blocks, bricks, or similar materials that do not create a *watertight* tank [7080.0130 Subp.1.I]
 - b. **How to Evaluate Maintenance Hole Risers (Skill/Procedure)**
 - i. Cues to action
 - ONE** Leaking through visual & acoustic evidence
 - TWO** Water streaking
 - THREE** Corrosion or decay
 - FOUR** Earth pressures damage
 - FIVE** Root intrusion
 - ii. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**
28. **Fix/Replace/Add Maintenance Hole Riser(s)**
 - a. **Foundation Facts, Concepts & Theories (Knowledge)**
 - i. Riser requirements
 - ONE** Strength
 - TWO** Height
 - THREE** Diameter
 - ii. Varieties of risers
 - ONE** Plastic
 - TWO** Concrete
 - THREE** Advantages of each
 - FOUR** Disadvantages of each
 - b. **How to Fix/Replace/Add Maintenance Hole Risers (Skill/Procedure)**
 - i. Tools
 - ONE** Plastic gloves
 - c. **Essential Behavior (Attitude)**

E. Close Tank

1. Foundation Facts, Concepts & Theories (Knowledge)

- a. Additive requirements
 - i. *Individual sewage treatment system additives* must not be used as a means to reduce the frequency of proper maintenance and removal of *septage* from the *septic tank* as specified in this part. *Individual sewage treatment system additives* that contain hazardous substances must not be used *individual sewage treatment systems*. [7080.0175 Subp.5]
- b. Maintenance hole cover requirements
 - i. If maintenance holes are covered with less than six inches of soil, the cover shall be secured to prevent unauthorized access. [7080.0130 Subp.2.M(1)]

2. How to Close Tank (Skill/Procedure)

- a. ?
 - i. Do not use additives
 - ii. If less than 6 inches of soil cover, secure maintenance hole cover
- b. Tools
 - i. Tools appropriate for concrete and/or plastic manhole with or without loops
 - ii. Plastic gloves

3. Essential Behavior (Attitude)

F. Abandon Tank(s)

1. Foundation Facts, Concepts & Theories (Knowledge)

- a. Tank abandonment requirements
 - i. Tank abandonment procedures for *sewage tanks*, *cesspools*, *leaching pits*, *drywells*, *seepage pits*, *vault privies*, *pit privies* not serving primitive *dwellings*, and *distribution devices* are as follows
 - ONE** All solids and liquids shall be removed and disposed of in accordance with part [7080.0175 Subp.6] [7080.0176 Subp.1.A]
 - TWO** Abandoned chambers shall be removed or be filled with soil material, rock, or other inter material; and [7080.0176 Subp.1.B]
 - THREE** Tanks buried close to the ground surface must be removed or crushed to permit drainage through the tank. [7080.0176 Subp.1.C]
 - FOUR** Access for future discharge to the system shall be permanently denied. [7080.0176 Subp.2]
 - FIVE** If *soil treatment systems* are removed, contaminated materials shall be properly handled to prevent human contact and shall be disposed of in a manner assuring that public health and the environment are protected [7080.0176 Subp.3]

2. How to Abandon Tank (Skill/Procedure)

- a. ?
 - i. Protect landscape, current and additional soil treatment areas
- b. Tools
 - i. Plastic gloves

3. Essential Behavior (Attitude)

G. Remove Solids & Liquids from Toilet Waste Treatment Devices

1. Foundation Facts, Concepts & Theories (Knowledge)

- a. *Toilet waste treatment device* requirements
 - i. The *owner* or *owner's* agent shall operate a *toilet waste treatment device* in accordance with manufacturer's requirements. For primitive *dwellings* and *dwellings* using *toilet waste treatment devices* in low density areas, *septage* disposal must not be to surface waters, drainageways, or in a manner or volume harmful to the environment or public health or that creates a nuisance if allowed under *local ordinance*. For all other uses of *toilet waste treatment devices*, *septage* disposal must meet the requirements of [7080.0175 Subp.6]. [7080.0175 Subp.5]

2. How to Remove Solids & Liquids from Toilet Waste Treatment Devices (Skill/Procedure)

3. Essential Behavior (Attitude)

H. Restore Property

1. Foundation Facts, Concepts & Theories (Knowledge)

a. Maintenance access requirements

- i. Activities on the *soil treatment system* or the additional *soil treatment area* as specified in part [7080.0305 Subp.4.F], that may impair the treatment abilities or hydraulic performance of the *soil treatment system* are prohibited. [7080.0175 Subp.7]

2. How to Restore Property (Skill/Procedure)

3. Essential Behavior (Attitude)

III. Distribute Septage

A. Distribute Septage to Approved Sewage Treatment Works

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Governing body requirements

ONE *Septage* shall be disposed of in accordance with state, federal, or local requirements. If *septage* is disposed of into a municipal *sewage* treatment facility, a written agreement must be provided between the accepting facility and the *septage* disposal firm. [7080.0175 Subp.6]

b. How to Distribute Septage to Approves Sewage Treatment Works (Skill/Procedure)

c. Essential Behavior (Attitude)

B. Distribute Septage by Land Application

1. Stabilize Septage with Lime & Record

a. Foundation Facts, Concepts & Theories (Knowledge)

i. pH

ONE Definition

TWO Function

THREE Units of measure

ii. Lime treatment

ONE Function

TWO Treatment levels required

iii. Lime stabilization rules

ONE The *pH* of *domestic septage* shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes. [503.33(b)(12)]*

TWO The *pH* of *domestic septage* applied to *agricultural land*, forest, or a *reclamation* site shall be raised to 12 or higher by alkali addition and, without the addition of more alkali, shall remain at 12 or higher for 30 minutes and the site restrictions in [503.32 (b)(5)(i) through (b)(5)(iv)] shall be met. [503.32(c)(2)]*

THREE If either the pathogen requirements in [503.32(c)(2)] or the *vector attraction* reduction requirements in [503.33(b)(12)] are met when *domestic septage* is applied to *agricultural land*, forest, or a *reclamation site*, each container of *domestic septage* applied to the land shall be monitored for compliance with those requirements. [503.16(b)]

b. How to Stabilize Septage with Lime & Record (Skill/Procedure)

i. Goal

ONE Septage remains at pH of 12.0 or greater for more than 30 minutes

ii. ?

ONE Add lime to reach pH of 12 or higher

TWO Record pH

THREE Record start time

FOUR Wait 30 minutes

FIVE Record finish time

SIX Record pH

SEVEN Correct for temperature

EIGHT How to measure

NINE How to sample

TEN How to add

ELEVEN How to determine amount of lime necessary

- iii. Significant Hazards
 - ONE** Lime
 - TWO** Quick Lime
- iv. Tools
 - ONE** Suitable lime materials
 - TWO** pH paper
 - THREE** Thermometer
 - FOUR** Timer
 - FIVE** Sampling tools
 - SIX** Addition tools
- c. Essential Behavior (Attitude)
- 2. Land Apply & Incorporate
 - i. Foundation Facts, Concepts & Theories (Knowledge)
 - ONE** Incorporation rules
 - *Sewage sludge* applied to the land surface or placed on an active *sewage sludge* unit shall be incorporated into the soil within six hours after application to or placement on the land, unless otherwise specified by the permitting authority. [503.33(b)(10)(i)]
 - When *sewage sludge* that is incorporated into the soil is Class A with respect to pathogens, the *sewage sludge* shall be applied to or placed on the land within eight hours after being discharged from the pathogen treatment process. [503.33(b)(10)(ii)]
 - TWO** Application requirements
 - *Septage* must be applied to land in such a manner as to provide a uniform application. Timing, rates and methods of application shall ensure that the *septage* remains where it was applied. [0000.0090 Subp1.C]
 - *Septage* must not be applied on areas ponded with water or *septage*. [0000.0090 Subp1.D]
 - The application vehicle must be moving at all times during application. [0000.0090 Subp1.G]
 - *Septage* cannot be applied by spraying from public roads or across road right of ways. [0000.0090 Subp1.H]
 - A distribution device such as a splash plate or spreader shall be used to evenly distribute the *septage*. [0000.0090 Subp1.I]
 - Large items contained in the *septage* shall be screened and properly disposed. [0000.0090 Subp1.K]
 - THREE** Daily application rate requirements
 - Daily surface application rates of liquid *septage* on non-frozen, non-snow covered sites are found in Table 3. [0000.0090 Subp1.E]
 - The site may be completed covered once when soils on the site are frozen or snow covered. The application rate is limited to 10,000 gallons/acre or less, and only on *slopes* of 2 percent or less. Subsequent applications are not allowed until the applied *septage* has infiltrated into the soil. [0000.0090 Subp1.F]
 - ii. How to Land Apply & Incorporate (Skill/Procedure)
 - ONE** Tools
 - Truck with screen & splash plate or spreader
 - iii. Essential Behavior (Attitude)

Table 3	
Soil Texture	Maximum Daily Application Rate – Gallons/Acre/Day
Fine sand and Loamy sand	25,000
Sandy loam, Loam, Silt or Silt Loam	15,000
Sandy clay loam, Clay loam, Sandy clay, or Silty clay loam	10,000

3. Land Application by Injection

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Injection rules

ONE *Sewage sludge* shall be injected below the surface of the land. [503.33(b)(9)(i)]

TWO No significant amount of the *sewage sludge* shall be present on the land surface within one hour after the *sewage sludge* is injected. [503.33(b)(9)(ii)]

THREE When the *sewage sludge* that is injected below the surface of the land is Class A with respect to pathogens, the *sewage sludge* shall be injected below the land surface within eight hours after being discharged from the pathogen treatment process [503.33(b)(9)(iii)]

b. How to Land Apply by Injection (Skill/Procedure)

i. Tools

ONE Truck with ?

c. Essential Behavior (Attitude)

4. Protect Site

a. Foundation Facts, Concepts & Theories (Knowledge)

i. Boundary identification requirements

ONE The boundary of a land application site must be identified and marked during *sewage* application unless apparent boundaries, such as fence-rows, roads, tree lines, type of vegetation, or steep *slopes*, exist. [0000.0090 Subp1.A]

ii. Informing landowner and land user requirements

ONE Pumpers must inform the landowner and land user of:

- Site restrictions contained in this chapter [0000.0090 Subp1.J.(1)]
- The pounds per acre of nitrogen applied per cropping year [0000.0090 Subp1.J.(2)]

b. How to Protect Site (Skill/Procedure)

c. Essential Behavior (Attitude)

IV. Complete Records & Submit

A. Complete Daily Hauling Record

1. Foundation Facts, Concepts & Theories (Knowledge)

a. Daily hauling record rules

i. The pumper must develop and maintain a record keeping system that provides the information of activities required in this chapter. These records must be kept for a minimum of five years. These records include

ONE The date(s) each site received *sewage* [503.18(b)(3)]

TWO The site code and location by either street address or latitude and longitude [503.18(b)(1)] per load

b. Daily hauling record requirements

i. The pumper must develop and maintain a record keeping system that provides the information of activities required in this chapter. These records must be kept for a minimum of five years. These records include

ONE The daily records of and application activities including

- Quantity of *sewage* applied [0000.1700 Subp.1.C(2)]* per load
- The application method [0000.1700 Subp.1.C(3)]* per load
- The number of acres and location of those acres on the site that received *sewage* [0000.1700 Subp.1.C(5)]*
- *Vector attraction* reduction method used. If alkali addition is used, records must indicate the *pH* readings of each load of *sewage* applied [0000.1700 Subp.1.C(6)]* per load
- Source of the *sewage* [0000.1700 Subp.1.C(7)]* per load
- All approved annual *permits* with their corresponding submittals. [0000.1700 Subp.1.A]*
- Any variances to this chapter that were issues [0000.1700 Subp.1.F]*
- A description of any additional management practices and site restrictions that were used [0000.1700 Subp.1.G]*

- Any other analysis or information as required by the *permitting authority* [0000.1700 Subp.1.I]*
 - ii. The information in [0000.1700 Subp.1] must be reported to the *permitting authority* no later than December 31 following the cropping year. [0000.1700 Subp.2]
 - c. Daily hauling record recommendations
 - ONE** Driver Name
 - TWO** Description of 'other' gallons per load
 - THREE** Amount in gallons of 'other' hauled per load
 - FOUR** *pH* test records
 - Temperature of *septage* per load
 - Time of initial *pH* measurement after lime added per load
 - Initial *pH* after lime added per load
 - Time of final *pH* measurement 30 minutes after lime added per load
 - Final *pH* measurement 30 minutes after lime added per load
2. How to Complete Daily Hauling Record (Skill/Procedure)
3. Essential Behavior (Attitude)
- B. Complete Site Specific Record**
1. Foundation Facts, Concepts & Theories (Knowledge)
 - a. Site specific record rules
 - i. The pumper must develop and maintain a record keeping system that provides the information of activities required in this chapter. These records must be kept for a minimum of five years. These records include
 - ONE** The location, by either street address or latitude and longitude, of each site on which *domestic septage* is applied. [503.18(b)(1)]
 - TWO** The number of acres in each site on which *domestic septage* is applied. [503.18(b)(2)]
 - THREE** The date *domestic septage* is applied to each site. [503.18(b)(3)]
 - FOUR** The nitrogen requirement for the crop or vegetation grown on each site during a 365 day period. [503.18(b)(4)]
 - FIVE** The rate, in gallons per acre per 365 day period, at which *domestic septage* is applied to each site. [503.18(b)(5)]
 - SIX** The following certification statement: I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements (insert either 503.32(c)(1) or 503.32(c)(2)) and the *vector attraction* reduction requirement in [insert 503.33(b)(9), 503.33(b)(10), or 503.33(b)(12)] was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment. [503.18(b)(6)]
 - SEVEN** A description of how the pathogen requirements in either [503.32(c)(1) or (c)(2)] are met. [503.18(b)(7)]
 - EIGHT** A description of how the *vector attraction* reduction requirements in [503.33 (b)(9), (b)(10), or (b)(12)] are met. [503.18(b)(8)]
 - b. Site specific record recommendations
 - ONE** Record keeping period
 - TWO** Landowner name
 - THREE** Crop grown
 - FOUR** Yield goal of crop grown
 - FIVE** A copy of a soil survey map or another map containing the same information with the site boundaries and unsuitable areas of the field identified
 - SIX** Load description per site
 - SEVEN** Running total of gallons applied at each site
 - EIGHT** Driver signature
2. How to Complete Site Specific Record (Skill/Procedure)
3. Essential Behavior (Attitude)

V. Maintainer vocabulary

- a. "Absorption area" means the area on original soil below a mound that is designed to absorb sewage tank effluent. The absorption area for trenches, seepage beds, and at-grade systems is the area in contact with the part of the distribution medium that is designed to absorb sewage tank effluent [7080.0020 Subp.1a]
- b. "Additive" means a product added to the wastewater or to the system with the intent to improve the performance of an individual sewage treatment system [7080.0020 Subp.1b]
- c. "Agricultural land" is land on which a food crop, a feed crop, or a fiber crop is grown. This includes range land and land used as pasture. [503.11(a)]
- d. "Alarm device" means a device which clearly alerts the system operator of malfunction by use of visual or audible methods; it is intended to prevent sewage overflows [7080.0020 Subp.3a]
- e. "Alternative local standards" means individual sewage treatment system standards that are less restrictive than the technical standards and criteria in this chapter and adequately protect public health and the environment [7080.0020 Subp.3b]
- f. "Baffle" means a device installed in a septic tank to provide retention of solids, and includes vented sanitary tees and submerged pipes [7080.0020 Subp.5]
- g. "Bedrock" means the layer of parent material that is composed of consolidated or cemented rock particles or composed of interlocking mineral crystals and is either in a weathered or unweathered condition. Bedrock also includes layers of which greater than 50 percent volume consists of unweathered in-place consolidated bedrock fragments. [7080.0020 Subp.6]
- h. "Cover crop" is a small grain crop, such as oats, wheat or barley, not grown for harvest [503.9(d)]
- i. "Damage" means
 - i. The substantial weakening, or destruction of any underground protective coating, housing, or other protective device [216D.01 Subd.2(1)]
 - ii. Penetration, impairment, or destruction of any underground protective coating, housing or other protective device or [216D.01 Subd.2(2)]
 - iii. Impact with or the partial or complete severance of an underground facility to the extent that the facility operator determines that repairs are required [216D.01 Subd.2(3)]
- j. "Distribution box" means a device designed to distribute sewage tank effluent concurrently and equally by gravity to a soil treatment system [7080.0020 Subp.12c]
- k. "Distribution device" means a device used to receive and transfer effluence from a supply pipe to distribution pipes of downslope supply pipes or both. These devices include drop boxes, valve boxes, distribution boxes, or manifolds. [7080.0020 Subp.12d]
- l. "Distribution pipes" means perforated pipes that distribute effluent into a distribution media [7080.0020 Subp.13]
- m. "Disclosure" means any conclusions or statements regarding ISTS or abandoned ISTS made by the owner of a property with or served by an ISTS to fulfill the requirements of Minnesota Statutes {115.55 Subd.6}. ISTS information provided by someone other than the property owner must meet the requirements in [7080.0315 Subp.2.F]
- n. "Domestic septage" is either liquid or solid material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar treatment works that receives only domestic sewage. Domestic septage does not include liquid or solid material removed from a septic tank, cesspool or similar treatment works that receives either commercial wastewater or industrial wastewater from humans or household operations that is discharged to or otherwise enters a treatment works. [503.9(f)]
- o. "Dosing chamber, or pump pit, or wet well, or lift station" means a tank or separate compartment following the sewage tank that serves as a reservoir for the dosing device [7080.0160 Subp.1a]
- p. "Dosing device" means a pump, siphon, or other device that discharges sewage tank effluent from the dosing chamber [7080.0020 Subp.15]

- q. "Drop box" means a distribution device used for the serial gravity application of sewage tank effluent to a soil treatment system [7080.0160 Subp.15b.]
- r. "Dwelling" means any building or place used or intended to be used by human occupants as a single-family or multifamily residence with no more than none bedrooms and producing sewage. Dwelling does not include a single-family or multifamily residence that serves as both a domicile and a place of business if the business increases the volume of sewage above what is normal for a dwelling or if liquid waste generated no longer qualifies as sewage. [7080.0020 Subp.16]
- s. "Effluent screen" means a device that filters solid materials from sewage tanks before discharge to a soil treatment system [7080.002 Subp.16a]
- t. "Emergency responder" means a fire department or company, a law enforcement official or office, an ambulance or other emergency rescue service, or the Division of Emergency Management created by section 12.04, or subdivision 1. [216D.01 Subd.4]
- u. "Emergency" means a condition that poses a clear and immediate danger to life or health, or a significant loss of property [216D.01 Subd.3]
- v. "Excavation" means an activity that moves, removes, or otherwise disturbs the soil by use of a motor, engine, hydraulic or pneumatically powered tool, or machine-powered equipment of any kind, or by explosives. Excavation does not include
 - i. The extraction of minerals [216D.01 Subd.5(1)]
 - ii. The opening of a grave in a cemetery [216D.01 Subd.5(2)]
 - iii. Normal maintenance of roads and streets if the maintenance does not change the original grade and does not involve the road ditch [216D.01 Subd.5(3)]
 - iv. Plowing, cultivating, planting, harvesting, and similar operations in connection with growing crops, trees, and shrubs, unless any of these activities disturbs the soil to a depth of 18 inches or more [216D.01 Subd.5(4)]
 - v. Gardening unless it disturbs the soil to a depth of 12 inches or more [216D.01 Subd.5(5)]
 - vi. Planting of windbreaks, shelterbelts, and tree plantation, unless any of these activities disturbs the soil to a depth of 18 inches or more [216D.01 Subd.5(6)]
- w. "Excavator" means a person who conducts excavation in the state [216D.01 Subd.6]
- x. "Failing system" means a seepage pit, cesspool, drywell, leaching pit, other pit, a tank that obviously leaks below the designated operating depth or any system with less than the required *vertical separation* as described in part [7080.0060 Subp.3] [7080.0160 Subp.16b]
- y. "Feed crops" are crops produced primarily for consumption by animals [503.9(j)]
- z. "Fiber crops" are crops such as flax and cotton [503.9(k)]
- aa. "Fine sand" means a sand soil having more than 50 percent sand having a particle size range of 0.05 millimeters (sieve size 270) to 0.25 millimeters (sieve size 60) [7080.0020 Subp.16c]
- bb. "Floodway" means the bed of a wetland or lake, the channel of a watercourse, and those portions of the adjoining floodplain that are reasonably required to carry or store the regional flood discharge [7080.0020 Subp.16f]
- cc. "Flow measurement" means any method to accurately measure water or sewage flow, including water meters, event counters, running time clocks, electronically controlled dosing, or any combination thereof. [7080.0020 Subp.16g]
- dd. "Food crops" are crops consumed by humans. These include, but are not limited to, fruits, vegetables, and tobacco. [503.9(l)]
- ee. "Forest" is a tract of land thick with trees and underbrush [503.11(g)]
- ff. "Hazardous waste" means any refuse, sludge, or other waste material or combinations of refuse, sludge or other waste materials in solid, semisolid, liquid, or contained gaseous form which because of its quantity, concentration, or chemical, physical, or infectious characteristics may (a) cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed. [116.06 Subd.11]

- i. Categories of hazardous waste materials include, but are not limited to: [116.06 Subd.11]
 - ONE** Corrosives.
 - TWO** Does not include source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended.
 - THREE** Explosives
 - FOUR** Flammables
 - FIVE** Irritants
 - SIX** Oxidizers
 - SEVEN** Poisons
- gg. "Individual sewage treatment system" means a sewage treatment system, or part thereof, serving a dwelling, or other establishment, or group thereof, and using sewage tanks followed by soil treatment and disposal or using advanced treatment devices that discharge below final grade. Individual sewage treatment system includes holding tanks and privies [7080.0020 Subp.21]
- hh. "Invert" means the lowest point of a channel inside a pipe [7080.0160 Subp.21b]
- ii. "ISTS" means an individual sewage treatment system as defined in [7080.0200 Subp.21]
- jj. "ISTS professional" means a person who designs, installs, alters, repairs, maintains, pumps, or inspects all or part of an individual sewage treatment system and is required to comply with applicable requirements. [7080.0020 Subp.19c]
- kk. "Land Application" is the spraying or spreading of sewage sludge onto the land surface; the injection of sewage sludge below the land surface; or the incorporation of sewage sludge into the soil so that the sewage sludge can either condition the soil or fertilize crops or vegetation grown in the soil. [503.11(h)]
- ll. "Land with a high potential for public exposure" is land that the public uses frequently. This includes, but is not limited to, a public contact site and a reclamation site located in a populated area (e.g., a construction site located in a city). [503.31(d)]
- mm. "Land with a low potential for public exposure" is land that the public uses infrequently. This includes but is not limited to, agricultural land, forest, and a reclamation site located in an unpopulated area (e.g., a strip mine located in a rural area). [503.31(e)]
- nn. "Liquid capacity" means the liquid volume of a sewage tank below the invert of the outlet pipe, or for holding tanks and dosing chambers, the liquid volume below the invert of the inlet [7080.0020 Subp.22b]
- oo. "Local ordinance" means any ordinance that complies with this chapter adopted by a local unit of government to regulate individual sewage treatment systems, and/or any ordinance to regulate the issuance of permits for variances for the addition of a bedroom or property served by an individual sewage treatment system [7080.0020 Subp.22c]
- pp. "Local unit of government" means a township, statutory or home rule charter city or county with jurisdiction over individual sewage treatment systems through a local ordinance [7080.0020 Subp.22d]
- qq. "Lot" means a parcel of land in a plat recorded in the office of the count recorder or registrar of titles or a parcel of land created and conveyed, using a specific legal description, for a building site to be served by an individual sewage treatment system. [7080.0020 Subp.22.e]
- rr. "Mitigation plan" means a planned course of action to be used in the event that a system fails to meet performance expectations established in part [7080.0310 Subp.7]
- ss. "Monitoring plan" means a plan which requires the periodic examination or testing of system performance established in part [7080.0310 Subp.7]
- tt. "More restrictive standards" means the modification of technical standards and criteria in a local ordinance to provide an additional measure of public health or environmental protection, additional margins or safety, or greater system longevity [7080.0020 Subp.22i]
- uu. "New construction" means installing or constructing an entirely new individual sewage treatment system or collector system; or altering, extending, or adding capacity to a system that has been issued an initial certificate of compliance [7080.0020 Subp.24b]

- vv. "Notification center" means a center that receives notice from excavators of planned excavation or other requests for location and transmits this notice to participating operators [216D.01 Subd.8]
- ww. "Operator" means a person who owns or operates an underground facility, A person is not considered an operator solely because the person is an owner of tenant of real property where underground facilities are used exclusively to furnish services or commodities on that property, unless the person is the state, a state agency, or a local governmental unit. [216D.01 Subd.9]
- xx. "Owner" means any person having possession of, control over, or title to property with an individual sewage treatment system [7080.0020 Sub.25a]
- yy. "Pasture" is land on which animals feed directly on feed crops such as legumes, grasses, grain stubble, or stover [503.11(k)]
- zz. "Percolation rate" means the timed rate of drop of water infiltrating into a test hole as specified in [7080.0110 Subp.4.E] [7080.0020 Subp.26]
- aaa. "Performance systems" means individual sewage treatment systems described in part 7080.0179 designed to adequately protect the public health and the environment and to provide long-term performance. [7080.0020 Subp.26a]
- bbb. "Permit" means a building, construction, sanitary, planning, zoning, or other such permit issued for new construction, replacement, repair, alteration or extension of an individual sewage treatment system or collector system. Permit also means a permit issued for the addition of a bedroom on property served by an individual sewage treatment system [7080.0020 Sub.26b]
- ccc. "Permittee" means a person who is named on a permit issued pursuant to local ordinance [7080.0020 Subp.26c]
- ddd. "Permitting authority" is either EPA or a State with an EPA-approved sludge management program [503.9(p)]
- eee. "pH" means the logarithm of the reciprocal of the hydrogen ion concentration measured at 25° Centigrade or measured at another temperature and then converted to an equivalent value at 25° Centigrade. [503.31(g)]
- fff. "Privy" means an aboveground structure with an underground cavity meeting the requirements of [7080.0172 Subp.2] that is used for the storage or treatment and disposal of toilet wastes, excluding water for flushing and greywater [7080.0020 Subp.28a]
- ggg. "Public contact site" is land with a high potential for contact by the public. This includes, but is not limited to, public parks, ball fields, cemeteries, plant nurseries, turf farms, and golf courses. [503.11(l)]
- hhh. "Public safety answering point" means a communications facility operated on a 24-hour basis which first receives 911 calls from persons in a 911 service area and which may, as appropriate, directly dispatch public safety services or extend, transfer, or relay 911 calls to appropriate public safety agencies. [403.02 Sub.19]*
- iii. "Qualified employee" means a state or local government employee who designs, installs, maintains, pumps or inspects individual sewage treatment systems as part of that person's employment duties. [7080.0020 Subp.28d]
- jjj. "Reclamation site" is drastically disturbed land that is reclaimed using sewage sludge. This includes, but is not limited to stop mines and construction sites. [503.11(n)]
- kkk. "Replacement" means the removal or discontinued use and installation of a sewage tank, holding tank, dosing chamber, privy, collector system or soil treatment system [7080.0020 Subp.28g]
- lll. "Saturated soil" means the highest elevation in the soil that is in a reduced chemical state because of soil voids being filled with water. Saturated soil is evidenced by the presence of redoximorphic features or other information. [7080.002 Subp.29a]
- mmm. "Seepage pit, or leaching pit, or dry well" means an underground pit into which a sewage tank discharges effluent and from which the liquid seeps into the surrounding soil through the bottom and openings in the side of the pit; it must meet the design requirements in part [7080.0950] [7080.0020 Subp.30]

- nnn. "Septage" means solids and liquids removed during periodic maintenance of an individual sewage treatment system, or solids and liquids that are removed from toilet waste treatment devices. [7080.0020 Subp.31]
- ooo. "Septic tank" means any watertight, covered receptacle designed and constructed to receive the discharge of sewage from a building sewer, separate solids from a liquid, digest organic matter, store liquids through a period of detention, and allow the effluent to discharge to a treatment system [7080.0020 Subp.31a]
- ppp. "Setback" means a separation distance measured horizontally [7080.0020 Subp.32]
- qqq. "Sewage sludge" is solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. [503.9(w)]
- rrr. "Sewage tank" means a receptacle used in the treatment of sewage, and includes septic tanks and aerobic tanks. Requirements for sewage tanks are set out in [7080.0130] [7080.0020 Subp.35]
- sss. "Sewage" means waste produced by toilets, bathing, laundry, or culinary operations, or the floor drains associated with these sources. Household cleaners in sewage are restricted to amounts normally used for domestic purposes [7080.0020 Subp.33]
- ttt. "Slope" means the ratio of vertical rise or fall to horizontal distance [7080.0020 Subp.40]
- uuu. "Soil textural classification" means the soil particle size classification and particle size distribution classification as specified in the Soil Survey Manual, Handbook No. 18, United States Department of Agriculture, 1993, incorporated by reference in part [7080.0110 Subp.4.D(3)]
- vvv. "Soil treatment area" means the area required for the soil treatment system including spacing between individual units [7080.0020 Subp.43]
- www. "Soil treatment system" means a system where sewage effluent is treated and disposed of into the soil by percolation and filtration, and includes trenches, seepage beds, drainfields, at-grade systems, and mound systems. [7080.0020 Subp.44]
- xxx. "Standard system" means an individual sewage treatment system specified in parts [7080.0065 to 7080.0170, and 7080.0600] [7080.0020 Subp.45]
- yyy. "Supply pipe" means a nonperforated pipe whose purpose is to transport sewage tank effluent [7080.0020 Subp.45c]
- zzz. "Toilet waste treatment devices" means other toilet waste apparatuses including incinerating, composting, biological, chemical, recirculating, or holding toilets or portable restrooms [7080.0020 Subp.48a]
- aaaa. "Trench" means an area excavated from 18 to 36 inches in width that contains drainfield rock or other distribution medium [7080.0020 Subp.48d]
- bbbb. "Underground facility" means an underground line, facility system, and its appurtenances used to produce, store, convey, transmit, or distribute communication, data, electricity, power, heat, gas, oil, petroleum products, water including storm water, steam, sewage, and other similar substances. [216D.01 Subp.11]
- cccc. "Valve box" means a watertight structure designed for alternate distribution of effluent to a soil treatment system [7080.0020 Subp.49]
- dddd. "Vector attraction" is the characteristic of sewage sludge that attracts rodents, flies, mosquitoes, or other organisms capable of transporting infectious agents [503.31(k)]
- eeee. "Vertical separation" means the vertical measurement of unsaturated soil or sand between the bottom of the distribution medium and the saturated soil level or bedrock. [7080.0020 Subp.49b]
- ffff. "Watertight" means a device constructed so that no water can get into or out of the device except through designed inlets and outlets [7080.0020 Subp.52]
- gggg. "Wellhead protection area" means the surface and subsurface area surrounding a well or well field that supplies a public water system through which contaminants are

likely to move towards and reach the well or well field as regulated under chapter 4720. For the purposes of this rule, wellhead protection area shall be that are bounded by the drinking water supply management area as regulated under chapter 4720. [7080.0020 Subp.54]