

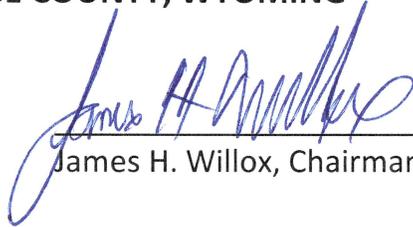
**CONVERSE COUNTY  
MINIMUM STANDARDS  
GOVERNING  
SMALL WASTEWATER  
SYSTEMS**

# Certification

## CONVERSE COUNTY MINIMUM STANDARDS GOVERNING SMALL WASTEWATER SYSTEMS

APPROVED AND ADOPTED THIS 2nd DAY OF February 2022

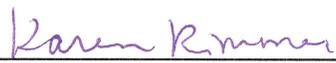
BOARD OF COMMISSIONERS  
CONVERSE COUNTY, WYOMING



James H. Willox, Chairman



ATTEST:

  
\_\_\_\_\_  
Karen Rimmer, County Clerk

# TABLE OF CONTENTS

## CHAPTER 1

Section I. Authority .....	4
Section II. Objective.....	4
Section III. Timing of Compliance with These Regulations .....	4
Section IV. Applicability.....	4
Section V. Intent.....	4
Section VI. Permit Required.....	5
Section VII. Definitions.....	5
Section VIII. Responsibility .....	7
Section IX. Application Requirements.....	7
Section X. Application Processing Procedures .....	8
Section XI. Construction and Operation in Compliance with Issued Permit.....	8
Section XII. Duration and Termination of Permits; Transfer of Permits .....	9
Section XIII. Renewal of a Permit .....	9
Section XIV. Denial of a Permit.....	10
Section XV. Modification of a Permit.....	10
Section XVI. Suspension or Revocation of a Permit .....	11
Section XVII. Types of Waste.....	11
Section XVIII. Backfilling .....	12
Section XIX. Small Wastewater Service.....	12
Section XX. Discharge of Effluents .....	12
Section XXI. Abandoned Septic Tanks.....	12

## CHAPTER 2 – STANDARDS

Section I. Design .....	13
Section II. Design Flows.....	13
Section III. Site Suitability .....	14
Section IV. Soil Absorption System Sizing.....	16
Section V. Building Sewer Pipes.....	18
Section VI. Septic Tanks. ....	19
Section VII. Effluent Distribution Devices. ....	20
Section VIII. Standard Soil Absorption Systems. ....	21
Section IX. Operation and Maintenance.....	24
Section X. Replacement Area.....	24
Section XI. Other Systems .....	24

<b>CHAPTER 3 - PENALTY .....</b>	<b>25</b>
----------------------------------	-----------

<b>APPENDIX A – PERCOLATION TEST PROCEDURE .....</b>	<b>A-1</b>
--	------------

# **CONVERSE COUNTY REGULATIONS FOR A PERMIT TO CONSTRUCT, INSTALL, OR MODIFY SMALL WASTEWATER FACILITIES AND RELATED DESIGN STANDARDS**

## **CHAPTER 1**

### **Section I. Authority**

These regulations are promulgated pursuant to Wyoming Statutes (W.S.) 35-11-101 through W.S. 35-11-1904, the Wyoming Environmental Quality Act. W.S. 35-11-301 (a) (iii) specifically stipulates that no person, except when authorized by permit, shall: construct, install, modify, or operate any sewerage system. W.S. 35-11-304 stipulates that to the extent requested, authority to enforce and administer W.S. 35-11-301 (a) (iii) shall be delegated to qualifying municipalities, water and sewer districts or counties.

### **Section II. Objective**

These regulations contain the minimum standards for the design and construction of small wastewater systems that are defined by W.S. 35-11-103(c)(ix).

The objective of these regulations is to prevent, reduce and eliminate pollution and enhance the waters of the State of Wyoming and to protect the health, safety and welfare of the environment and its inhabitants by ensuring that the design and construction of small wastewater systems meet the purpose of the Environmental Quality Act. These regulations pertain to permits required pursuant to Chapter 25, Wyoming Water Quality Rules and Regulations. The installation of all components of a small wastewater system requires a permit to construct.

### **Section III. Timing of Compliance with These Regulations**

Any permit to construct conventional small wastewater systems issued for facilities subject to these regulations prior to the effective date of these regulations shall remain covered under those permits. New construction or modification of existing facilities following the effective date of this regulation must obtain authorization under a new permit.

### **Section IV. Applicability**

These regulations shall apply to all small wastewater systems as defined in Section VII of these regulations within Converse County.

### **Section V. Intent**

The design and construction standards included in these regulations are directed toward conventional small wastewater systems. These standards impose limiting values of design for which a construction, installation or modification permit application and plans and specifications can be evaluated by the Converse County Special Projects Director.

The terms “shall” and “must” are used when practice is sufficiently standardized to permit specific delineation of requirements or when safeguarding public health or when protection of water quality justifies such definite action. Other terms, such as “should”, “recommend”, and “preferred,” indicate desirable procedures or methods, which allow deviations, provided the purpose of these regulations can be accomplished.

## **Section VI. Permit Required**

- A. No person may discharge sewage from an individual dwelling, install a small wastewater system or make an addition thereto:
  - 1. Without first obtaining a permit from the Special Projects Director.
  - 2. Unless in compliance with the requirements of these regulations.
- B. Final inspection is required before the system is backfilled.
- C. Permits may be issued only when it has been determined that the location of the small wastewater system will be on lands that are in compliance with Converse County Subdivision Regulations.
- D. No permits may be issued within the 100-year flood plain without a letter of map amendment (LOMA) from the Federal Emergency Management Agency (FEMA).
- E. The issuance of a permit to construct does not relieve the permittee of his responsibility to properly plan, design, construct, operate and maintain the facility described in the application and permit conditions.

## **Section VII. Definitions**

**“100 year floodplain”** means a tract of land throughout a watershed that has a one-in-one hundred chance or occurrence of flooding in any given year or a return period of once every 100 years, as determined by the United States Geological Survey (USGS), Federal Emergency Management Agency (FEMA) or a local planning and development authority.

**“Absorption surface”** means the interface where treated effluent infiltrates into native or fill soil.

**“Bed”** means a soil treatment and dispersal system where the width is greater than three (3) feet.

**“Bedrock”** means geological layers, of which greater than fifty percent (50%) by volume consist of unweathered in-place consolidated rock or rock fragments. Bedrock also means weathered in-place rock that cannot be hand augered or penetrated with a knife blade.

**“Bedroom”** means any room that is or may be used for sleeping.

**“Blackwater”** means water containing fecal matter and/or urine.

**“Building sewer”** means the pipe that carries wastewater from the building.

**“Chamber”** means a domed open bottom structure that is used in lieu of perforated distribution pipe and gravel media.

**“Delegated small wastewater program”** means a local governmental entity, delegated by the Department of Environmental Quality Administrator, with the authority to administer the provisions of W.S. 35-11-301(a) (iii) for small wastewater systems pursuant to the provisions of W.S. 35-11-304.

**“Distribution box”** means a watertight structure, which receives liquid effluent from a septic tank and distributes such effluent in equal portions into two or more pipes leading to the disposal area.

**“Domestic wastewater”** means a combination of the liquid or water-carried wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

**“Domestic septage”** means liquid or solid material removed from a septic tank that has received only wastes from residences, business buildings, institutions, and other establishments arising from normal living activities.

**“Dosing system”** means a tank equipped with an automatic siphon or pump designed to discharge effluent on an intermittent basis.

**“Effluent”** means liquid flowing out of a septic tank, other treatment vessel, or system.

**“Effluent filter”** means a removable, cleanable device inserted into the outlet piping of a septic tank or other treatment vessel designed to trap solids that would otherwise be transported to the soil absorption system or other downstream treatment components.

**“Evapotranspiration”** means the combined loss of water from soil by evaporation from the soil or water surface and by transpiration from plants.

**“Greywater”** means untreated wastewater that has not been contaminated by any toilet discharge; that is unaffected by infectious, contaminated, or unhealthy bodily wastes; and does not present a threat from contamination by unhealthful processing, manufacturing, or operating wastes. “Greywater” includes but is not limited to wastewater from bathtubs, showers, washbasins, clothes washing machines (unless soiled diapers are serviced), laundry tubs, and kitchen sinks.

**“Groundwater”** means subsurface water that fills available openings in rock or soil materials such that they may be considered water saturated under hydrostatic pressure.

**“High groundwater”** means seasonally or periodically elevated levels of groundwater.

**“Holding tank”** means a concrete watertight receptacle designed to receive and store wastewater.

**“Mound system”** means an onsite wastewater system where any part of the absorption surface is above the elevation of the existing site grade and the absorption surface is contained in a mounded fill body above the grade.

**“Percolation rate”** means the time expressed in minutes per inch required for water to seep into saturated soil at a constant rate.

**“Percolation test”** means the method used to measure the percolation rate of water into soil as described in Appendix A.

**“Restrictive layer”** means a nearly continuous layer that has one or more physical or chemical properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide unfavorable root conditions. Examples are bedrock, cemented layers, and dense layers.

**“Septage”** means liquid or solid material removed from a waste treatment vessel that has received wastes from residences, business buildings, institutions, and other establishments.

**“Septic tank”** means a watertight tank designed and constructed to receive and treat raw wastewater

**“Serial distribution”** means a group of trenches arranged so that the total effective absorption area of one trench is used before liquid flows into the next trench.

**“Small wastewater system”** means any sewerage system, disposal system or treatment works having simple hydrologic and engineering needs which is intended for wastes originating from a single residential unit, serving no more than four families or which distributes 2,000 gallons or less of domestic sewage per day.

**“Soil absorption system”** means a shallow, covered, excavation surface, or mound made in unsaturated soil into which wastewater effluent from the septic tank is discharged through distribution piping for application onto absorption surfaces through porous media or manufactured components.

**“Trench”** means an absorption surface with a width of three (3) feet or less.

## **Section VIII. Responsibility**

The issuance of a permit does not constitute the assumption by Special Projects Director or their representative, of liability for the failure of any sewage disposal system.

## **Section IX. Application Requirements**

The following procedure will be followed in applying for a permit:

- A. Any person who proposes to construct, install or modify a facility required to be permitted under Section VI, shall submit a written application on forms provided by the Special Projects Director.
- B. The applications for a permit to construct, install or modify must be accompanied by plans, specification, design data or other pertinent information covering the project, and any additional information required by the Special Projects Director. All plans and specifications must be submitted on forms provided by Converse County.
- C. All plans and specifications must conform to the minimum design standards identified in Chapter II.

## **Section X. Application Processing Procedures**

All permit applications received will be processed in the following manner:

- A. The Special Projects Director shall review each application and take final action within 15 days from the date the application is received.
- B. Incomplete applications will not be processed. The Special Projects Director shall promptly notify the applicant of any deficiencies in the submitted permit application package.
- C. Applications for a modification of an existing permitted facility to increase the capability to treat, hold, or dispose of wastes require a new permit application. Facilities not in compliance with these regulations will require additional modifications to other portions of the facility to bring the facility into compliance with these regulations.
- D. Each application must be submitted with all supporting data necessary for review.
- E. The Special Projects Director shall promptly notify the applicant of the final action taken on the application. If the conditions of the permit are different from the proposed application submitted by the applicant for review, the notification shall include reasons for the changes made.
- F. If, upon review of an application, the Special Projects Director determines that a permit should not be granted, the Special Projects Director shall notify the applicant of the permit's denial and state the reasons for denial.
- G. If the applicant is dissatisfied with the permit conditions or denial of any permit issued by the Special Projects Director, he may request a hearing in accordance with Section XIV.C.

## **Section XI. Construction and Operation in Compliance with Issued Permit**

The permittee shall:

- A. Conduct all construction, installation, or modification of any facility permitted consistent with the terms and conditions of the permit. Unauthorized changes, deviations, or modifications will be a violation of the permit. A new application or amended application must be filed with the Special Projects Director to obtain modification of a permit. No modification shall be implemented until a new or modified permit has been issued.
- B. Conduct the operation in accordance with statements, representations, and procedures presented in the complete application and supporting documents, as accepted and authorized by the Special Projects Director.

- C. Notify the Special Projects Director at least 48 hours prior to backfilling of system. The Special Projects Director's representative will perform a final inspection of the installation to ensure compliance with these regulations. The compliance section of the permit will then be signed. If the applicant does not notify Special Projects Director, the following actions may be taken or required by the Special Projects Director.
1. digging up the system to show compliance with these regulations,
  2. revocation of the permit,
  3. legal action, or
  4. all of the above.

## **Section XII. Duration and Termination of Permits; Transfer of Permits**

- A. The duration of construction, installation or modification permits will be variable, but shall not exceed **one (1) year** from the date of issuance. The expiration date will be recorded on each permit issued. Those permits issued without a specified expiration date will be in force no more than **one (1) year** from the date of issuance.
- B. Permits will be issued only to the official applicant of record, who must be the owner of the permitted facility, for only the type of construction of record and shall be automatically terminated:
1. within 60 days after sale or exchange of the facility unless application for transfer is received pursuant to subsection C. of this section.
  2. when construction is completed, except that conditions included in the permit will remain in effect throughout the life of the facility.
  3. upon issuance of a new, renewed or modified permit.
  4. upon written request of the permittee.
- C. Permits shall be transferred to new owners by submitting a written request to the Special Projects Director.
- D. Any conditions established in a construction, installation or modification permit will be automatically transferred to the new owner whenever a transfer of ownership of the facility occurs.

## **Section XIII. Renewal of a Permit**

A permit may be renewed where construction has not been completed by contacting the Special Projects Director stating that there will not be any changes in the plans for construction, installation, or modification of a permitted facility no less than 30 days prior to the expiration date of the permit.

**Section XIV. Denial of a Permit**

- A. The Special Projects Director may deny a permit for any of the following reasons:
  - 1. The application is incomplete or does not meet applicable minimum design and construction standards as specified in these regulations.
  - 2. The project, if constructed, will cause violation of applicable state surface or groundwater standards;
  - 3. Other justifiable reasons.
- B. If the Special Projects Director proposes to deny issuance of a permit, the applicant shall be notified of the intent to deny and the reason for denial.
- C. In the case of the denial or conditioning of a permit by the Special Projects Director, the applicant, if he so desires, may request a hearing before the Converse County Board of Health. A request for hearing shall be made in writing within 20 days of notification of the denial to the Converse County Health Board and shall state the grounds for the request. (Any hearing shall be conducted pursuant to the regulations of Converse County.) The Converse County Board of Health may not issue a waiver from the design standards to these regulations.

**Section XV. Modification of a Permit**

Either before construction is completed upon a permitted small wastewater system, or during the review of a proposed facility application, the Special Projects Director may, for good cause, modify a construction permit.

- A. When reviewing an application or before construction on a facility is completed, the Special Projects Director may modify a permit due to the following reasons:
  - 1. existing, unknown or changing site conditions which would prevent construction and resultant operation from complying with these regulations; or
  - 2. receipt of additional information; or
  - 3. any other reason necessary to effectuate applicable statutes, standards or regulations.
- B. The Special Projects Director shall notify the permittee by registered or certified mail of intent to modify the permit.
- C. Such notification shall include the proposed modification and the reasons for modification and the time frame to have modifications constructed, installed or operational. Modification requirements shall be implemented before construction, installation, or modification of a facility is completed.
- D. The modification shall become final within 20 days from the date of such notice unless within that time the permittee requests a hearing before the Converse County Board of Health. Such request for hearing shall be made in writing to the Converse County Board of Health and shall state the grounds for the request. Any hearing held shall be conducted pursuant to the regulations of Converse County.

- E. A copy of the modified permit shall be forwarded to the permittee as soon as the modifications become effective.

### **Section XVI. Suspension or Revocation of a Permit**

The Special Projects Director may suspend or revoke a permit before construction; installation or modification of a facility is completed for the reasons set forth below, in item B.

- A. Before a permit may be suspended or revoked, the permittee shall be given an opportunity to show compliance with all lawful requirements for the retention of the permit.
- B. The Special Projects Director shall notify the permittee of its intent to suspend or revoke the permit in the event that it becomes necessary, due to:
  - 1. non-compliance with the terms of the permit; or
  - 2. unapproved modifications in design or construction; or
  - 3. false information submitted in the application; or
  - 4. changing site conditions, which would result in violations of applicable regulations;
  - 5. non-compliance with any requirements of these regulations; or
  - 6. any other reason necessary to effectuate applicable statutes, standards or regulations.
- C. The notification shall include the reasons for suspension or revocation.
- D. The suspension or revocation shall become final 20 days from the date of such notice unless within that time the permittee requests a hearing before the Converse County Board of Health. Such a request for hearing shall be made in writing to the Converse County Board of Health and shall state the grounds for the request. Any hearing held shall be conducted pursuant to County's regulations.

### **Section XVII. Types of Waste**

- A. The system shall be designed to receive all sanitary sewage from the buildings served. Any normal household waste, including that from the laundry, bath and kitchen, must pass into the septic tank.
- B. Industrial wastes shall not be discharged into small wastewater systems without approval from the Wyoming Department of Environmental Quality, Water Division and a UIC Permit to Construct has been issued.

**Section XVIII. Backfilling**

Backfilling over the small wastewater system shall not be done until an on-site inspection by the Special Projects Director’s representative is completed. If not inspected within 48 hours after the County representative has been notified, the system may be backfilled with the approval of the Special Projects Director and the submittal of digital photographs. (Notification shall take place during normal business hours, Monday through Friday.) Backfilling shall be done with clean earth from the site, or similar to that found at the site.

**Section XIX. Small Wastewater Service**

The use of a small wastewater system by more than one property, dwellings of different ownership, commercial unit, or other premises, is prohibited.

**Section XX. Discharge of Effluents**

The effluent from a small wastewater systems may not discharge onto the surface of the ground, into any water course, abandoned well, pit, mine, or other similar excavation, or anywhere except through a properly designed and approved leaching field.

**Section XXI. Abandoned Septic Tanks**

Abandoned septic tanks shall be filled with soil, sand, or other approved materials. It shall be the responsibility of the property owner to see that an abandoned tank is filled.

## CHAPTER 2 – STANDARDS

### Section I. Design

The design of a small wastewater system shall take into consideration proximity to wells or other sources of water supply, topography, existing sewage disposal systems on adjacent property, water table, soil characteristics, available area, and shall provide for adequate treatment of the volume of sewage discharges from the premises served.

### Section II. Design Flows

The volume of wastewater shall be determined by Table 1 provided below.

**Table 1. Residential Design Flow Rates per Bedroom (gallons per day, gpd)<sup>1</sup>**

1 bedroom	150
2 bedrooms	280
3 bedrooms	390
4 bedrooms	470
5 bedrooms	550
6 bedrooms	630

<sup>1</sup>An unfinished basement is considered two (2) additional bedrooms.

<sup>2</sup>The design flow shall be increased by eighty (80) gpd for each additional bedroom over six (6).

**Table 2. Non-Residential Wastewater Design Flow Rates<sup>1</sup>**

Facility	Unit	Flow (gallons/unit/day)
Airports	person	4
Apartment	bedroom	120
Automobile Service Station	vehicle served	10
Bars	seat	20
Bathhouses and swimming pools	person	10
Campgrounds (w/ toilets only)	person	25
Campgrounds (w/shower facility)	person	45
Church	person	4
Country Club	member	25
Day School, Office Building, Retail Store, Warehouse (no showers)	person	15
Hospital	bed	250
Industrial Building (sanitary waste only)	employee	20
Laundry (self-service)	machine	450
Mobile Home	bedroom	see Table 1
Motel, Hotel, Resort	bedroom	140
Recreational Vehicle	each	100
Rest Home, Care Facility, Boarding School	bed	100
Restaurant	meal	10
Restaurant ( kitchen waste only)	meal	6
Theater	seat	3

<sup>1</sup>Values shown in the above table are the typical flow rates from *Wastewater Engineering Treatment and Reuse*, Metcalf and Eddy, 2003.

**Section III. Site Suitability**

- A. Small wastewater systems must be located where the surface drainage is sufficient to allow proper operation of the small wastewater system. Avoid depressions and bases of slopes and areas in the path of runoff from roofs, patios, driveways, or other paved areas unless surface drainage is provided. Small wastewater systems shall not be located beneath buildings, parking lots, roadways, driveways, irrigated landscaping, or compacted areas.
- B. The site must include area for both the proposed soil absorption system and a future replacement soil absorption system. Both the proposed and replacement soil absorption systems shall be sized to receive one-hundred (100%) percent of the wastewater flow. If a trench system is used, the replacement soil absorption system may be located between the trenches of the proposed soil absorption system if there is at least nine (9) feet of spacing between trench sidewalls.
- C. For standard soil absorption systems, effective suitable soil depth shall extend at least four (4) feet below the bottom of the soil absorption system to any restrictive layer, fractured rock, or highly permeable material.
- D. The depth to high groundwater or restrictive layer such as clay or bedrock or other impermeable materials shall be at least four (4) feet below the bottom of the absorption surface for all treatment systems.
- E. Slope
  - 1. Table 3 shows the maximum permissible slopes of the site on which an absorption system may be constructed

**Table 3. Slope and Percolation Rates for Absorption Systems**

<b>Percolation Rate</b>	<b>Maximum Slope<sup>1</sup></b>
5	25%
6-45	20%
46-60	15%

<sup>1</sup> Flatter slopes may be required where the effluent surfaces downslope.

- 2. Serial distribution, with the use of drop boxes or approved fittings, is the preferred installation method for sloping terrain. The bottom of individual trenches shall be level and the trenches shall be constructed to follow the contours of the land.
- 3. The placement of multiple trenches, with each subsequent trench down slope of the previous trench shall be avoided when the addition of effluent to the soil absorption system trenches may lead to either an unstable slope or seepage down slope.
- 4. All absorption surfaces must be located at least 15 horizontal feet from the top of any break in slope that exceeds the maximum slope allowed.
- F. Soil Exploration Pit and Percolation Tests

1. Delegated small wastewater programs shall require a percolation test in addition to the soil exploration pit.
  2. A minimum of one soil exploration pit within the proposed soil absorption system location shall be excavated to a minimum depth of four (4) feet below the bottom of the proposed soil absorption system to evaluate the subsurface conditions.
- G. The percolation test shall be performed in accordance with Appendix A of these regulations. An evaluation of the soil texture, in the proposed soil absorption system location, by a person experienced in soils classification, may be used as an additional tool to confirm the percolation rate.
- H. Minimum horizontal setback distances (in feet) are as follows:

**Table 4. Minimum Horizontal Setbacks for Domestic Wastewater in Feet<sup>1,2</sup>**

<b>From</b>	<b>To Septic Tank Or Equivalent</b>	<b>To Absorption System</b>
Wells (includes neighboring wells)	50	100
Public Water Supply Well	100	200 <sup>2</sup>
Property Lines	10	10
Foundation Wall (w/o drains)	5	10
Foundation Wall (with drains)	5	25
Potable Water Pipes	25	25
Septic Tank	N/A	10
Surface Water, Spring (including seasonal and intermittent)	50	50
Cisterns	25	25

<sup>1</sup> For disposal of non-domestic wastewater, the setback distance shall be determined by a hydrogeological study in accordance with Section 17(b) of Chapter 3, but shall not be less than the distances shown in Table 4. This requires a DEQ WQD permit.

<sup>2</sup> Small wastewater systems that discharge to the same aquifer that supplies a public water supply well and are located within Zone 1 or 2 (Attenuation) of the public water supply well, as determined by *Wyoming Department of Environmental Quality Source Water Assessment Project (2004)* or as established in Section 2 of the *Wyoming Wellhead Protection Guidance Document (1997)*, shall provide additional treatment. These systems will be required to obtain an individual permit to construct and will require that a PE sign, stamp, and date the application for a DEQ WQD permit.

**Section IV. Soil Absorption System Sizing**

- A. The total infiltration surface area of a soil absorption system shall be calculated by dividing the design flow rates (gpd) from Table 1 or Table 2 by the loading rate (gpd/ft<sup>2</sup>) found in Table 5.

**Table 5. Rates of Wastewater Application for Soil Absorption System Areas**

<b>Percolation Rate (mpi)</b>	<b>Loading Rate (gpd/ft<sup>2</sup>)</b>	<b>Percolation Rate (mpi)</b>	<b>Loading Rate</b>
5	0.80	21	0.45
6	0.75	22	0.44
7	0.71	23-24	0.43
8	0.68	25	0.42
9	0.65	26-27	0.41
10	0.62	28-29	0.40
11	0.60	30-31	0.39
12	0.58	32-33	0.38
13	0.56	34-35	0.37
14	0.54	36-37	0.36
15	0.52	38-40	0.35
16	0.50	41-43	0.34
17	0.49	44-46	0.33
18	0.48	47-50	0.32
19	0.47	51-55	0.31
20	0.46	56-60	0.30

- B. The total infiltration area shall be defined as follows:

1. For standard trenches the total infiltration area shall be calculated based on the following formula:

$$A = L(W + 2S)$$

A = Total infiltration area

L = Total length of trench

W = Bottom width

S = Sidewall height of 12 inches or less

- a. The sidewall height is the depth below the flowline of the pipe to the bottom of the trench.
- b. The maximum credit for sidewall height shall not exceed twelve (12) inches even if the actual sidewall height exceeds twelve inches.

2. For chamber trenches, the total infiltration area shall be calculated based on the following formula:

$$A = L(E + 2S)$$

$A$  = Total infiltration area

$L$  = Total length of trench

$E$  = Effective bottom width (Multiply width of the chamber by factor of 1.43 to get effective bottom width)

$S$  = Sidewall height of 12 inches or less

- a. The factor of 1.43 incorporates a thirty percent (30%) reduction of the bottom area.
  - b. The maximum credit for sidewall height shall not exceed twelve (12) inches even if the actual sidewall height exceeds twelve (12) inches.
  - c. The sidewall height is the height of the slotted sidewall of the chamber or depth below the flow line of the inlet pipe, whichever is less.
  - d. The total length of the trench is the number of chambers in a row multiplied by the length of one piece of chamber.
3. For standard bed systems, the total infiltration area shall be calculated based on the following formula:

$$A = LW$$

$A$  = Total infiltration area

$L$  = Total length of bed

$W$  = Width of the bed

- a. The sidewall credit shall not be used in calculating the total infiltration area for a bed system.

4. For chamber bed systems, the total infiltration area shall be calculated based on the following formula:

$$A = L(E \times R)$$

$A$  = Total infiltration area

$L$  = Total length of bed

$E$  = Effective bottom width of the chamber (Multiply width of the chamber by factor of 1.43 to get effective bottom width)

$R$  = Number of chamber rows (Multiply effective bottom width of chamber by number of chamber rows to get effective bottom width of bed.)

- a. The factor of 1.43 incorporates a thirty percent (30%) reduction of the bottom area.
- b. The total length is the number of chambers in a row multiplied by the length of one piece of chamber.

Coarse sand or soils having a percolation rate less than one (1) minute per inch (mpi) are unsuitable for subsurface effluent disposal. These soils may be used if a one (1) foot layer of fine sand or loamy sand is placed below the constructed soil absorption system. The soil absorption system shall be sized based on the percolation rate of the fill material.

#### **Section V. Building Sewer Pipes.**

All building sewers shall be installed in accordance with the 2012 International Plumbing Code (IPC). In the absence of a locally approved plumbing code, and in addition to the IPC, the building sewer shall comply with the following:

- A. Suitable building sewer pipe materials are polyvinyl chloride (PVC) or acrylonitrile-butadiene-styrene (ABS). The septic tank inlet and outlet pipes shall be schedule 40 PVC or ABS pipe and shall span the excavations for the septic tank and/or dosing chamber. American Society for Testing and Materials (ASTM) D-3034 Standard Dimension Ratio (SDR) 35 plastic pipe may be used if the void at the tank's side is filled with material that is granular, clean, and compacted.
- B. Building sewer pipes shall be sized to handle the peak hourly flow from the building and shall not be smaller than four (4) inches in diameter. When two different sizes or types of sewer pipes are to be connected, a proper type of fitting or conversion adapter shall be used.
- C. Sewer pipe shall not decrease in size flowing downstream.
- D. Building sewer pipes shall be laid at a standard slope of 1/4 inch per foot, and shall not be flatter than 1/8 inch per foot.

- E. Cleanouts shall be provided between the structure and the tank, at branch connections, every change in alignment, and at least every 100 feet in straight runs.
- F. All sewer piping shall be laid on a firm bed throughout its entire length. It shall be protected from damage due to rocks, hard lumps of soil, debris, and the like.
- G. Special care shall be used to prevent lateral movement or deformation during backfill. The backfill material shall be compacted to a density at least equivalent to the trench walls. Backfill over the pipe shall be of sufficient depth to protect the pipe from expected traffic loads and the wastewater from freezing.

**Section VI. Septic Tanks.**

- A. Septic tanks shall be fabricated or constructed of concrete, fiberglass, thermoplastic or an approved material. Tanks shall be watertight and fabricated to constitute an individual structure, and shall be designed and constructed to withstand anticipated loads. Only septic tanks on the Department of Environmental Quality, Water Quality Division's (DEQ/WQD) list may be used.
- B. The septic tank shall be placed on a level grade and a firm bedding to prevent settling. Where rock or other undesirable protruding obstructions are encountered, the opening for the septic tank shall be over excavated, as needed, and backfilled with sand, crushed stone, or gravel to the proper grade.
  - 1. Septic tanks shall not be buried deeper than the tank manufacturer's maximum designed depth for the tank. The minimum depth of soil cover over the top of the tank is six (6) inches.
  - 2. Backfill around and over the septic tank shall be placed in such a manner as to prevent undue strain or damage to the tank or connected pipes.
  - 3. Septic tanks shall not be placed in areas subject to vehicular traffic unless engineered for the anticipated load.
  - 4. Size: The minimum liquid volume of a septic tank shall be 1000 gallons for residences up to a four (4) bedroom capacity. Additional capacity of 150 gallons per bedroom shall be provided for each bedroom over four (4).

- C. If additional septic tank capacity over 1,000 gallons is needed, it may be obtained by joining tanks in series provided the following requirements are met:
  - 1. The inlet of each successive tank shall be at least two (2) inches lower than the outlet of the preceding tank, and shall have no tee or baffle except for the inlet to the first tank and the outlet for the last tank.
  - 2. The first tank or the first compartment of the first tank shall be equal to fifty percent (50%) or larger of the total septic tank system volume.
- D. An access opening shall be provided to each compartment of the septic tank for inspection and cleaning.
  - 1. The access opening(s) in the cover/lid of the tank shall have a minimum diameter of twenty (20) inches. Both inlet and outlet devices shall be accessible.
  - 2. The riser from the access opening shall terminate at a maximum of six (6) inches below the ground surface. Riser covers terminating above grade shall have an approved locking device.

## **Section VII. Effluent Distribution Devices.**

Distribution boxes and flow divider tees are suitable for level or nearly level ground and are installed before the soil absorption system with the goal of splitting flows equally between soil absorption system laterals. Drop boxes are suitable for sloping ground and are installed to achieve serial loading.

- A. Distribution Boxes
  - a. The distribution box shall be installed on a level, stable base to prevent tilting or settling, and to minimize movement from frost heave.
  - b. Boxes shall be watertight and constructed of concrete or other durable material.
  - c. Boxes shall be designed to accommodate the inlet pipe and the necessary distribution lines. The inlet piping to the distribution box shall be at least one (1) inch above the outlet pipes and all pipes shall have a watertight connection to the distribution box.
  - d. The box or shall be protected against freezing and made accessible for observation and maintenance.
  - e. Boxes shall have flow equalizers installed on each outflow.
- B. Flow divider tees may be used in place of distribution boxes.
- C. Drop boxes are suitable for sloping ground and are installed to achieve serial loading. The drop boxes shall meet the requirements in paragraphs A (1 through 5) of this section.

## Section VIII. Standard Soil Absorption Systems.

### A. General Design Requirements:

1. All soil absorption systems shall be designed in such a manner that the effluent is effectively filtered and retained below the ground surface. The absorption surface accepts, treats, and disperses wastewater as it percolates through the soil.
2. Soil absorption systems shall not be excavated when the soil is wet enough to smear or compact easily. Excavations which have been opened for the installation of a soil absorption system shall be protected from surface runoff to prevent the entrance of silt and debris. All smeared or compacted surfaces shall be raked to a depth of one (1) inch, and loose material removed before filter or filler material is placed in the soil absorption system excavation.
3. Soil absorption systems shall be designed to approximately follow the ground surface contours so that variation in excavation depths will be minimized. The trenches may be installed at different elevation but the bottom of each individual trench shall be level throughout its length.
4. Shallow soil absorption system depths are encouraged to promote treatment and evapotranspiration. The minimum soil cover depth over the soil absorption system is one (1) foot. The maximum depth to the bottom absorption surface of a soil absorption system is five (5) feet. Finished grading shall prevent ponding and promote surface water runoff.
5. Pipes, chambers or other products shall be bedded on firm, stable material. Heavy equipment shall not be driven in or over soil absorption systems during construction or backfilling.
6. Standard trenches refer to perforated pipe embedded in aggregate-filled trenches that shall conform to the following:
  - a. The perforated pipe shall have a minimum diameter of 4 inches. Suitable pipe materials include: ASTM D-2729-11 PVC, ASTM D-3034-08 PVC, Schedule 40 PVC ASTM D1784-11, and ASTM F810-07 PE.
  - b. The aggregate shall be crushed rock, gravel or other acceptable, durable and inert material that is free of fines, and has an effective diameter between ½ inch and 2-½ inches.
  - c. Prior to backfilling, the aggregate shall be covered throughout with a woven/non-woven geotextile material or a three (3) inch layer of straw.
  - d. Aggregate shall extend the full width and length of the soil absorption system to a depth of at least twelve (12) inches with at least six (6) inches of drain gravel

- under the distribution pipe and at least two (2) inches over the distribution pipe.
- e. Maximum width of trench excavation is three (3) feet.
  - f. Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area.
7. Standard beds shall conform to the same pipe and aggregate requirements for trenches as found in subparagraphs 6 (a through d) of this section. Standard beds shall also conform to the following:
- a. The soils shall have percolation rates less than 60 minutes per inch (5-60 mpi). The bottom of the bed must be level, therefore the site shall be relatively flat, sloping no more than one (1) foot from the highest to the lowest point in the installation area.
  - b. Distribution laterals within a bed must be spaced on not greater than six (6) feet centers. Sidewalls shall not be more than three (3) feet from a distribution lateral.
  - c. Beds must not be wider than twenty-five (25) feet if gravity distribution is used. Multiple beds must be spaced at one-half the bed width.
  - d. Rubber tired vehicles must not be driven on the bottom surface of any bed excavation.
8. Chambered trenches, when used in lieu of perforated pipe and aggregate, shall be installed in conformance with the manufacturer recommendations. No cracked, weakened, modified, or otherwise damaged chamber units shall be used in any installation.
- a. All chambers shall be an open, arch-shaped structure of durable, non-degradable design, suitable for distribution of effluent without filter material.
  - b. All chamber endplates shall be designed so that the bottom elevation of the inlet pipe is at least six (6) inches from the bottom of the chamber.
  - c. Inlet and outlet effluent sewer pipes shall enter and exit the chamber endplates. Inspection ports shall be installed at all outlet effluent sewer pipes.
  - d. All chambers shall have a splash plate under the inlet pipe or another design feature to avoid unnecessary channeling into the trench bottom.
  - e. The maximum width of the bottom absorption surface for a chambered trench is three (3) feet. The excavation to install a chambered trench may exceed three (3) feet.

- f. Minimum spacing of trenches (wall to wall) is three (3) feet. Trench spacing shall be increased to nine (9) feet when the area between each trench is considered as reserve area.
9. Chambered beds shall conform to the same requirements for chambered trenches as found in subparagraphs 8 (a through d) of this section. Aggregate, as specified in subparagraph 6 c of this section, or native soil shall be used to fill the space between the chambers.
10. Serial Sidehill Trench:
- a. A minimum of six (6) feet of undisturbed soil shall be maintained between adjacent trench or bed side walls.
  - b. The bottom of each serial trench or bed system shall be level.
  - c. The overflow pipe between serial soil absorption systems shall be set no higher than the mid-point of the upstream distribution pipe. The overflow pipe shall not be perforated.

Disposal Trench Construction – Disposal trenches shall be constructed in accordance with the following table:

Minimum lines per field	2
Maximum length per trench	100 feet
Minimum diameter of distribution lines	4 inches
Minimum width of trench bottom	3 feet or less
Minimum distance between wall to wall of trenches	3 feet
Minimum absorption area per dwelling/structure	400 square feet
Minimum soil cover over absorption area	1 foot
Maximum depth of bottom of absorption area	5 feet
Maximum depth of lines	36 inches
Top depth of lines	18 inches below grade

Distribution lines must form a complete system.

**Section IX. Operation and Maintenance**

- A. For any system that disposes of wastewater by subsurface filtration, the owner shall not add any chemical or biochemical additive to the system that would adversely affect the quality of the groundwater as stated in the WYDEQ Water Quality Rules & Regulations, Chapter 8.
- B. Septic tanks shall be pumped as needed to prevent solids carryover into the soil absorption system.
- C. Any service provider that pumps septic tanks shall dispose of the wastewater contents at a permitted wastewater treatment facility or in a manner approved by the WYDEQ Water Quality Division.
- D. Damaged fittings and broken, crushed or plugged piping associated with any small wastewater system shall be replaced in a timely manner.

**Section X. Replacement Area**

An area shall be designated and shown on the plans for future installation of a replacement absorption system. If a trench or chamber system is used, the replacement area may include the area between the trenches if sufficient spacing has been provided. At least three feet of undisturbed soil shall remain between the existing and replacement trench sidewalls.

**Section XI. Other Systems**

Systems requiring DEQ approval:

- Systems with Dosing Tanks
- Privies or Outhouses
- Pressure Distribution Systems
- Sand Mound Systems
- Small Wastewater Lagoons
- Greywater Systems
- Commercial and Industrial Wastes and/or Domestic Wastes Greater Than 2000 gallons per day

The following situations will require the application package to be sealed, signed, and dated by a professional engineer (PE) and submitted to the Department of Environmental Quality / Water Quality Division: non-domestic wastewater from commercial and industrial facilities, high strength wastewater, individual permits to construct, or standard soil absorption systems with a soil percolation rate that is either less than 5 minutes per inch (mpi) or greater than 60 minutes per inch (mpi).

### **CHAPTER 3 - PENALTY**

Any person who violates the provisions of these regulations shall be guilty of a misdemeanor and upon conviction thereof, shall be punished by a fine of not less than \$100 and not more than \$200, or shall be imprisoned in the County Jail not to exceed six (6) months, or shall be punished by both such fine and imprisonment. Each day of violation shall constitute a separate offense.

# **APPENDIX A**

## **PERCOLATION TEST PROCEDURE**

### **Section I. Purpose**

Percolation tests are used to determine absorption system site suitability and to size the absorption system.

### **Section II. Procedure**

#### **A. General Requirements:**

1. Percolation tests shall not be conducted in test holes that extend into groundwater, bedrock, or frozen ground.
2. The percolation test shall be conducted only after the soil exploration pit has been dug and examined.
3. A minimum of three (3) percolation test holes are required.
4. The percolation test holes shall be spaced uniformly over the proposed soil absorption system site.

#### **B. Preparation**

1. A twelve (12) inch diameter hole shall be dug or bored to the proposed depth of the soil absorption system.
2. The walls shall be vertical, with the natural soil surface exposed without smearing.
3. The sides and bottom shall be scarified with a sharp pointed instrument and the loose material shall be removed from the hole.
4. Two (2) inches of gravel or coarse sand shall be placed in the bottom of the hole to prevent it from scouring and sealing during water addition.

#### **C. Presoaking**

The purpose of presoaking is to have the water conditions in the soil reach a stable condition similar to that which exists during continual wastewater application. The minimum time of presoaking varies with soil conditions but must be sufficiently long so that the water seeps away at a constant rate. The following presoaking instructions are usually sufficient to obtain a constant rate.

1. Fill each hole with clear water to a level at least eighteen (18) inches above the gravel or coarse sand. If the eighteen (18) inches of water seeps away in eighteen (18) minutes or less, add eighteen (18) inches of water a second time. If the second filling of eighteen (18) inches of water seeps away in eighteen (18) minutes or less, this indicates the soil is sandy and is excessively permeable. This soil absorption system requires a DEQ permit.

2. If either the first or second fillings of eighteen (18) inches of water does not seep away in ninety (90) minutes, eighteen (18) inches of water must be maintained in the hole for at least four (4) hours to presoak the test hole. After the four (4) hours of water contact time, wait at least twelve (12) hours before starting the percolation rate measurement.

D. Percolation Rate Measurement

1. Fill each test hole with twelve (12) inches of water and allow the soil to rehydrate for fifteen (15) minutes prior to any measurements.
2. Establish a fixed reference point to measure the incremental water level drop at constant time intervals. The water level drop should be measured to the nearest  $\frac{1}{8}$  of an inch and the minimum time interval is ten (10) minutes.
3. Refill the test hole to twelve (12) inches above the gravel before starting the measurements. Continue to measure the incremental water level drop at a constant time interval until a consistent incremental water level drop is achieved. A consistent water level drop is achieved when three (3) consecutive water level drops are within  $\frac{1}{8}$  inches of each other.
4. Before the water level drops below one (1) inch above the gravel, refill the test hole to twelve (12) inches and continue to measure the incremental water level drop.
5. The percolation rate is calculated for each hole using the following formula:

$$\frac{\textit{Time Interval (Minutes)}}{\textit{Final Water Level Drop (inches)}} = \frac{\textit{Percolation Rate}}{\textit{(minutes/inch)}}$$

6. If only three to five percolation tests are performed, the design percolation rate for the absorption system is the largest rate from all the holes tested. If six or more percolation tests are performed, the design percolation rate for the absorption system is the average of all the holes tested as determined by the above formula.

E. The following information shall be recorded:

1. Date(s) of test(s);
2. Location, diameter, and depth of each test hole;
3. Duration of presoak;
4. Time of day for beginning and end of each water-level drop interval
5. Each water-level drop measurement;
6. Calculated percolation rate;
7. Name and signature of person performing test;
8. Name of owner or project name; and
9. Certification that the percolation test was done in accordance with Wyoming Water Quality Rules and Regulations Chapter 25 Appendix A.