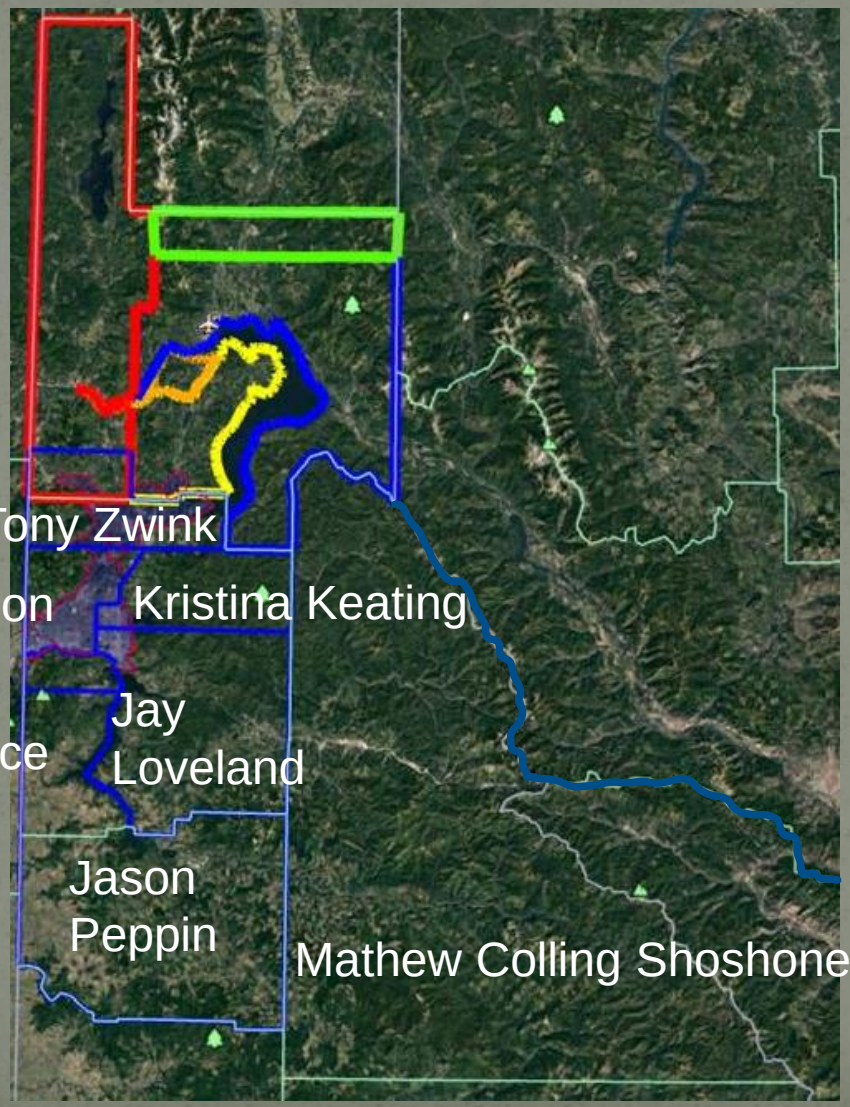
2020 Septic Installer Course
Panhandle Health District

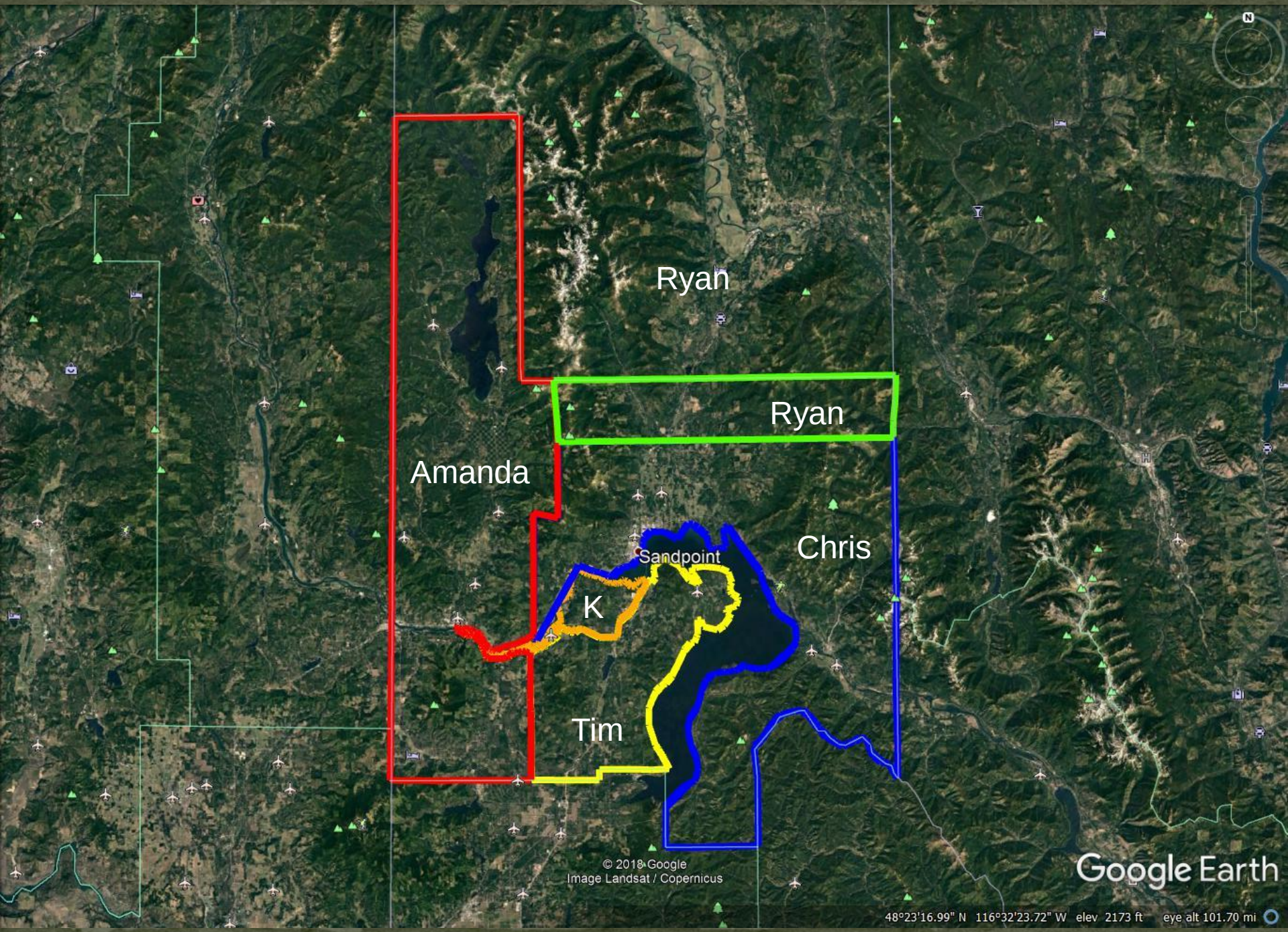
Public Health
Prevent. Promote. Protect.

AGENDA

- Administration Information
- Importance of Septic Systems
- Soils and Groundwater
- Septic Permit Processes
- Septic System Components
- Basic/Alternative Systems
- Failed Systems
- Exam

Benewah, Kootenai, Shoshone Staff areas




Ryan
Ryan
Amanda
Chris
Sandpoint
K
Tim
© 2018 Google
Image Landsat / Copernicus
Google Earth
48°23'16.99" N 116°32'23.72" W elev 2173 ft eye alt 101.70 mi

Relevant Rules & Guidance

- IDAPA 58.01.03 Individual and Subsurface Sewage Disposal Rules
- IDAPA 41.01.01 Rules of Public Health
- Idaho DEQ Technical Guidance Manual for Subsurface Sewage Disposal (TGM)
- Idaho Subsurface Sewage Disposal Standard Operating Procedures (SOP)
- Idaho Land Development Program Standard Operating Procedures (SOP)
- IDAPA 58.01.11 Ground Water Quality Rule
- IDAPA 58.01.02 Water Quality Standards
- IDAPA 41.01.01 Rules of Public Health

RULES & REGULATIONS REVIEW

- Property owners are jointly and individually responsible
- PHD has authority to protect the health, environment, and safety of the people of Idaho
- Septic Permit - required to modify, repair, or construct
- Installer Permit - secure a installer's registration permit
- Violation a Misdemeanor for willful or negligent violations.
  - Potential fines up to $10,000 or $1,000 a day, whichever is greater

New Septic Installer Class

- Attend class & pass exam
- RULE - IDAPA 58.01.03.006
- Refresher course every 3 yrs ★
- Basic vs. Complex Installers License
- Obtain License Application & Submit fee $50 basic or $100 complex with bond.
- Renewal <u>Every Year on Jan. 1st</u> ★
- If license lapse 1 year, must retest

Installer License Revocation

IDAPA 58.01.03.006.08 and SOP 5.6

- Installer's license may be revoked for failure to comply with rules.
- Written notice for first violation
- Second violation results in revocation for remainder of calendar year.
- Usually due to installing before permit issued.

Installer License

Panhandle Health District I
Environmental Health Section
SEPTIC INSTALLER LICENSE

COUNTIES OF:
Benewah
Bonner
Boundary
Kootenai
Shoshone

THIS PERMIT - LICENSE IS NON-TRANSFERABLE AND IS THE PROPERTY OF THE ISSUING AGENCY AND MAY BE REVOKED FOR FAILURE TO MAINTAIN COMPLIANCE WITH THE APPLICABLE HEALTH REGULATIONS OR ANY APPLICABLE STATE AND LOCAL LAWS, ORDINANCES AND REGULATIONS AS REFERRED TO THEREIN.
IDAHO CODE §39-414 (2)

[redacted]
[redacted]
ATHOL, ID 83801-0403

[redacted]
[redacted]
ATHOL, ID 83801

[redacted]

DATE ISSUED: 12/17/2014

DATE EXPIRES: 12/31/2015

COUNTY: KOOTENAI

ID NUMBER: 15-107455

[redacted]

LICENSED FOR BASIC SYSTEMS: YES

LICENSED FOR COMPLEX SYSTEMS: YES

Dick Martindale

HEALTH AUTHORITY

Installation Exemption

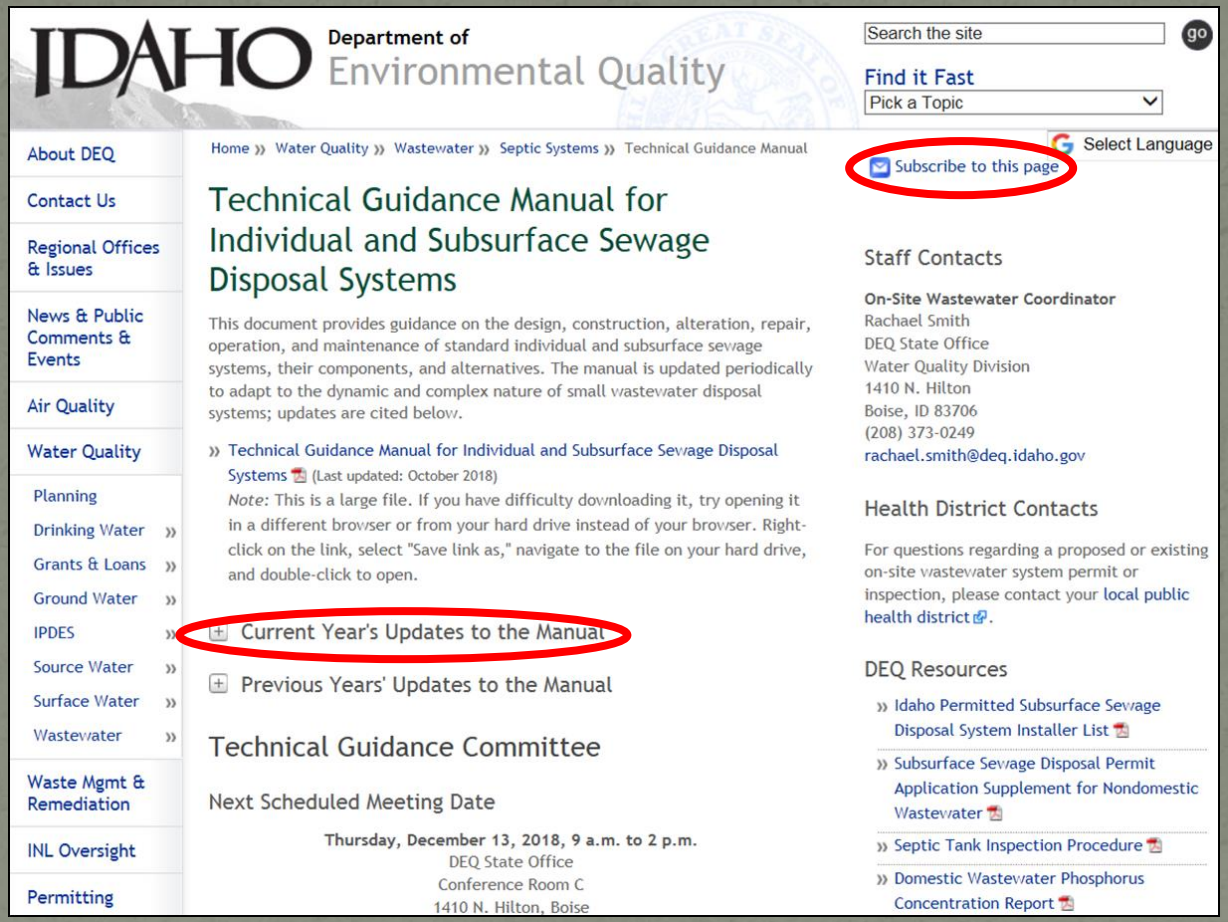
•**Exemption. An installer's license shall not be required for:**

a. Any person, corporation, or firm constructing a central or municipal subsurface sewage disposal system if that person, corporation, or firm is a licensed public works contractor as provided in Title 54, Chapter 19, Idaho Code, is experienced in the type of system to be installed and is under the direction of a professional engineer licensed in the state of Idaho; or

b. An owner installing his own standard or basic alternative system.

Technical Guidance Manual

Downloadable or purchase for $25.



IDAHO Department of Environmental Quality

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- INL Oversight
- Permitting

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Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems

This document provides guidance on the design, construction, alteration, repair, operation, and maintenance of standard individual and subsurface sewage systems, their components, and alternatives. The manual is updated periodically to adapt to the dynamic and complex nature of small wastewater disposal systems; updates are cited below.

» Technical Guidance Manual for Individual and Subsurface Sewage Disposal Systems (Last updated: October 2018)

Note: This is a large file. If you have difficulty downloading it, try opening it in a different browser or from your hard drive instead of your browser. Right-click on the link, select "Save link as," navigate to the file on your hard drive, and double-click to open.

Current Year's Updates to the Manual

Previous Years' Updates to the Manual

Technical Guidance Committee

Next Scheduled Meeting Date

Thursday, December 13, 2018, 9 a.m. to 2 p.m.
DEQ State Office
Conference Room C
1410 N. Hilton, Boise

Staff Contacts

On-Site Wastewater Coordinator
Rachael Smith
DEQ State Office
Water Quality Division
1410 N. Hilton
Boise, ID 83706
(208) 373-0249
rachael.smith@deq.idaho.gov

Health District Contacts

For questions regarding a proposed or existing on-site wastewater system permit or inspection, please contact your local public health district.

DEQ Resources

- » Idaho Permitted Subsurface Sewage Disposal System Installer List
- » Subsurface Sewage Disposal Permit Application Supplement for Nondomestic Wastewater
- » Septic Tank Inspection Procedure
- » Domestic Wastewater Phosphorus Concentration Report

http://www.deq.idaho.gov/water-quality/wastewater/septic-systems/technical-guidance-manual.aspx

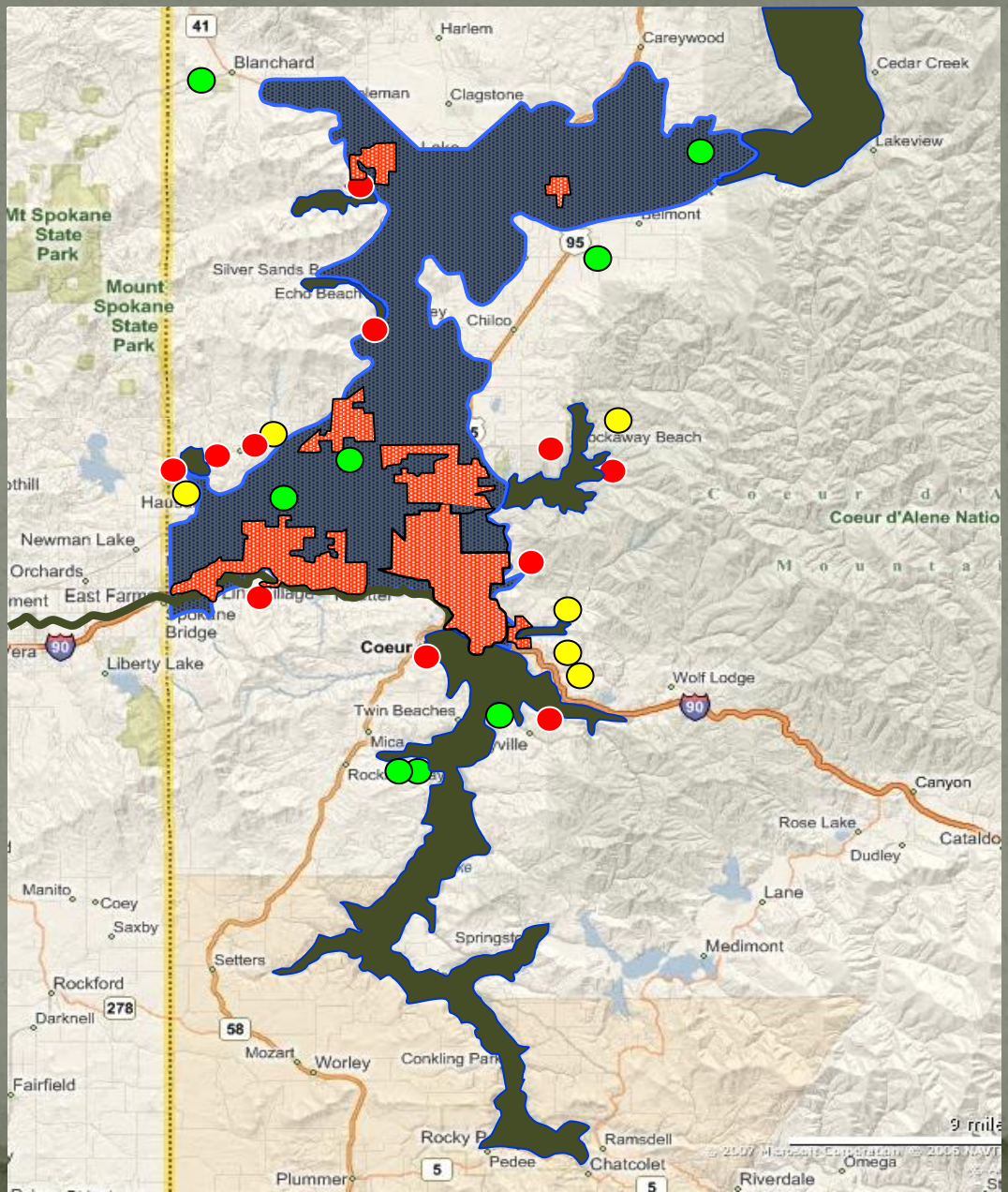
Or Google "Idaho Technical Guidance Manual"

Importance of Septic Systems

Why Do Wastewater Disposal Regulations Exist ?

- Keep inadequately treated sewage away from human contact to prevent disease.
- Reduce levels of disease-causing bacteria and viruses discharged to the environment.
- To prevent ground and surface water contamination from disease-causing organisms and nutrients in wastewater.

Public Sewer serves a small portion of Northern Idaho



What is Wastewater?

"Any combination of liquid or water … containing blackwater, greywater or commercial or industrial pollutants; and sewage. "

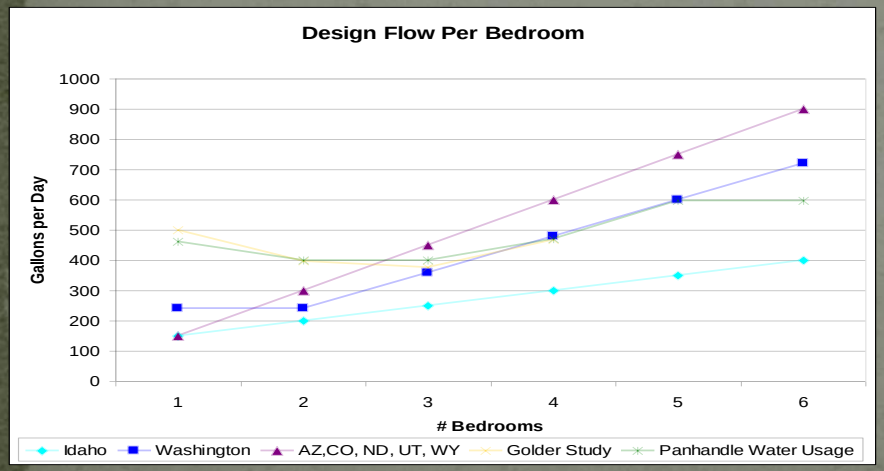
~IDAPA 58.01.03.003.36

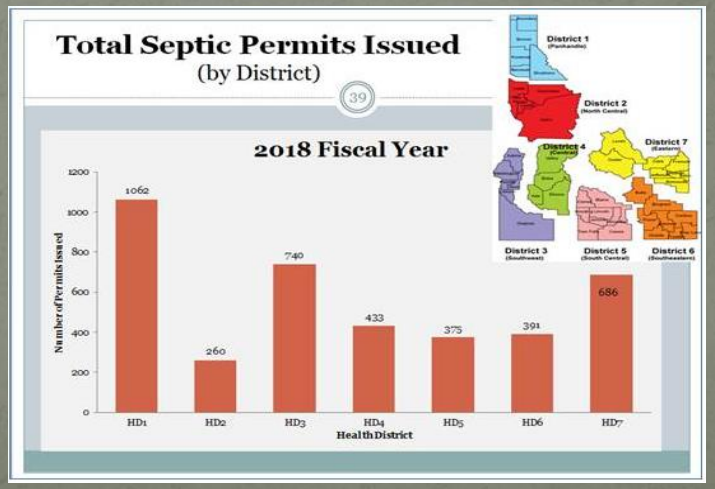
Idaho rules apply to all wastewater generated on a property!

- Composting toilets, outhouses, etc. only address black waste and do not make every property "buildable"
- Rules apply to all properties, including recreational

How Much Wastewater?

- **Bedrooms** used to estimate residential wastewater flow in Idaho
  - 150 gpd/1 bedroom, 50 gpd for each additional
- Idaho flows lower than other states
- Idaho flows lower than measured flows in Panhandle
- 1062 new systems x 250 gpd ~ 265,000 gallons of wastewater disposal **per day** from new systems alone!
- TGM flows or measured flow for other projects

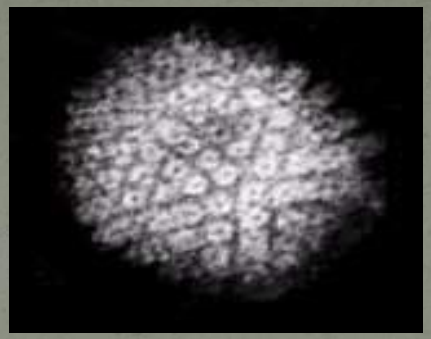


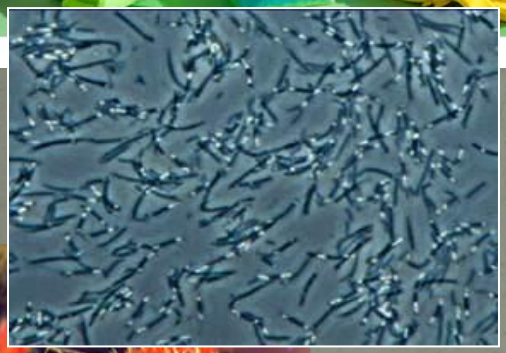


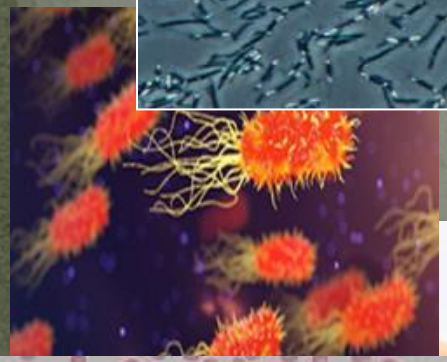
Septic Systems in Northern Idaho

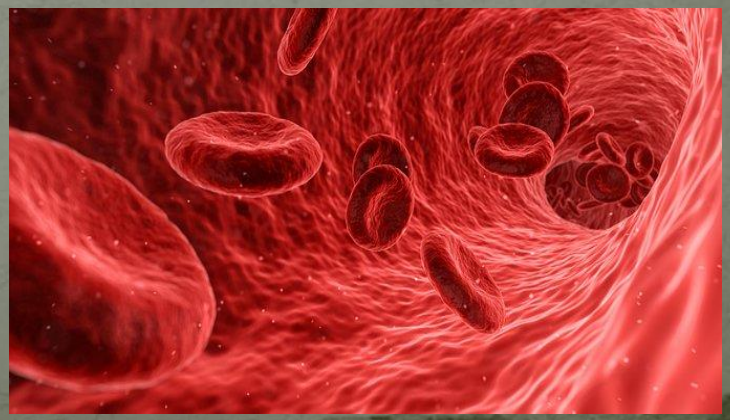
- 14% of State's population (2010 census)
- 9% of State's surface area
- 33% of State's surface water
- 27% of Septic Permits issued in Idaho (2018)
- 1062 permits in 2018, peak of 2400 permits in 2005
- 35% of Complex Permits issued in Idaho

Contaminants in Wastewater:









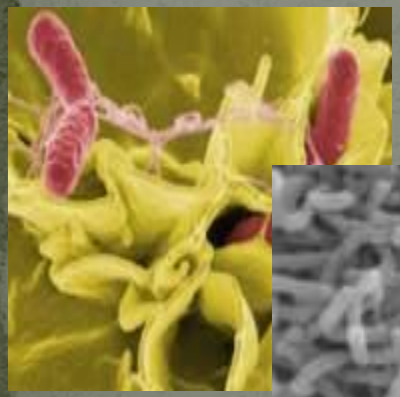
- Bacteria
- Viruses
- Parasites
- Blood
- Chemicals
- Nutrients
- Pharmaceuticals
- Antibiotics
- Personal Care Products
- Steroids
- Natural & Synthetic Hormones
- Nonprescription Drugs.
- Detergents
- Fire Retardants
- Pesticides

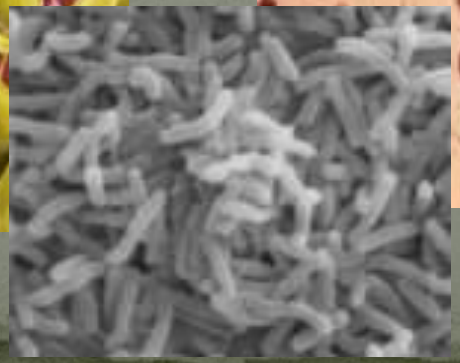
Some Wastewater Pathogens

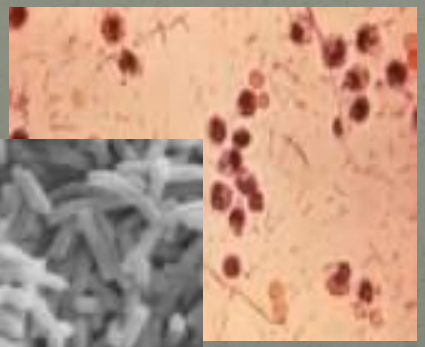
- E. coli 0157:H7
- Hepatitis A,B,C viruses
- Norwalk viruses
- Amoebic dysentery
- Tapeworms
- Pseudomonas
- Salmonella
- Shigella
- Cholera
- Giardia
- Cryptosporidium
- Trichinosis
- Tetanus

Effects of Illness Caused by Wastewater Pathogens

- Diarrhea
- Fever
- Vomiting
- Chills
- Abdominal Cramping
- Nausea
- Headaches
- Jaundice
- Muscle Aches
- Bloody Stools
- Liver Damage
- Intestinal Damage
- Kidney Failure
- Partial Paralysis
- Lung Infections
- Skin & Eye Infections
- Arthritis
- Death







Prevalence of Illness Caused by Waterborne Organisms

- **3.4 million people die as a result of water related diseases** (World Health Org)
- **It is the leading cause of disease & death around the world.**

In the United States (2017):

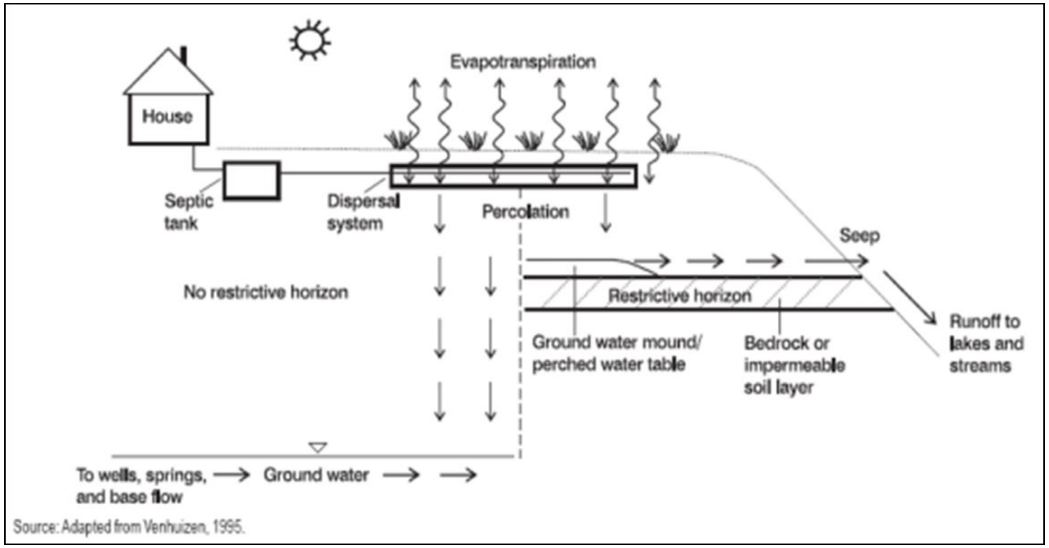
- **6,939 annual total deaths from 13 diseases caused by pathogens that can be transmitted by water**
  - 91% associated with three environmental pathogens: *Legionella* (Legionnaires' disease) (250 deaths), NTM (1,216 deaths), *Pseudomonas*-related pneumonia (1,618 deaths) & septicemia (3,217 deaths)
  - 7% associated with seven pathogens transmitted by the fecal–oral route: *Campylobacter, Cryptosporidium, E. coli, Giardia*, Hepatitis A, *Salmonella* non-typhoidal, and *Shigella*
- **477,000 annual Emergency Dept. visits for 13 diseases caused by pathogens that can be transmitted by water**
- **Total water-related illnesses, including Giardia, Cryptosporidium, and Legionella, result in an estimated 40,000 hospitalizations each year and cost $970 million annually.**

CDA Stats for 2017 Waterborne Disease Burden Data

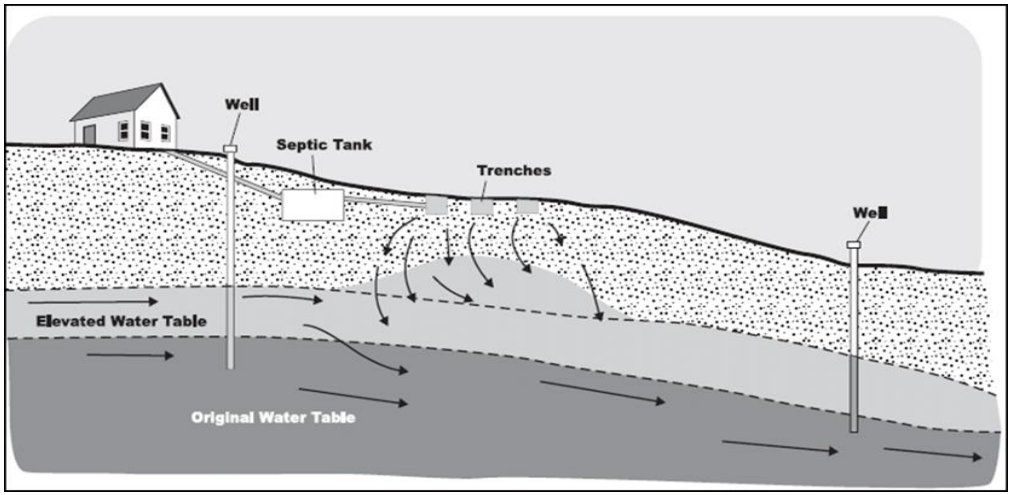
Installer Safety

- Protective gear (rubber gloves, rubber boots, coveralls, and eye protection)
- Hepatitis A and B vaccinations for anyone contacting sewage.
- Careful of soil and site conditions.
- Wash hands.
- Shower and laundry after work.

Septic Systems & Effluent Pathways



Source: Adapted from Venhuizen, 1995.



Wastewater Contaminant Movement

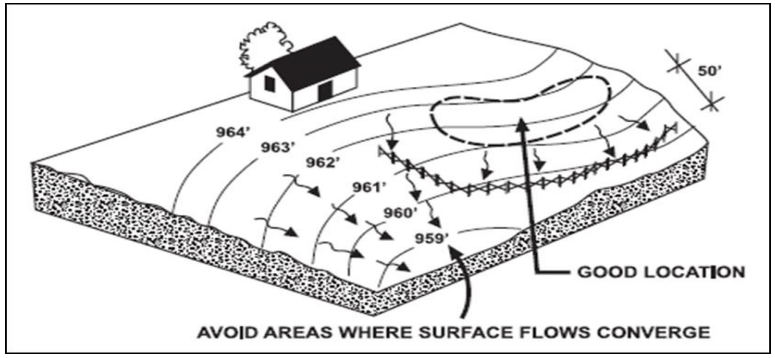
- **Viruses that reach Ground Water can travel at least 220 ft vertically & 1,338 ft laterally in some porous soils & still remain infective.**
- **Fecal coliform bacteria have been observed to move 2ft down & 50ft longitudinally 1 hour after being injected into a shallow trench in saturated soils on a 14% slope.**
  2002 USEPS Onsite Wastewater Treatment System Manual
- **Effluent plumes can intermix with ground water & contaminate wells &/or surface water.**
- **Effluent plumes & contaminants can be swept away by natural water runoff & high groundwater tables.**

Septic Systems
Need Unsaturated Soils
to Properly Treat Wastewater
Before it reaches Ground Water

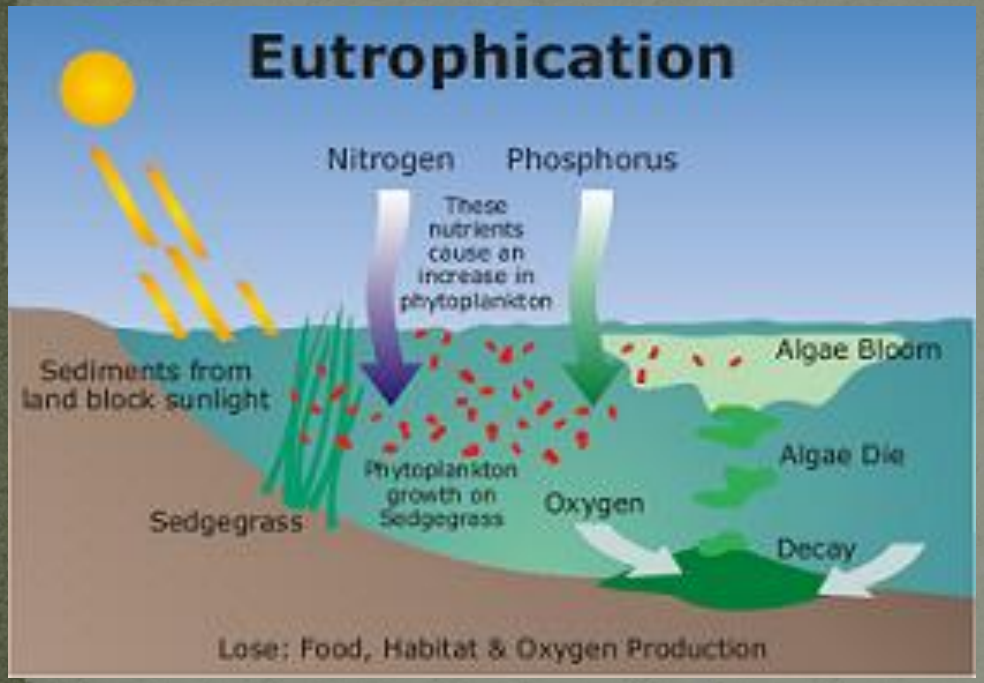
Proper Sizing & Placement

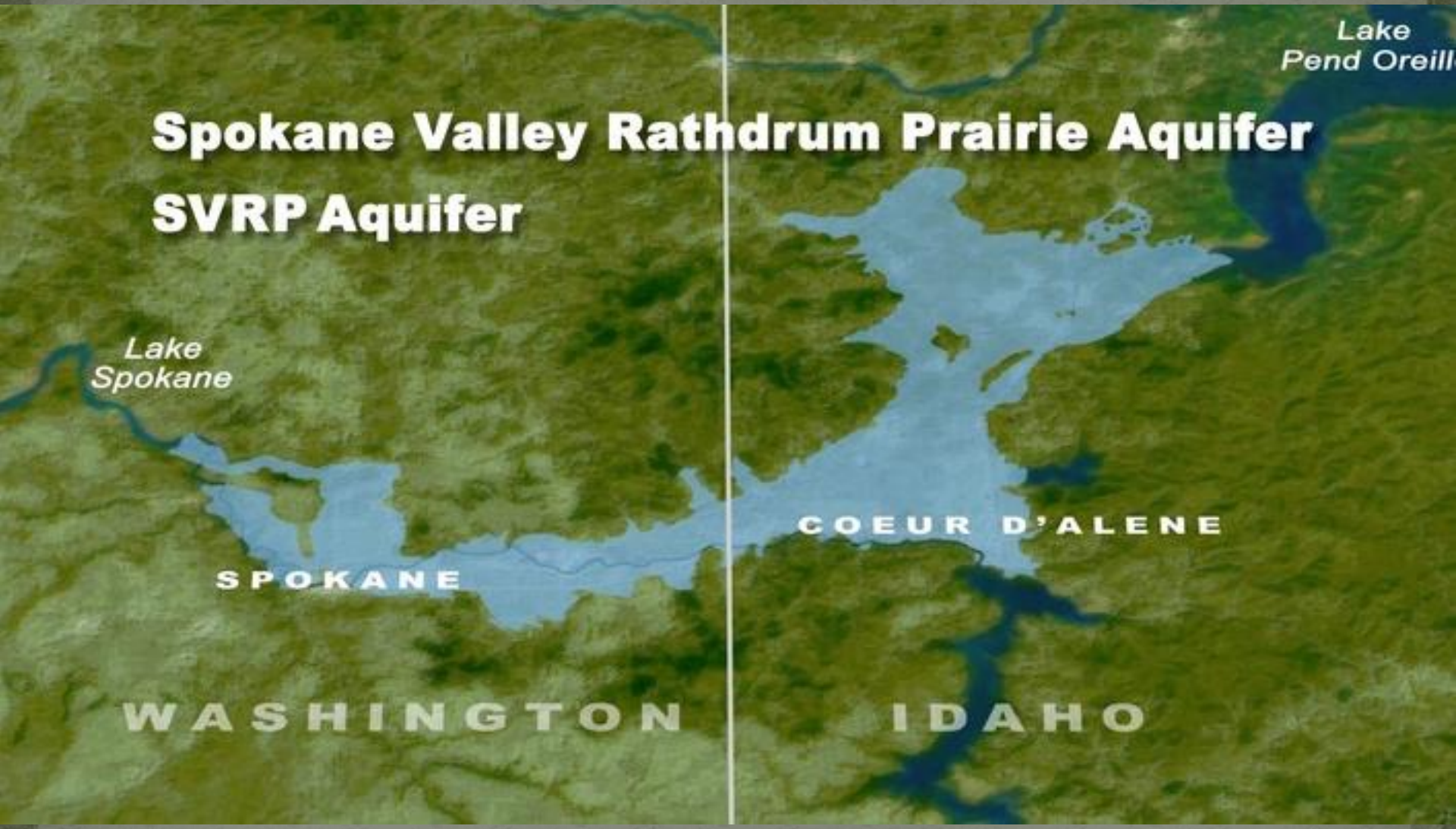
Prevents pathogens & contaminants from entering ground water & surface water.

Promotes Long-Term Functionality of the System



Impacts of Nutrients on Surface Water




Spokane Valley Rathdrum Prairie Aquifer
SVRP Aquifer
Lake Spokane
Lake Pend Oreille
SPOKANE
COEUR D'ALENE
WASHINGTON
IDAHO

SVRP Stats:

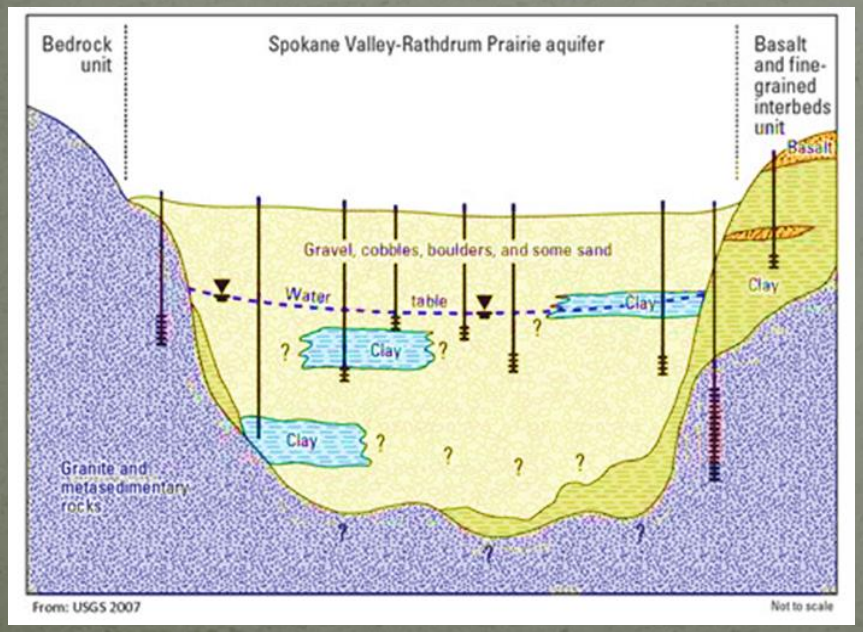
- Covers roughly 370 square miles in northern Idaho and eastern Washington
- Primary source of drinking water for over 500,000 people living in the area
- EPA- designated Sole Source Aquifer
- Idaho DEQ- designated sensitive resource aquifer
- Vulnerable to pollution
- Up to 1,000,000,000 gallons of water/day

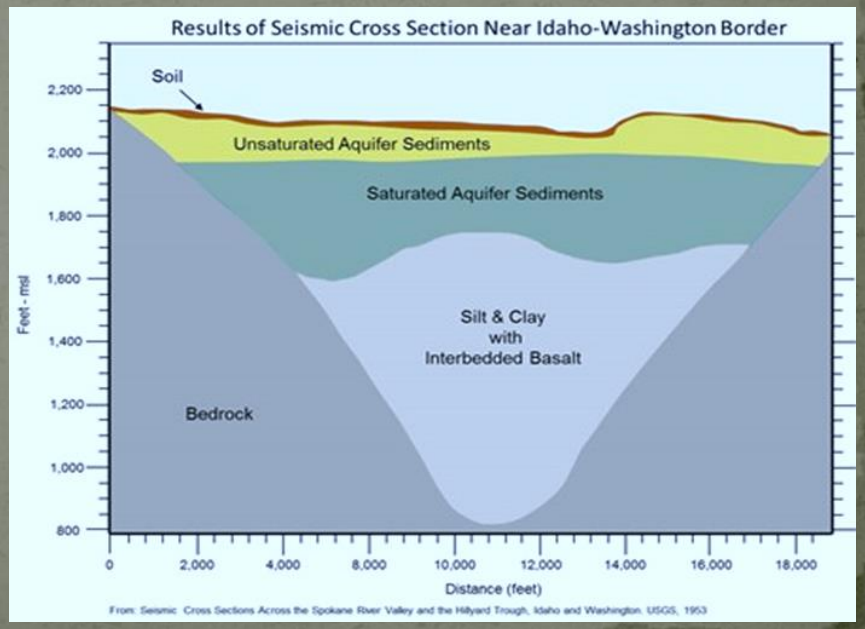
Composition

Aquifer: Ice Age Flood-deposited gravels, cobbles, and boulders

Valley Walls: rocks and clay

Aquifer Edges or Basin: Bitterroot and Selkirk Mountains

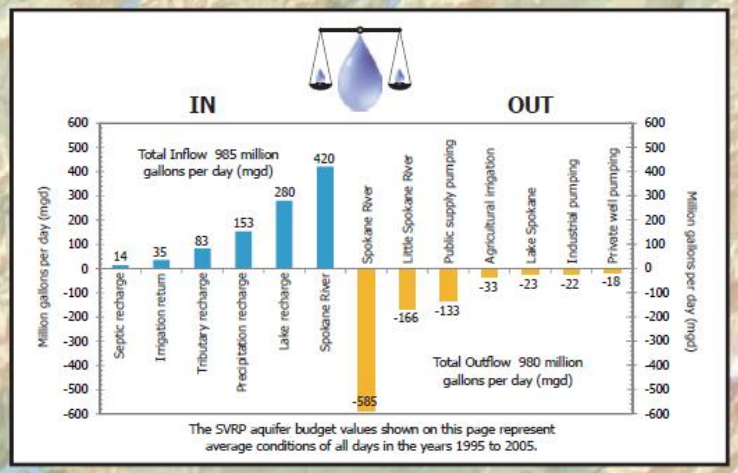




Vancouver
Cordilleran Ice Sheet
Washington
Okanogan Ice
Columbia Ice
Purcell Ice
Canada
Laurentide Ice Sheet
Rocky Mountains
Montana
Olympics
Puget Ice
Seattle
I-5
Cascades
Dry Falls
Grand Coulee
Moses Coulee
Lake Columbia
ice dam
Eddy
Lake Missoula
Camas
I-90
Spokane
scablands
Washtucna Coulee
Palouse Falls
Bitterroot Range
Clark Fork
Missoula
Mt Rainier
Mt St Helens
Lake Lewis
Yakima
Columbia River
Pacific Ocean
Pasco
Burlingame
Wallula Gap
Snake River
Idaho
continental divide
Columbia Gorge
Mt Hood
Lake Condon
I-84
Portland
Salem
Coast Range
today's coastline
Oregon
Lake Willamette
Glacial Lake Missoula and the scablands
0
100 km
Pleistocene ice cover
ice-dammed lake
temporary lake
flood-scoured scabland
notable coulee
river today
freeway
major city
state line
feature

WATER BUDGET

The Spokane Valley – Rathdrum Prairie (SVRP) aquifer is dynamic with water flowing into and out of the system. Like a household budget, a water budget is an accounting of the amount and source of water recharging the SVRP aquifer, and the amount and destination of water discharging from the SVRP aquifer. This water budget is organized into two categories: inflow (water that recharges or flows IN to the SVRP aquifer) and outflow (water that discharges or flows OUT of the SVRP aquifer). In any successful budget, the IN and OUT numbers should match. More information could narrow the small gap in this budget.



The SVRP aquifer budget values shown on this page represent average conditions of all days in the years 1995 to 2005.

153 mgd enter the aquifer from precipitation that lands on the ground above the aquifer.

Lake Pend Oreille adds 43 mgd

Spirit Lake adds 36 mgd

Twin Lakes add 26 mgd

The Spokane River plays a key role in the aquifer water budget: the river provides about 43% of the SVRP aquifer inflow, and it receives almost 60% of the SVRP aquifer outflow. The lakes near the SVRP aquifer contribute about 28% of the inflow.

Human uses are only about 21% of the SVRP aquifer outflow. Look on page 15 to find out how much SVRP aquifer water people in Idaho and Washington use.

Agricultural and golf course irrigation returns 35 mgd

Tributary basins add 83 mgd

Irrigation only wells pump 33 mgd

Hayden Lake adds 45 mgd

Hayden Lake recharge

This is Waikiki Spring discharging to the Little Spokane River.

Subsurface flow to Lake Spokane takes 23 mgd

166 mgd discharge to the Little Spokane River

Newman Lake adds 15 mgd

Hauser Lake adds 13 mgd

Domestic wells pump 18 mgd

Public water systems pump, store, and deliver SVRP aquifer water.

585 mgd discharge to the Spokane River

Public supply wells pump 133 mgd

Industrial wells pump 22 mgd

The Spokane River adds 420 mgd

Fernan Lake adds 10 mgd

Coeur d'Alene Lake adds 89 mgd

Liberty Lake adds 4 mgd

Septic systems add 14 mgd

Water that goes down a storm drain is included with the precipitation that lands on the ground.

Water flowing into the SVRP aquifer

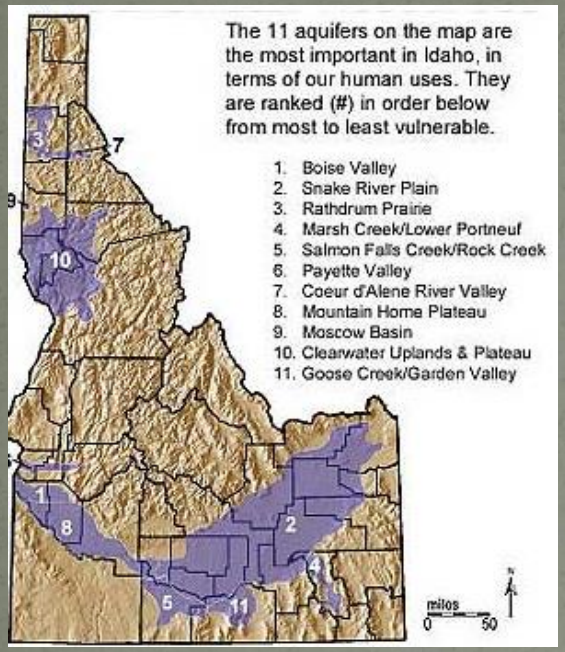
Water flowing out of the SVRP aquifer

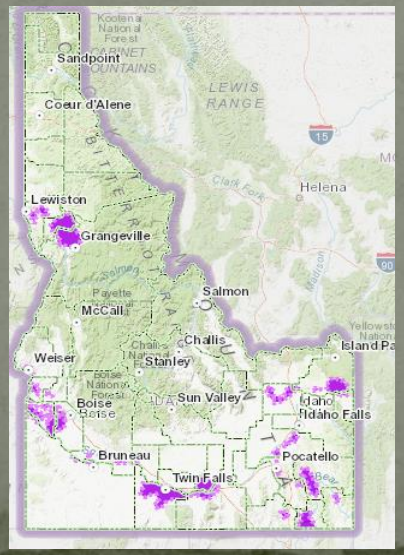
Did you know?

Close to 1 billion gallons of water flows into and out of the SVRP aquifer each day.

The information on this page are adapted from USGS Scientific Investigations Report 2007-5044.

Aquifer Contamination in Idaho

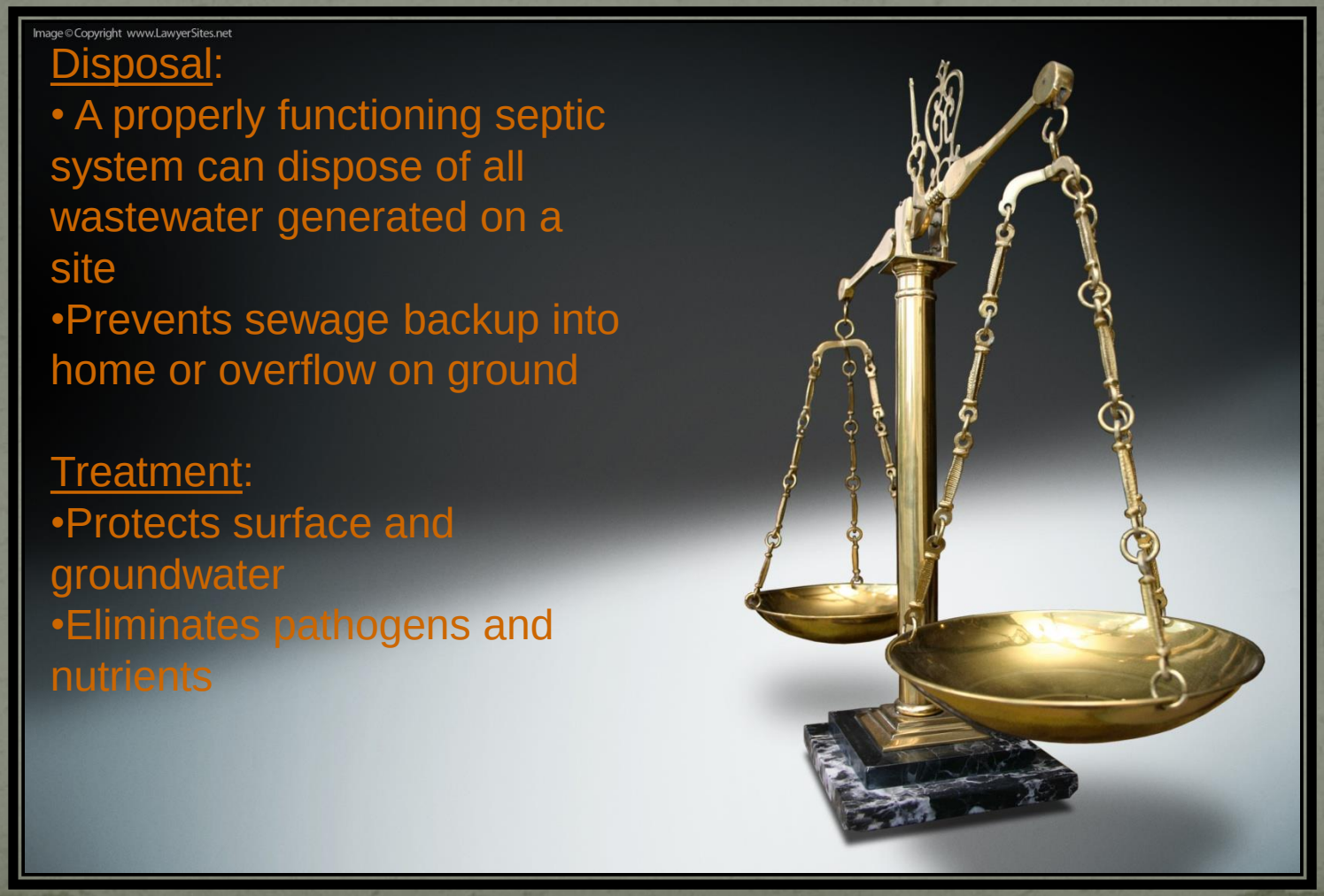




- Other areas of Idaho have aquifers with 5 mg/L or higher of Nitrate
- Very difficult to remediate once contaminated
- Septic systems a factor, but not the only factor
- SVRP Aquifer rules were adopted to limit density of systems over the aquifer
- Critical Materials Program regulates chemicals over the aquifer
- SVRP Aquifer is sampled continuously for contamination
- Decrease in Nitrate concentrations despite ~5X population growth over the last 40 yrs
- Aquifer Rules adopted in 1997 to protect the aquifer

Soils and Groundwater

Balance of Disposal and Treatment



Disposal:

- A properly functioning septic system can dispose of all wastewater generated on a site
- Prevents sewage backup into home or overflow on ground

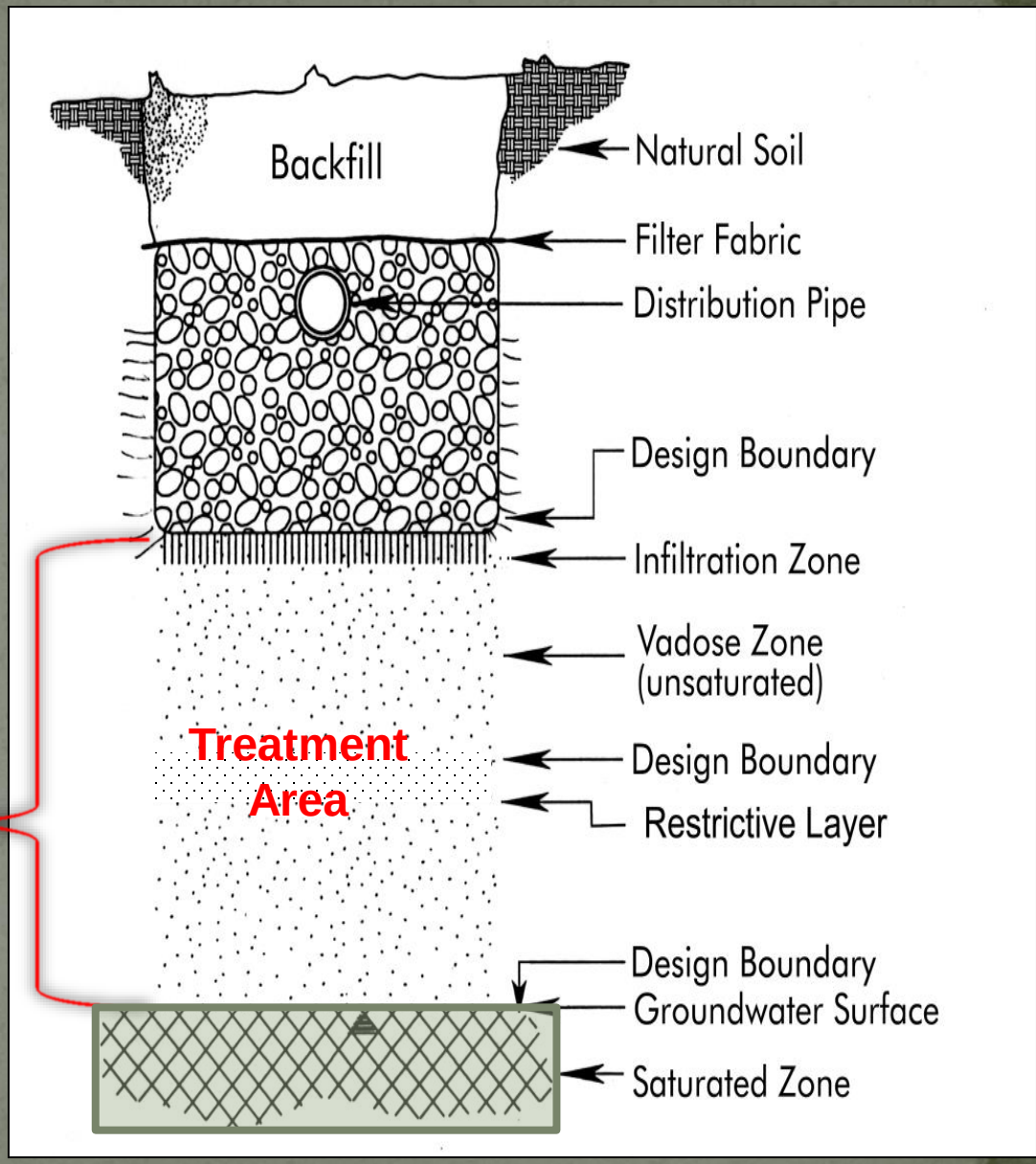
Treatment:

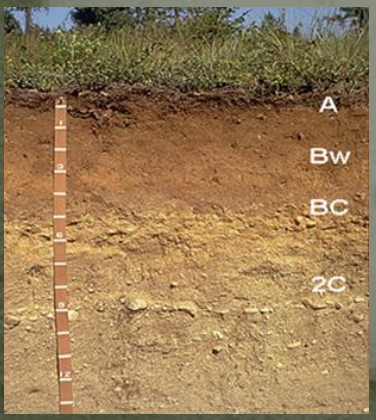
- Protects surface and groundwater
- Eliminates pathogens and nutrients

Septic Systems and Soils Work Together

Adequate and consistent soils are necessary to reduce or eliminate pathogens.

****Destruction of pathogens occurs in the top 4 feet of soil.***



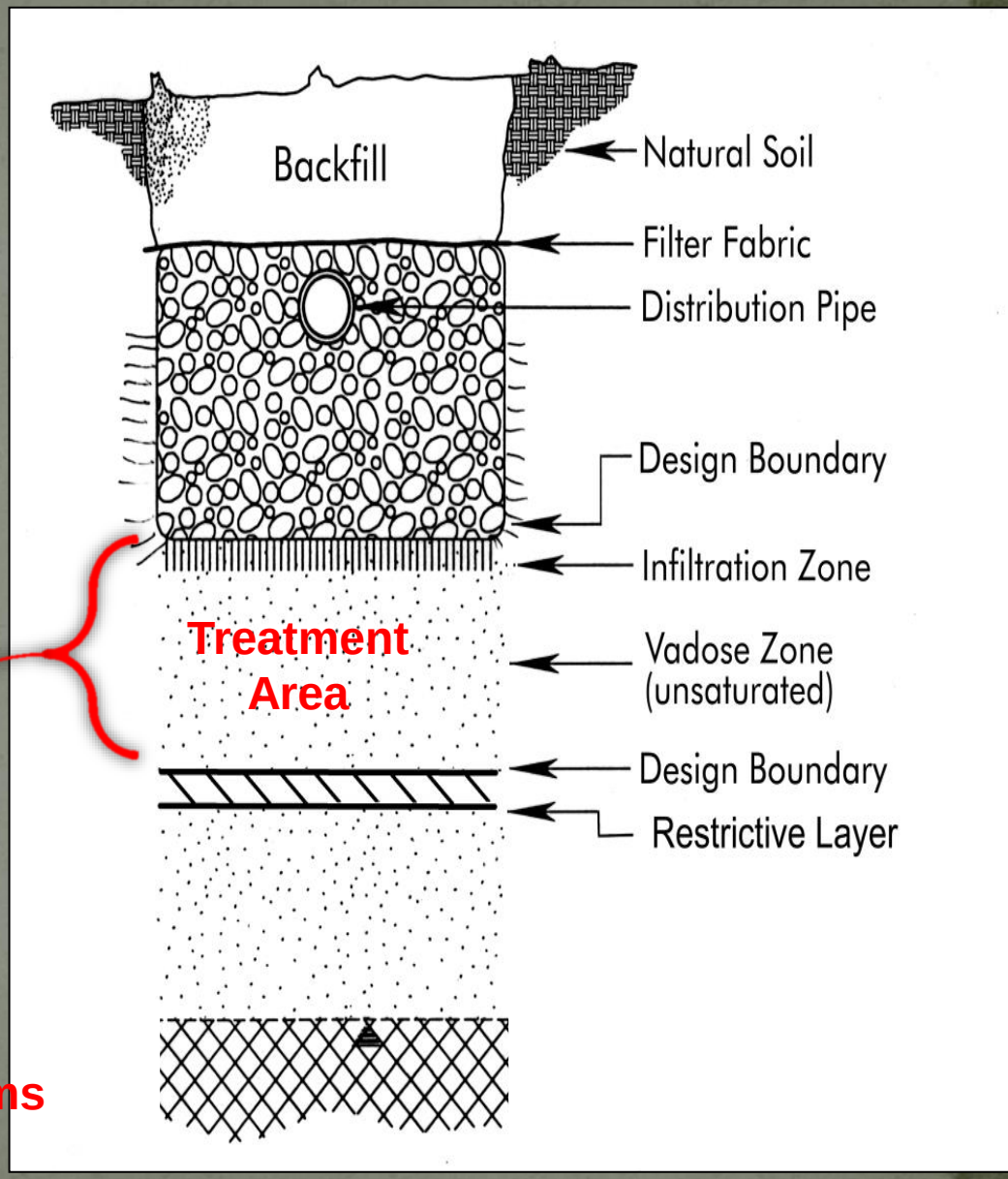


Standard systems

Septic Systems and Soils Work Together

Soil that is too shallow, too tight, too loose, fractures in rock, and groundwater…. reduce the *treatment* of the sewage.

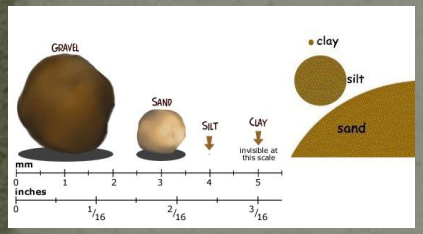
Alternative systems are used to provide additional treatment

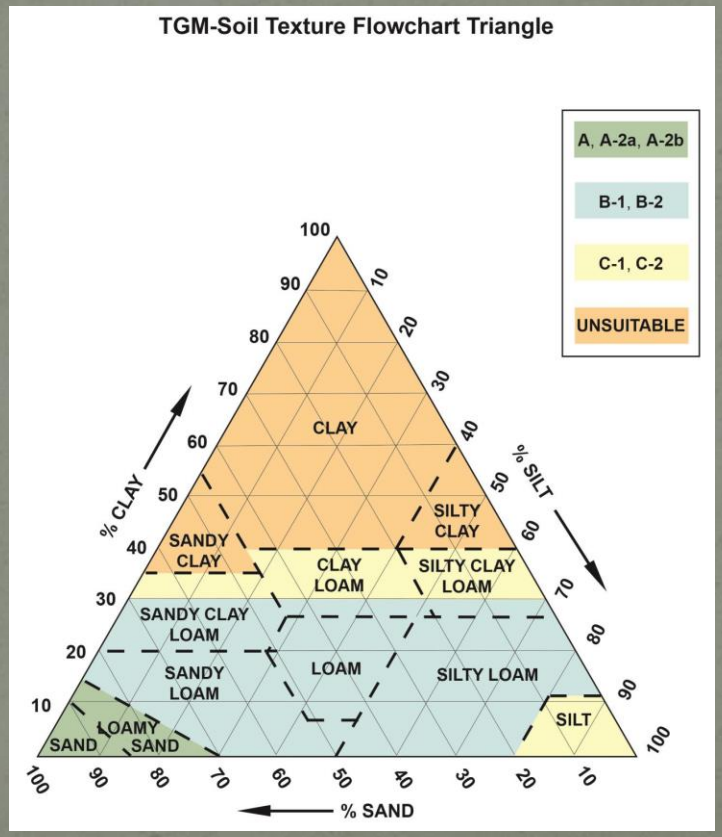


Alternative systems

Soil Types and Treatment

Soil is a combination of sand, silt and clay particles





- (A) Sands good permeability / poor treatment (As a general rule)

  300ft surface water setback

- (B) Loam soils (equal mixture) – good permeability / good treatment

  200ft surface water setback

- (C) Clay soils (more clay, but< ~40% clay)- poor permeability / good treatment

  100ft surface water setback

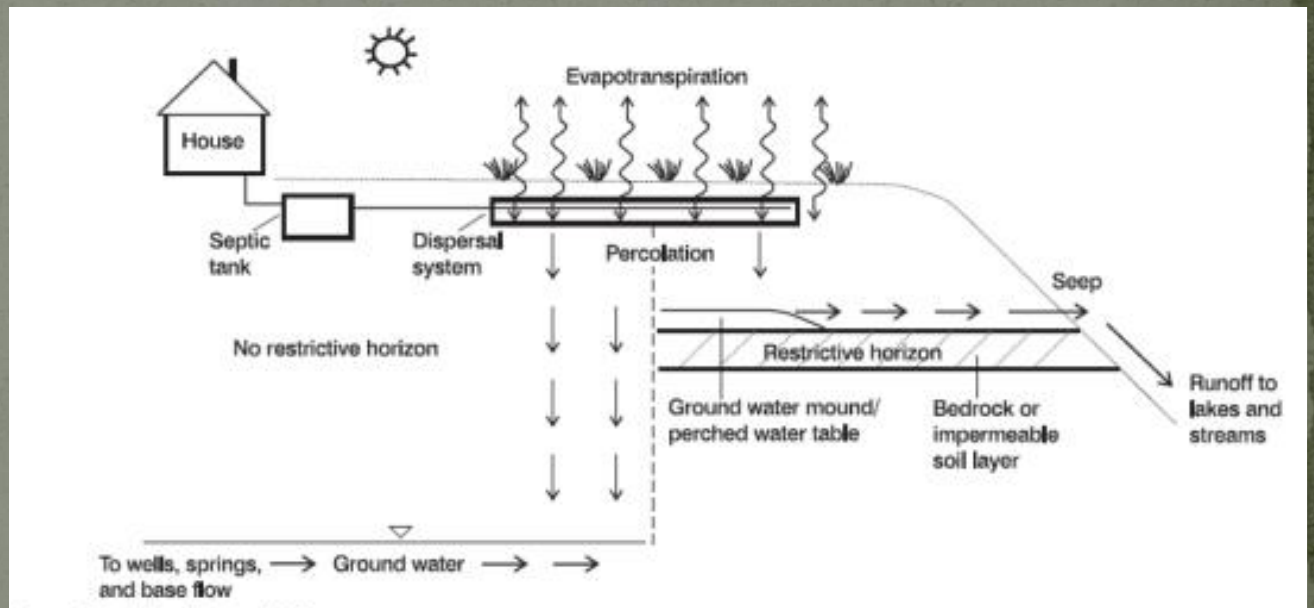
Unsuitable Soils

- Gravel
- Coarse Sand
- All Clays
- Organic Muck
- Claypan
- Hardpan
- Duripan
- Bedrock

Site Considerations

Effective Soil Depth is Determined by:

- Impermeable Layer
- Fractured Bedrock, Fissured Bedrock
- Extremely Permeable Material
- Normal High Ground Water
- Seasonal High Ground Water



Source: Adapted from Venhuizen, 1995.

Effective Soil Depth

(In Feet by Soil Design Group to Limiting Layer, TGC page 2-9)

Site conditions Limiting Layer	Soil Classifications		
	A Porous	B ↔	C Less Porous
Impermeable Layer	4	4	4
Fractured Bedrock, Fissured Bedrock or Extremely Permeable Material	6	4	3
Normal High Ground Water Level (6 or more weeks / year)	6	4	3
Seasonal High Ground Water Level (1 week / year)	1	1	1

Conditions Affecting Site Suitability:

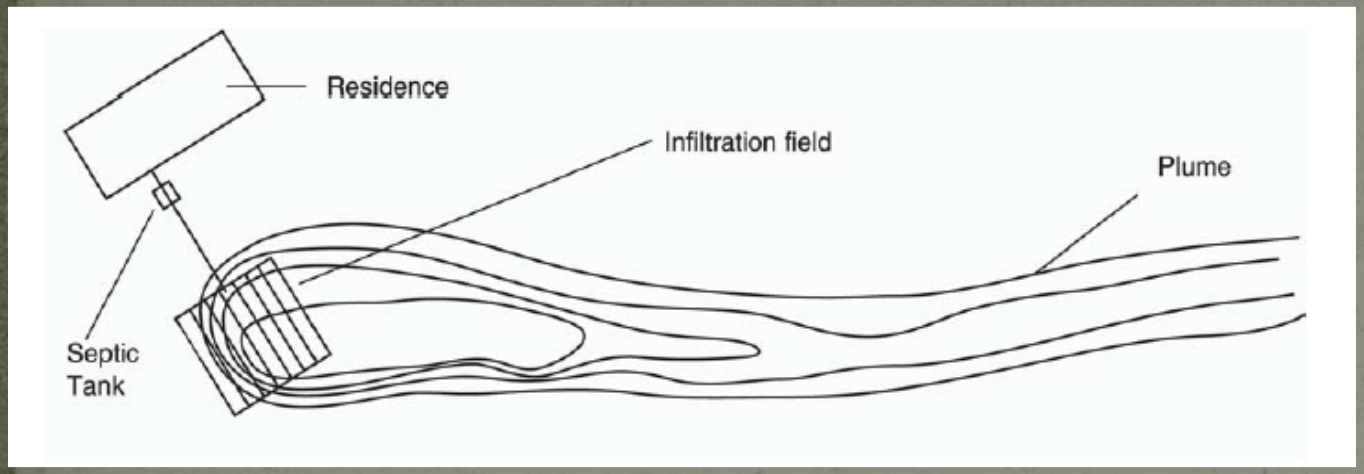
vs

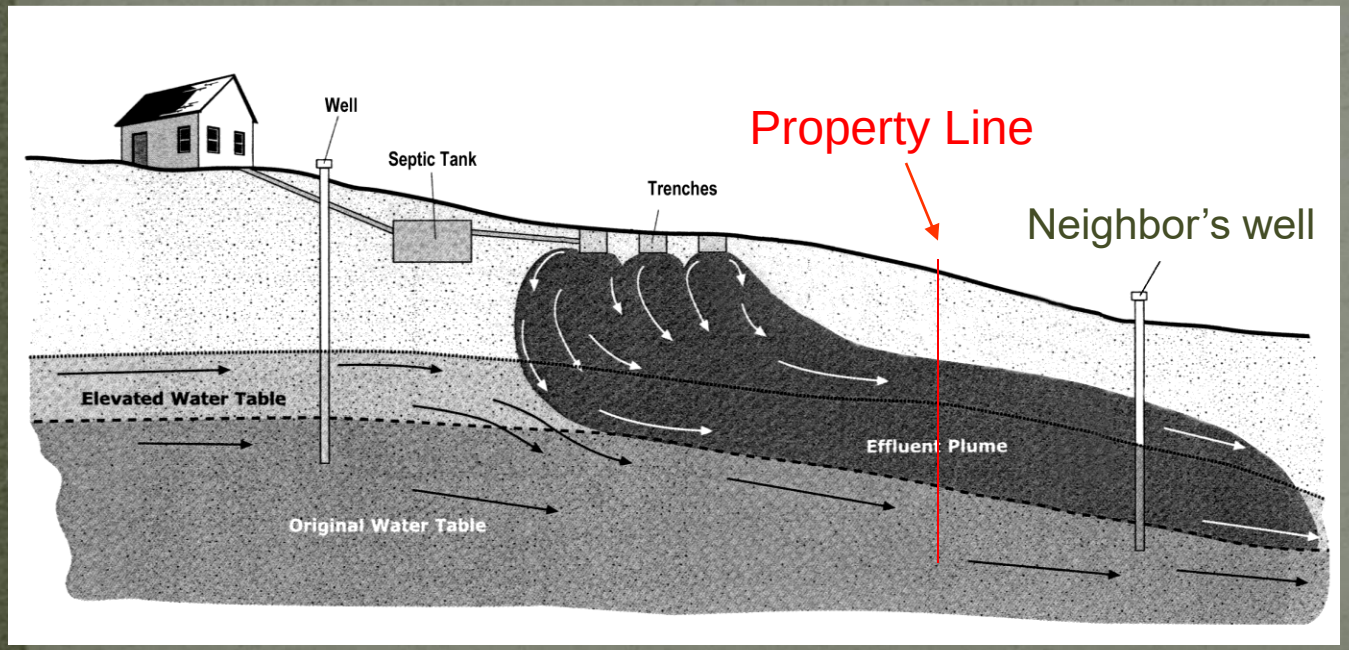
- Surface Water
- Ground Water
- Steep Slopes
- Native vs. Disturbed Soil

- Rock Outcroppings
- Effective Soil Depth
- Soil Classification
- Well Locations

Vegetation does not indicate good soil depth.

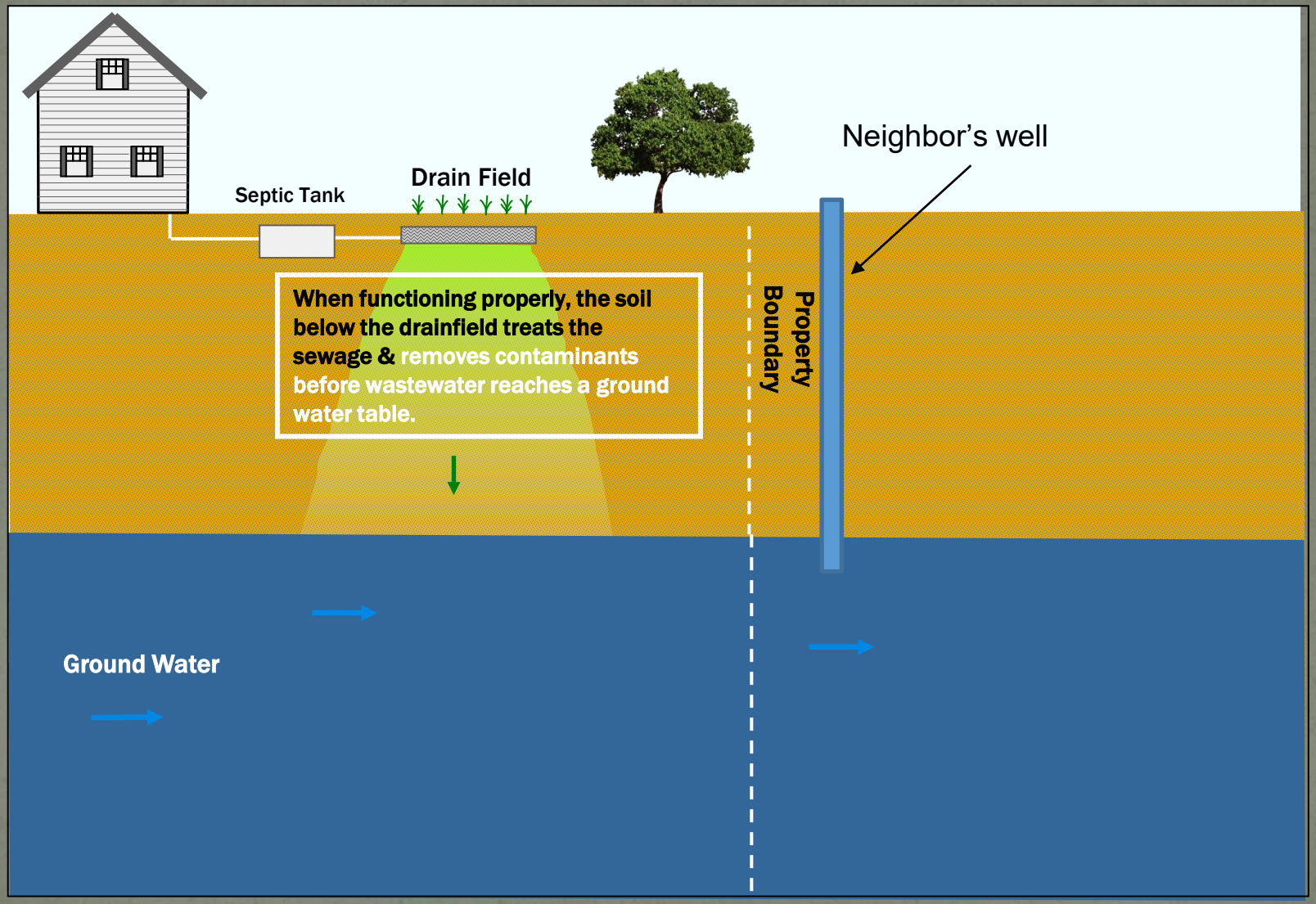
Effluent Plume





- Site suitability vary (type and size)
- Effluent affects groundwater, surface water, and wells underground, thus the regulation
- What happens on your property doesn't always stay on your property!

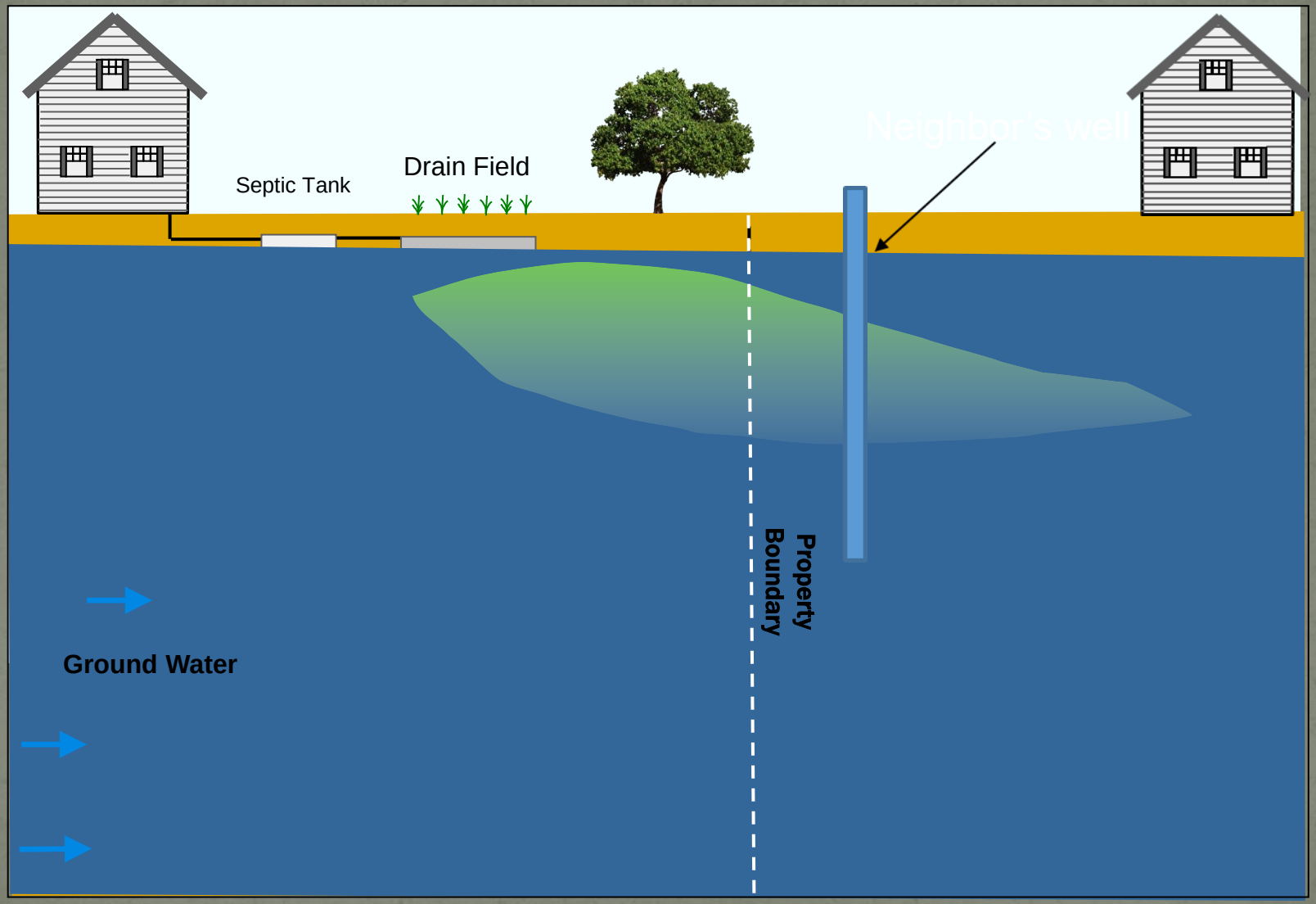
Adequate Effective Soil Is Required To Properly Treat Wastewater Before It Enters Ground Water



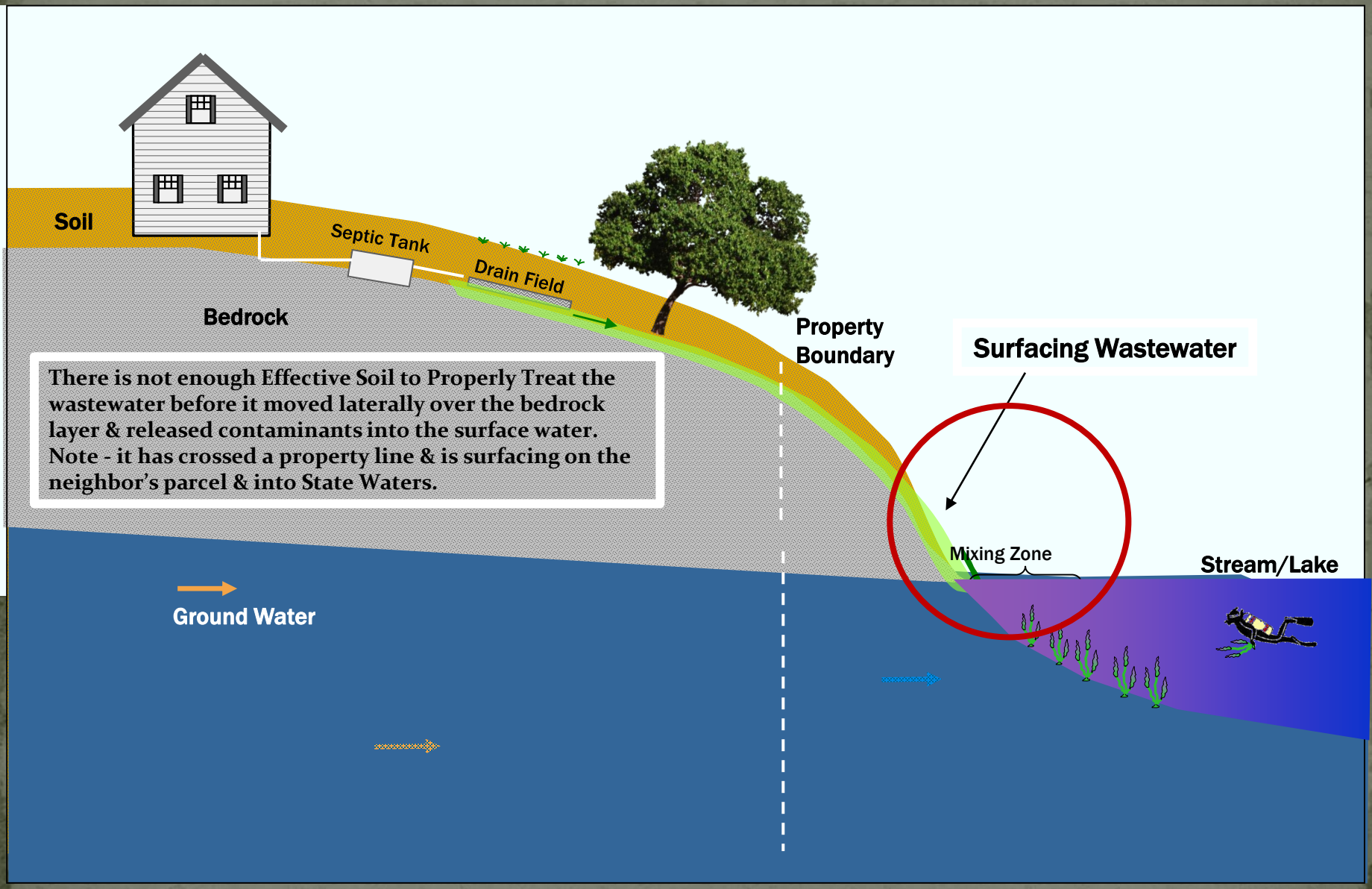
Most Treatment of Wastewater occurs in the first 2-4ft of soil.

Contamination of ground water can impact others…

It's important to have adequate soil depth for effective treatment of wastewater.



Adequate Effective Soil Depth between a Drainfield & Bedrock Limiting Layer is Required for Proper Treatment of Sewage:

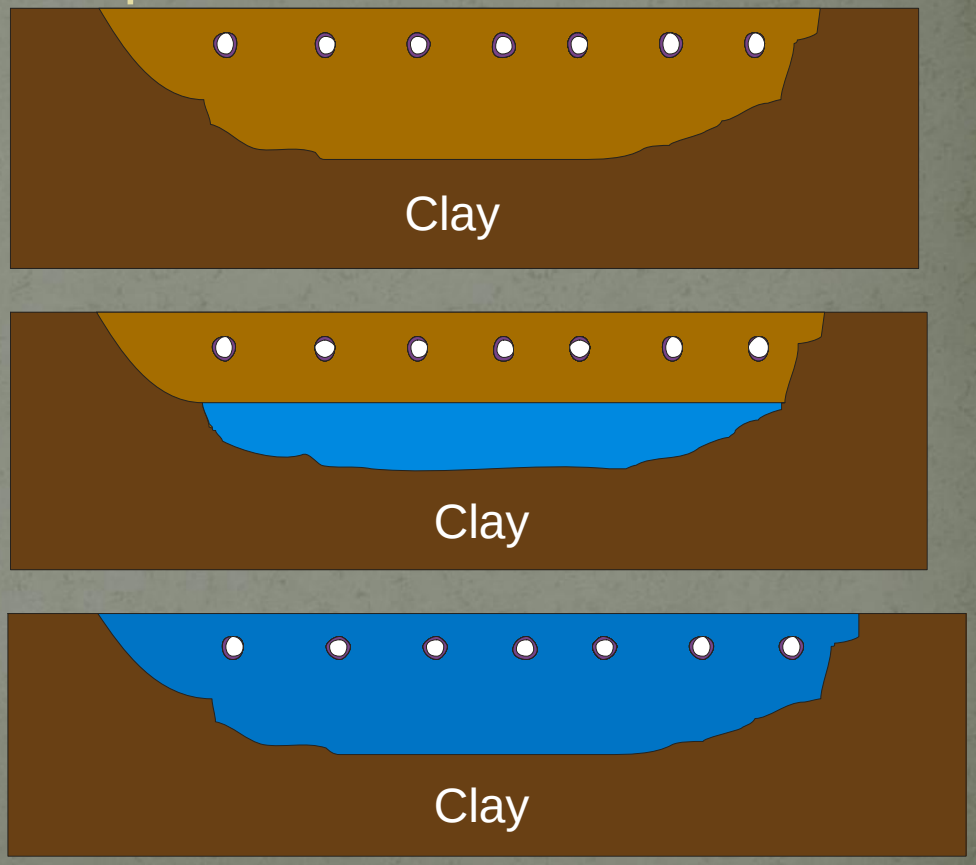


Site Considerations

Native vs. Disturbed Soils

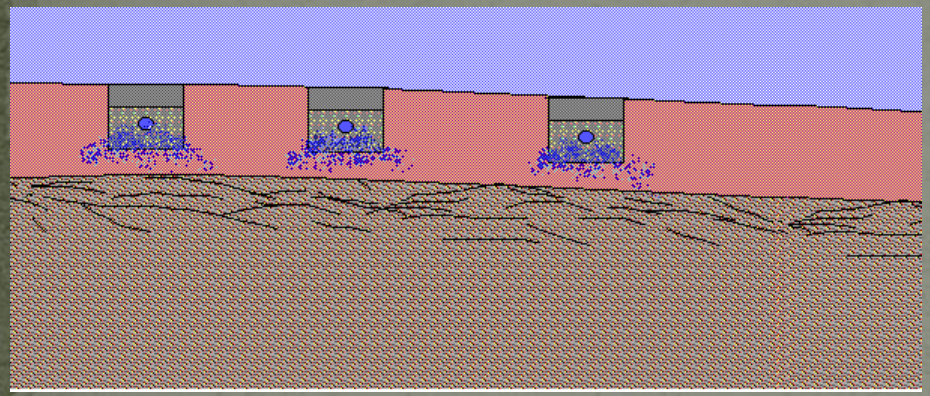
- Native, non-disturbed soils are required.
- Good fill does not relieve the poor qualities of the soil that surrounds it.

Soup Bowl Effect of Soil Addition

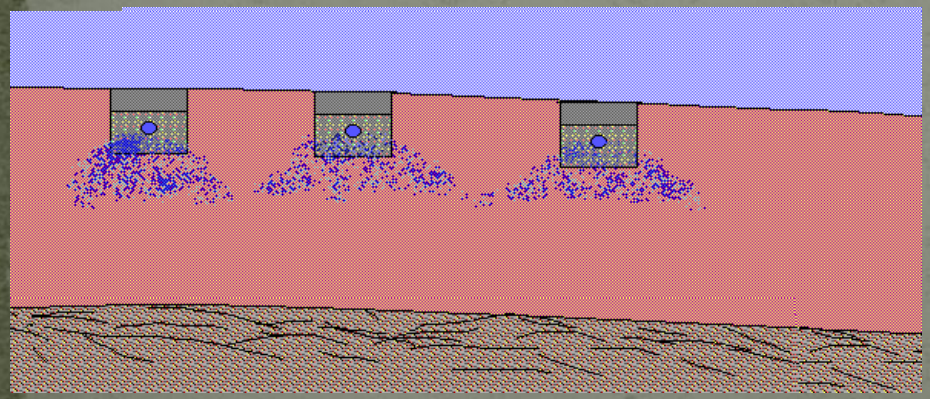


Mounding on Impermeable Layer

Shallow soils -> mounding & risk of drainfield failure.

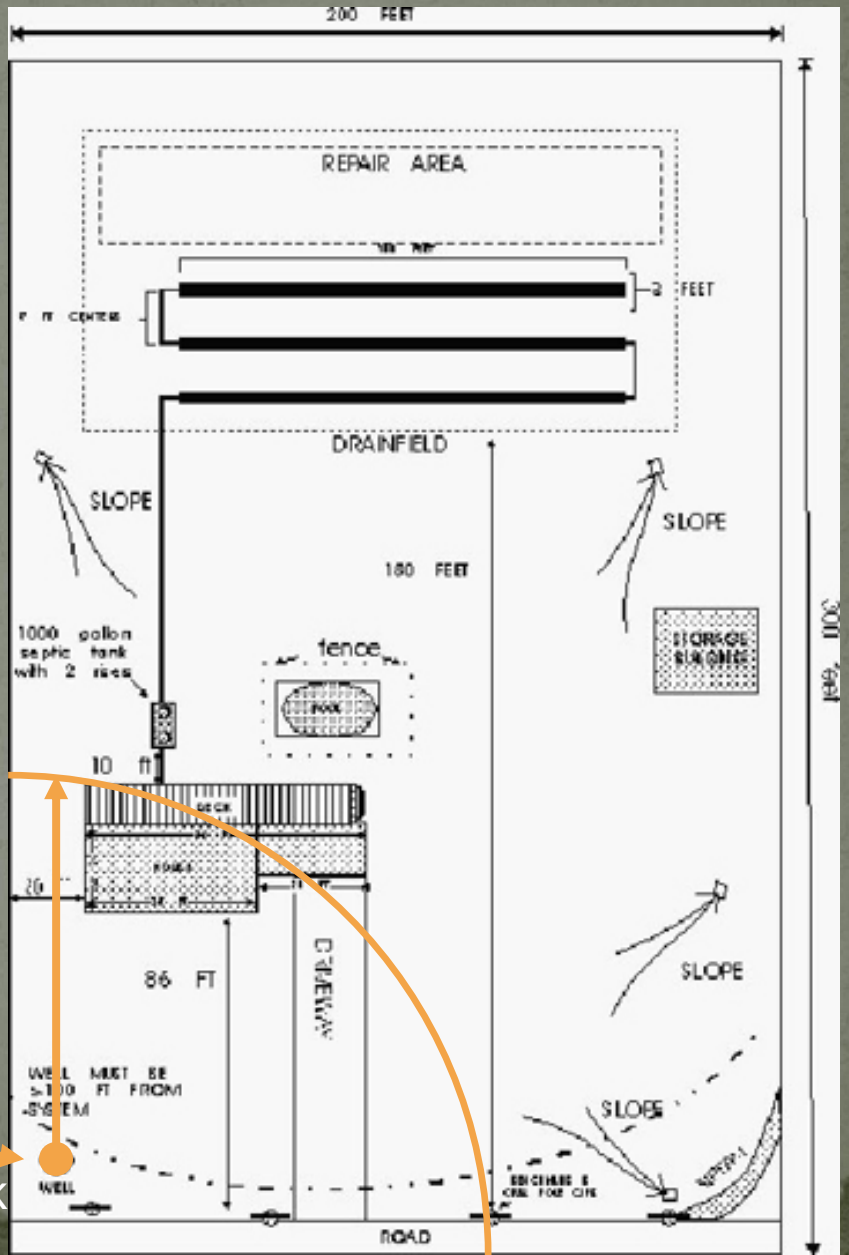


Deep soils -> mounding does not interfere w/drainfield function.



Site Considerations

- Prior Land Use
  - driveway or other cause for compaction
  - foreign soils, buried materials, Wells
- Land Use Restrictions
  - future building, garage, shop
  - parking lot
  - Pool, tennis/basketball court



Well
100 ft setback

Things can go wrong……

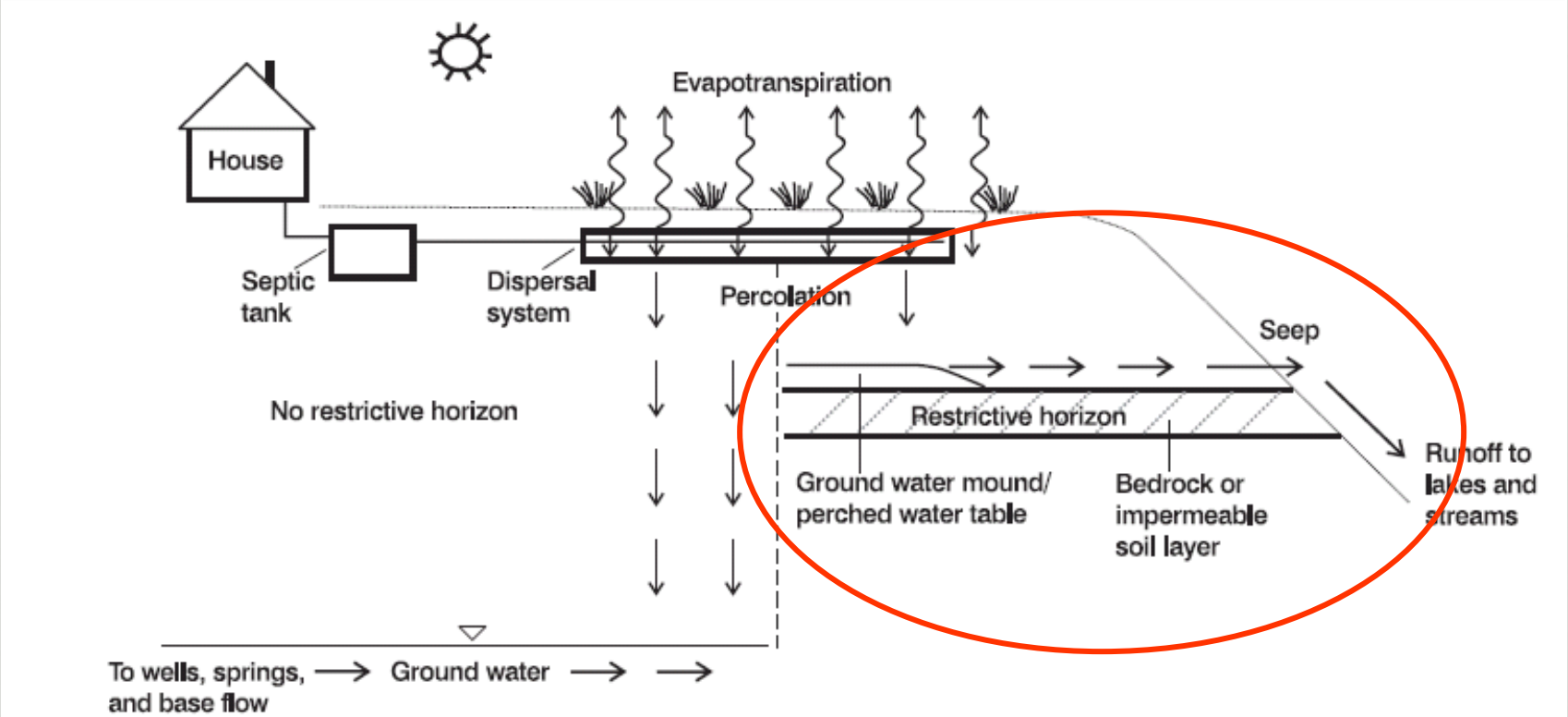
Protect Septic Systems!

- No driving or parking
- No patios
- No structures
- No wells drilled within 100ft
- No downslope cutbanks/scarps
- No trees, pools, ponds
- No gardens
- No livestock

- Permitted Drainfield is under approx. 5ft of fill & landscaping w/ a water feature
- The prior owner installed the landscaping after PHD had approved the system. The landscaping ruined the drainfield. It no longer accepts wastewater from the home.
- For many months, the new owners (of their dream retirement home) had to pump their septic tank regularly, & drastically reduce their water usage (no laundry, very short showers etc), before a solution could be found & a system installed.
- This site now has a non-conforming & engineered system.

This was a preventable problem!!!

Site Considerations

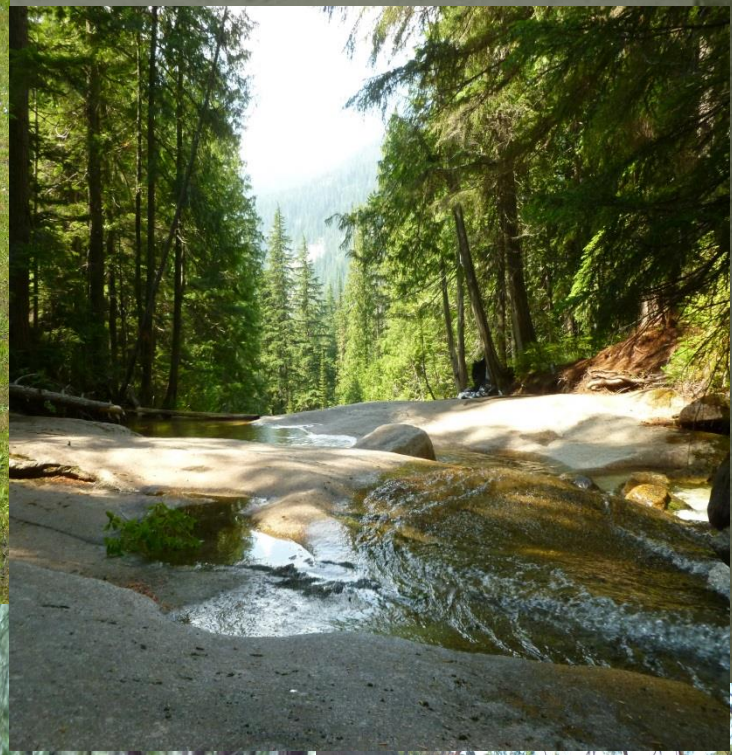


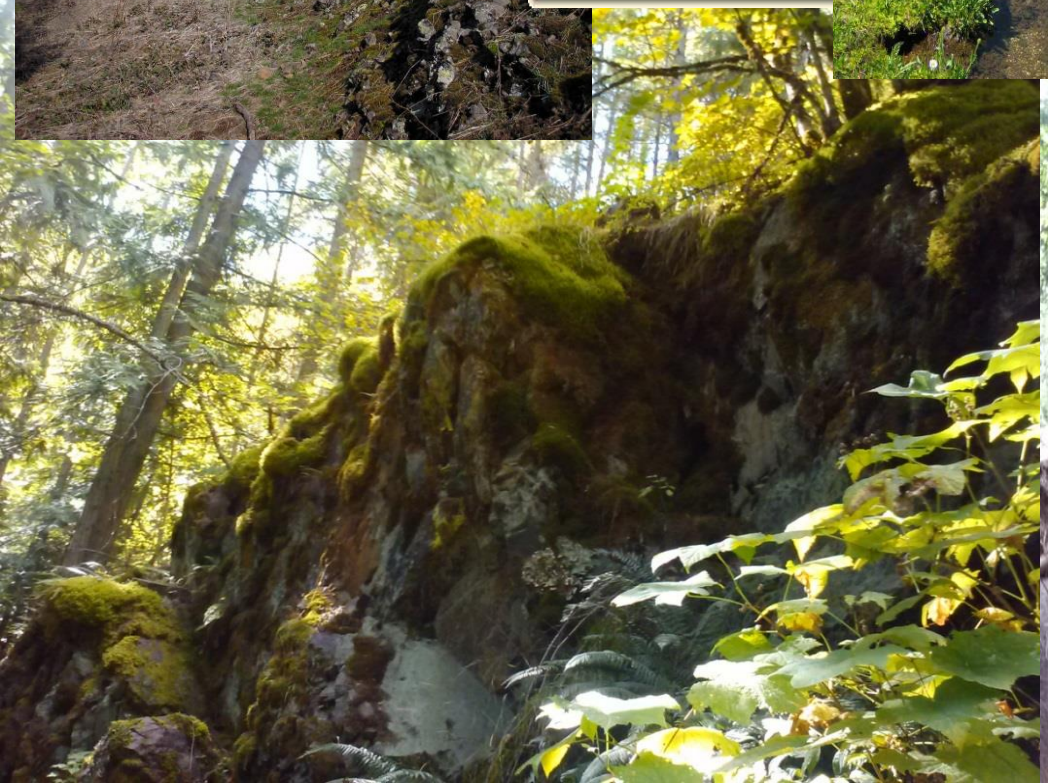
Source: Adapted from Venhuizen, 1995.

Slope and soil restrictive layer can lead surfacing effluent that is a public health hazard.

Before PHD even comes out, a site can tell you a lot……

- Bedrock
- Steep Slopes
- Scarps/Cutbanks
- Water Pathways
- Wetland vegetation





Surface Water – Intermittent, Permanent, Temporary

Any waters of the State which flow or are contained in natural or man-made depressions in the earth's surface. This includes, but is not limited to, lakes, streams, canals, and ditches.

b. An intermittent surface water exists continuously for a period of more than two (2) months but not more than six (6) months a year. *(Requires 100ft, 200ft or 300ft setback)*

c. A permanent surface water exists continuously for a period of more than six (6) months a year.
(100ft, 200ft or 300ft setback)

d. A temporary surface water exists continuously for a period of less than two (2) months a year. *(50ft setback)*

Some Sites May Appear Acceptable…

…When In Fact They Are Not due to Spring Runoff or Flood area

Groundwater

- 40% of the U.S. domestic water supply originates from groundwater
- Over 40 million people use groundwater as their drinking water via private wells
- Several studies have shown that microbial pathogens, such as *Salmonella*, *E. coli*, *S. faecalis*, and enteroviruses are relatively stable in groundwater.
- **Some pathogens can survive up to 400 days** depending on the soil temperature.

~Contamination of water resources by pathogenic bacteria
Pramod K. Pandey, [1] Philip H. Kass,[1] Michelle L. Soupir,[2] Sagor Biswas,[1] and Vijay P. Singh[3]

Groundwater Definitions

a. Normal high groundwater
The highest elevation of ground water that is maintained or exceeded for a continuous period of six (6) weeks a year.

b. Seasonal high groundwater
The highest elevation of ground water that is maintained or exceeded for a continuous period of one (1) week a year.

~IDAPA 58.01.03

- **Fluctuating Water Tables Create Soil Mottling.**

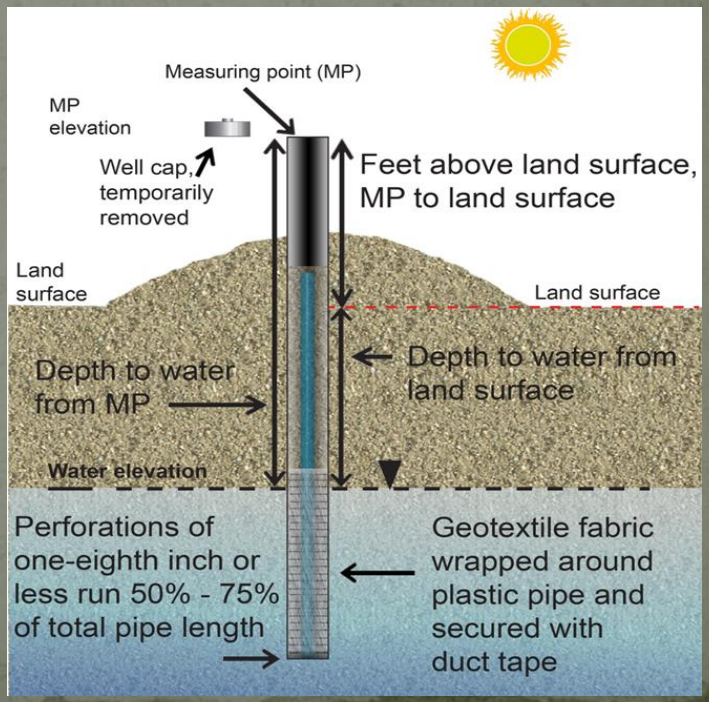
- **Spring Monitoring may be necessary to determine actual Normal and Seasonal water levels.**

Dull gray general soil background, or matrix color, and bright red-orange iron concentrations, or mottles, indicate a fluctuating water table. *Corps of Engineers*

Groundwater Monitoring

- Mottling: Evidence of seasonal high groundwater

- Groundwater monitoring in the spring to determine normal and seasonal groundwater levels



Separation Distances From Features of Concern (TGC page 2-9, IDAPA 58.01.03):

- Surface Water
- Water Wells
- Property Lines
- Structures
- Scarps
- Ground Water

Septic Permit Processes

Permitting

- New Septic Permit
  - Intended use known
  - Septic system installation to serve new structure
  - $950 fee
- Repair Permit
  - Repair a failed 'permitted system' (existing septic permit or system installed prior to January 1, 1973)
  - $300 fee
- Commercial Permit
  - $2.50 per gallon/day fee (based on design flow above 2500 gpd)

Permitting

- Speculative Site evaluation
  - Review of soil types
  - Planning purposes, does not constitute approval or disapproval
  - $400 fee can be applied towards permit
- Expansion permit
  - Used to expand an existing, permitted drain field greater than 10% (bedroom addition, etc)
  - $400 fee

Speculative Site Evaluation

- Site Considerations
- Testholes
- Information only

Testholes

- Appointment options: pre-dug or appointment
- Where to dig?
- 8 feet deep (10 feet over aquifer), 3 feet wide, sloped and minimize roots and other nuisance and hazards.
- 2-3 suitable holes within 50' of proposed drainfield/reserve areas typically required

WINTER SITE EVALUATIONS

- Snow, ice, frozen ground, site access issues
- It may not be possible to provide accurate determinations when evaluating potential drainfield sites.
- Snow can hide well heads, rock outcroppings, small water courses, springs etc.
- Frozen ground can prevent accurate determinations of soil type as well as affect groundwater movement.
- Further fieldwork may be necessary after the site features become visible.
- Generally, PHD will not conduct winter site evaluations.

Plan Ahead!

Septic Systems over the Aquifer

- "5 Acre Rule" limits one residence / 5 acres.
  - Accessory Living Units Not Allowed
- Applies to all parcels created after 1977.
- Commercial use limited to 250 gallons per day/5acres.
- Test holes now required on aquifer parcels.

AQUIFER TESTHOLE PROCEDURE

1. Completed Septic Permit APP and Fees
2. EHS can sign building permit before septic permit issued
3. Evaluate testholes when equipment is on site
4. Issue Septic Permit matching soil conditions
   - Alternative systems may be required if inadequate soil depth
5. System installed and approved before Certificate of Occupancy is signed.

Role As Installer

- System design/Project planning
- Install system per permit conditions (system type, size, location)
- Changing site conditions? STOP, call EHS.
- Ensure that there is adequate replacement area.
- Record accurate As-built plans if required.
- Communication

Bedroom Sizing:

- Privacy for the occupant
- Primarily used for sleeping
- Two (2) or more methods of ingress/egress
- Local building department may designate any additional room as a bedroom (i.e. loft)
- Plan ahead for future expansion

Detached Structures:

- Add flow to property even if structure is dry
- Design flow based on classification
- Could be classified as dwellings
- May not be possible in all areas (aquifer, community system, etc)

SOP 3.7.3 Vested Rights

Bedrooms determine Vested Rights for systems installed prior to 1973

Three scenarios:

1. No increase in bedrooms & building foundation remains the same.
   - No new septic permit
2. Number of bedrooms remains the same & building foundation increases:
   - Protect reserve area
   - Setbacks to building foundation met
   - Setbacks to wells, waterlines, and surface water must meet current standards if possible.
   - A detailed drawing/plot plan must be submitted.
3. Any increase in bedrooms.
   - System must be upgraded to meet current standards.

Abandoned System: Any system that has not received flow for 2 years

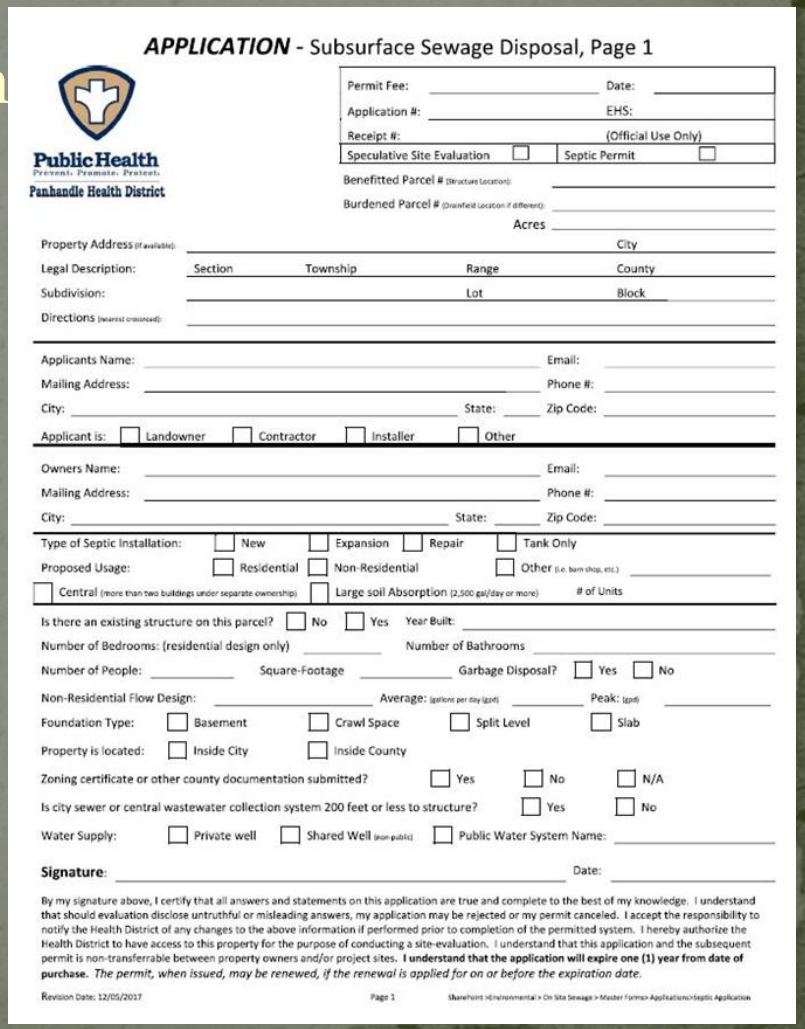
- System must meet current standards to connect

Septic Permit

- Site suitability + approved paper work = a septic permit
- Permit Conditions (what type, what size, where it goes).
- DON'T INSTALL UNTIL PERMITTED
- **Failure to follow Permit Conditions could result in permit disapproval.**

Septic Permit Application

- Application
- Scaled and Dimensioned Plot Plan
- Floor Plans if available
- Intended use
- <u>Good directions</u>



APPLICATION - Subsurface Sewage Disposal, Page 1

Public Health
Prevent. Promote. Protect.
Panhandle Health District

Permit Fee: _____ Date: _____
Application #: _____ EHS:
Receipt #: (Official Use Only)
Speculative Site Evaluation ☐ Septic Permit ☐

Benefitted Parcel # (Structure Location): _____
Burdened Parcel # (Drainfield Location if different): _____
Acres _____

Property Address (if available): _____ City _____
Legal Description: Section Township Range County
Subdivision: Lot Block
Directions (nearest crossroad): _____

Applicants Name: _____ Email: _____
Mailing Address: _____ Phone #: _____
City: _____ State: ____ Zip Code: _____
Applicant is: ☐ Landowner ☐ Contractor ☐ Installer ☐ Other

Owners Name: _____ Email: _____
Mailing Address: _____ Phone #: _____
City: _____ State: ____ Zip Code: _____

Type of Septic Installation: ☐ New ☐ Expansion ☐ Repair ☐ Tank Only
Proposed Usage: ☐ Residential ☐ Non-Residential ☐ Other (i.e. barn shop, etc.) _____
☐ Central (more than two buildings under separate ownership) ☐ Large soil Absorption (2,500 gal/day or more) # of Units

Is there an existing structure on this parcel? ☐ No ☐ Yes Year Built: _____
Number of Bedrooms: (residential design only) _____ Number of Bathrooms _____
Number of People: _____ Square-Footage _____ Garbage Disposal? ☐ Yes ☐ No
Non-Residential Flow Design: _____ Average: (gallons per day (gpd) _____ Peak: (gpd) _____
Foundation Type: ☐ Basement ☐ Crawl Space ☐ Split Level ☐ Slab
Property is located: ☐ Inside City ☐ Inside County
Zoning certificate or other county documentation submitted? ☐ Yes ☐ No ☐ N/A
Is city sewer or central wastewater collection system 200 feet or less to structure? ☐ Yes ☐ No
Water Supply: ☐ Private well ☐ Shared Well (non-public) ☐ Public Water System Name: _____

Signature: _____ Date: _____

By my signature above, I certify that all answers and statements on this application are true and complete to the best of my knowledge. I understand that should evaluation disclose untruthful or misleading answers, my application may be rejected or my permit canceled. I accept the responsibility to notify the Health District of any changes to the above information if performed prior to completion of the permitted system. I hereby authorize the Health District to have access to this property for the purpose of conducting a site-evaluation. I understand that this application and the subsequent permit is non-transferrable between property owners and/or project sites. **I understand that the application will expire one (1) year from date of purchase.** *The permit, when issued, may be renewed, if the renewal is applied for on or before the expiration date.*

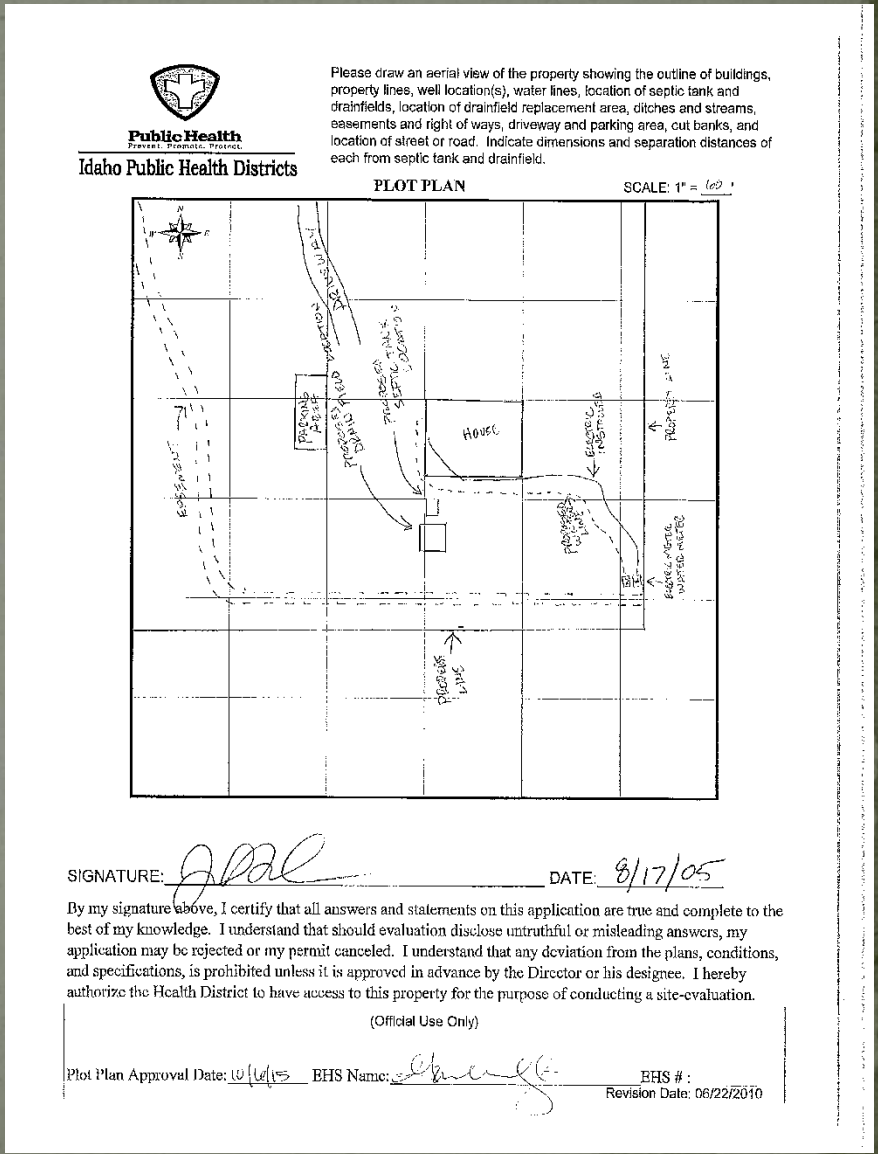
Revision Date: 12/05/2017 Page 1 SharePoint >Environmental > On Site Sewage > Master Forms> Applications>Septic Application

Plot Plan Requirements

➲ **PLOT PLAN**

- Proposed drainfield location(s)
- Features of concern
- Incorporated as part of permit and acts as a construction drawing (**design phase**)
- Subject to change
- Review allows potential issues to be identified before installation

DON'T INSTALL unless septic permit is in your hand-Read Permit conditions before beginning any work.



Public Health
Prevent. Promote. Protect.
Idaho Public Health Districts

Please draw an aerial view of the property showing the outline of buildings, property lines, well location(s), water lines, location of septic tank and drainfields, location of drainfield replacement area, ditches and streams, easements and right of ways, driveway and parking area, cut banks, and location of street or road. Indicate dimensions and separation distances of each from septic tank and drainfield.

PLOT PLAN SCALE: 1" = 100 '

SIGNATURE: _____ DATE: 8/17/05

By my signature above, I certify that all answers and statements on this application are true and complete to the best of my knowledge. I understand that should evaluation disclose untruthful or misleading answers, my application may be rejected or my permit canceled. I understand that any deviation from the plans, conditions, and specifications, is prohibited unless it is approved in advance by the Director or his designee. I hereby authorize the Health District to have access to this property for the purpose of conducting a site-evaluation.

(Official Use Only)

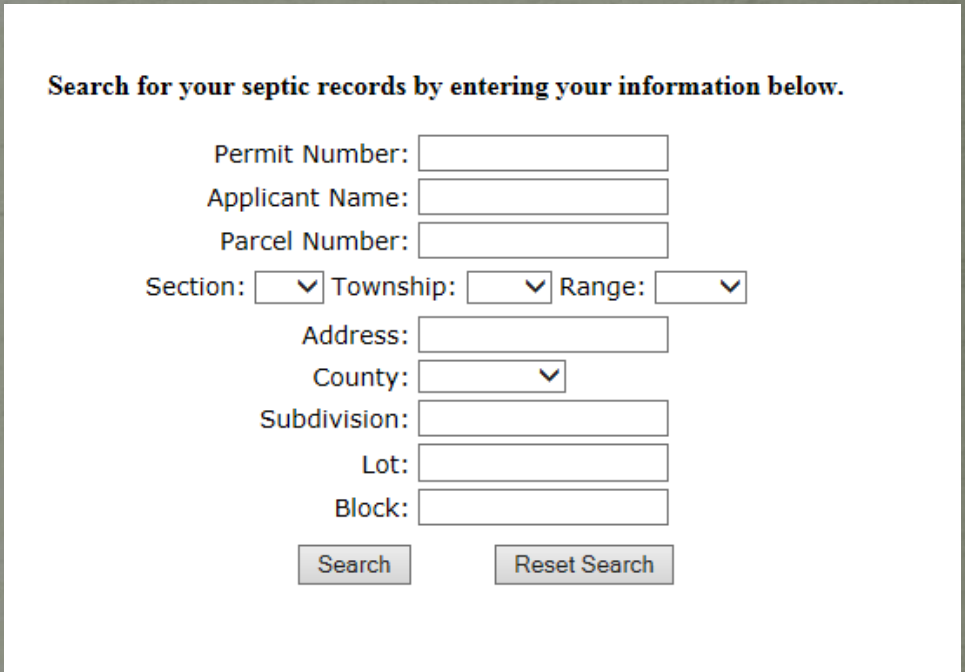
Plot Plan Approval Date: 10/16/15 EHS Name: _____ EHS # :

Revision Date: 06/22/2010

Septic Permit Search

www.panhandlehealthdistrict.org

www.phd1.Idaho.gov



Search for your septic records by entering your information below.

Permit Number:
Applicant Name:
Parcel Number:
Section: Township: Range:
Address:
County:
Subdivision:
Lot:
Block:

Search Reset Search

http://www2.phd1.idaho.gov/septic2007/search.html

County Mapping Tools

- Every county has an online mapping tool
- Great source of information (parcel #, Ownership, property lines, etc)
- Benewah and Boundary <u>not</u> updated regularly
- Can be used to measure and draw plot plans, distances to wells, etc.

Potential Requirements

- Staking out a primary and replacement drain field
- Multiple site visits
- Easements: monument, survey, recorded
  - Prepared by attorney
  - Recorded easement prior to permit
  - Even if common ownership
- Groundwater Monitoring
- Updated plot plan

All of these can cause delays. *Plan ahead!!*

Septic Permit Example

PERMIT-Subsurface Sewage Disposal

Public Health
Idaho Public Health Districts

Panhandle Health District

8500 N. ATLAS
HAYDEN, ID 83835
(208) 415-5200

Permit # : 16-28-134262
Date : 07/19/2017
Parcel # : 049000040090
Doc ID # :

Applicant's Name: EDWARDS SMITH CONSTRUCTION LLC
Owners Name: BSCR LIVING TRUST
Property Address: 8166 W CANOE LP , COEUR D ALENE, ID 83814

Legal Description		Township	48N	Range	04W	Section	18
Subdivision:	LENZ LAKEWOOD PARK, LT 6 BK 4	Lot	06	Block	04	Size(acres):	0.263

Type of Installation	Type of System (check all that apply)			Water Supply
X New System □ Expansion □ Repair □ Tank Only	□ Absorption Bed □ Capping Fill □ Central System □ Composting Toilet X Drip Distribution □ ETPS □ Experimental □ Extra Drainrock □ Evapotranspiration □ Gravel Drainfield	□ Gravelless Drainfield □ Gray Water Sump □ Gray Water System □ Holding Tank □ Incinerator Toilet □ Individual Lagoon □ Intermittent SF □ Intrench SF □ LSAS □ Pit Privy	□ Pressurized DF □ Pump In Gravity □ Recirculating GF □ RV Dump Station □ Sand Mound □ Seepage Pit X Steep Slope Drainfield □ Two Cell Lagoon □ Vault Privy □ Other (see below)	□ Private X Shared □ Public **Water Source** X Well □ Spring
□ Basic System X Complex System				

Condition of Approval:

This permit is for a shared steep slope drip distribution system within the easement on lot 6, block 3 of Lenz Lakewood Park to service a 4 bedroom residence on lot 5, block 4; the existing two bedroom residence on lot 6, block 4; and a proposed 3 bedroom residence on lot 5, block 4. Septic system must be installed as shown on the approved engineered plans dated 6/12/2017 (see attached). Complete and accurate record drawings and specifications depicting the actual construction must be submitted to this office within thirty (30) days after the completion of the construction. Alternately, if the construction was conducted in compliance with the approved plans and specifications, a statement to that effect may be submitted. The drip field must be installed to a depth of 6 to 18 inches with a final cover of 12 inches. This system is designed without pre-treatment and must contain a 100-115 micron filter prior to the drip field. A recorded copy of the record of survey for the easement must be submitted to this office prior to final approval. Water Service lines must be double encased if located within 25 feet of a drainfield. Sewer lines effluent lines must be double encased under roadways. No parking, driving, structures or livestock over the drainfield or replacement area. Manufacturer's recommendations must be followed on all components.
Unless otherwise stated within this permit, all requirements of IDAPA 58.01.03 shall be met on system installation.
Per IDAPA 41.01.01.100.05.b.- A drainfield that is installed, inspected and approved shall be valid to be connected to under the conditions of the original permit for which it was issued, for five (5) years from the date of permit application, provided that the site and its surroundings are not substantially modified.

Single Family Dwelling			4,3, Bedrooms
Design Flow			750 Gallons Per Day
Soil Type (USDA)	B-2	Loading Rate 0.45	Adjusted Loading Rate
The minimum septic tank capacity is:			2900 Gallons
The minimum effective drainfield absorption area is:			1667 Square Feet
The drainfield can be no closer to permanent/intermittent surface water than:			200 Feet

Note: (Final approval of this permit requires inspection of the uncovered system.)

All plans, specifications, and conditions contained in the approved permit application are hereby incorporated into, and are enforceable as part of the permit. The permit will expire one (1) year from date of issuance. The permit may be renewed if the renewal is applied for on or before the expiration date.

EHS Signature

JASON PEPPIN
EHS

07/19/2017
Date

Issue Date

Type of Installation

Type of System

Permit Conditions

Approved use

Soil Type

Septic Tank Size

Drainfield Size

Surface Water Setback

Process/Priority

- Permitting Process Parts
  1. Application – defines system needs
  2. Permit – authorizes installation
  3. Final inspection – accepts installation
- All must match
- Must have permit to install
- Must install what is authorized in permit

Final Inspection Requirements

- No exceptions - call the PHD receptionist, not the EHS (24hrs).
- Need septic permit #, installer #, time and date.
- Leave septic tank uncover to seam and drainfield exposed. PHD will call or leave a green or red inspection tag.
- System may have to be uncovered for verification if covered without inspection!

The Paper Trail

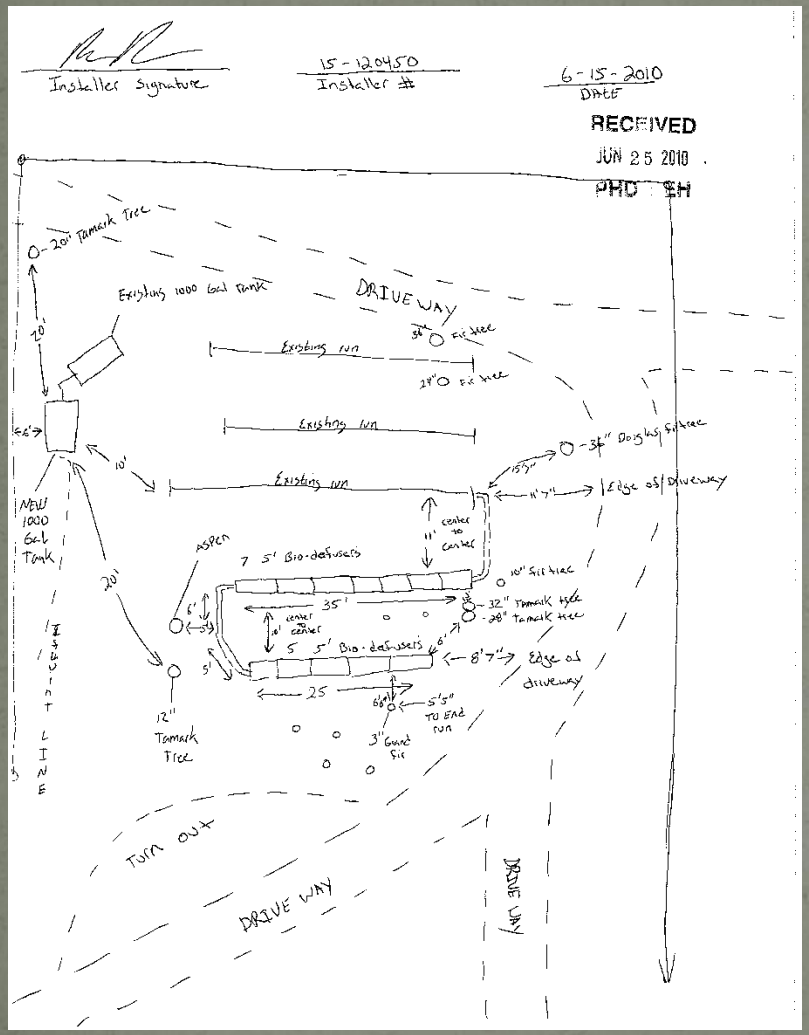
- Reminds installers what they installed
- Verify what was permitted was installed accurately and right
- Communication component to relay information to property owners,

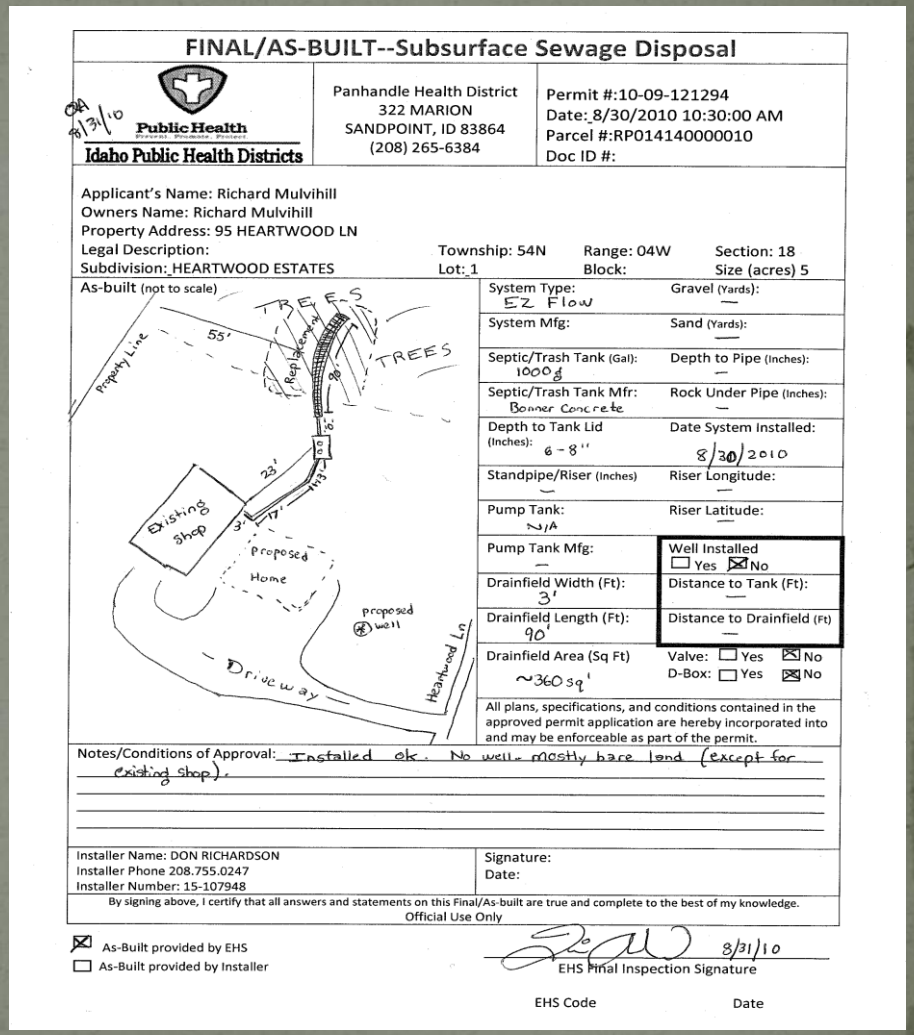
  new and old
- Photos

AS-BUILT DRAWINGS

- "AS-BUILT" installation plot plan
- SEPTIC TANK - measure from lid to 2 permanent marker (triangulate). If a riser is required, note it on plan.
- DRAINFIELD - indicate linear footage of all piping, both solid & distribution.
- Geographical references and valve boxes
- Items of interest: wells, springs, and water lines
- Replacement area.
- Sign and date the plan and submitted to PHD

“AS-BUILT” Examples





FINAL/AS-BUILT--Subsurface Sewage Disposal

Public Health — Idaho Public Health Districts

Panhandle Health District
322 MARION
SANDPOINT, ID 83864
(208) 265-6384

Permit #:10-09-121294
Date: 8/30/2010 10:30:00 AM
Parcel #:RP014140000010
Doc ID #:

Applicant's Name: Richard Mulvihill
Owners Name: Richard Mulvihill
Property Address: 95 HEARTWOOD LN
Legal Description:
Subdivision: HEARTWOOD ESTATES
Township: 54N Range: 04W Section: 18
Lot: 1 Block: Size (acres) 5

As-built (not to scale)

System Type: EZ Flow	Gravel (Yards): —
System Mfg:	Sand (Yards): —
Septic/Trash Tank (Gal): 1000 g	Depth to Pipe (Inches): —
Septic/Trash Tank Mfr: Bonner Concrete	Rock Under Pipe (Inches): —
Depth to Tank Lid (Inches): 6-8"	Date System Installed: 8/30/2010
Standpipe/Riser (Inches) —	Riser Longitude: —
Pump Tank: N/A	Riser Latitude: —
Pump Tank Mfg: —	Well Installed ☐ Yes ☒ No
Drainfield Width (Ft): 3'	Distance to Tank (Ft): —
Drainfield Length (Ft): 90'	Distance to Drainfield (Ft) —
Drainfield Area (Sq Ft) ~360 sq'	Valve: ☐ Yes ☒ No; D-Box: ☐ Yes ☒ No

All plans, specifications, and conditions contained in the approved permit application are hereby incorporated into and may be enforceable as part of the permit.

Notes/Conditions of Approval: Installed ok. No well. mostly bare land (except for existing shop).

Installer Name: DON RICHARDSON
Installer Phone 208.755.0247
Installer Number: 15-107948

Signature:
Date:

By signing above, I certify that all answers and statements on this Final/As-built are true and complete to the best of my knowledge.

Official Use Only

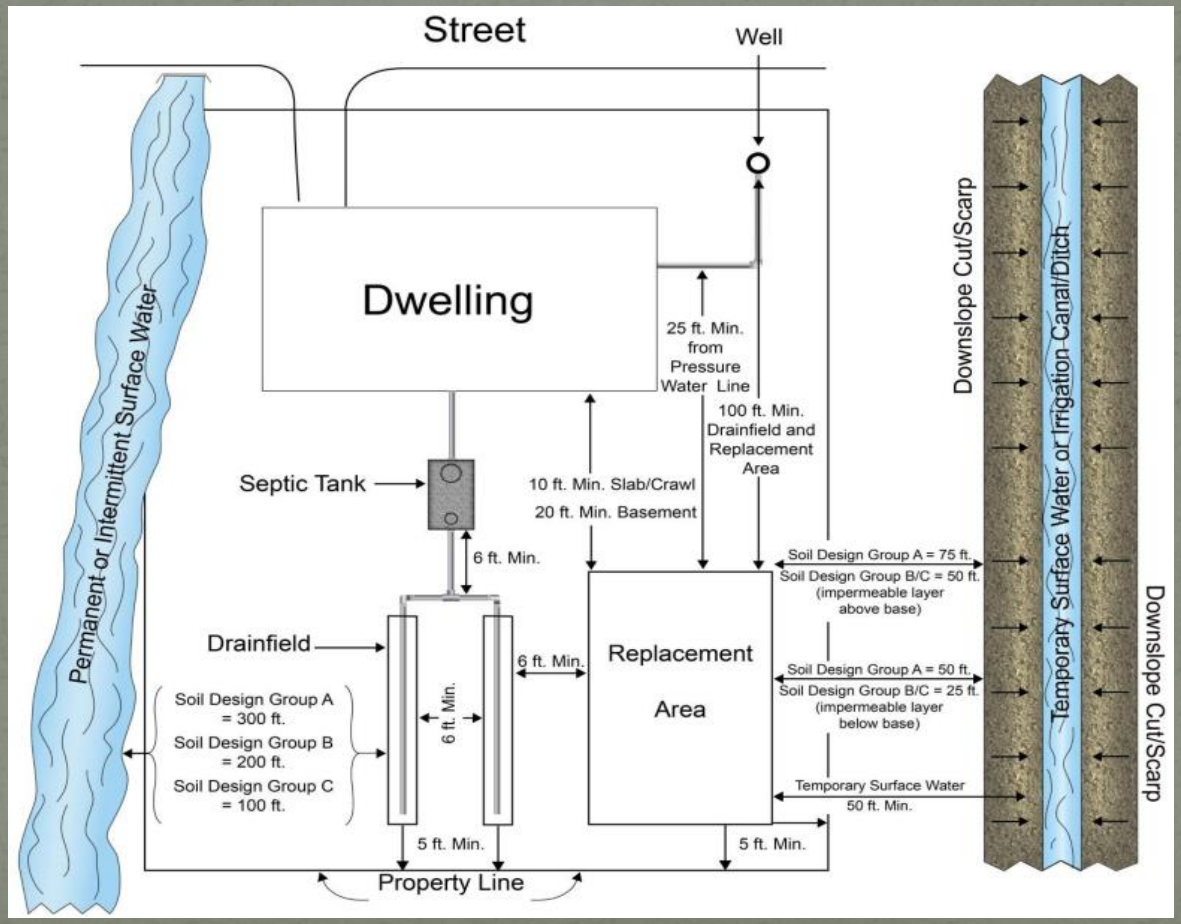
☒ As-Built provided by EHS
☐ As-Built provided by Installer

8/31/10
EHS Final Inspection Signature

EHS Code Date

Septic System Components

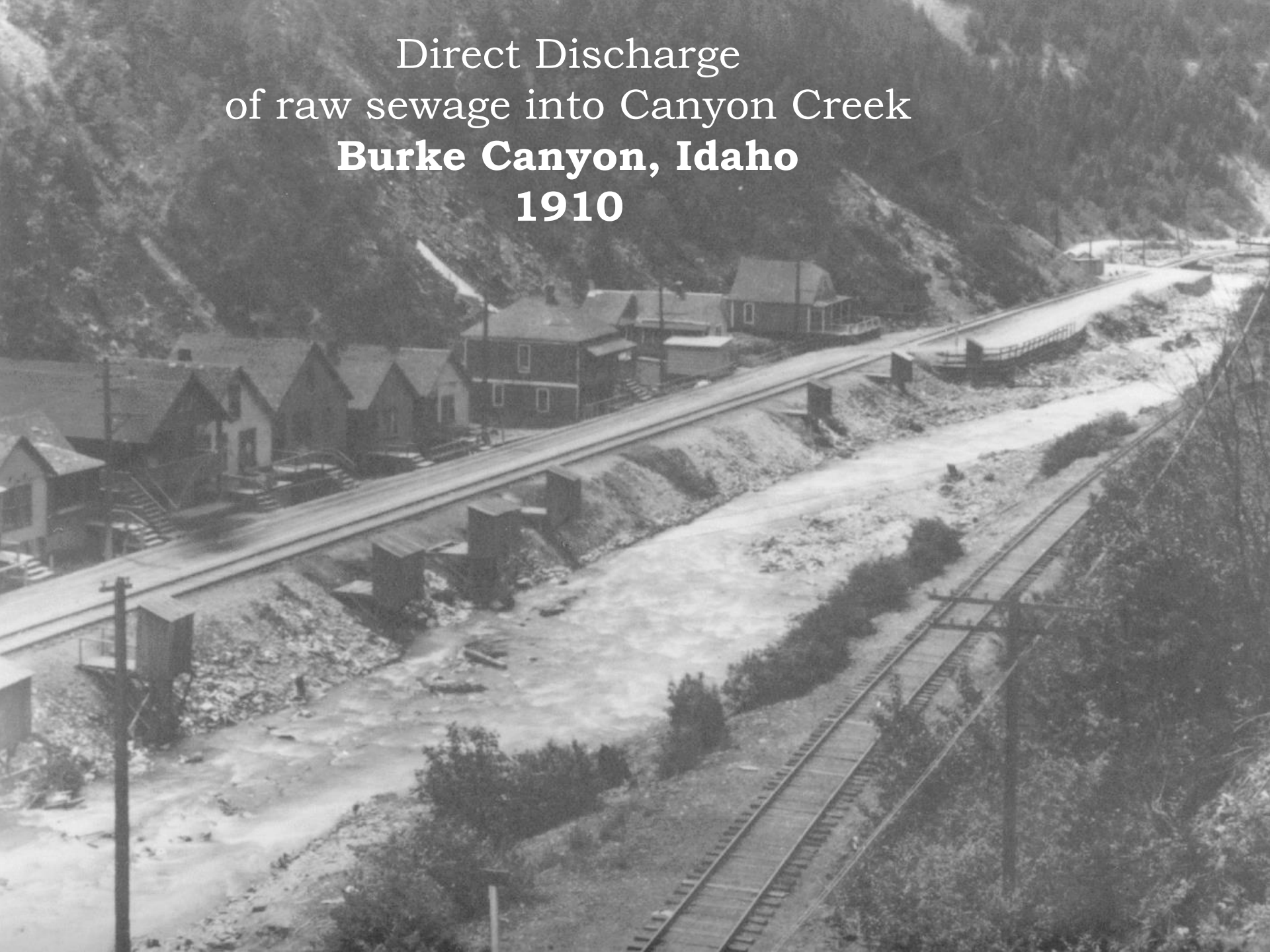
What is a Septic System?



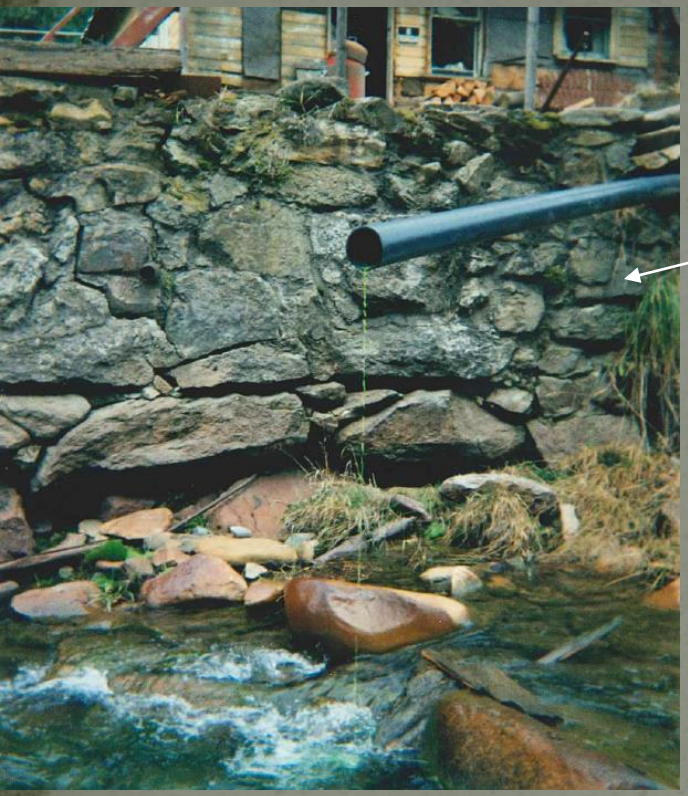
Historic Wastewater Disposal Systems

- Direct Discharge (prior to 1960's)
- Cesspools (1960's)
- Metal Tanks to Drywells (Late 1960's,early 1970's)
- Cement / Composite Tanks to Drainfields (current)
- Many complex alternatives for complicated sites

As a Septic Installer you may come across all of these system types!


Direct Discharge
of raw sewage into Canyon Creek
Burke Canyon, Idaho
1910

Historic Wastewater Disposal Systems



Direct discharge to Surface Water

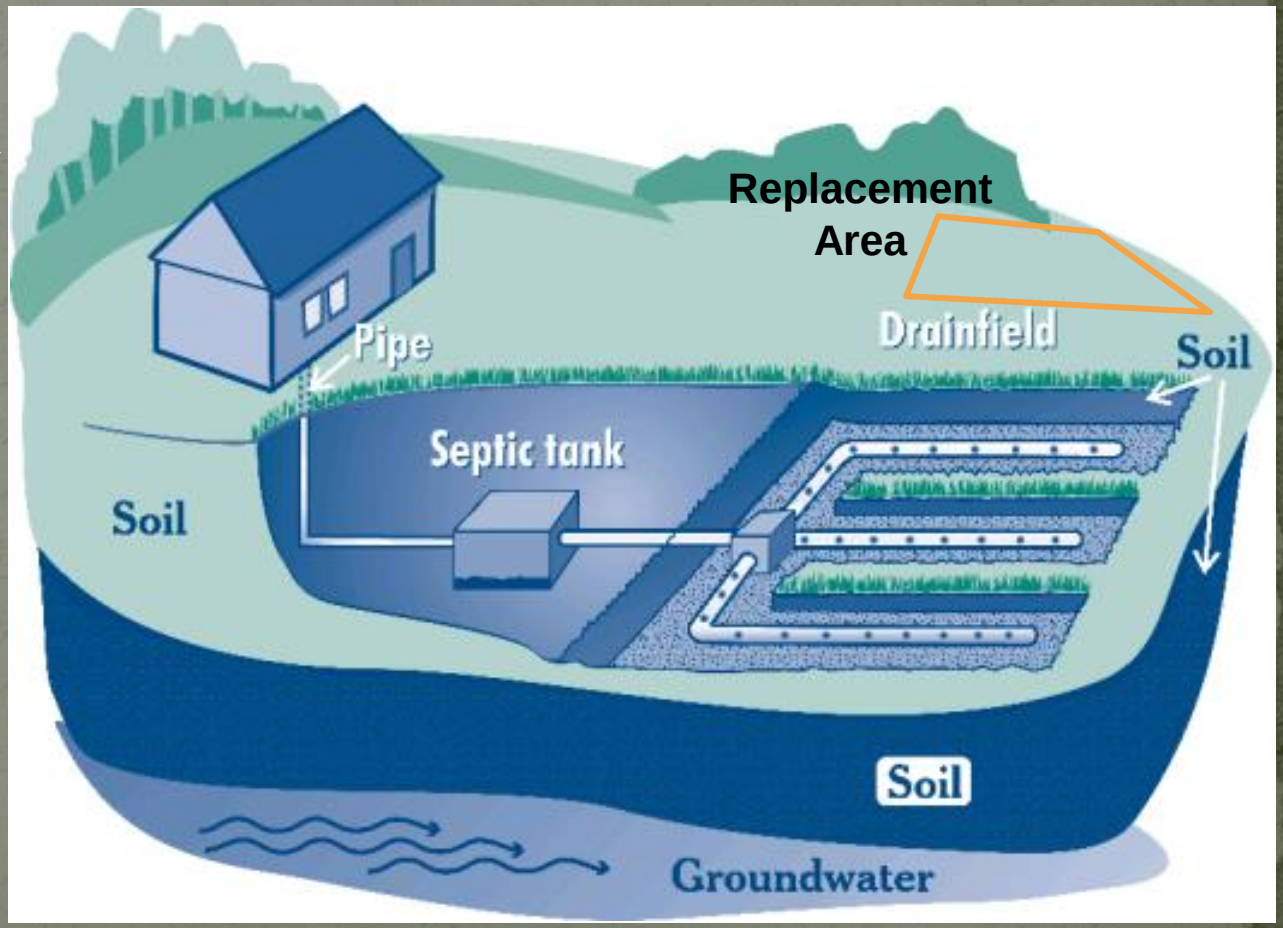
Leaky metal tank

Drywell

Cesspool

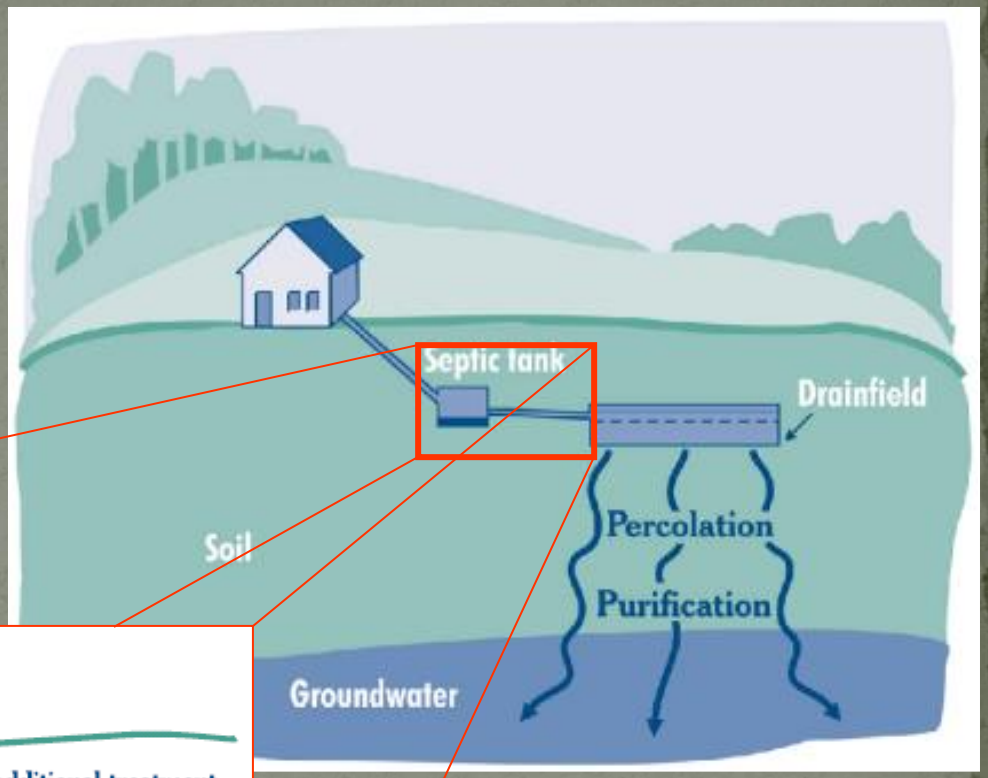
Septic Systems

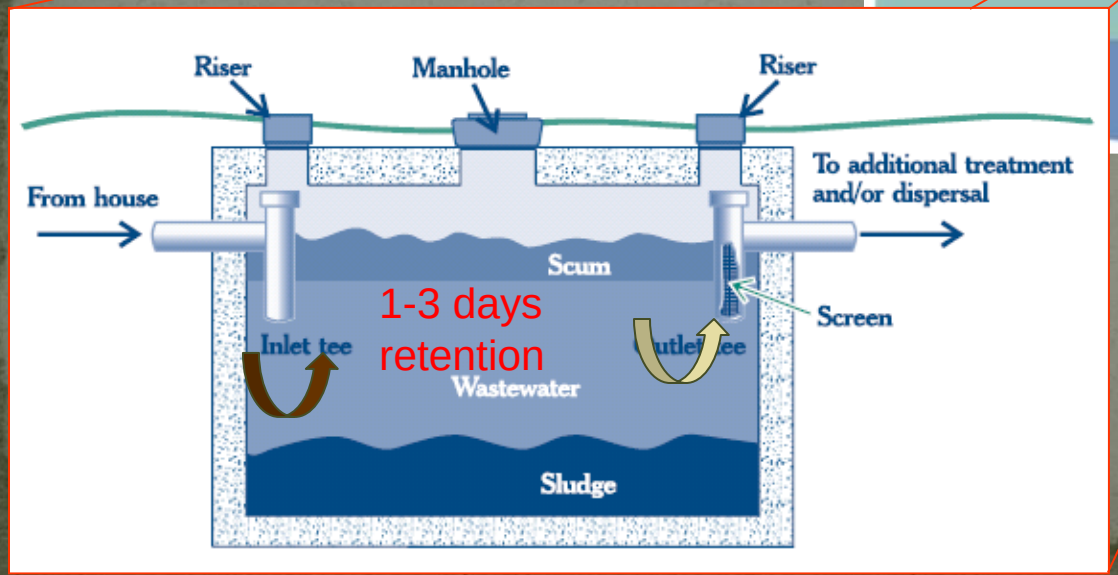
- Septic Tank
  - Dosing Chamber and pump
- Drainfield
  - Variety of systems
  - Replacement Area



Protection of Public Health

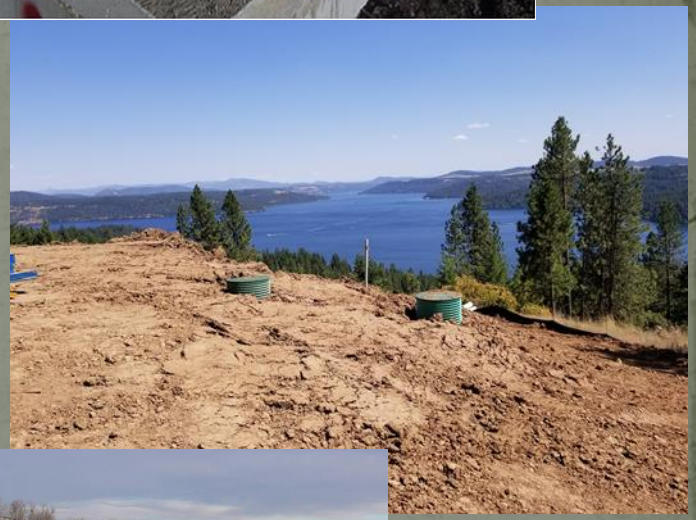
- The septic tank separates the sewage, and provides storage.
- Many disease-causing organisms are destroyed and never leave the septic tank.
- The drain field discharges the wastewater to the soil which acts as a natural filter to treat and remove disease causing organisms.





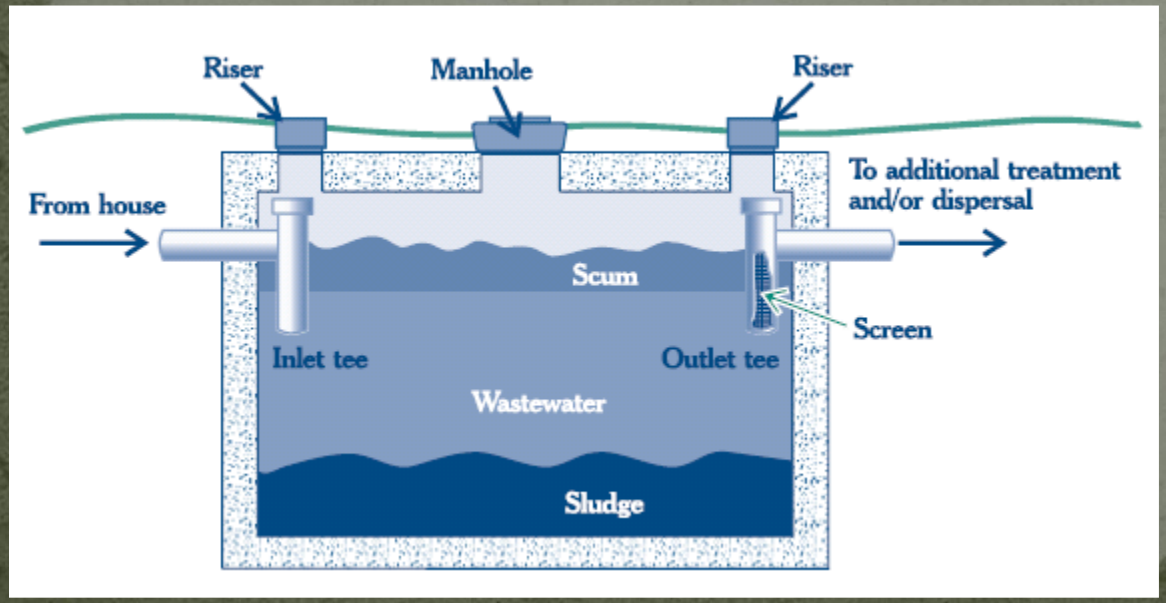
SEPTIC TANKS

- State Approved TGM p 5-2
- 1000 gallons serving up to four (4) bedrooms.★
- Add 250 gallons for every bedroom over four (4).★
- Install tank per manufacturer's recommendations.
- Vented tees or baffles will extend below the liquid level to a depth where 40% of the tank's volume is above the bottom of the tee (~18"). Will also extend 7" min. above liquid level - but not closer than 1" to top of tank.



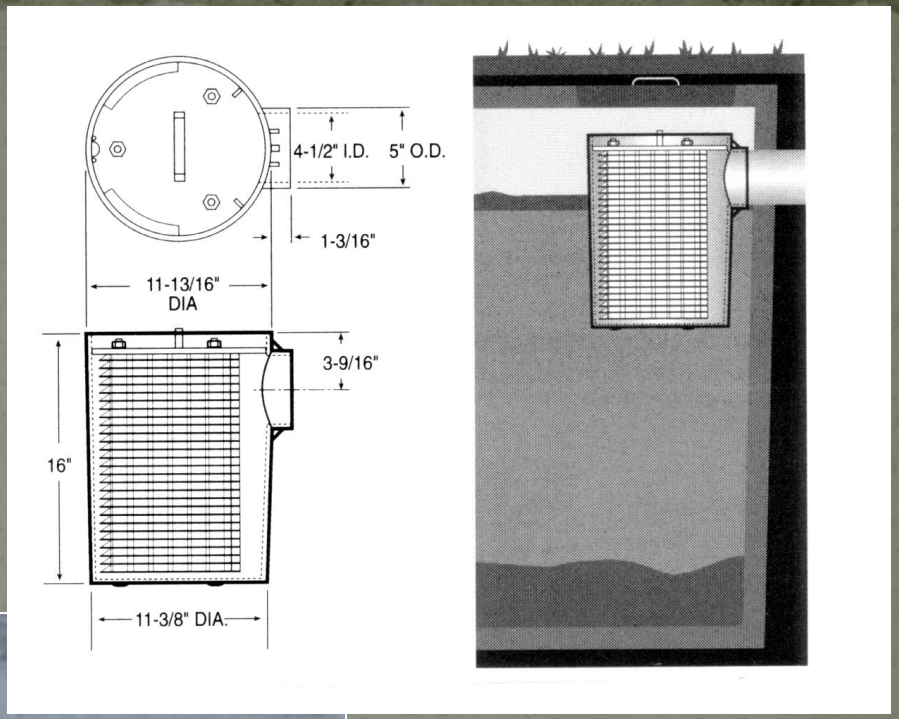
….continued

- Tees should not extend horizontally in the tank beyond 2X the diameter of the inlet or outlet. Inlet/Outlets must be at least 4”.
- Inspection port above each inlet/outlet.
- Follow manufacturer’s recommendations, some tanks have specific backfill requirements.
- **Tanks deeper then 24” require a riser.**
- **Bituminous coating recommended in high groundwater** ☆



Outlet Devices

- Filters
- PVC Pipe Baffle vs. Concrete Baffle
- Protect drainfield from solid/grease
- Risers to grade



Concrete Baffle

INLET & OUTLET BAFFLES

No more than 8” from wall of tank

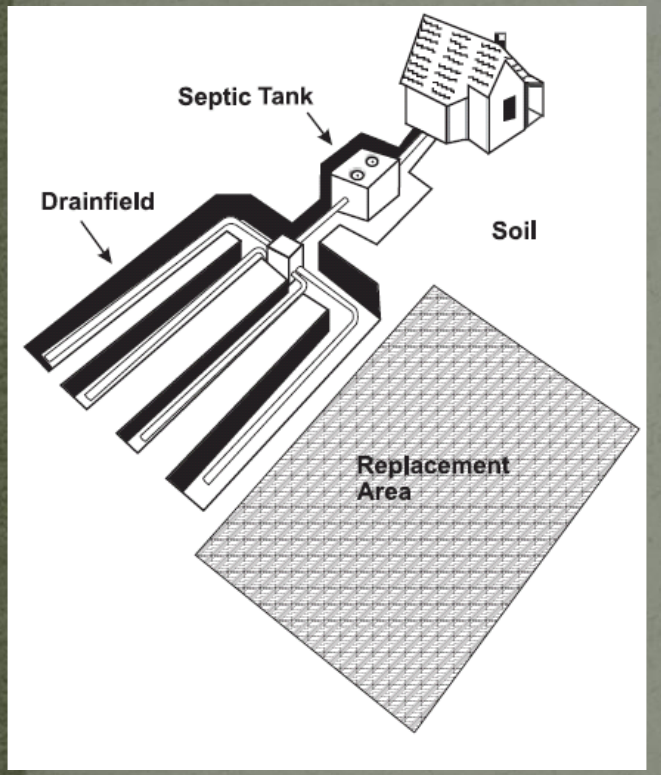
Risers

- Risers required if more than 24” below finished grade or with effluent filter.
- Riser needs to extend to within 18” of finished grade.
- Know the maximum rated cover depth of the septic tank.
- Always a good idea!

Pump to gravity

- All pump back systems must be installed by a complex licensed installer

Septic Tank Separation Distances (TGM p 3-1)

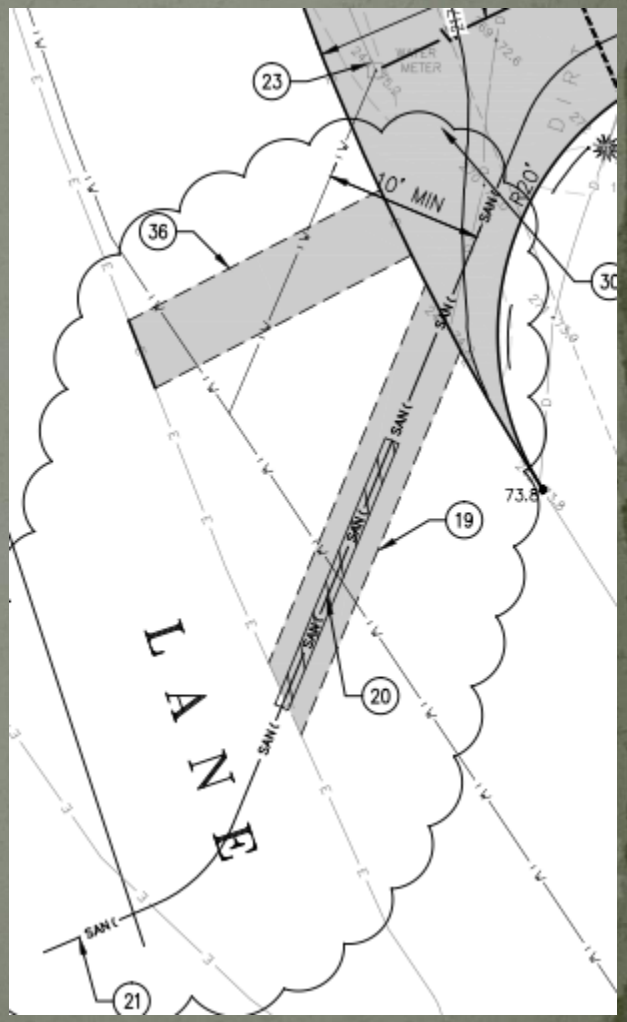


Septic Tank and Effluent Line Separation Distances

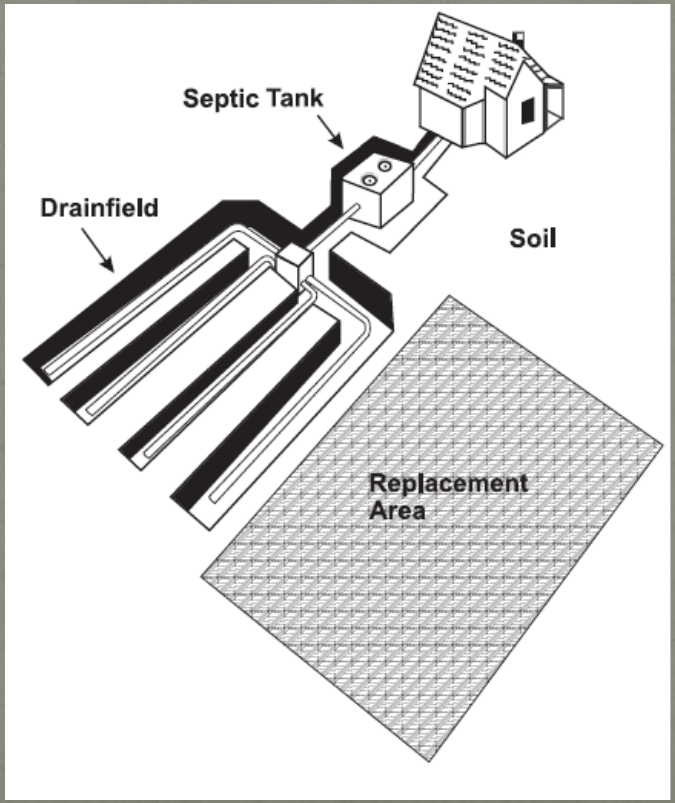
Features of Concern		Minimum Distance to Septic Tank in Feet
Well or Spring or Suction Line	Public Water Other	100 50
Water Distribution Line	Public Water Other	25 ★ 10
Permanent or Intermittent Surface Water		50
Temporary Surface Water		25
Downslope Cut or Scarp		25
Dwelling Foundation or Building		5
Property Line		5
Seasonal High Water Level Vertically from Top of Tank		2

Effluent Line Setbacks

- Same setbacks as septic tanks
- Can be double encased to reduce setbacks:
  - Wells: 25’ minimum
  - Private Water Line
  - Public Water Line:
    - Submit a drawing to PHD and Water District
    - Approval letter from Water District
    - Joint inspection if possible



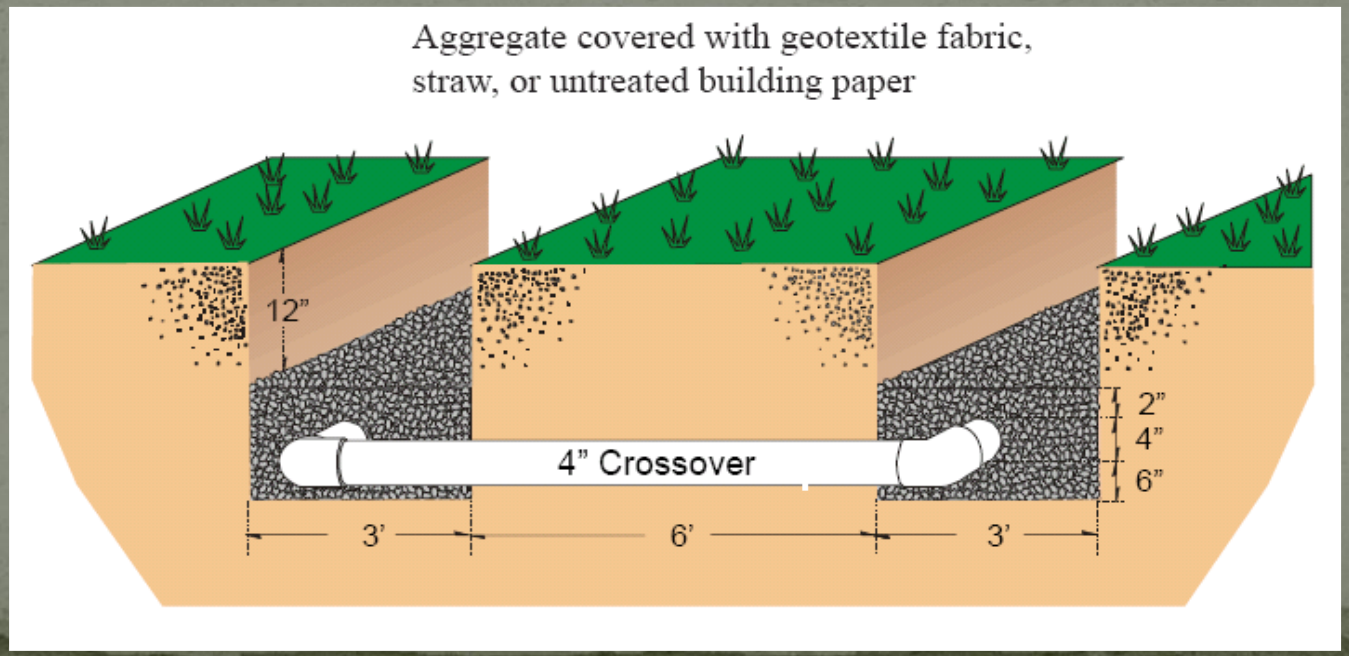
Basic Septic Systems



Standard Drainfield Trench TGM p 3-1

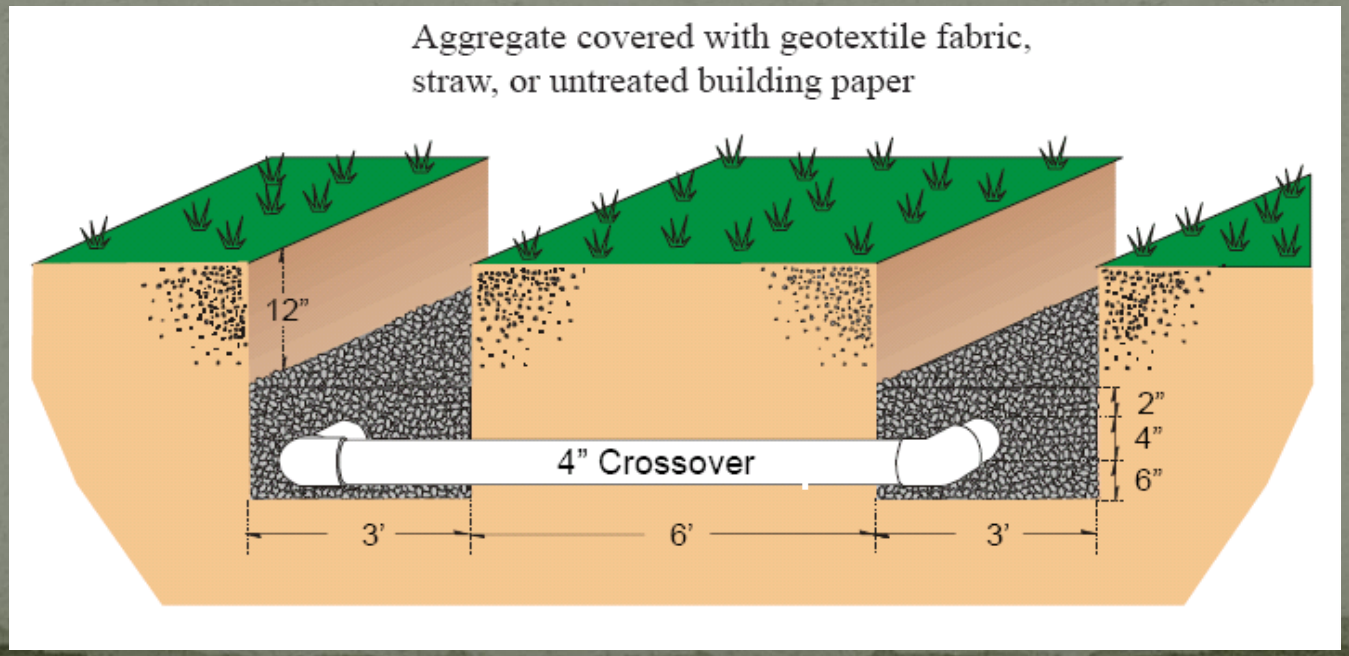
Length of ground trench needed is based on bottom square footage of drainfield. Example: 3' wide by 100' long trench = 300 ft. 2

- **100 feet maximum lateral length for gravity systems.** ★
- **Bottom of trenches - grade must be level.**
- **Width of Trenches – 1 to 6 feet**
- **Depth of Trenches - 2 feet minimum ★ / 4 feet maximum**
- **Undisturbed Earth Between Trenches - 6 feet minimum / 8 feet for steep slope.**
- **Undisturbed Earth Between Septic Tank and Trenches - 6 feet minimum**



Standard Drainfield Trench

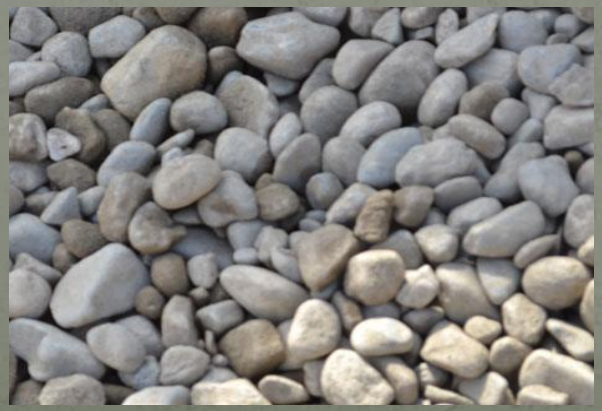
- Depth of Aggregate: Total 12 inches minimum (6" under pipe / 2" above pipe).
- Depth of Soil Over Top of Aggregate - 12 inches minimum.
- Soil Barrier - three (3) inches of straw, untreated building paper, or geotextile (greater than 1 ounce / square yard weight).
- Aggregate - diameter from ½ to 2 ½ inches, inert, durable, and free of fines.



Aggregate and Construction Media for Septic Systems

Aggregate and Construction Media must come from an approved source before installation of any septic system.

- Drainrock
- Pea Gravel
- Pit Run
- ASTM C-33 Sand



Gravel System

Drainfield Setbacks

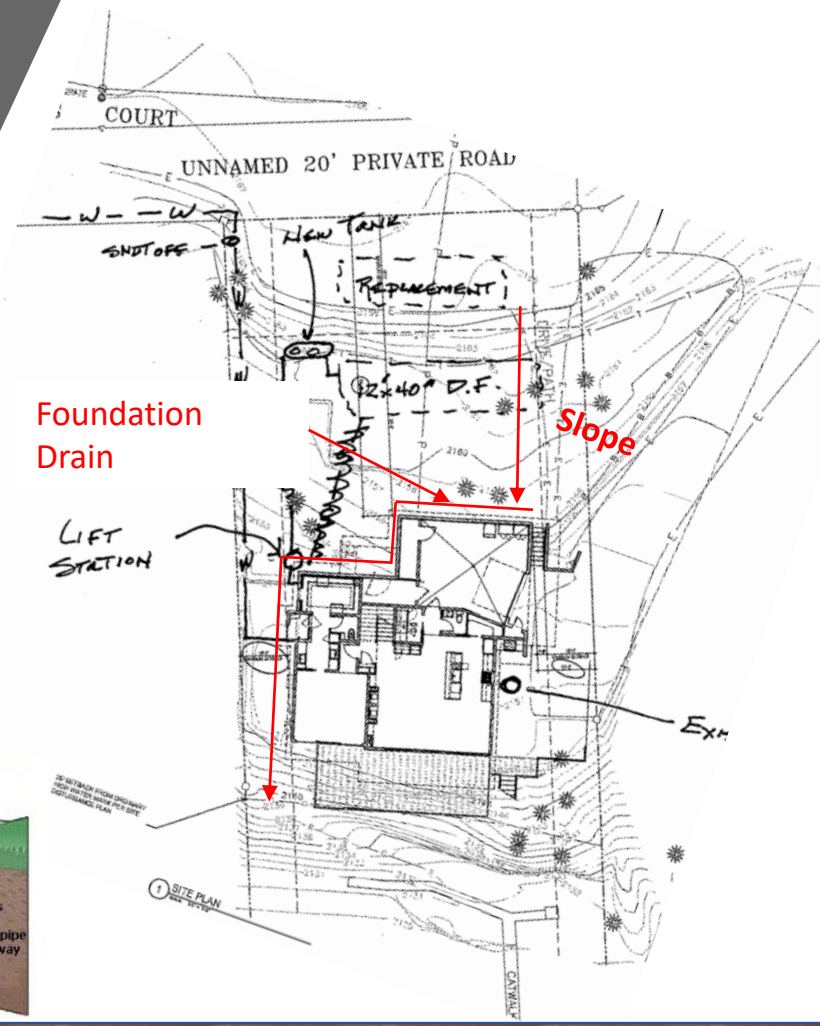
Features of Interest	Soil Type			
	All	A	B	C
Public Water Supply	100			
All Other Domestic Water Supplies Including Springs and Suction Lines	100			
Water Distribution Lines: Pressure Suction	 25 100			
Permanent or Intermittent Surface Water Other Than Irrigation Canals & Ditches		300	200	100

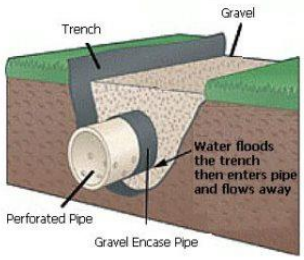
Drainfield Setbacks (Continued)

Features of Interest	Soil Type			
	All	A	B	C
Temporary Surface Water and Irrigation Canals and Ditches	50			
Building Foundation (with drain) Crawl Space or Slab Basement	50 10 20			
Property Lines	5			

Drainfield to Foundation Drain Setback

- Problem:
- TGM Section 2.5.3 (Cutoff Trenches) requires cutoff trenches to meet surface water setbacks to **upgradient** drainfields.
- IDAPA Rule setback is 10’ to foundation, 20’ to basement.
- Setback is intended to prevent interception of untreated effluent
- Seasonal surface water setback of 50’ typically used
- Setback also applies to cutoff trenches for retaining walls, etc.

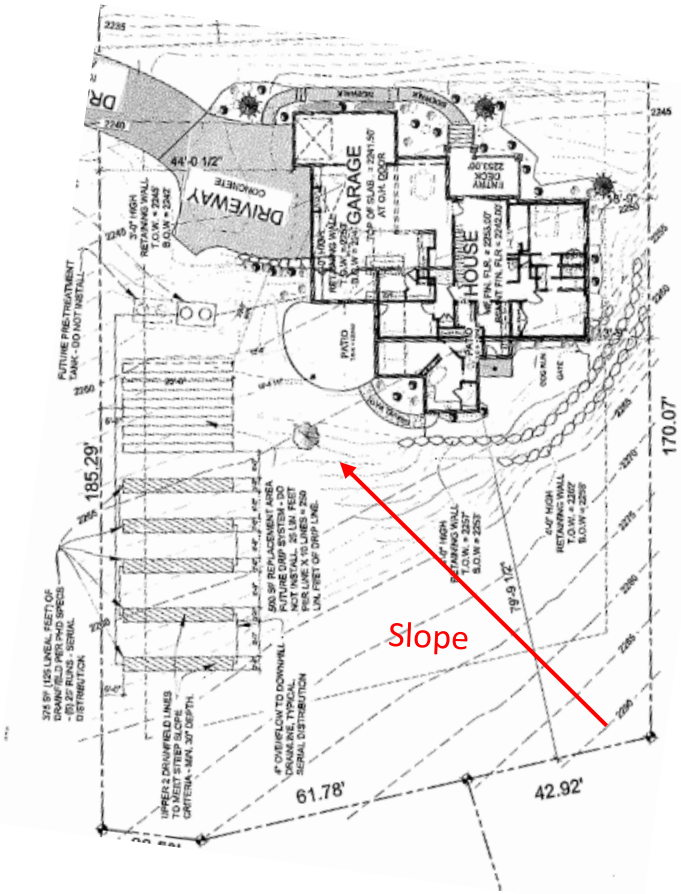




Drainfield to Foundation Drain Setback

Possible Solutions:

- Move drainfield at least 50 feet above foundation drain (not always possible)
- Foundation drain with drainrock only (no perforated pipe in drain)
  - Based on input from DEQ
  - Builders typically not in favor
  - Use foundation setback only
- Configure system so drainfield is not upgradient from foundation drain
- Not always possible to meet setback on best-fit repairs

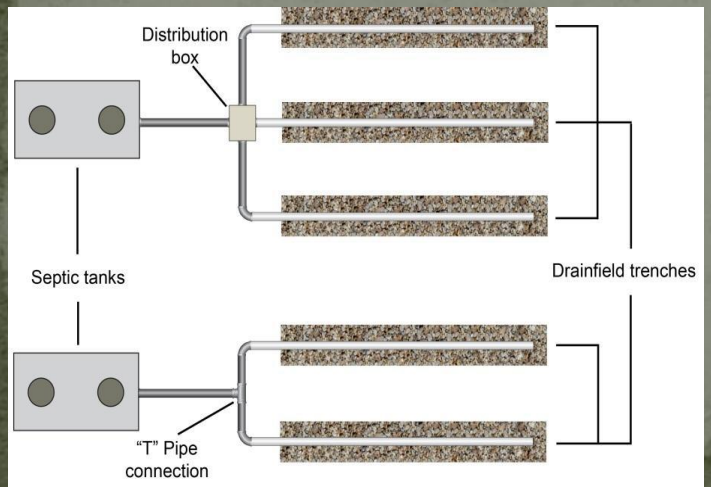


Effluent Distribution

Equal Distribution: Allows for even distribution throughout all trenches

- "T" connections only on flat sites, not recommended with >2 trenches
- Distribution boxes are great in theory, but can lead to overloading if box settles

  ***D-boxes should always be marked and accessible, base for box and effluent lines thoroughly compacted
- Pressure Distribution is the only way to ensure equal distribution
  - > 1500 square feet of trench
  - Part of another system that requires pressurized component (sand mound, intermittent sand filter, Etc.



Equal Distribution

Serial Distribution

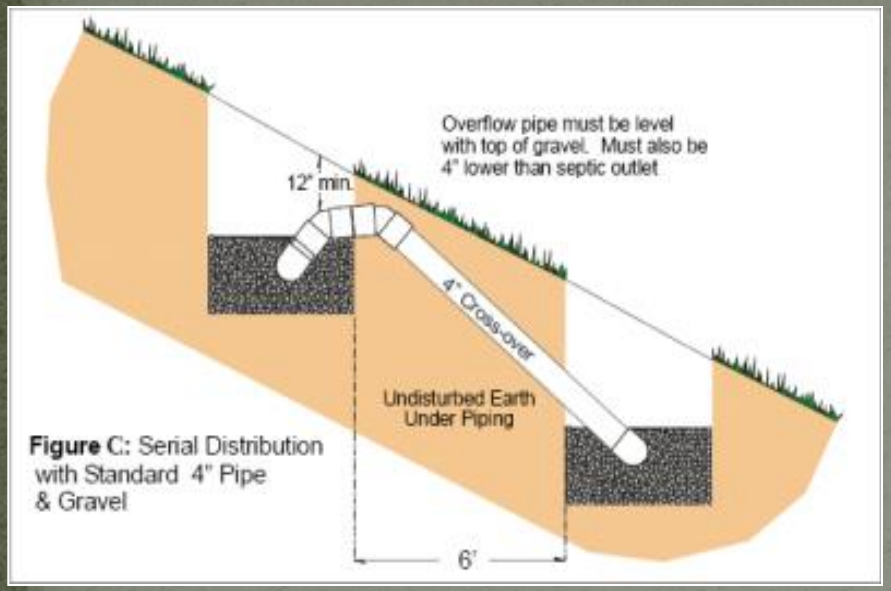


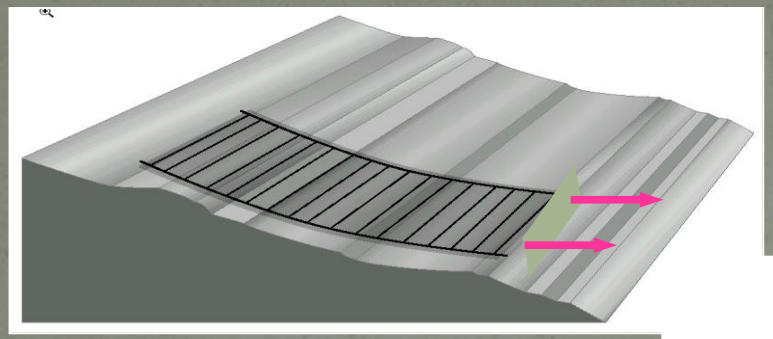
Figure C: Serial Distribution with Standard 4" Pipe & Gravel

- Laterals connected end-to-end
- Cross-over made with solid pipe
- Entire upper trench fills before passing to next trench

Drop Boxes

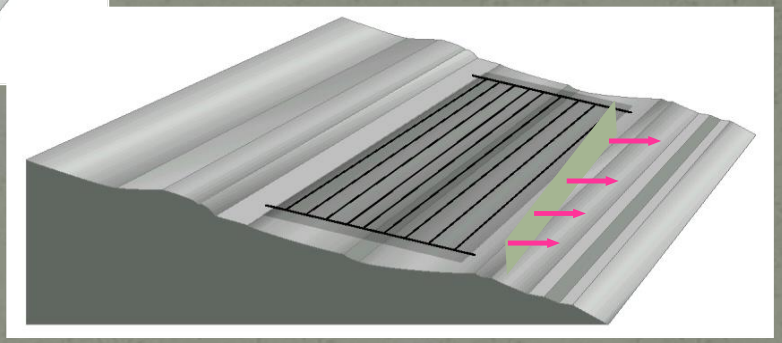
- Drop box installed on each lateral to control flow
- Preferred method of Serial Distribution
- Prevents overloading upper trenches

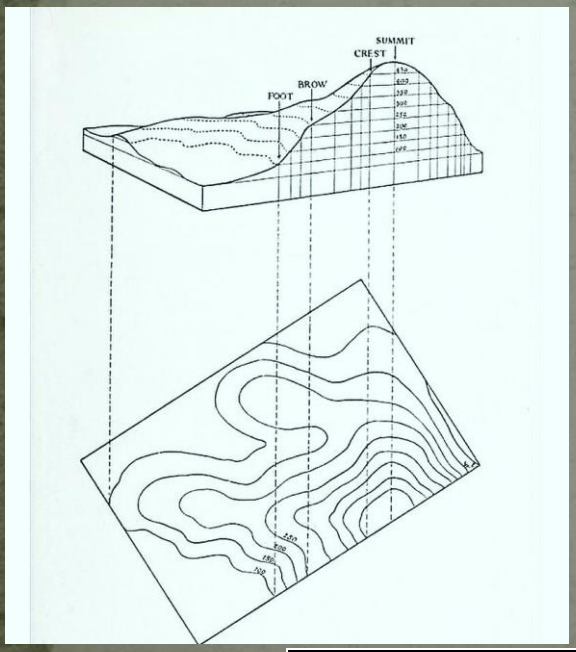
Drainfield Layout

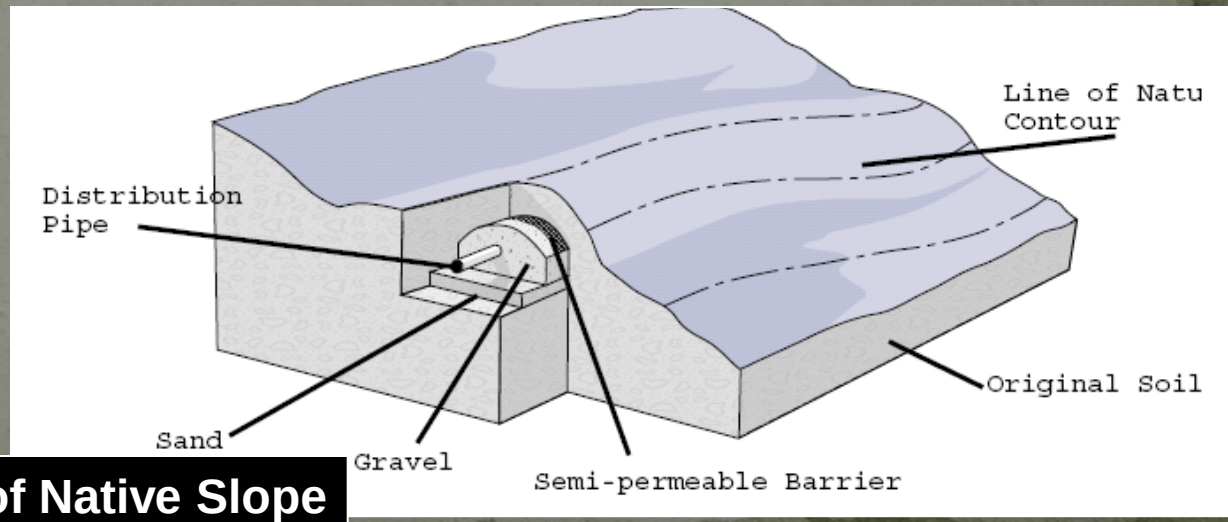


Less Desirable Layout

More Desirable Layout



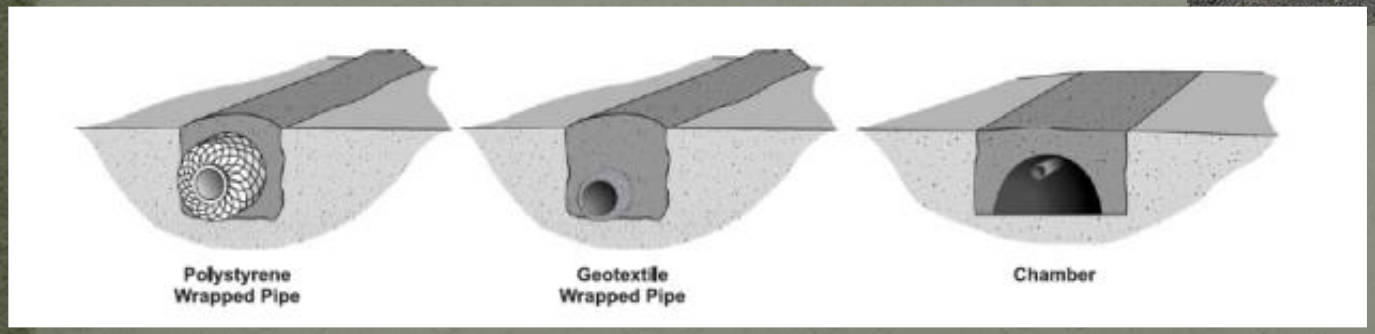




Follow Contour of Native Slope

Standard Gravelless Drainfield

- Bottom - pipe installed level with an allowable variation of not more than ½ “ per 100 feet.
- Width - 18 inches minimum to 3 feet maximum
- Depth - 24 inches minimum / 4 feet maximum. Unless otherwise noted.
- Undisturbed Earth Between Septic Tank and Trenches - 6 feet minimum
- Always connect to top connection!



Gravelless Drainfield Reductions

EZ Flow: 25% reduction for 1203. Does not apply to 6' wide trenches, absorption beds, or steep slope systems. (4 ft^2/ lineal ft)

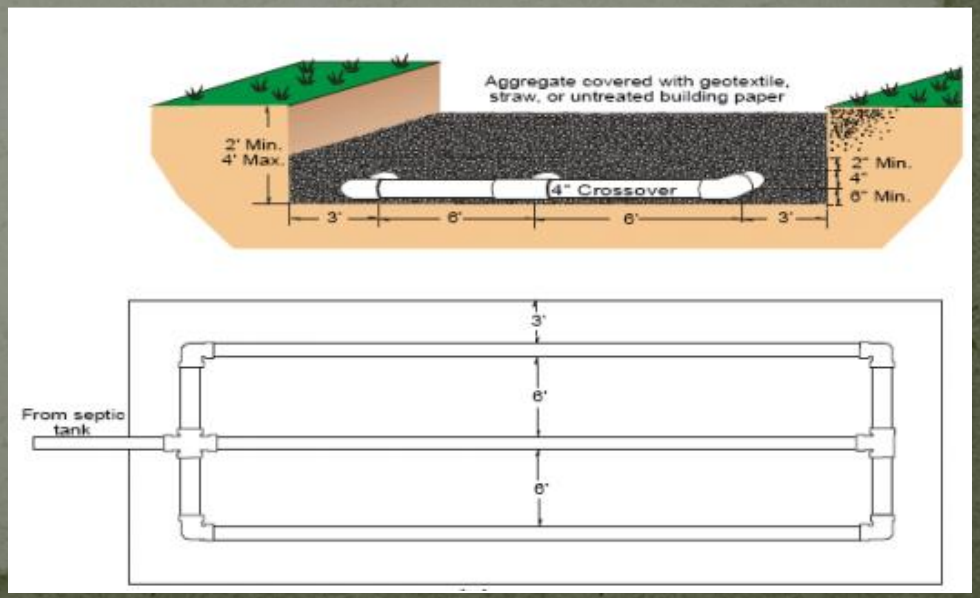
10" Gravelless: 1.3 ft^2 per lineal foot in 1 foot wide trench. (1.33ft^2/lineal ft)
1/3 size of Chambers & EZ Flow!

Dome Chambers: 25% Reduction. Does not apply to 6' wide trenches, absorption beds or steep slope systems. (4 ft^2/ft)

Gravelless Chambers

Standard Drainfield Absorption Bed

- Slope Limitations: Cannot be excess of eight percent (8%)
- Vehicular Traffic: Rubber tired vehicles must not be driven on the bottom surface
- Distribution laterals must be spaced on not greater than six (6) feet centers nor may any sidewall be more than three feet
- No reduction for gravelless
- **Only installed if NO room for trenches**



Basic Alternative Systems

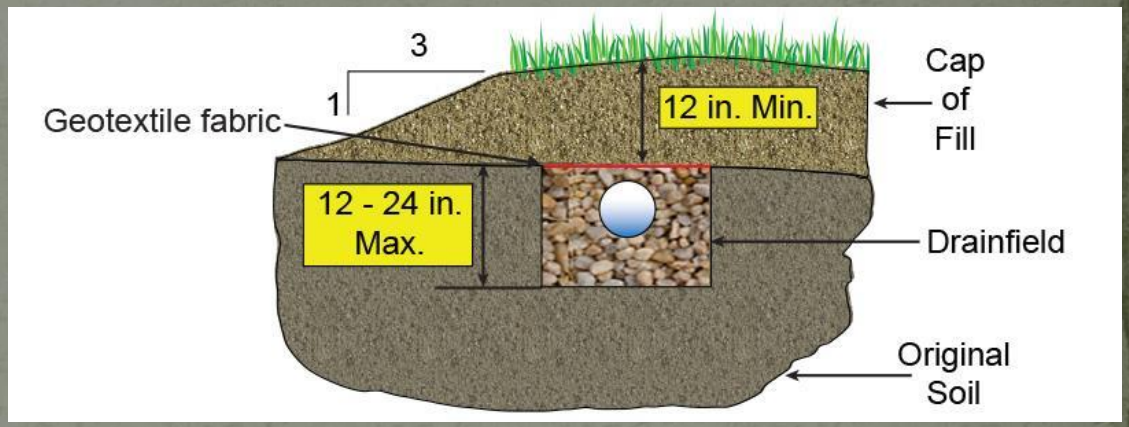
- Capping Fill
- Steep Slope Criteria
- Extra Drainrock Drainfield
- Curtain Drain/Diversion Ditch
- Seepage Pit
- Gray Water Sump
- Gray Water System
- Pit Privy
- Sealed Vault Privy
- RV Dump Station
- Individual Wastewater Incinerator

Capping Fill Drainfields (4.3)

Description: Drainfield installed between 3”-24” into native soil with a cap of fill material to provide suitable cover.

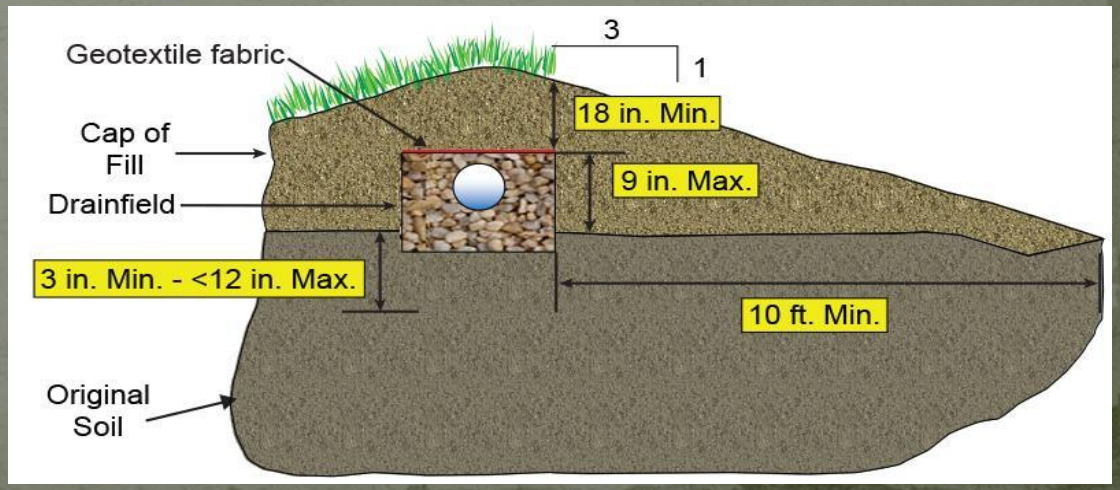
Below-grade:

- 12-24”
- 20% Slope



Above-Grade:

- 3-12”
- 12% Slope ☆
- Cap Constructed 1st



Capping Fill Drainfield

- Fill area needs plowed and scarified Finished side slopes graded with a slope of 3:1 (3' horizontal for every 1' vertical)
- Use of pneumatic tires on fill or cover is prohibited
- Minimum of 12” cap, 18” on above grade
- Diversion ditch to to divert water
- “Cap”, 10' beyond the nearest trench
- Cap installed before trenches for Above-Grade installations.

Standard Capping Fill Drainfield

Capping Fill Drainfield Prior to 12” cover

Capping Fill Drainfield after 12” cover

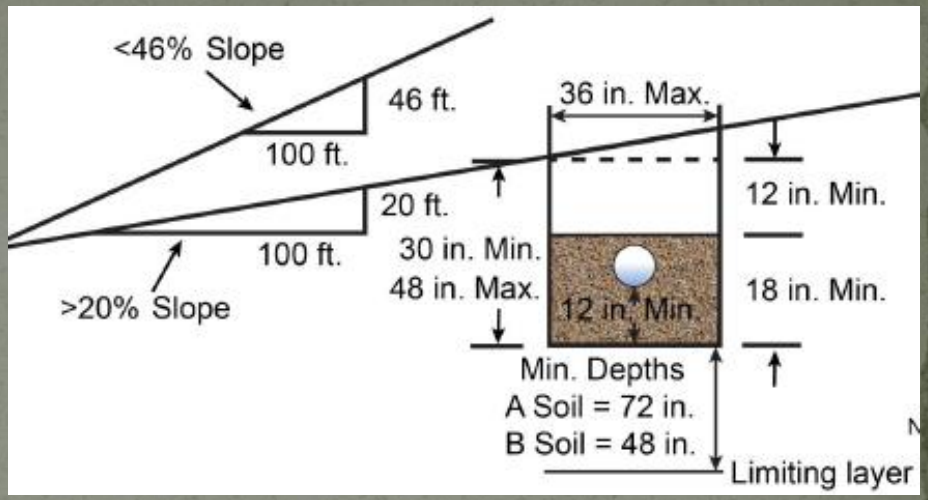
Steep Slope System (4.26)

Conditions of Approval:

- >20% but <46% ★
- Soil is well-drained with no evidence of saturation or textural change and of Soil Design Group A or B.

Construction:

- Eight (8) feet between trenches
- **Serial distribution must be used or pressurized if required.**
- 30" deep on downhill side of trench
- 18" of drainrock, (12) inches of cover.
- **No Gravelless reduction**



Extra Drainrock Trench (4.9)

When more than six (6) inches of aggregate under the perforated pipe is included in a standard

drainfield, the required drainfield length may be reduced.

Trench Width (Table 4.3 in TGM)

Gravel Depth Below Drain Pipe	12”	18”	24”	30”	36”	48”	60”	72”
12”	0.75	0.78	0.80	0.82	0.83	0.86	0.87	0.89
18”	0.60	0.64	0.66	0.69	0.71	0.75	0.78	0.80
24”	0.50	0.54	0.57	0.60	0.62	0.66	0.70	0.73
30”	0.43	0.47	0.50	0.53	0.55	0.60	0.64	0.67

Example: Using the appropriate factor from Table 4-3, calculate the reduced trench length for a standard trench 278 feet long (3 bedroom dwelling in C1 soil) 36 inches wide with 18 inches of gravel under the drain pipe.

Trench Reduction = (Trench length)(Multiplying Factor) = (278 foot trench) (0.71) = 197 foot trench

Extra drainrock trench

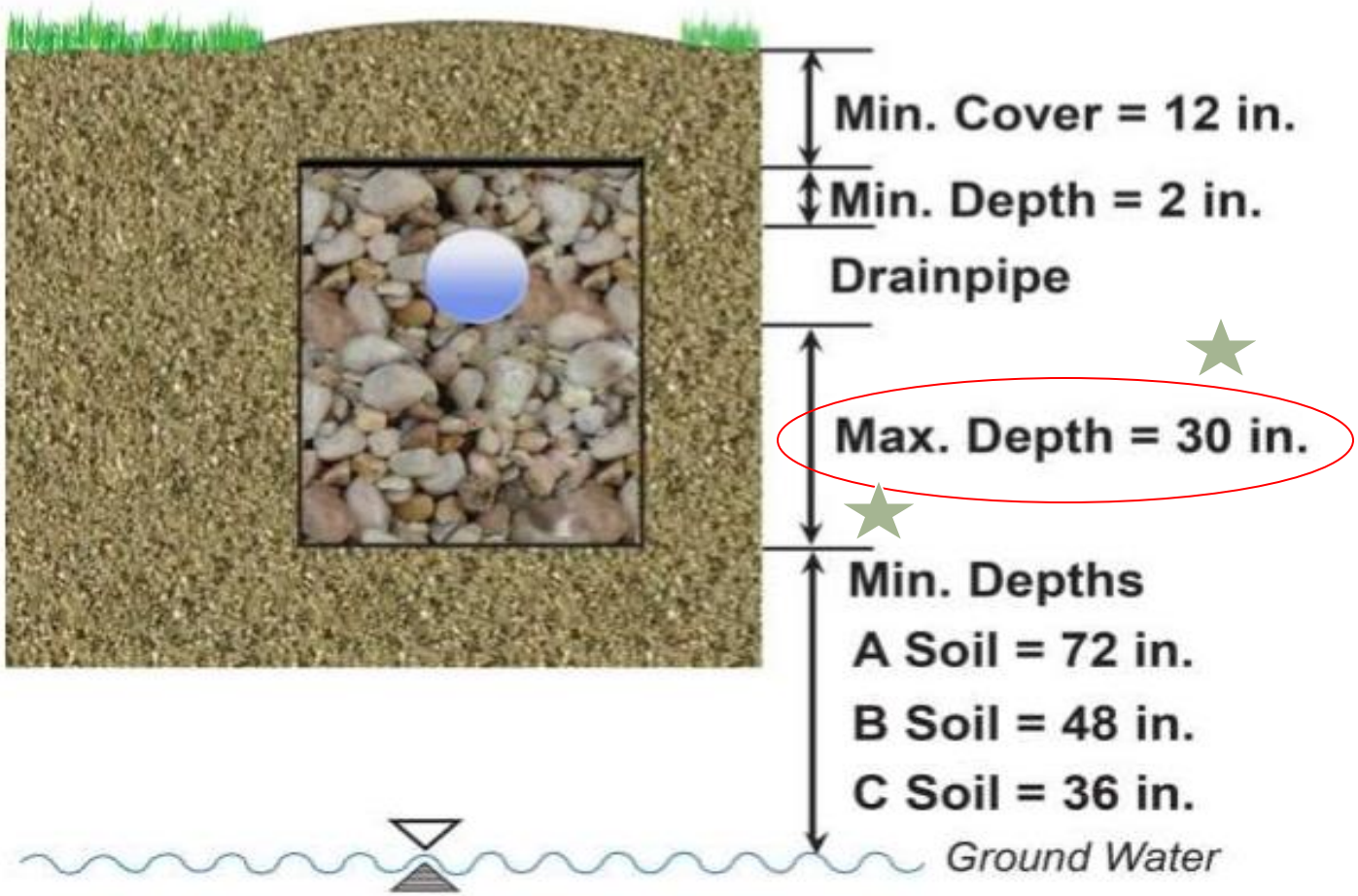


Figure 4-13. Cross section of standard trench with extra drainrock.

Curtain Drain/Cut-off Trench vs. Diversion Ditch to protect trenches

Curtain Drain/Cut-off Trench:

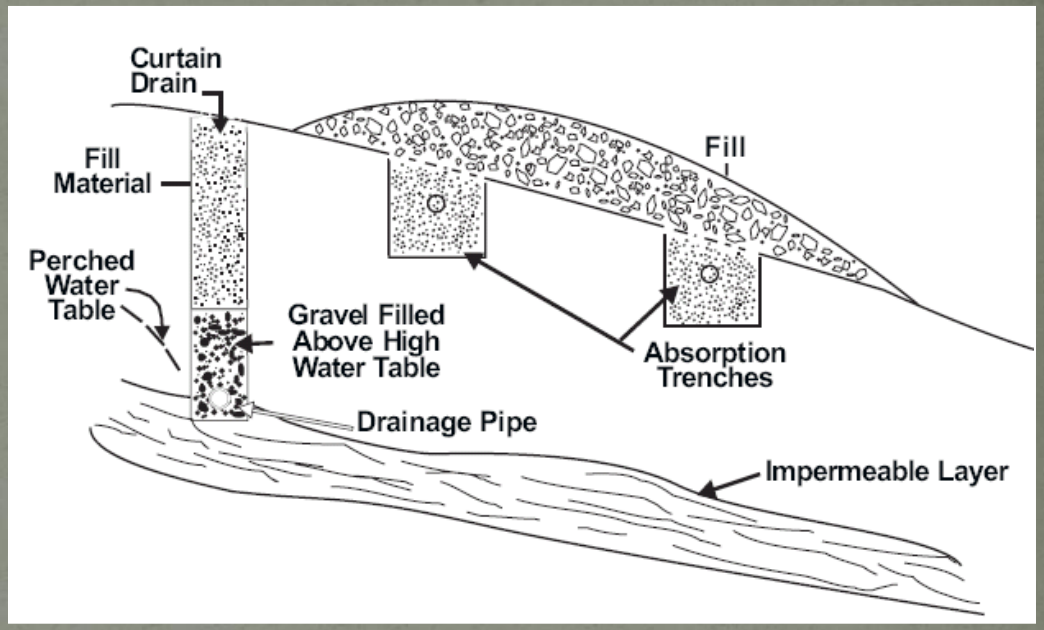
1) Drain must tie into impermeable layer.

2) Drain must divert runon/runoff water away from drainfield.

3) Drainage pipe at bottom of trench to collect water for re-routing

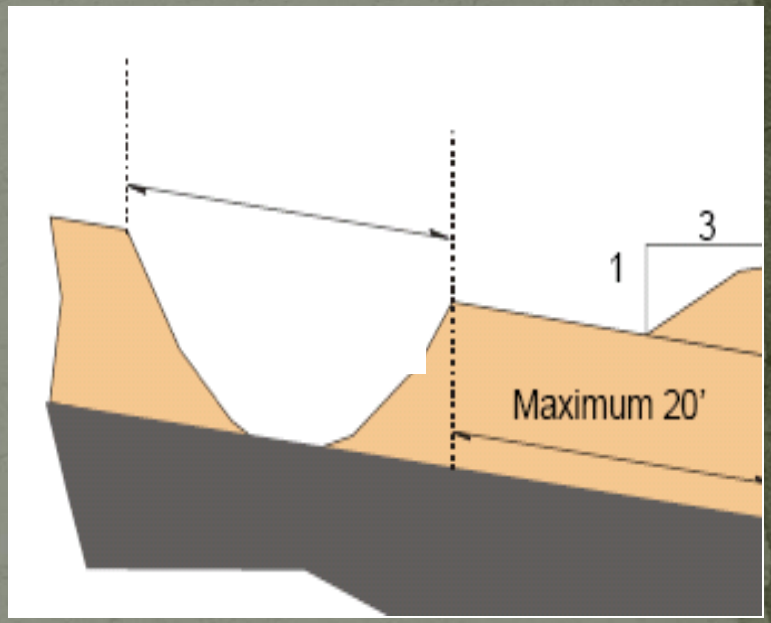
4) Separation distance requires TGM guidance

5) Monitor through wet season before site can be approved.



Diversion Ditches

- Protect drainfield from laterally flowing ground/surface water.
- 1) Separation distance requires TGM guidance.
- 2) Ditch width and depth dependent on site characteristics.
- 3) Ditch must tie into impermeable layer.
- 4) Ditch must divert runon/runoff water away from drainfield.
- 5) Monitor through wet season



Seepage Pit (4.25)

- Only allowed in Health District 7 for new systems
  - **May be allowed in other districts as a last resort for replacement systems
- Maximum depth of the pit is 18 feet
- Top of pit may be deeper than 4 feet
- May not be used in C type soils (clays and silts)
- Test hole must reach a depth of 6 feet below the proposed pit bottom

Seepage Pit

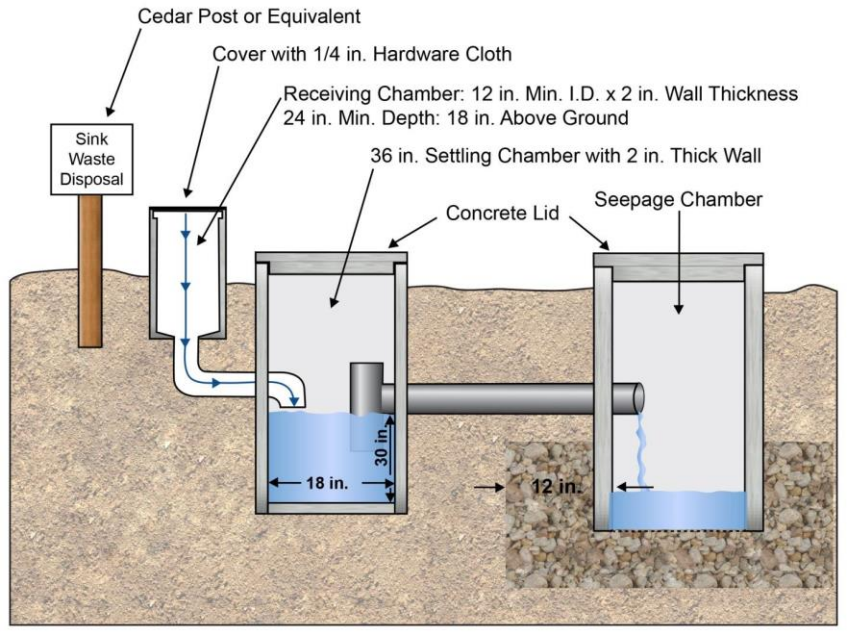
- *Last Resort*: recommend other alternative systems
  - Better treatment of effluent
    - Oxygen can reach the drainfield
    - More soil below the infiltrative surface
  - Easier installation
- Sizing
  - Based only on the excavation sidewalls
  - Bottom area is not counted
  - See TGM for details

Seepage Pit

- Aggregate Requirements
  - Drainfield aggregate (drainrock) must fill the entire pit or bed
  - Must fill excavation void
  - Must cover the effluent pipe entering the pit or bed by at least 2 inches
- Soil barrier
  - The pit or bed must be covered with geotextile fabric, straw, or untreated building paper

Gray Water Sump (4.12)

- Seasonal/Recreational sites only
- Limited to 10 gpd
- Hand Carried waste only
- Soil Evaluation by PHD
- At least 100' from surface water



Gray Water System (4.13)

- Only allowed for wastewater from bathtubs, showers, handwashing sinks.
- **Requires a separate septic system or connection to sewer for all other wastewater.**
- Same effective soil depth as standard drainfields
- Subsurface disposal required, not allowed for irrigating vegetable gardens.
- Flows based on occupancy.*

Pit Privy (4.17)

- Not allowed if structure is served by water under pressure
- Requires same setbacks to surface and groundwater as drainfields

Sealed Vault Privy (4.29)

- Not allowed if structure is served by water under pressure
- Either an approved septic tank or vault toilet
- Same setbacks as septic tank

Dry Cabin Scenarios

Blackwater Disposal Options

- Composting Toilet (4.4)
- Sealed Vault Privy (4.29)
- Pit Privy (4.17)
- No Water Under Pressure, no plumbing

Graywater Disposal Options

- Gray water System (4.13)
  - Does *not* include toilets, kitchen sinks, dishwashers, washing machines, water softeners.
  - Require approval from Plumbing Bureau
  - Still require connection to approved system/sewer
- Gray Water Sump (4.12)
  - Hand Carried Wastewater only
  - Limited to 10 gpd
  - Seasonal dwellings, camp sites

No dry cabins in Kootenai County.

Dry Cabins

- Graywater is wastewater
  - Contains pathogenic bacteria and harmful nutrients
  - Can contaminate ground/surface water
  - Unapproved disposal is illegal!
- Dry cabins rarely stay dry
  - Especially if lived in full time
- Often built in sensitive areas
  - Conventional septic systems may not be possible

Individual Wastewater Incinerator (4.15)

- Incinerates daily flow for <u>all</u> black and grey water generated on site
- Non-discharging system
- Uses propane, natural gas or diesel fuel
- Up to 300 gpd (4 bedroom house)
- Water system limitations:
  - Water under pressure requires storage tanks
- Wastewater holding tanks must be 2X water tank capacity

RV Dump Station (4.20)

- Only for commercial, municipal, and private RV parks (not individual RVs)
- No direct connection to RVs
- Same setbacks as septic tanks
- Minimum 1500 gallon tank

- High water alarm set to 2/3 capacity
- Discharge to municipal sewage treatment plant, septage land application site, public sewer only

Holding Tanks (4.14)

- Only allowed for temporary emergency situations or to replace a vested non-discharging system with no other option.
  - *Not practical for full time use*
- Written agreement with management entity or pumper prior to permitting
- Permit must specify a date of abandonment
- High water alarm set to 2/3 capacity
- Minimum 1500 gallon capacity

Failed Systems

- **<u>Step #1:</u> Apply for a Repair Permit from PHD prior to any work**
- **<u>Step #2:</u> Site Suitability & Evaluation process with test holes**

Failing System:

1) Does not meet the intent of Subsection 004.01.

2)The system fails to accept blackwaste and wastewater.

3)The system discharges blackwaste or wastewater into the waters of the State of Idaho or onto the ground surface.

Failed Systems

- *Useful Information for repair permit:*
  - Age, Type, and size of failing system
  - Number of bedrooms in home
  - Number of bedrooms on original permit (if available)
  - Type of failure
  - When tank was last pumped and how often
  - Unusually high water usage (leaky fixtures, water softener/filter backflush, etc)

Failed Systems

- Sewage leaking onto ground from system failure

Failed Systems

- Bio-mat prevents effluent from moving down through soils after 15 to 20 years of use depending on soil classification

Failed System Continued

- Failed Drywell

- Drainfield not

- Collapsed pipe

Do You Know Where Your Septic Tank Is Located?

Need *a* ***good As-Built*** to find system later for pumping and/or repairs

Pictures of Sites That Don’t Meet Install Conditions

Failed Systems/ Bad Installation

- Tank Seams not sealed properly
- Risers not sealed properly
- Backfilled with rocks

Failed Systems/ Improper Install

- Bedding under tank needed
- Follow manufacturer's recommendation
- Install during low groundwater
- Only install approved components

Failed Systems/ Improper Install

- Serial distribution or D-Box needed to prevent trench bypass

Need proper seal to drainfield component

ANY QUESTIONS
DO YOU HAVE?
memegenerator.net

****

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http://www.deq.Idaho.gov/waterquality/wastewater
****

2020 Complex Septic Installer Class

Complex Alternative Systems

$$\hat{f}(\xi) = \int_{-\infty}^{-\infty} f(x) e^{-2\pi i x \xi} dx$$

Complex Alternative System

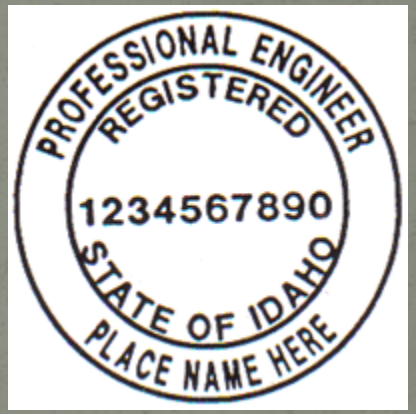
Per IDAPA 58.01.03.006.01.b

- *May be used to make <u>some</u> sites suitable for sub-surface sewage disposal.*
- *Requires a complex installer license*
- *All pump to gravity systems require a complex license.*

A recently installed sandfilter. Prior to operation of the system, the filter will be covered with filter fabric and all covered with soil. Grass can be planted over the top as a final landscape treatment with only the inspection lids visible from the surface.

Engineered Complex Alternative Systems

- Drip Distribution System
- Evapotranspiration and Evapotranspiration/Infiltrative System
- Experimental System
- Individual Lagoon
- Pressure Distribution System
- Recirculating Gravel Filter
- Intermittent Sand Filter
- Sand Mound
- Pump back systems with over 100 vertical feet of separation between septic tank and drain field or 500 lineal feet away



Septic Tank and Pumps (4.19.3.2.1)

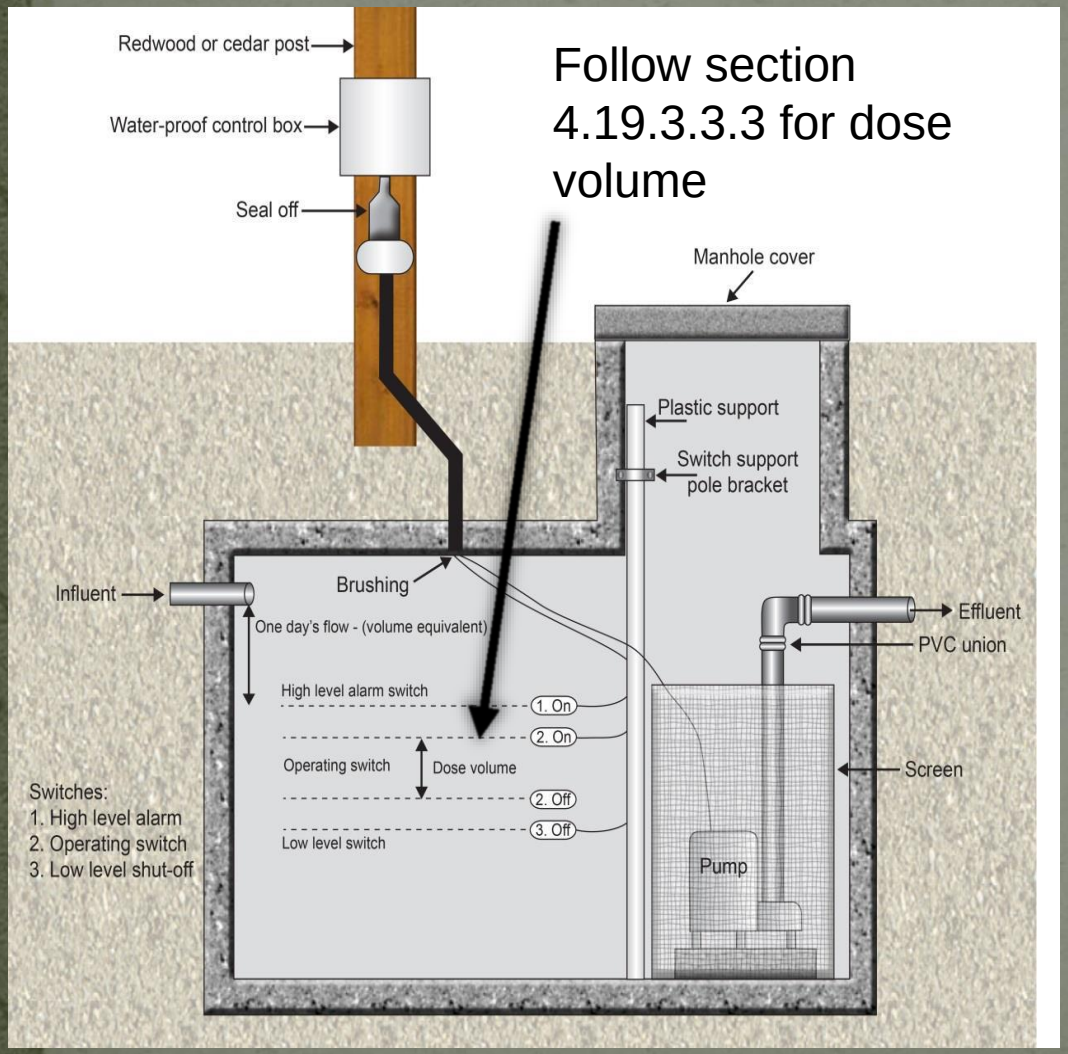


Figure 4.20

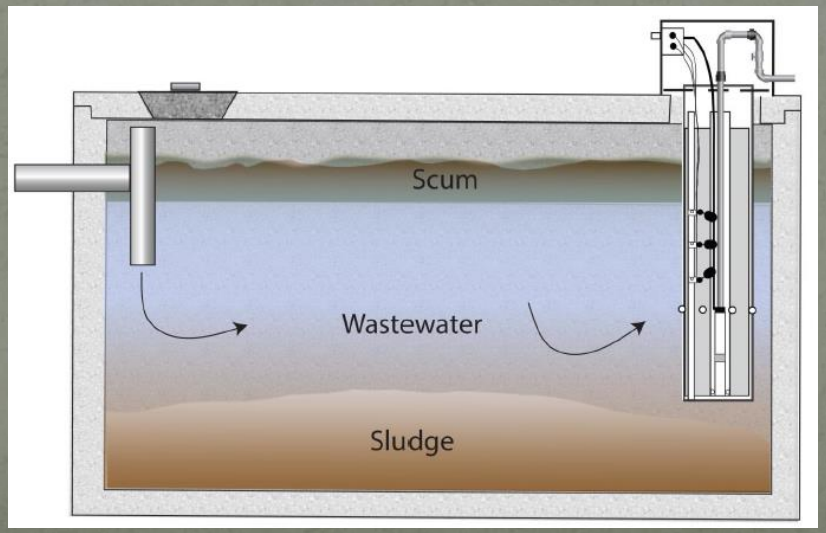
- Dosing chamber
  - Separate chamber or integrated with tank
  - 2x daily flow
  - State approved
  - Watertight, all joints sealed
- Effluent Pump
  - Screen or effluent filter
  - Floats
    - Low Level: 2-3" above top of pump
    - Operating Switch: turns pump on/off
    - High level: 2-3" above pump "on" level

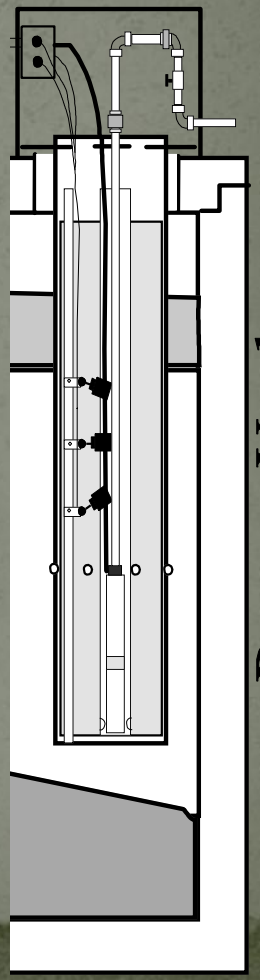
Septic Tanks and pumps

- Pumps must be serviceable from the ground level without having to enter the pump chamber.
- Riser to grade over pump chamber
- Wiring must meet Idaho State Electrical Code requirements and be inspected.
- Volume of dosing chamber must be 2x daily flow and be on approved list (TGM table 5.3).
- Demand Dosing (4.19.3.3.1):
  - Pumps volume of effluent to drainfield when floats are triggered.
  - Can overload drainfield with high use
- Time Dosing (4.19.3.3.2):
  - Effluent is evenly dosed to drainfield throughout the day
  - Can be used to level peak/surge flows

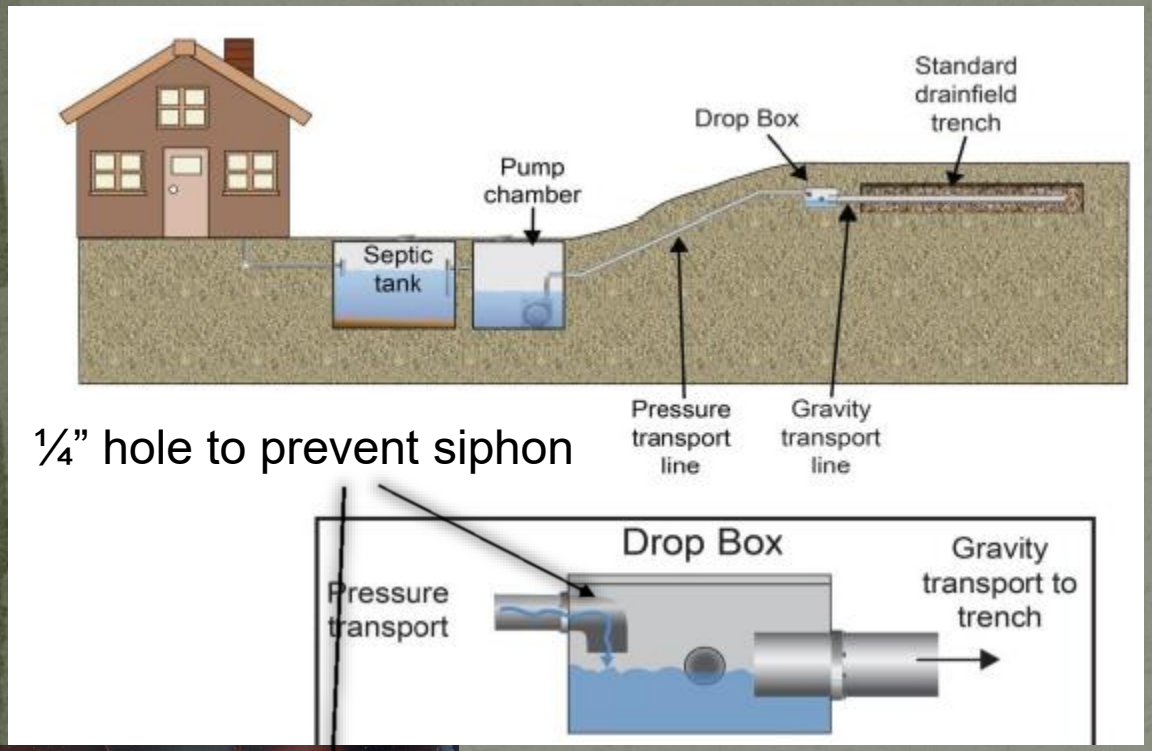
In-tank Pumps 4.19.3.5

- Only allowed for repairs with no space for pump chamber or system less than 100 gpd
- In-tank pump vault should be easily removable for cleaning
- Pump vault and pump must not interfere with the floats or alarm
- Inlets set at 50% of the liquid volume
- Pump vault screens
  - 1/8" holes, or slits;
  - non-corrosive material; and
  - 12 square feet of area

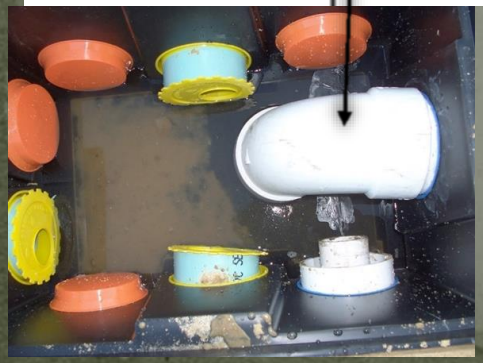




Pump to Gravity4.19.3.6



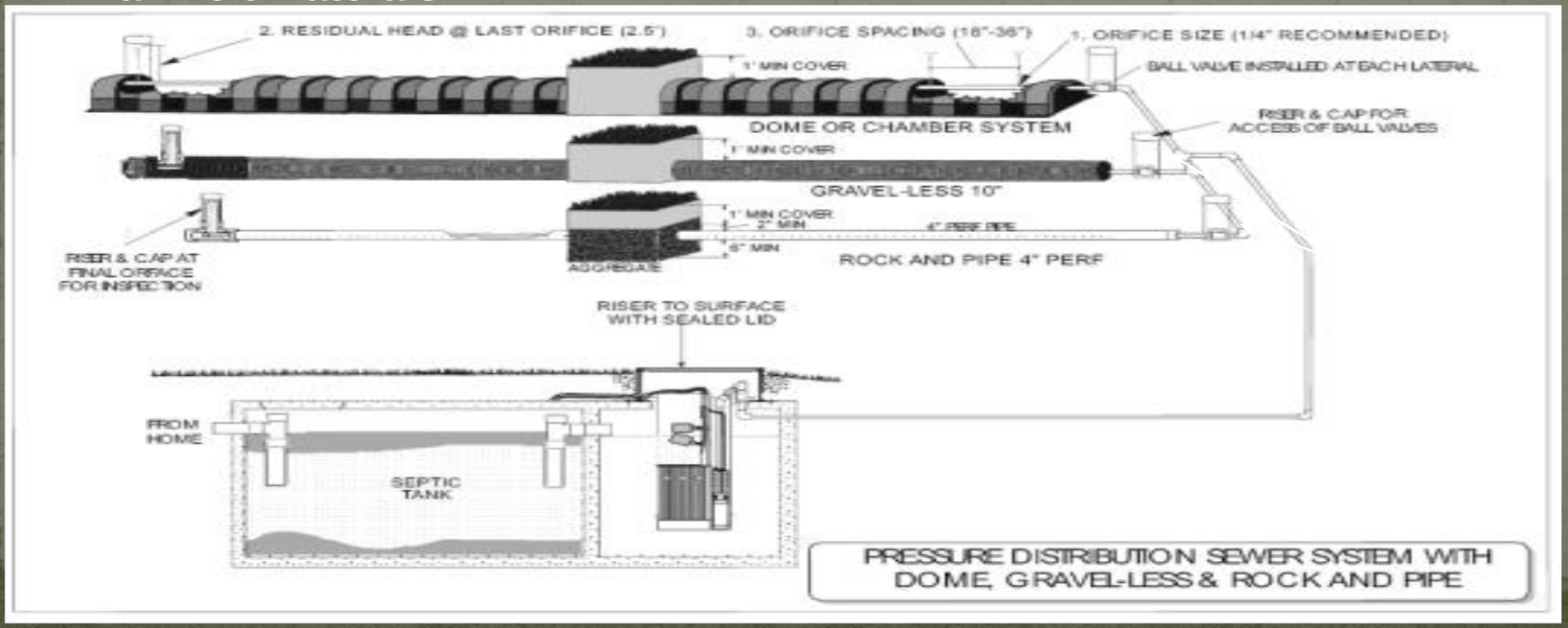
- Effluent Pumped to Gravity drainfield
- Drop box or other method to break pressure should be used
- Engineering recommended if > 500' in length, and/or 100' in elevation



Not like this!

Pressure Distribution (4.19)

- A low-pressure system of small diameter perforated pipe that applies effluent evenly throughout a drainfield or absorption bed.
- <u>Pressure Drainfield Components</u>:
  - Septic Tank with effluent pump
  - Transport pipe
  - Manifold
  - Drainfield Laterals



Pressure Distribution 4.19

Uses of Pressure Systems:

- **Maintain uniform application of effluent throughout the drain field area.**
- **Treat and dispose of effluent in the upper levels of the soil profile.**
- **Improve performance and increase drain field life span.**
- **Required for any drain field in excess of 1500 square feet.**
- **Used in Sand mounds, sand filters, sand filled trenches.**

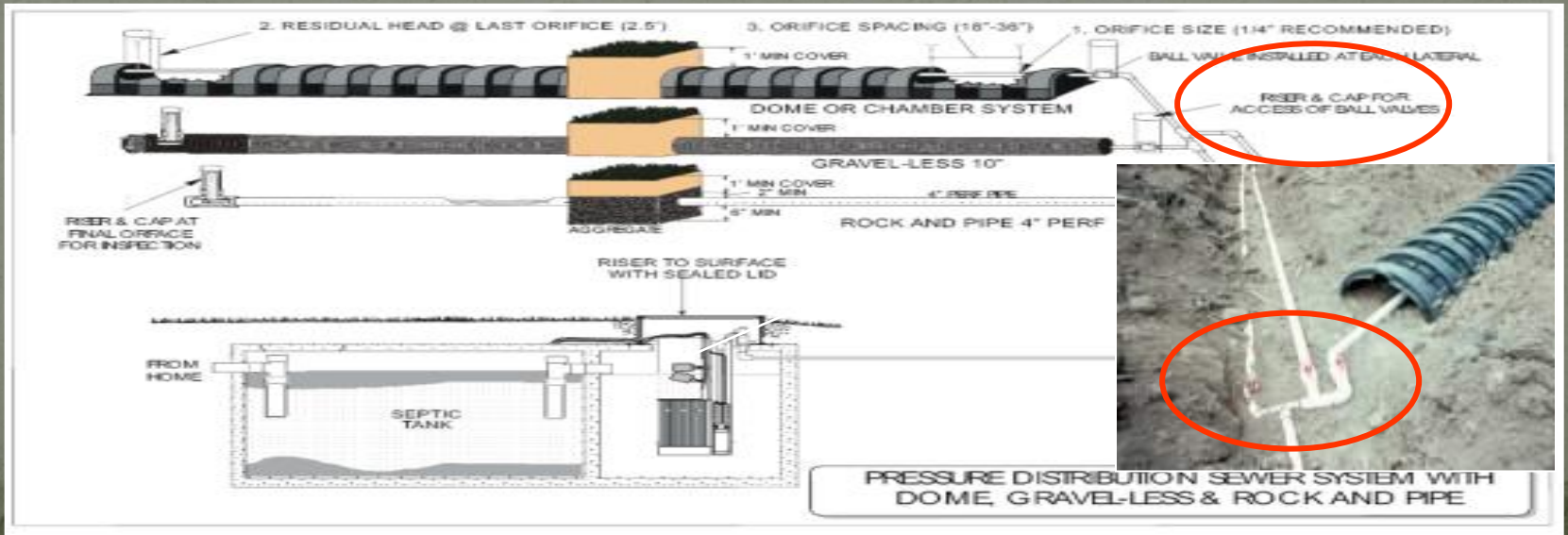
Pressure Distribution

- All Pressurized drainfields must be designed by a licensed Engineer
- All drainfields must be pressurized if trench bottom exceeds 1500 sq. ft.
- This includes any system with a pressurized component:
  - Sand mounds
  - Sand/gravel filters
  - Drip Systems

Pressure Distribution

Drainfield Design criteria:

- **Ball valves must be installed at the beginning of each lateral to control flow independently.**
- **Check Valves should be installed on each lateral to keep lines charged between doses.**
- **A weep hole should be installed at beginning of long transport lines to drain water back to tank.**



Pressure Distribution

<u>Orifice holes and inspection ports</u>:

- **Orifices typically pointed up on graveless products, down in drainrock applications.**
- **Inspection port (4"pipe with cap) should be installed over last orifice and 2'- 3' from end of drain field lines.**
- **Inspection ports must be approximately 1' above the ground.**
- **Sweeping cleanout required.**
- **Orifice size and spacing determined by engineer-Know this before drilling holes.**

Pressure Distribution Construction

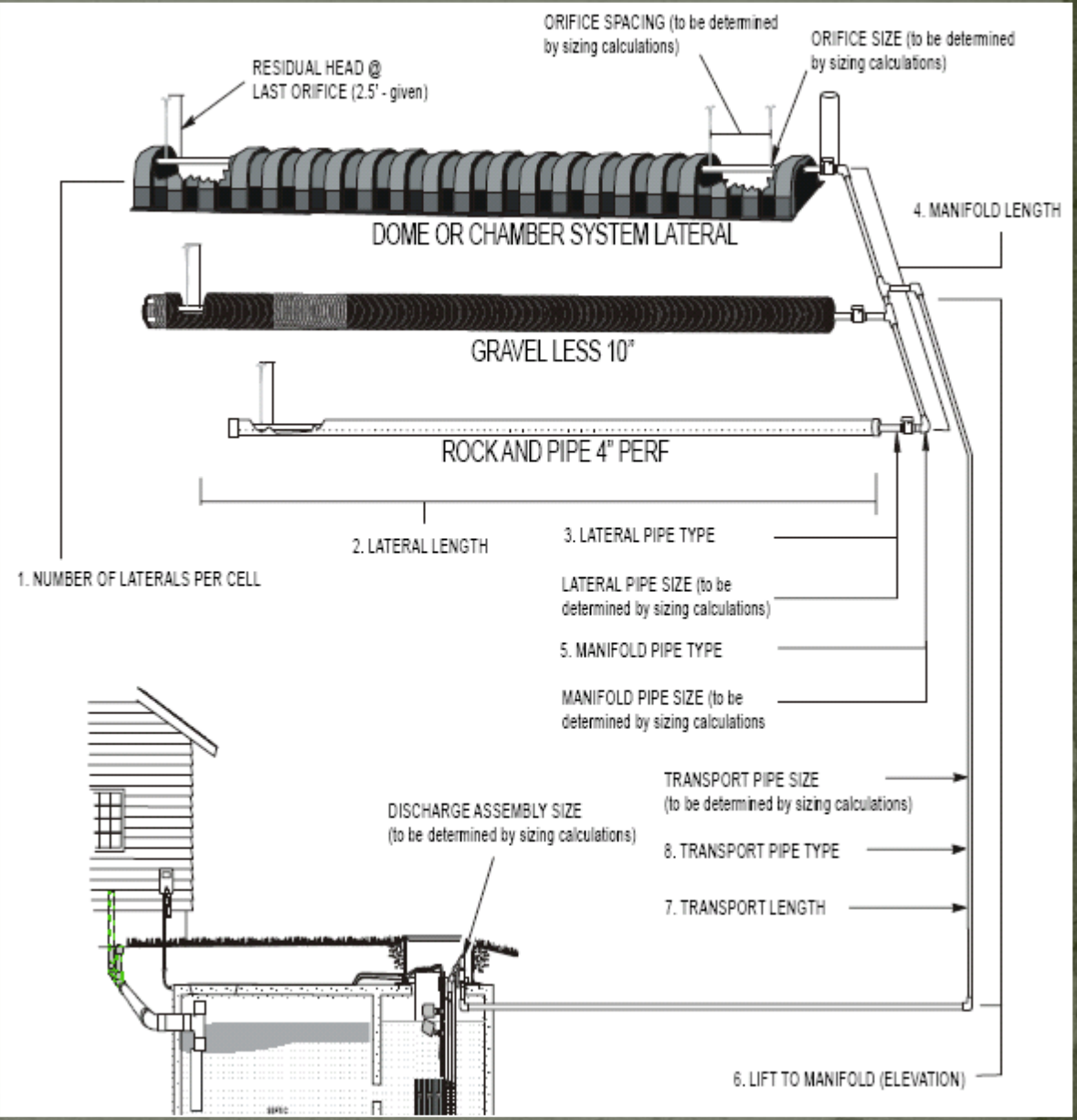
1. If needed (over 1500 gpd), designed by a Professional Engineer, plans approved by PHD, permit issued.

2. Install according to Engineered plans.

3: Test system to determine squirt height

4: Call for inspection.

5: Bury drainfield.



CENTRAL SYSTEMS

- Systems that serve <u>three or more</u> connections with a design flow of **<u>less than 2,500 gallons per day</u>**. (generally 3-9 homes)
- Must be designed by a professional engineer licensed in Idaho.
- Collection lines must be reviewed and approved by DEQ
- Engineering As-Built drawings must be provided.

Large Soil Absorption System (IDAPA 58.01.03.13)

- Drainfields with a design flow of **more than 2,500 gallons per day and less than 10,000 gallons per day** (each drainfield module cannot exceed 10,000 gallons per day; generally 10-40 homes)
- Must be designed by a professional engineer licensed in Idaho.
- Two (2) complete drainfields must be installed, each sized to accept the daily design flow, and a replacement area equal to the size of one (1) complete drainfield will be reserved. ★
- A Water Quality Impact Study will be required.
- LSAS standards apply to separate drainfields on a single parcel if combined flow > 2500

Large Soil Absorption System

LSAS Drainfields require greater setbacks and Effective Soil Depths than conventional drainfields:

LSAS Effective Soil Depths			
Site conditions	Design Soil Group		
Limiting Layer	A	B	C
Normal High Groundwater	12	8	6
Seasonal High Groundwater	2	2	2
Impermeable Layer	8	8	8
Fractured Rock	12	8	6

TABLE -- SEPARATION DISTANCES			
Feature of Interest	Design	Soil	Group
	A	B	C
All Domestic Water Supplies			
Sewage Volume - 2,500-5,000 GPD	250	200	150
Sewage Volume - 5,000-10,000 GPD	300	250	200
Property Lines			
Sewage Volume - 2,500-5,000 GPD	50	50	50
Sewage Volume - 5,000-10,000 GPD	75	75	75
Building Foundations - Basements			
Sewage Volume - 2,500-5,000 GPD	50	50	50
Sewage Volume - 5,000-10,000 GPD	75	75	75
Downslope Cut or Scarp			
Impermeable Layer - Below Base	100	50	50
Separation Distance - Between Modules	12	12	12

Pre-Treatment Systems

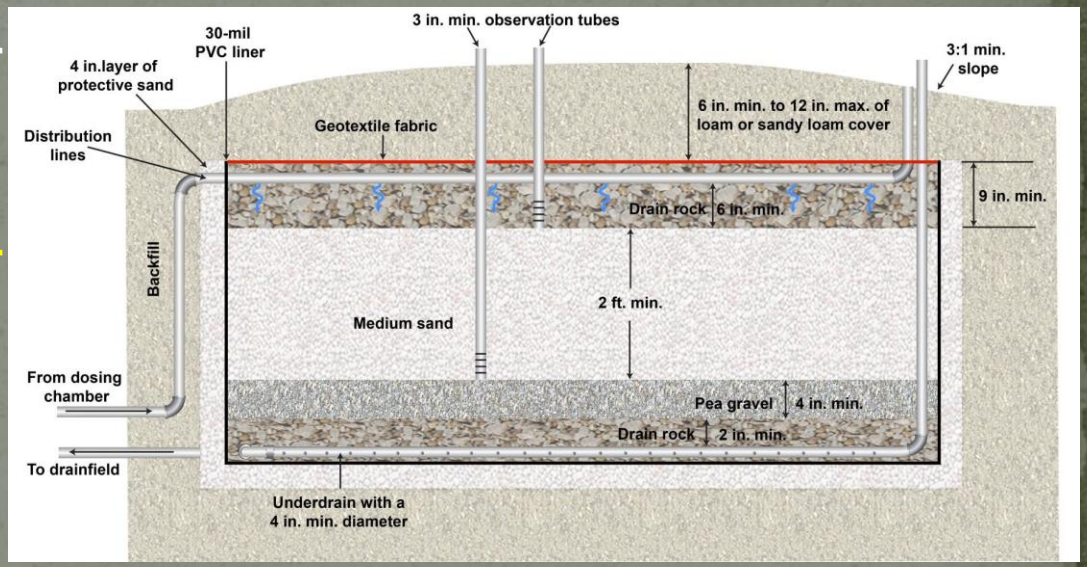
- Provide additional treatment of septic tank effluent before being discharged to soil.
- Higher quality effluent allows for reduction to limiting layers (groundwater, fractured rock, impermeable layers, etc.) ★
- Allows for reduction in drain field sizing.
- No combined reductions.
- Two Main types:
  - Single Pass filters
  - Recirculating filters
- Will not make every site approvable.
- Do not reduce horizontal setbacks (suface water, etc) ★

Intermittent Sand Filter (4.22)

- Pressurized absorption bed above a minimum of 2' of ASTM-C33 sand that drains treated effluent to a drainfield.
- Decreases the required effective soil depth to limiting layers (ground water, fractured rock, etc), but <u>NOT</u> horizontal setbacks (surface water, wells, etc.)

<u>Conditions for Approval</u>:

1. Slope must be 30 percent or less.
2. Maximum wastewater flow cannot exceed 600 gallons per day/module.
3. The bottom of the filter must not come within 12" of seasonal groundwater.



Intermittent Sand Filter

Filter Design:

1. Sized at 0.7 gallons per square foot per day.
2. ASTM-C-33 (medium sand) for filter
3. Constructed with reinforced concrete or flexible membrane liner equivalent to or greater than thirty 30 mil PVC. ★

Disposal Trenches: (Drainfield size and depth will be on septic permit)

- Pumping may be required to meet minimum trench depth.
- May be used with capping fill to obtain adequate separation to limiting layers

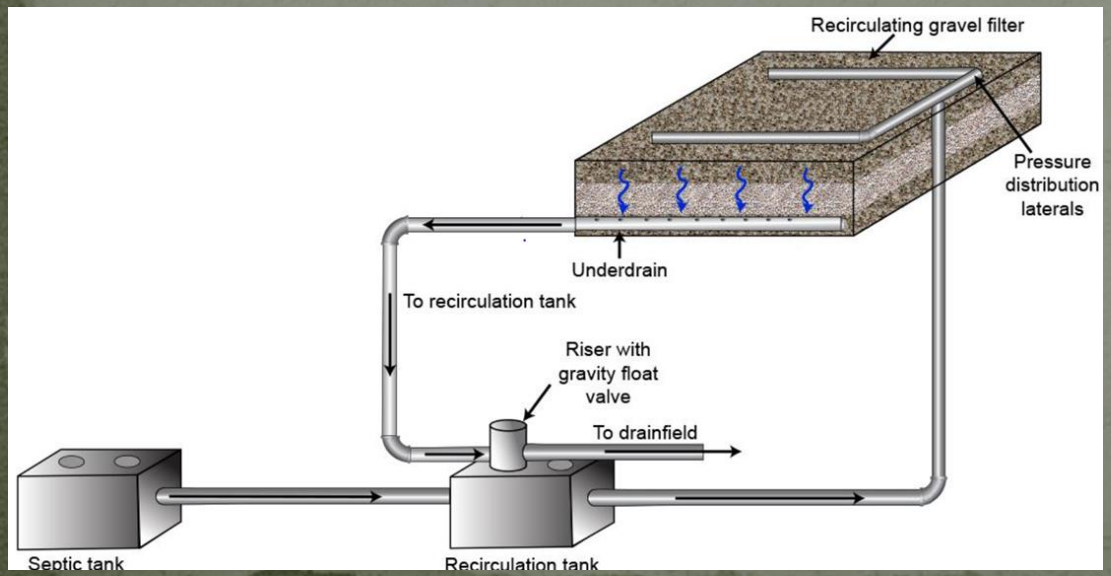
Decreased Effective Soil Depths
&
Soil Loading Rates

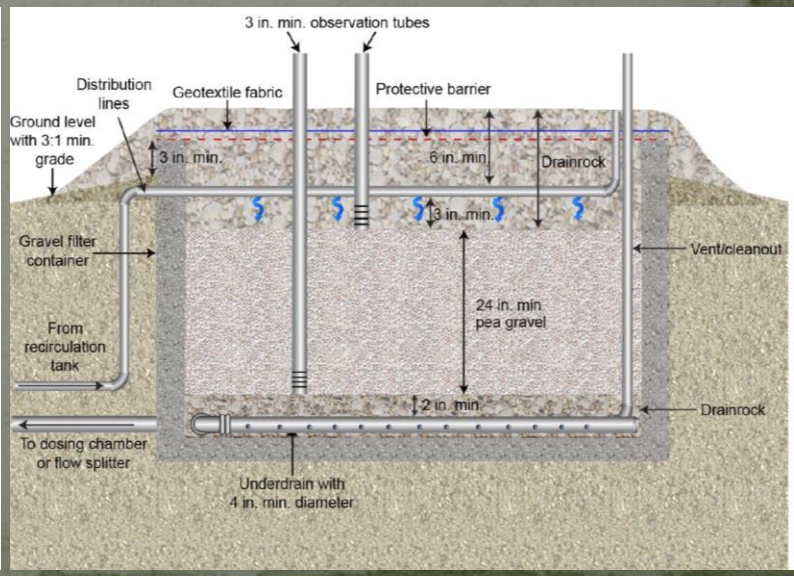
	Soil Group		
Limiting Layer	A	B	C
Impermeable Layer	2	2	2
Fractured Rock or Very Porous Layer	1	1	1
Normal High Ground Water	1	1	1
Seasonal High Ground Water	1	1	1

Soil Group	Gallons/ft²/Day
A-1	1.7
A-2	1.2
[illegible]	0.8
B-2	0.6
C-1	0.4
C-2	0.3

Recirculating Gravel Filter (4.21)

- A type of pre-treatment that recirculates effluent through a gravel bed prior to discharge to a drainfield.
- Consists of a recirculation tank to mix treated and untreated effluent and a pressurized bed over a minimum of 24” of pea gravel.
- Designed to recirculate at a 5:1 to 7:1 ratio of treated to untreated effluent.
- Decreases the required effective soil depth to limiting layers (ground water, fractured rock, etc), but NOT horizontal setbacks (surface water, wells, etc.) ★
- Contract with Service Provider required for all RGF systems permitted after 7/1/17.





Recirculating Gravel Filter (4.21)

System Design:

1. **Filter media must meet requirements for pea gravel (filter) and drainrock (underdrain).**
2. **The minimum recirculation tank is 2X daily flow.**
3. **Sized at 5 g/day/ft^2, smaller footprint than intermittent sand filter**
3. **Filter left open to atmosphere to allow gas exchange.**
4. **The filter container constructed of reinforced concrete or flexible liners equivalent to least 30 mil PVC** ★

Decreased Effective Soil Depths

Limiting Layer	Flow <2,500 GPD	Flow ≥2,500 GPD
	All Soil Types	All Soil Types
Impermeable Layer	2	4
Fractured Rock or Very Porous Layer	1	2
Normal High Ground Water	1	2
Seasonal High Ground Water	1	2

Increased Loading Rates

Soil Group	Gallons/ft^2/Day
A-1	1.7
A-2	1.2
B-1	0.8
B-2	0.6
C-1	0.4
C-2	0.3

Extended Treatment Package System (ETPS) (4.8)

1. DEQ Approval
    1. Provisional-Effluent sampling to demonstrate performance
    2. General-No effluent sampling unless required by permit

2. Owner must contract with licensed Service Provider

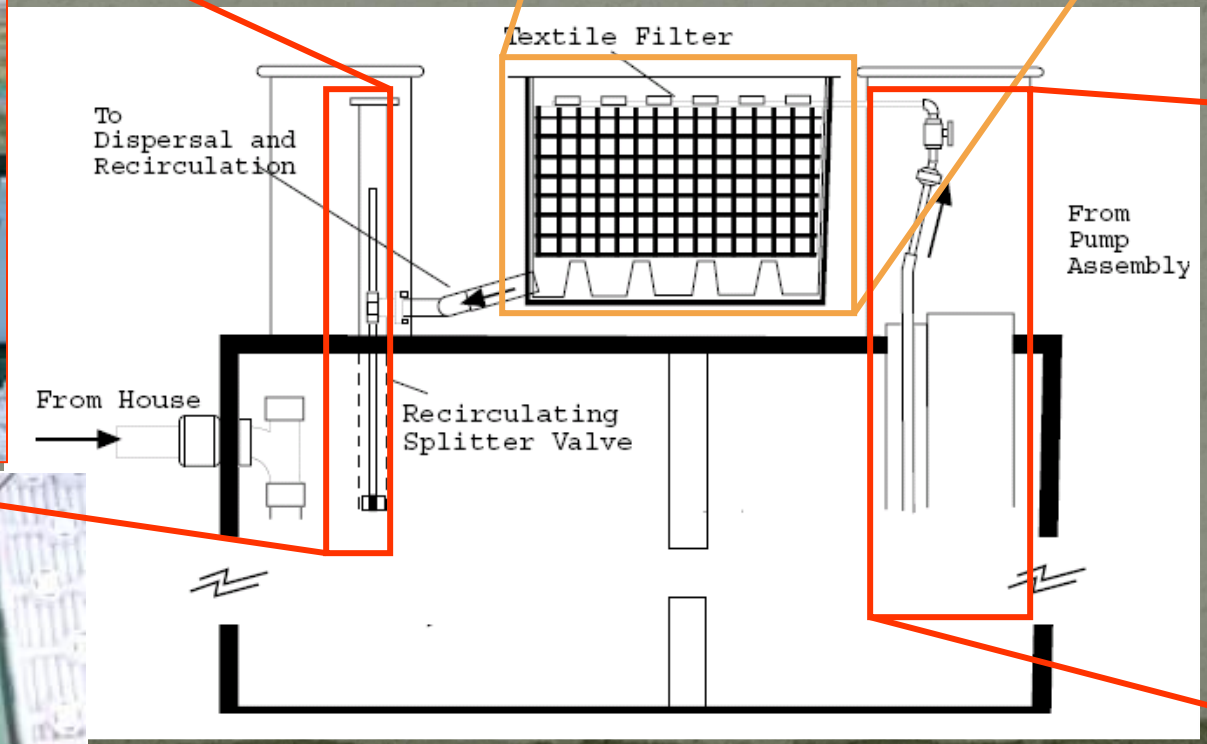
3. Annual reports submitted

by Service Provider

ETPS/IS Setback Reductions

Limiting Layer	Soil Group A	Soil Group B	Soil Group C
Impermeable Layer	2	2	2
Fractured Rock or Very Porous Layer	1	1	1
Normal High Ground Water	1	1	1
Seasonal High Ground Water	1	1	1

Extended Treatment Package System



Service Providers (1.6)

- Replaces the O&M Entity model for ETPS management
- Designed to give property owners options of providers
- All owners of ETPS and RGF (permitted after 7/1/17) systems must contract with a licensed service provider
  - Contract not required prior to permit issuance
  - Service Provider list maintained by DEQ and Health Districts
- Service Provider endorsement is added to complex installer license
  - Passing score on SP exam for general SP approval, refresher every 3 years
  - Manufacturer-specific training required for each ETPS type contracted to work on
  - Annual reports submitted by Service Provider for each system they maintain

Drip Distribution 4.5

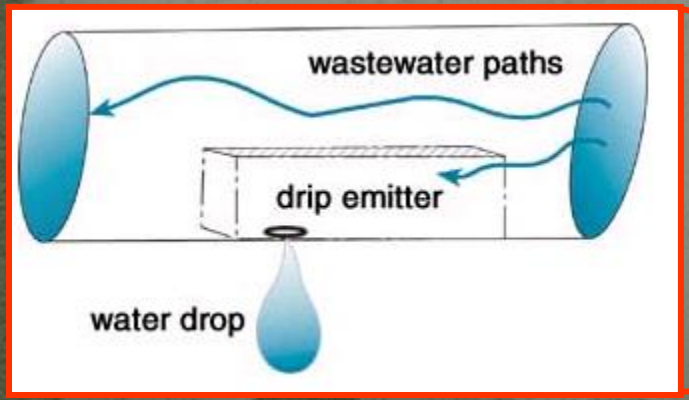
Description: A small-diameter flexible piping network with emitters to discharge filtered effluent into the root zone of the receiving soils.

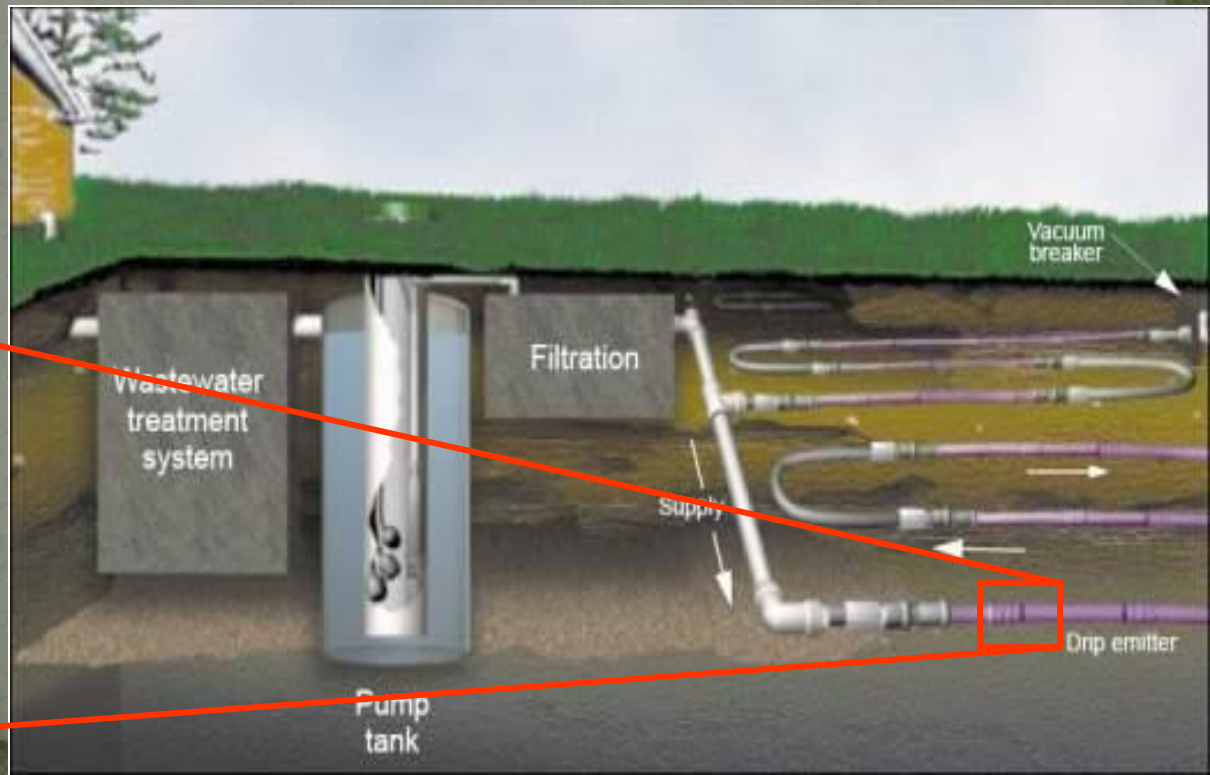
Benefits of Drip Disposal:

- **Requires less overall soil depth than other systems since effluent is discharged as shallow as 6" into the soil.**
- **Requires Less area than conventional drainfield systems.**
- **Disposal in root zone provides better treatment of effluent**

Site Limitations:

- **Now allowed up to 45% slope**
- **Avoid low lying areas or areas that collect water.**
- **Must be placed in undisturbed soil.**

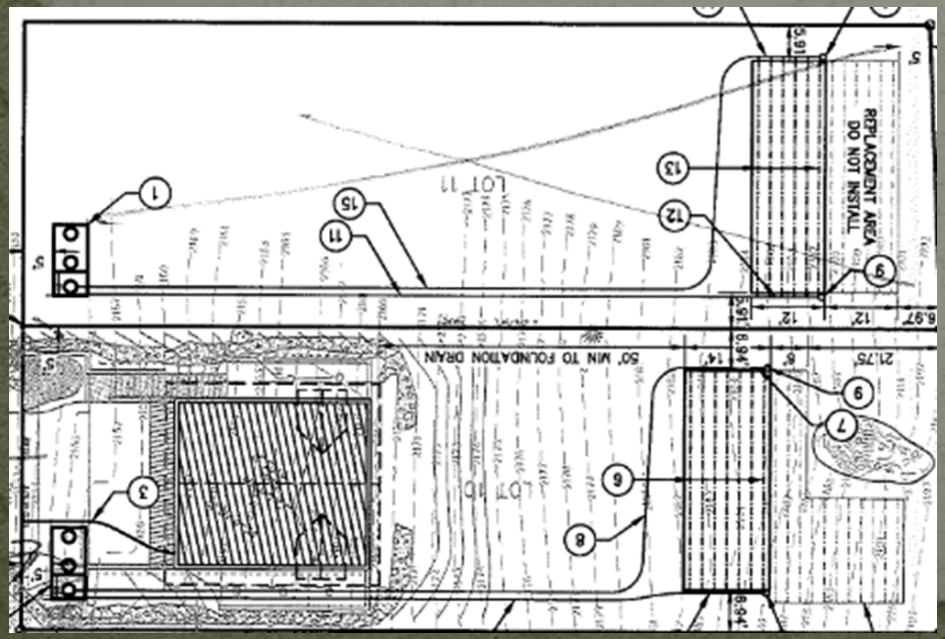




Drip Distribution System

Design:

1. Application areas up to 2 ft²/ft of drip irrigation line may be used.
2. Drip lines may be placed on a minimum of two-foot centers.
3. Drip lines are placed directly in native soil at a depth of 6 to 18 inches with a minimum final cover of 12 inches.
4. Septic tank effluent is requires a 100-micron or smaller disk filter prior to drip field. Manufacturer's recommendations must be followed for all components.
5. Drip laterals are flushed to prevent biofilm and solids build up in the piping network. Drip systems without pre-treatment are flushed more often.
6. Minimum of two vacuum relief valves per zone. Valves are located at the highest points on both the distribution and return manifolds. Vacuum relief valves are located in a valve box, adequately drained, and insulated to prevent freezing.



Drip Distribution System

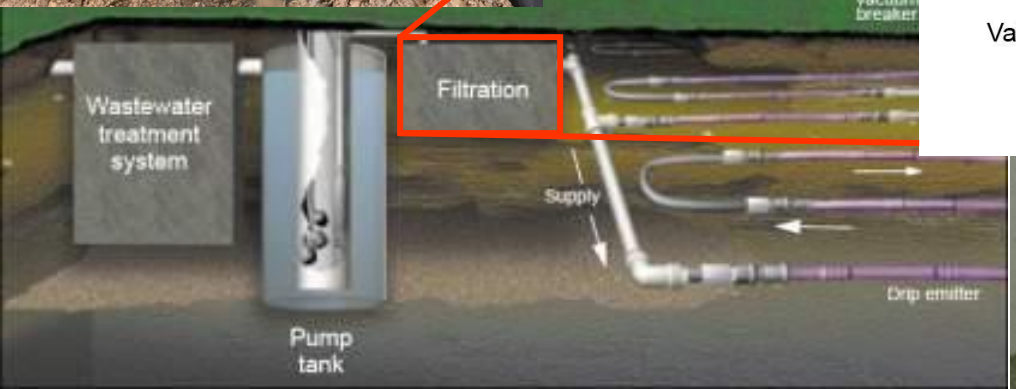
7. Pressure regulators/pressure compensators are to be used on sloped installations. Pressure is to be between 25 and 40 psi. Pressure regulators/pressure compensators are located at the manifold of each zone, Pressure compensating emitters must be used on sloped installations.

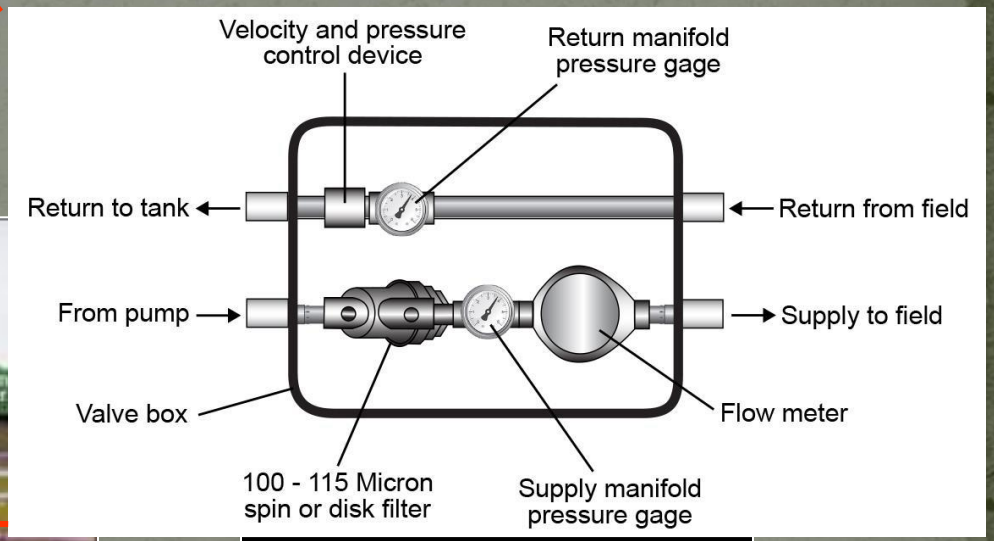
8. Return manifold is required to drain back to the septic tank.

9. Timed dosing is required. Timed or event counted backflushing of the filter is required.

10. Filters, flush valves, and pressure gauge may be placed in a head works (between pump chamber and drip field). Each component is required to be insulated to prevent freezing.

11. System must be designed by an Idaho licensed professional engineer.



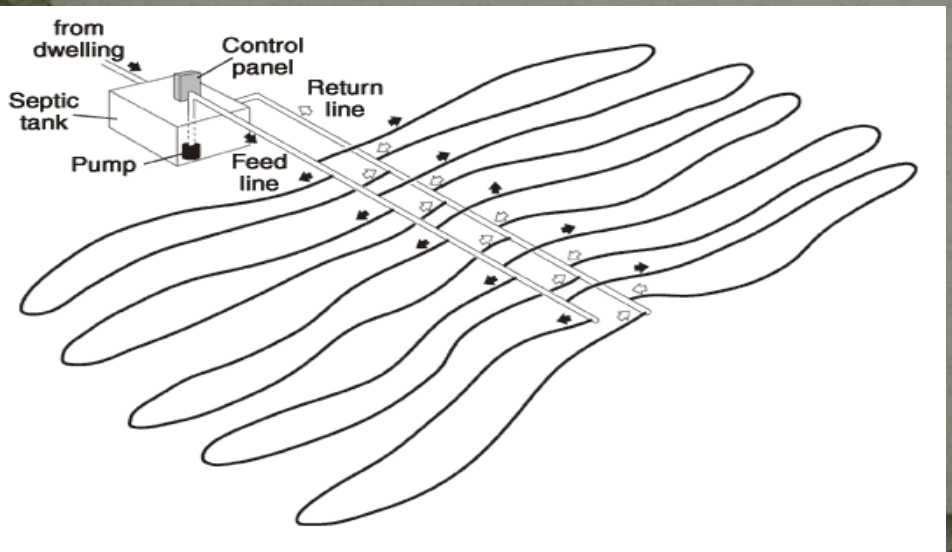


Sample Headworks

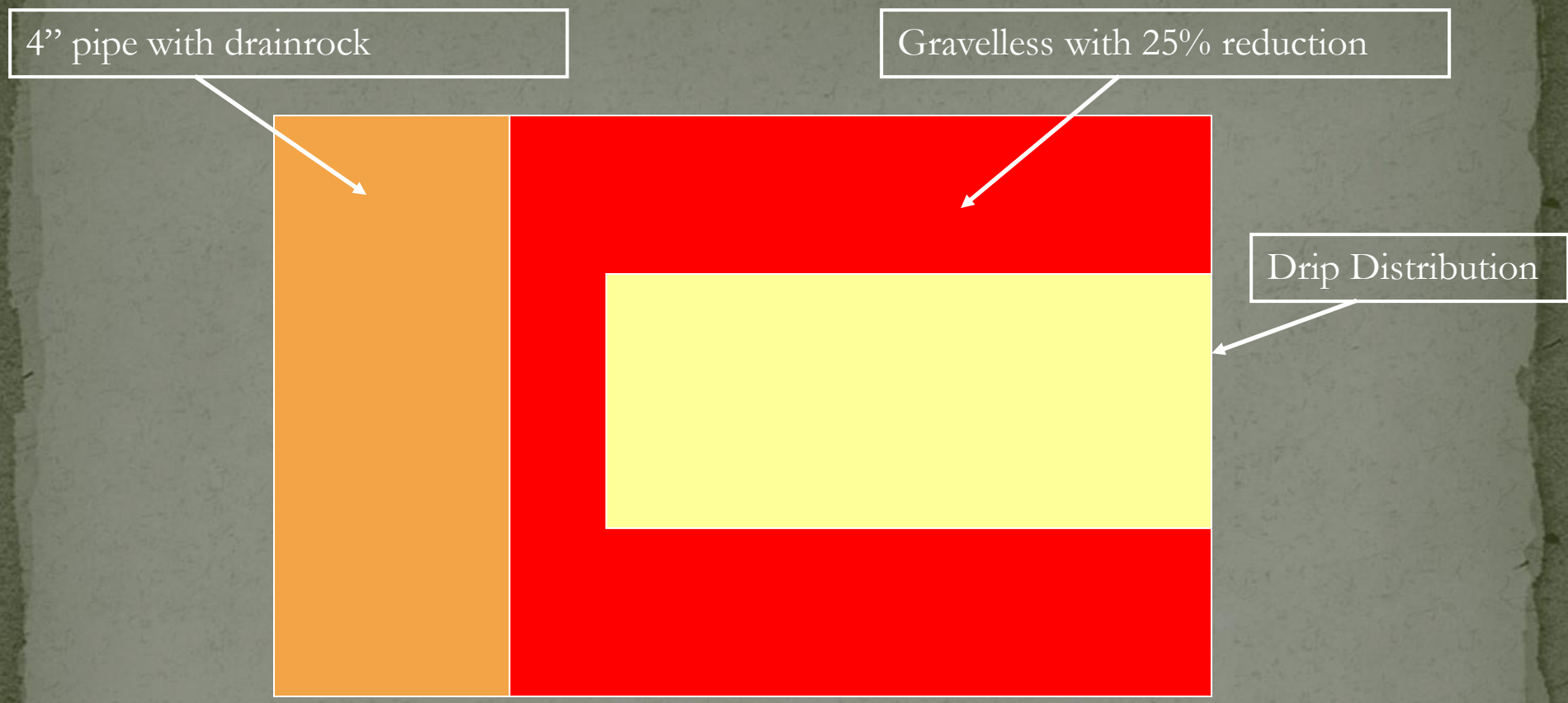
Drip Distribution System

Construction:

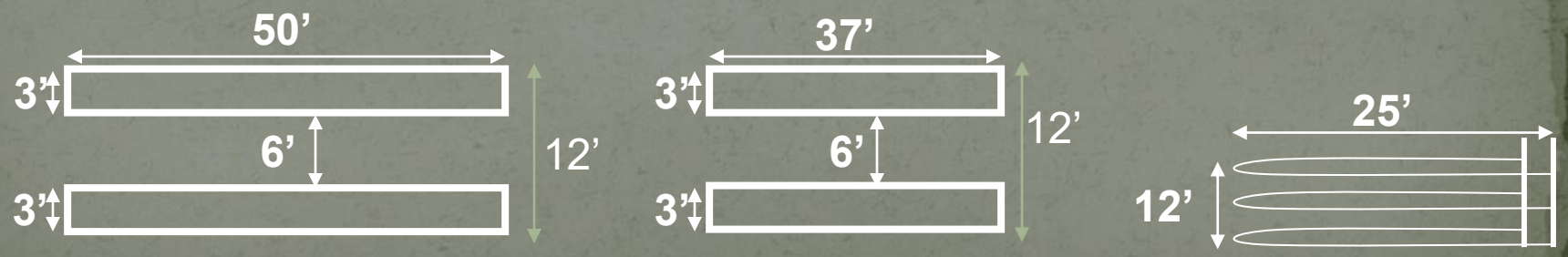
1. **No wet weather installation.**
2. **No construction activity or heavy equipment on the drainfield area other than minimum to install the drip system. Do not park or store materials on drainfield area.**
3. **Horizontal spacing between drip lines installed per plans (typically 2' spacing)**
4. **All PVC pipe and fittings PVC sch 40 type 1 rated for pressure applications. All glued joints cleaned and primed with purple (dyed) PVC primer prior to being glued.**
5. **All cutting of PVC pipe, flexible PVC and/or drip tubing shall be accomplished with pipe cutters.**
6. **Once completed, drainfield area for shallow installations (less than 12 inches) are to be capped with 6-8 inches of clean soil and suitably revegetated.**



Drip Distribution System Comparison



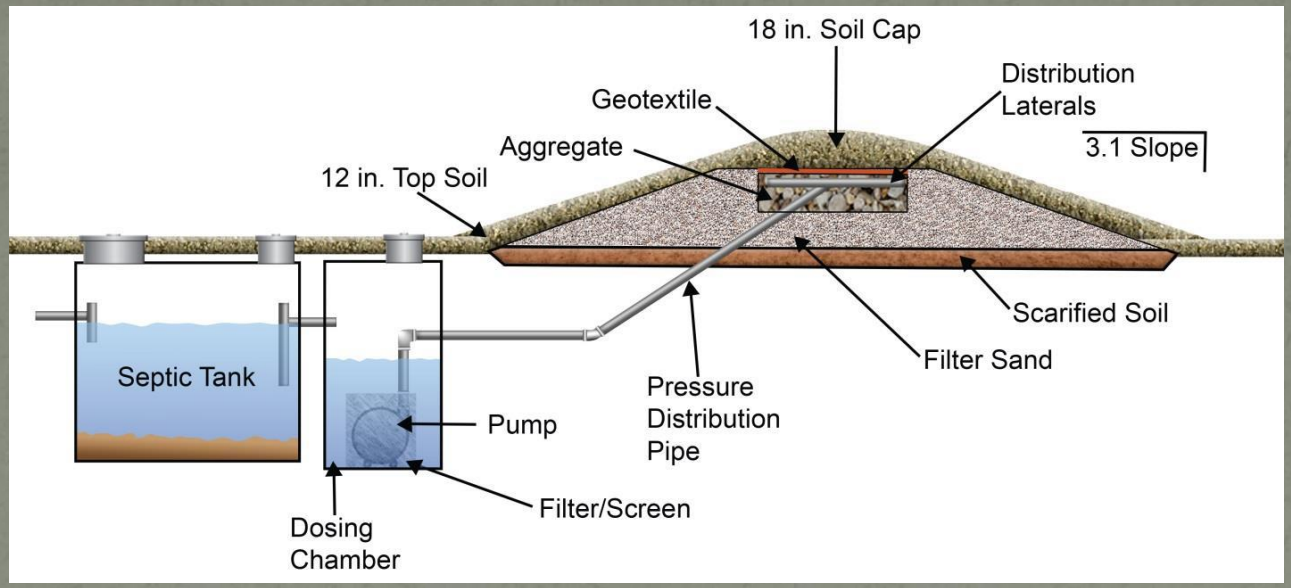
Example with 300 sq ft drainfield:



600 sq ft of space | **450 sq ft of space** | **300 sq ft of space**

Sand Mounds 4.24

Description: An elevated pressure bed built within a mound of medium sand that treats effluent before percolating through the soil.



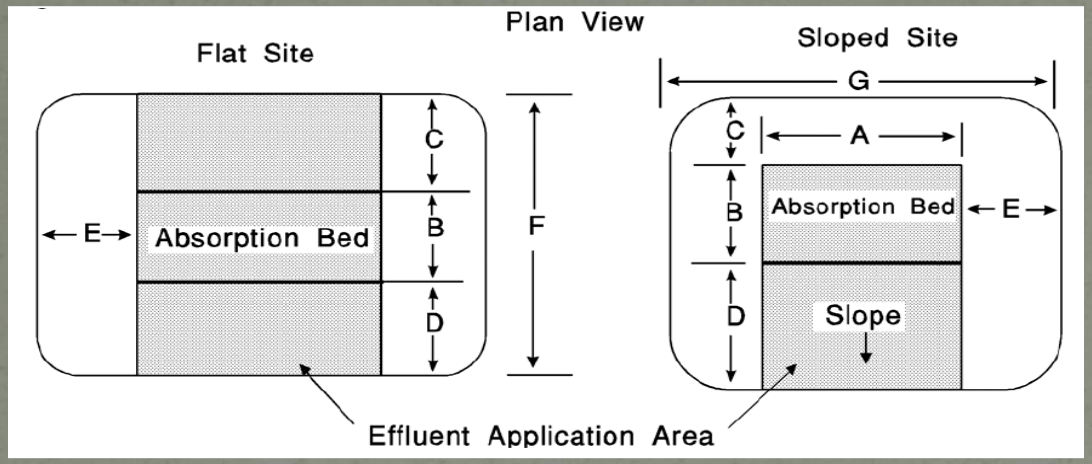
Conditions of Approval:

Soil Design Group	Extremely Impermeable Layer	Extremely Permeable Layer	Normal High Groundwater	Seasonal High Groundwater
12" of Filter Sand				
A,B	3	3	3	
C	3	2	2	
24" of Filter Sand				
All Soil Types	2	1	1	1
Maximum Slope of Native Ground				
Design Group	A	B	C-1	C-2
Slope (%)	20 ★	20	12	6

Sand Mounds

Conditions for approval (cont.):

- **Cannot be installed in flood ways, areas with large trees and boulders, in concave slopes, slope bases or depressions.**



Design:

1. **Bed design**: **TGM Update -**(Size at 1.5 times the wastewater daily flow)****
   a. **Only absorption beds may be used. Beds should be as long and narrow as practical.**
   b. **b. Sand bed sized at 1.0 gallon per square foot.**
   c. **Absorption beds for high strength wastewater sized at 0.5 gallons per square foot (0.5 g/ft^2).**
   d. **The bed must be filled with nine inches (9") of clean drainrock.**

Sand Mounds

2. <u>Sand fill design</u>:

a. Filter sand must be ASTM-C-33 from approved source.

b. Minimum of 1 or 2 feet of sand below bed depending on design

c. Flat sites: The effective area will be A x (C+B+D). Sloped sites: The effective area will be A x (B+D).

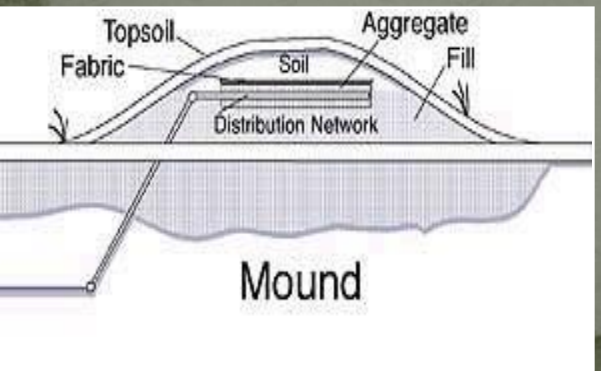
e. *Effluent Application Area = Design Flow (gpd)/ Soil Application Rate (gpd/sq ft)*

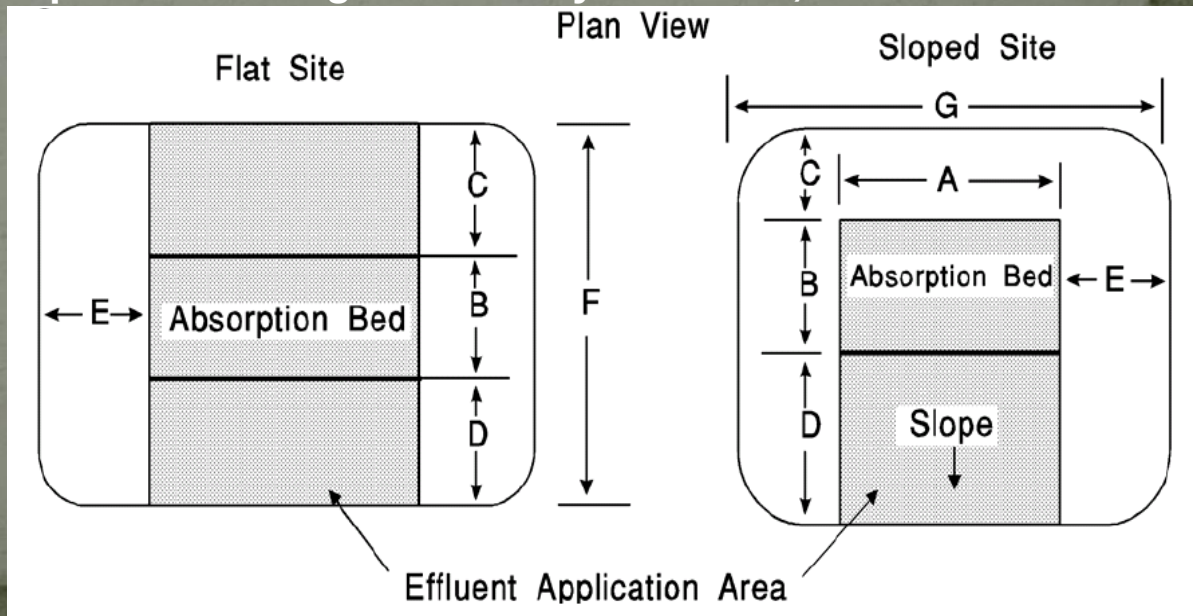
f. The slope of all sides must be 3 horizontal to 1 vertical (3:1) or flatter.

g. The sand mound must be covered with a minimum topsoil depth of twelve (12) inches with center of the mound crowned to eighteen (18) inches. Topsoil and soil cap must be a sandy loam, loamy sand, or silt loam.

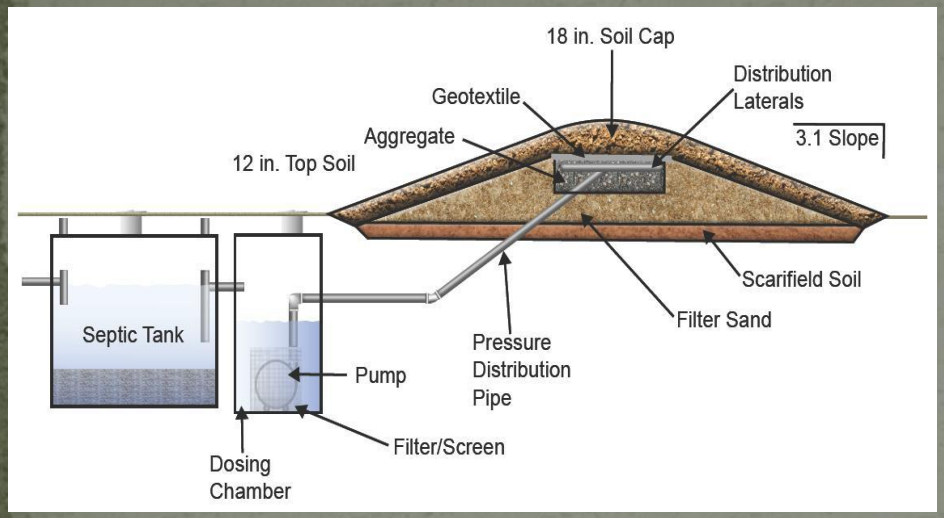
h. The mound should be protected to prevent damage caused by vehicular, livestock or excessive pedestrian traffic.

i. The sand fill area must be as long and narrow as practical.





Sand Mounds



Construction:

1. The **pressure line from the dosing chamber should be installed first** and should be located upslope of the mound. If located downslope, consider using anti-seep collars on trench.

2. Grass, shrubs, and trees cut close to ground surface and removed. Remove extremely heavy vegetation or organic mat prior to **scarification and replacing with filter sand** (typically 3-4"). The area of the sand fill scarified or ripped to 6" to 8".

3. The sand fill is then placed and shaped before it freezes or rains. No pneumatic-tired vehicles on the sand to **prevent the soils from being compacted**. For sloped sites, all work is done from the up-slope side.

Sand Mounds

Construction (CONT.):

4. The absorption bed will be shaped and filled with clean drainrock.

5. After leveling the drainrock, install pressure manifold, then test for uniformity of distribution.

6. Geotextile must be placed over the absorption bed and backfilled with twelve (12) inches of soil on sides and shoulders, and eighteen (18) inches of soil on the top center. Soils types must be sandy loam, loamy sand, or silt loam.

7. Typical lawn grasses and other appropriate low-profile vegetation should be established as soon as possible. Do not plant trees or shrubs on the mound. Trees with roots that aggressively seek water must be planted at least fifty (50) feet from the mound (poplar, willow, cottonwood, maple, elm, etc…).

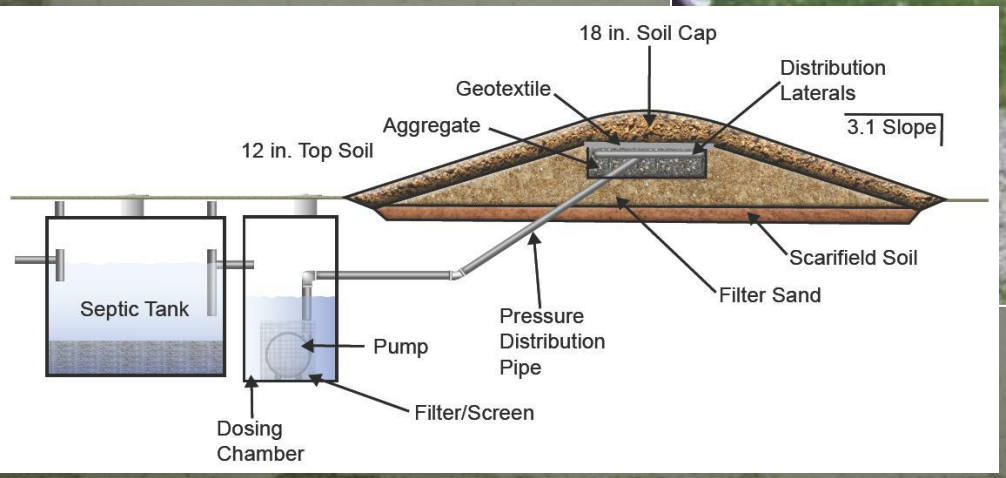
8. Two standpipes must be installed within the bed, down to the fill sand, so that ponding water can be measured periodically.

Sand Mounds

Inspections:

1. Site inspections must be made before, during and after construction.

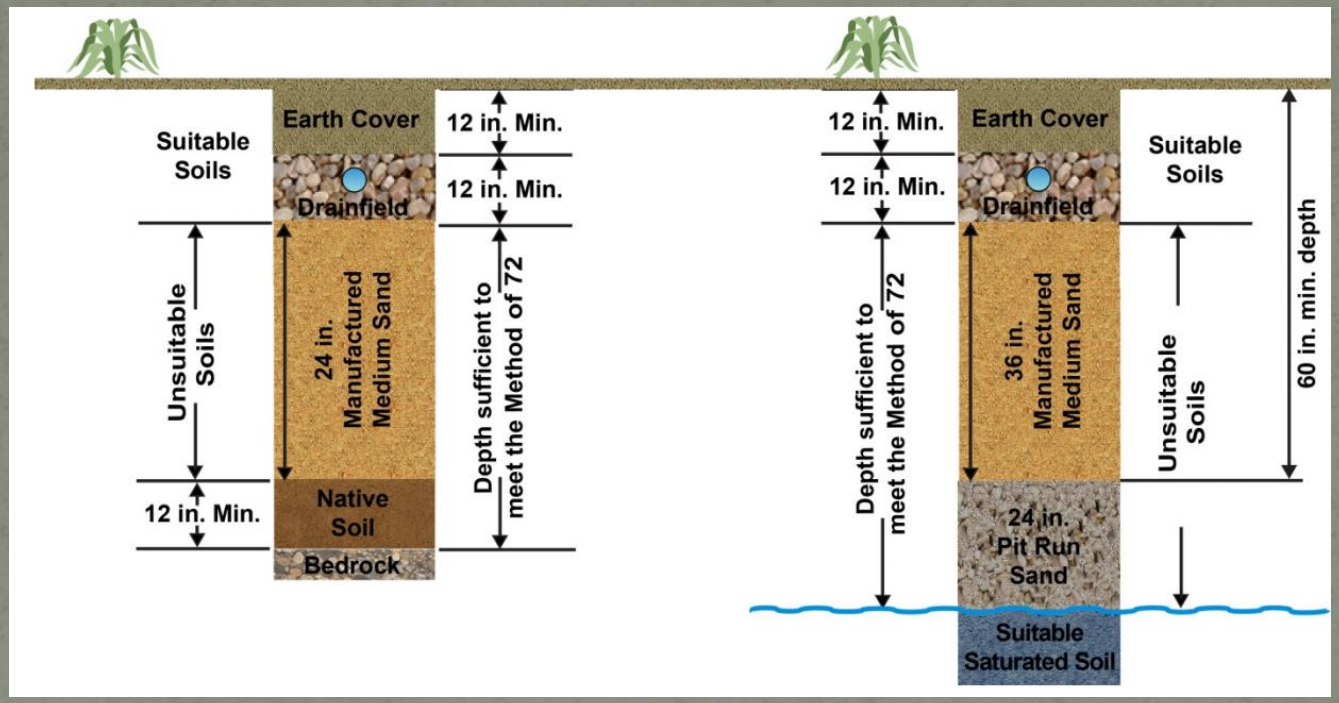
2. Engineer must certify that the system has been installed per the approved plans.



Orifice pressure test

In-trench sand filter (4.23)

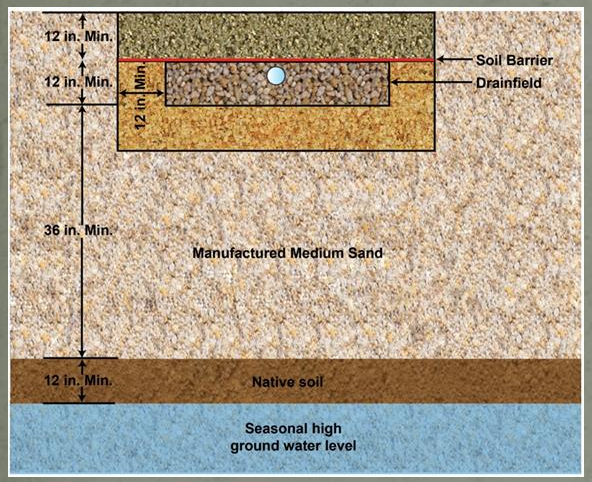
Drainfield or absorption bed installed over a filter of ASTM C-33 sand



<u>Standard in-trench sand filter</u>: Used to bridge unsuitable layers in the soil

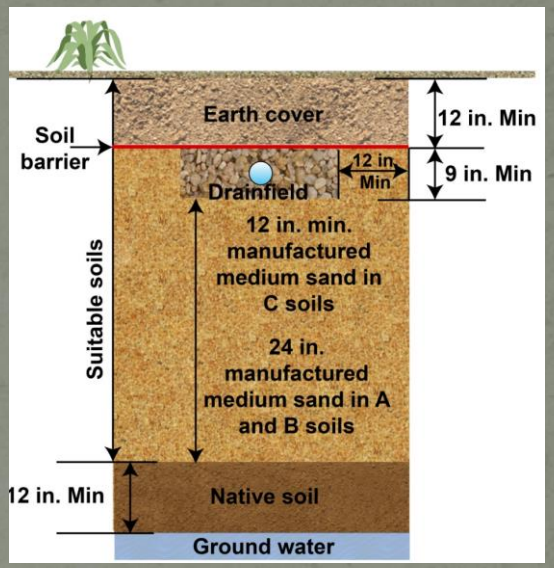
In-trench sand filter (4.23)

Enveloped in-trench sand filter Used to provide treatment in coarse and very coarse sands & gravel



Gravity disposal (4.23.3)

- Minimum of 36” sand
- Drainfield surrounded be 12” sand

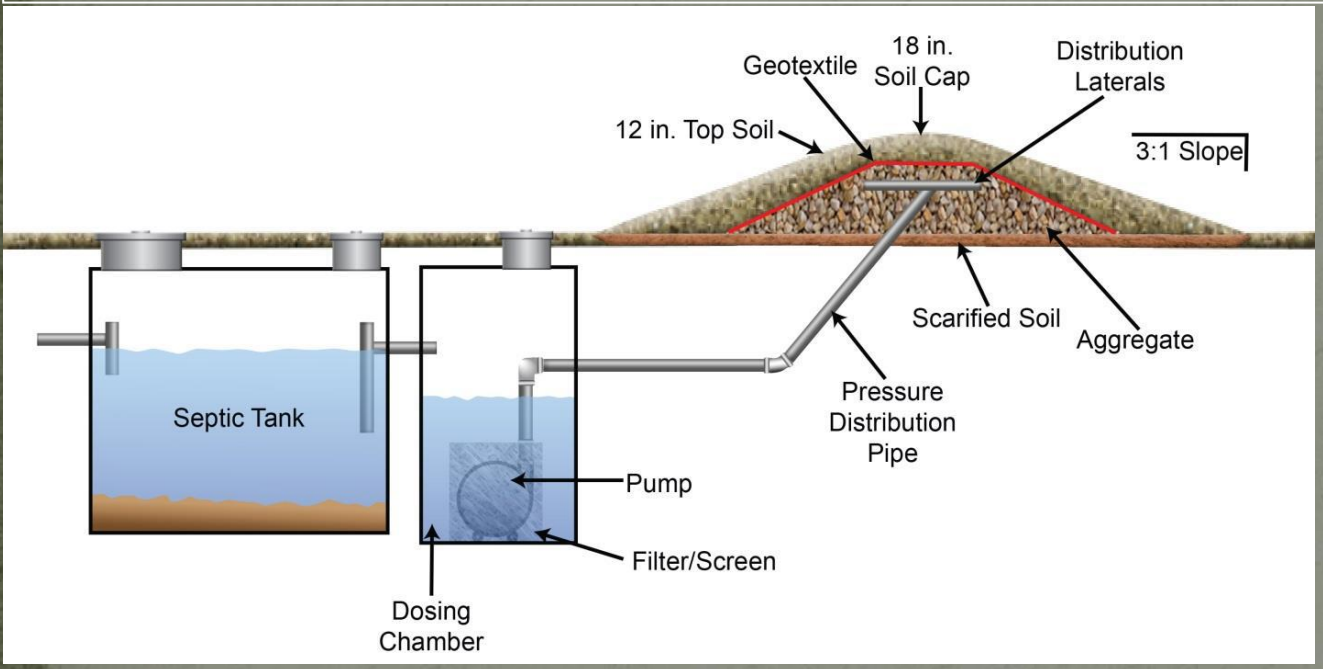


Pressure disposal (4.23.3.2.3)

- Minimum sand depends on soil type:
  - 12” in C soils
  - 24” in A and B soils
- Drainfield surrounded by 12” sand

At-Grade Soil Absorption System (4.2)

Description: An elevated pressure bed constructed over aggregate (drainrock) above the native ground surface.

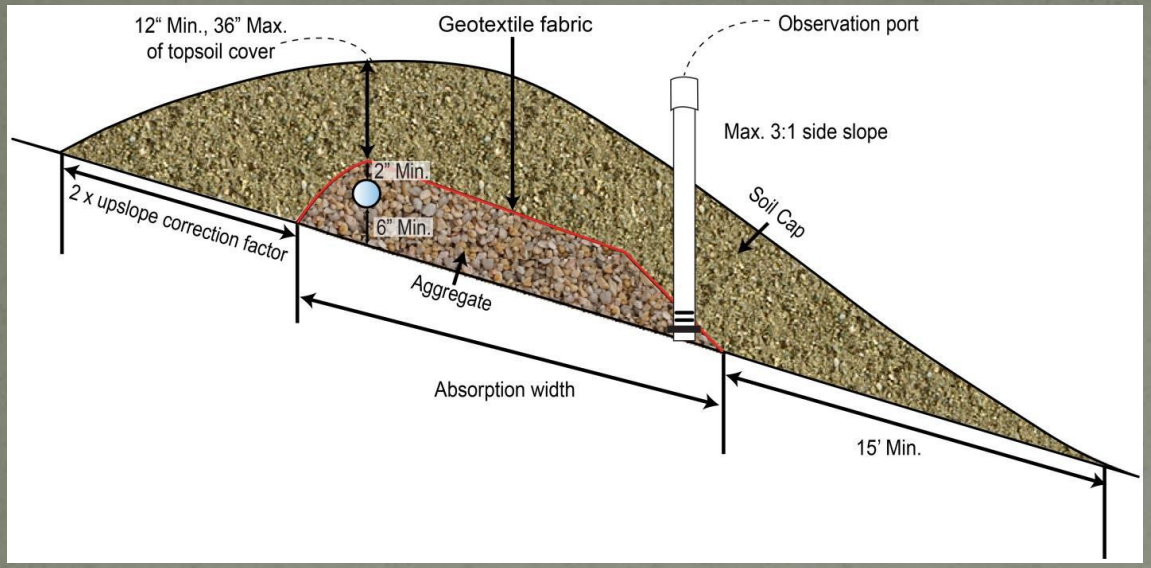


Approval Conditions:

- Designed by a licensed Engineer
- Slope Limitations:

Design Group	A	B	C-1	C-2
Slope (%)	20	20	12	6

At-Grade Soil Absorption System (4.2)

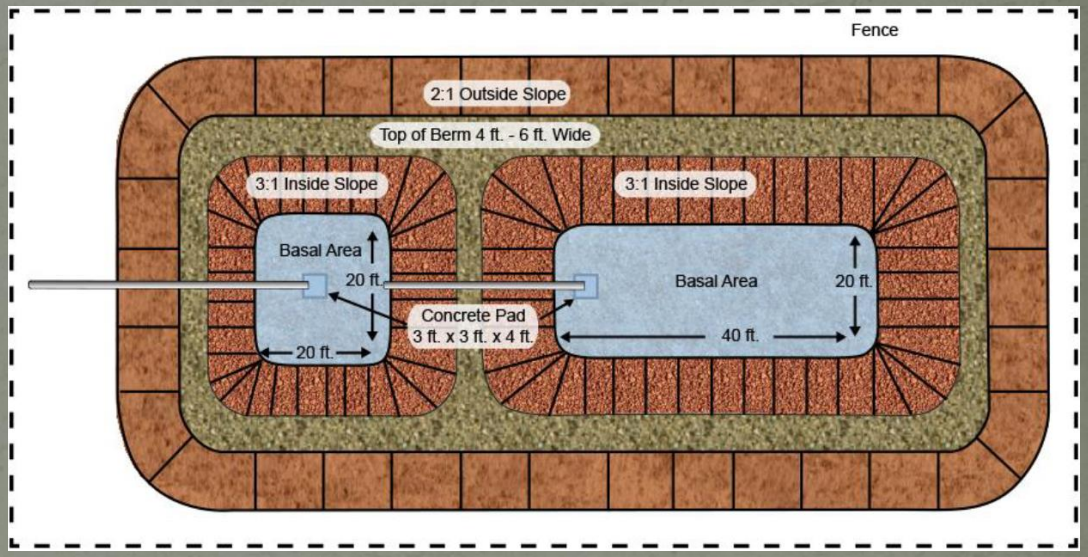


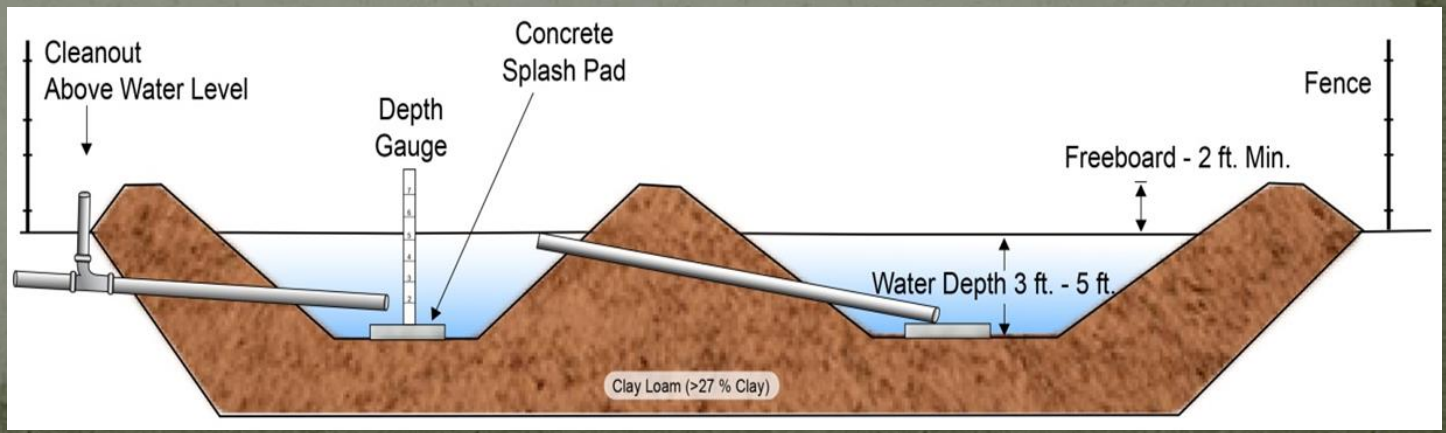
<u>System Construction</u>:

- Unique design for each application, pre-construction meeting with engineer & PHD is strongly recommended
- Sized at 1.5 X loading rate for a safety factor
- Minimum of 6" aggregate below pressure bed, 2" above
- Minimum soil cap of 12", 18" over center on flat sites to promote runoff, no more than 36" cover.
- Operation and Maintenance manual should be provided by design Engineer

Two Cell Infiltrative Lagoon (4.28)

- Use in soils with **high clay** content.
- Cells would have to be placed at least **100' from the property line and at least 300' from a neighboring dwelling**. Minimum **5 Acre lot**.
- Max slope 6%
- Inspections during and after installation

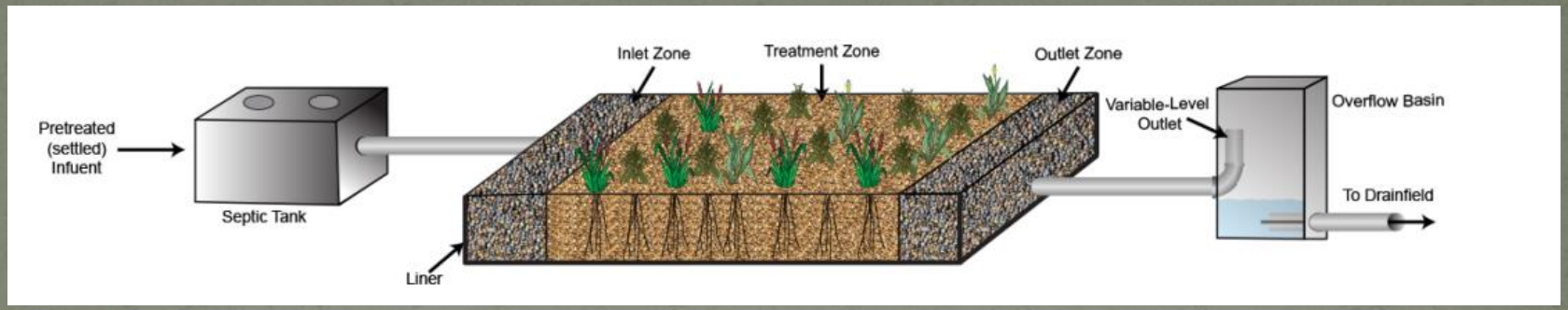




Two Cell Infiltrative Lagoon

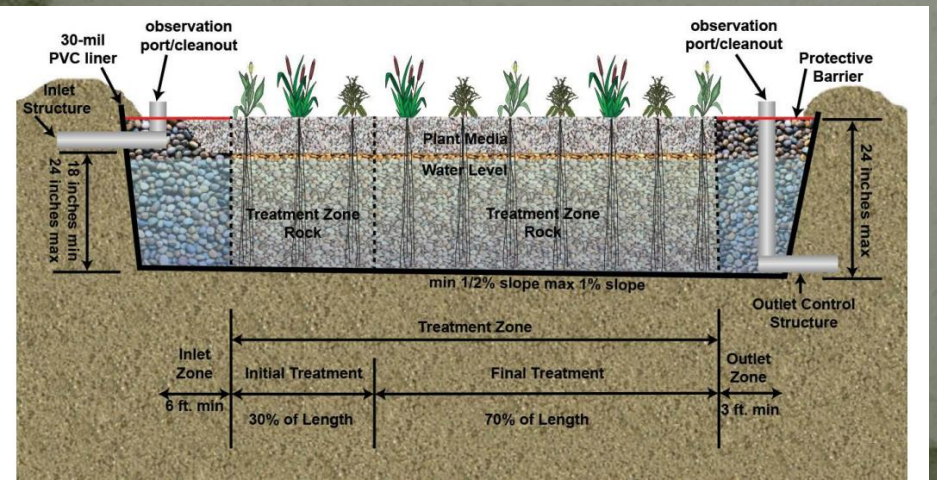
- May require Curtain Drain/Cutoff trench or Diversion Ditch

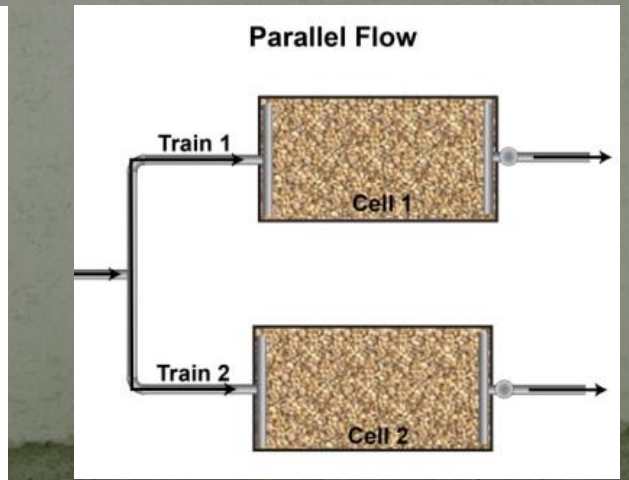
Constructed Wetlands (4.27)

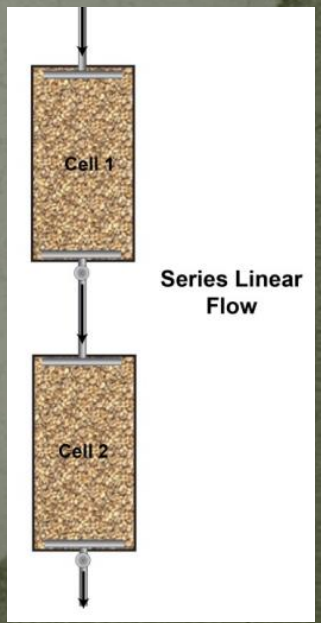


Wastewater flows through lined constructed wetland cell to treat effluent before disposal in a drainfield.

- Must be designed by a licensed engineer
- Same setbacks as a septic tank
- Must be at least 12” above groundwater

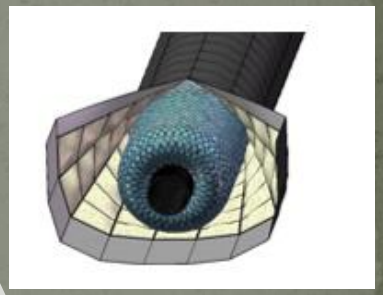






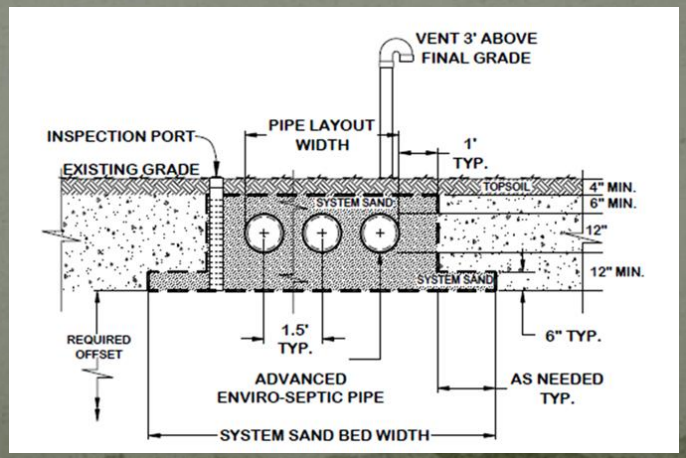
Propietary Wastewater Treatment Products (1.4.2.4)

- New TGM section for combined treatment and disposal technologies
- Allow for same reduction in effective soil depth as pre-treatment (Table 4-21)
- Use pre-treatment loading rates (Table 4-22)
- Approval Based on NSF40 testing and TGC review
- Every technology will have a specific manual separate from TGM
  - Fully understand the requirements before installing
  - Pre-construction meeting with installer highly recommended
  - Very detailed site plans required to ensure system is designed properly



Presby Enviro-Septic

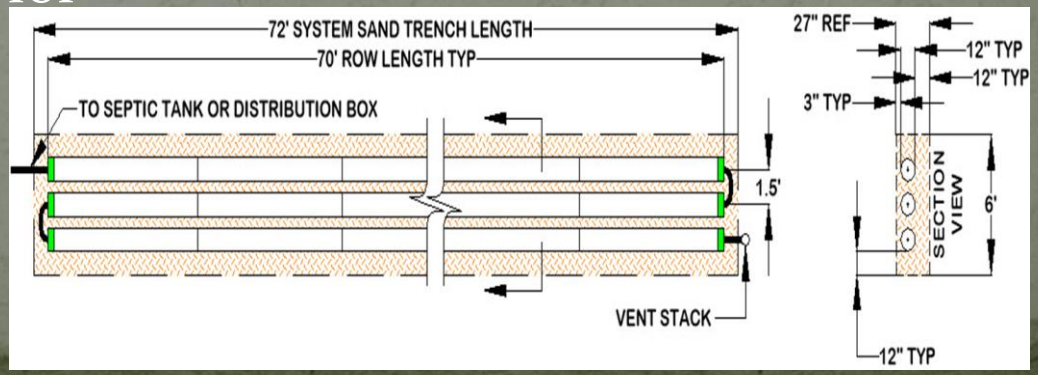
- Approved as a proprietary product with pre-treatment reductions.
- Trenches or beds with 12" diameter Presby pipe on 12" of ASTM C-33 sand.
- Complex system, but engineering not required.
- Idaho-specific manual, available from manufacturer or DEQ website.
- Every system design unique-work closely with PHD.



Presby continued…..

Basic requirements:

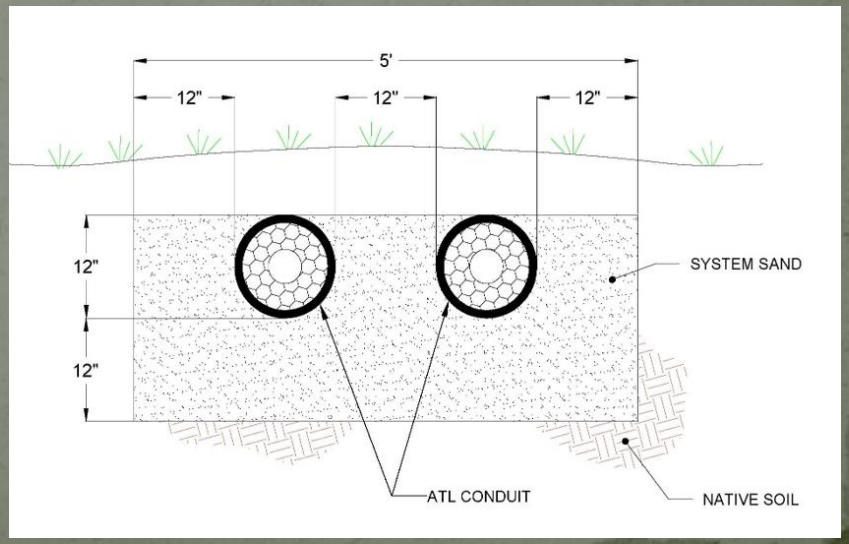
- Minimum of 50 lineal feet of Presby pipe/bedroom
- Absorption area based on soil type & design flow
- ASTM C-33 sand from approved source
- Cannot be pressurized
- Tank or d-box required on pump systems to slow flow
- Vented to allow O_2 through system
- Beds allowed if no room for trenches



Infiltrator ATL

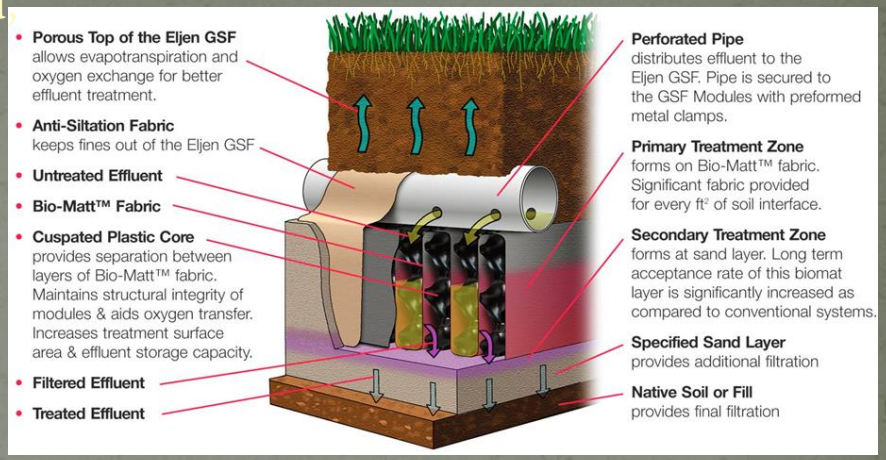
Installation Guidelines

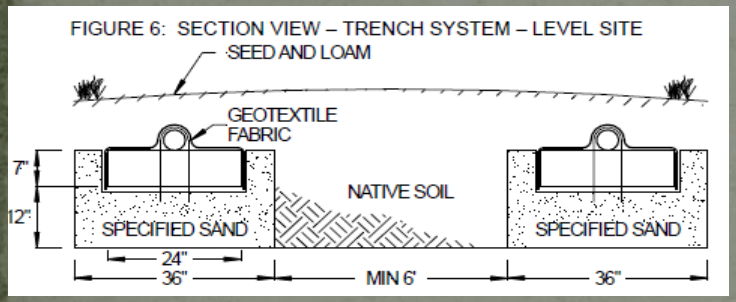
- Can be used in standard and steep slope systems
- Minimum 70 feet of ATL pipe per bedroom
  - Absorption area still meets Idaho sizing criteria (gallons per day/loading rate)
  - Can be used in trenches or beds (if space is limited)
- Can be pressurized
- Size limited to 1500 gpd per module
- Complex System, engineering not required (unless >1500 ft^2)
- Sand/Soil interface is design boundary
- ASTM C-33 Sand from approved source

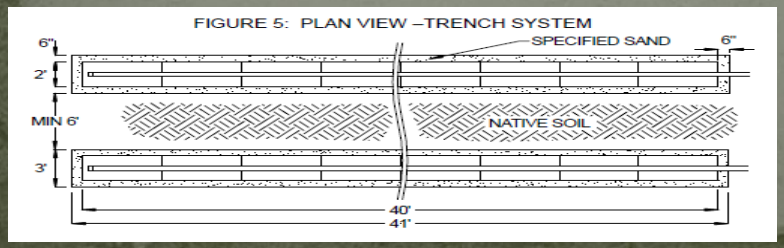


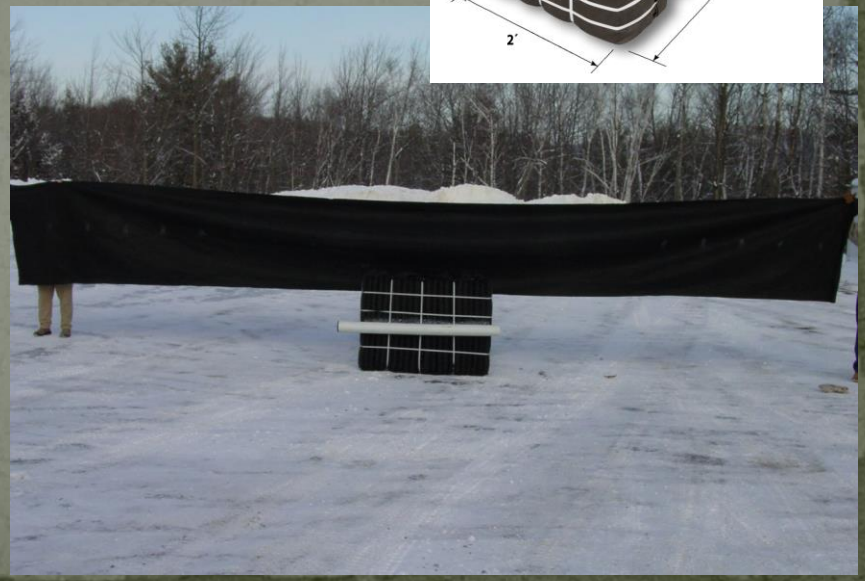
Eljen GSF

- Eljen modules placed 12" of ASTM C-33 sand and perforated pipe above to distribute effluent.
- Can be used in capping fill, steep slope trenches, and sand mounds.
- Can be pressurized
- Venting required > 18" depth
- Minimum of 6 modules/bedroom



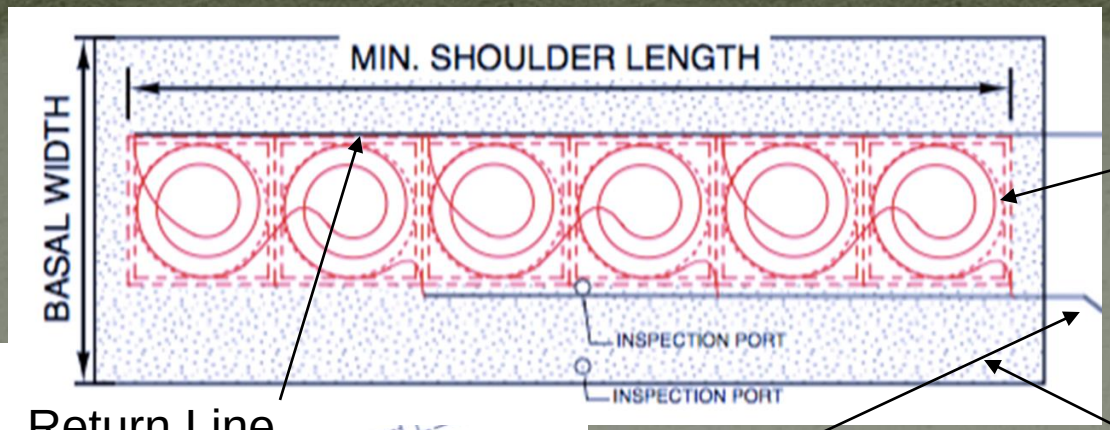






Oscar-II Treatment System

- Coiled drip tubing over 12” of ASTM-C33, 6” of sand cover.
- At-Grade system: Can be installed directly on ground surface
- Can be used on slopes up to 20%
- Effluent is time-dosed and flushed automatically
- Engineering <u>not</u> required if:
  - Elevation and distance pumped within pre-engineered parameters (table in manual)
  - System for 350 gpd or less (5 bedroom residence)

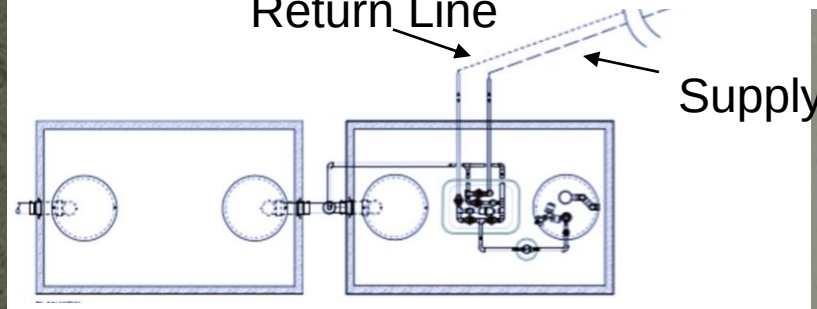


Hydraulic Layout

Return Line

Supply Line

Absorption area



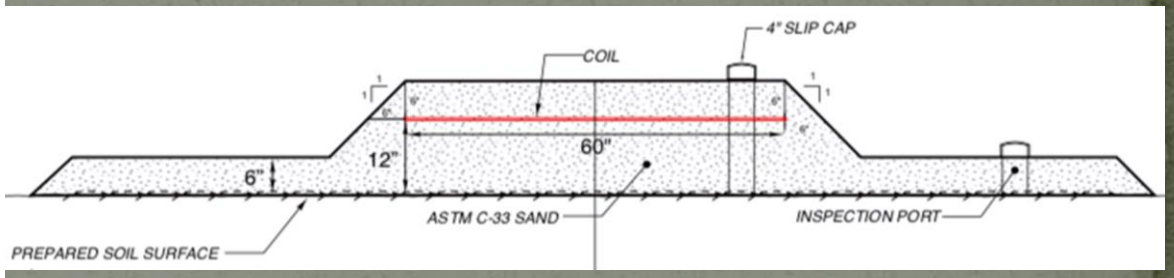
Septic Tank

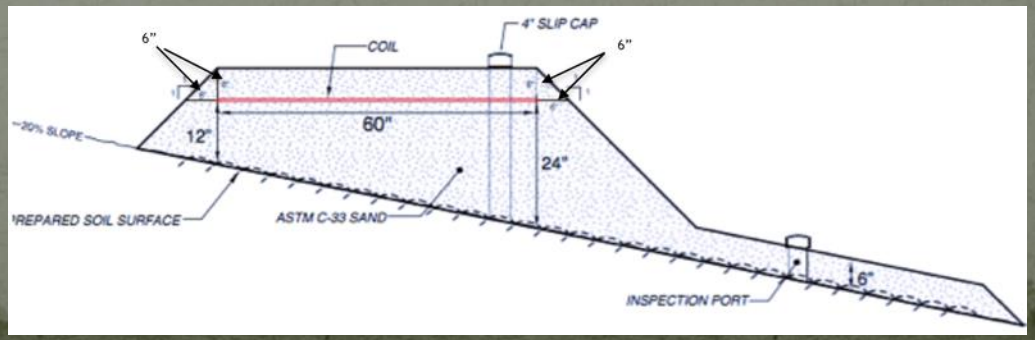
Pump Chamber

Table I: Total Dynamic Head Chart

Elevation lift in feet	Supply	Line	Length	in Feet				
			1" Sch 40					
	20'	40'	60'	80'	100'	150'	200'	300'
2	4'	6'	7'	9'	10'	14'	18'	26'
5	7'	9'	10'	12'	13'	17'	21'	29'
10	12'	14'	15'	17'	18'	22'	26'	34'
15	17'	19'	20'	22'	23'	27'	31'	39'
20	22'	24'	25'	27'	28'	32'	36'	44'
25	27'	29'	30'	32'	33'	37'	41'	49'
30	32'	34'	35'	37'	38'	42'	46'	54'
35	37'	39'	40'	42'	43'	47'	51'	59'
40	42'	44'	45'	47'	48'	51'	56'	64'
45	47'	49'	50'	52'	53'	56'	61'	69'
50	52'	54'	55'	57'	58'	61'	66'	74'

Note: Installers must verify that the total dynamic head of the supply line falls within the blue shaded areas. Outside the shaded area an Idaho PE must design system.





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Health District Website: http://www.phd1.Idaho.gov

TGM Website:
http://www.deq.Idaho.gov/waterquality/wastewater
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