Conventional Onsite Wastewater Systems

18 AAC 72 Regulations
Effective Oct. 1, 2023

Alaska Department of Environmental Conservation
Division of Water, Water Quality Program
Engineering Support and Plan Review

18 AAC 72 Wastewater Treatment and Disposal

Covers both large and small systems, point sources and non-point sources, domestic and non-domestic wastewater by:

- Specifying minimum treatment requirements
- Establishing minimum separation distance requirements and minimum construction standards
- Requires registration or approval for ALL wastewater systems; may also require a discharge permit
- Allows waivers to be evaluated and approved for deviations from some regulatory requirements

18 AAC 72 Wastewater Treatment and Disposal

Webinar Focus: Conventional Wastewater Systems

Target Audience: Certified Installers and Engineers

What you will learn:

- Detailed changes in regulation affecting onsite private water systems
- Detailed changes in regulation affecting conventional onsite wastewater system construction and installation

Regulations Overview

- Alaska DEC authority comes from **AS 46.03**
- Regulations that directly apply to wastewater systems:

  18 AAC 15 – *Administrative Procedures*

  18 AAC 70 – *Water Quality Standards*

  18 AAC 72 – *Wastewater Treatment and Disposal*

  18 AAC 83 – *APDES*

- Regulations that may also apply to wastewater systems:

  18 AAC 80 – *Public Water Systems*

  18 AAC 30 – *Environmental Sanitation*

  Contaminated Sites, Underground Storage Tanks

Overview of restructure

- Article 1 and 2 applies to BOTH domestic and non-domestic wastewater systems
- Article 3 remains fully repealed (subdivision plan reviews)
- Article 4 continues to address requirements for Certified Installers and Approved Homeowners
- Article 5 and 6 were repurposed to cover conventional and alternative wastewater systems
- Article 7 continues to address to general items and fees
  - Definitions updated

See the Crosswalk document available at septic.alaska.gov

Separation Distances to Drinking Water Systems

Not much has changed. Amended regulations clarified some separation distance requirements.

Public Water Systems – 18 AAC 80.020

Private Water Systems – 18 AAC 72.100

Minimum Separation Distance table in New OWSIM

Public Water Systems

Changes to Table A at 18 AAC 80.020

- **sewer line, and sewer line cleanout – 200 feet**
  - Clarified that this separation distance requirement applies to all sewer lines and cleanout is one on a sewer line
  - Sewer line is defined at 18 AAC 72.990(86) – a pipe or conduit that carries domestic or nondomestic wastewater but does not include a private sewer line or sewer service line, or an open-ended culvert or unlined ditch for stormwater only
- **sewer main, wastewater holding tank – 200 feet**
  - Sewer main was a previously undefined commonly used term
  - Clarified holding tank was any tank storing wastewater

Public Water Systems

Changes to Table A at 18 AAC 80.020

- **<u>sewer service line, drain (buried in the ground)</u> – 100 feet**
  - Added the term "sewer service line" for clarification and is treated the same as a private sewer line for separation distances
  - Added the term "drain" and distinguished that the separation distance requirement applies to drains that a buried below the ground surface
    - Drain is defined at 18 AAC 72.990(34) and means a line in or beneath a building that receives and carries sewage to a sewer service line or private sewer line
    - Does not apply to drains in a crawl space or above ground below a building

Private Water Systems

New: 18 AAC 72.100

- Separation distance requirements for private water systems previously contained at 18 AAC 72.020
- Most separation distance requirements remain the same

Private Well	
To Sewer Line, including community sewer line and sewer main	
100 horizontal feet	Previous: 75 horizontal feet, except cleanouts and manholes required to be 100 feet
To wastewater holding tank	
100 horizontal feet	Previous: 75 horizontal feet

Private Water Systems

New: 18 AAC 72.100 (b)

Private water lines and water holding tanks	
To septic tank, treatment tank, wastewater holding tank, lift station, community sewer line, land surface discharge or leach field	
5 horizontal feet	Previous: Same as UPC which requires 5 horizontal feet
To private sewer lines	
12 horizontal inches	Previous: Same as UPC which requires 12 inches and materials equivalent to water line
At locations where private water lines must cross, locate the water line above sewer line at least 12 vertical inches and joints at least 9 feet apart	

MINIMUM HORIZONTAL SEPARATION DISTANCES TO DRINKING WATER SYSTEMS

all horizontal separation distances must be measured from nearest edge to nearest edge

	Private Sewer Line[a] and Cleanouts, Basement Sump	Sewer Line[b] and Cleanouts, Manholes, Lift Station	Septic Tank, Wastewater Holding Tank, Lift Station, Manholes	Pit Privy, Soil Absorption System	Fuel Tank[c] and Lines	Drinking Water Treatment Waste disposal system	Other Sources of Contamination[d]
Public Water System	100 feet	200 feet	200 feet	200 feet	100 feet	100 feet	200 feet
Private Water System	25 feet	100 feet	100 feet	100 feet	25 feet	25 feet	100 feet
Water line	10 feet	10 feet	10 feet	10 feet	10 feet	10 feet	Contact DWP
Private Water Line	1 foot	5 feet	5 feet	5 feet	10 feet	5 feet	--

Additional separation distance requirements may apply for public water systems; 18 AAC 80 must be referenced for all public water system requirements.

a. A drain pipe buried in the ground below a building is required to meet the same separation distance as a private sewer line to a public water system.

b. Sewer line includes sewer main, community sewer line, and stormwater sewer lines.

c. The separation distance to fuel tanks applies to below-ground fuel tanks and fuel lines, and to above-ground tanks greater than 500 gallons.

d. Other sources of contamination include, but are not limited to, animal byproducts, manure, and agricultural waste. The separation distance to landfills is covered under 18 AAC 60. DWP = Drinking Water Program.

MINIMUM VERTICAL SEPARATION DISTANCES TO DRINKING WATER COMPONENTS

	Private Sewer Line, Building Sewer	Community Sewer Line or Cleanout, Sewer Main	Septic Tank, Wastewater Holding Tank	Soil Absorption System	Fuel Tank** and Lines	Drinking Water Treatment Waste disposal system	Other Sources of Contamination*
Water line	18 inches recommended	18 inches	cannot cross	cannot cross	no crossing recommended	10 feet	Contact DWP
Private Water Line	12-inches	12-inches	cannot cross	cannot cross	no crossing recommended	5 feet	--

Well Classification and Select Abbreviated Definitions (See 18 AAC 80.1990 or 18 AAC 72.990 for complete definitions)

Public Water System: a potable water system serving 25 or more people at least 60 days per year or a system that has at least 15 service connections.

Water Line: is a pipe or conduit used to carry water as part of a public water system but does not include a water service line or private water line.

Private Water System: a potable water system that is not a public water system

Private Water Line: is a line, pipe, or conduit used to carry water as part of a private water system. The department interprets regulations to not include a water service line that is connected to a public water system in the definition of private water line.

MINIMUM HORIZONTAL SEPARATION DISTANCES FROM SEWER COMPONENTS					
	River, Lake, Stream, Spring, Slough[c]	Slopes >25%	Soil Absorption System	Lot Line[a]	Foundation[a]
Septic Tank, Holding Tank, Lift Station	100 feet	need to be stable	5 feet	10 feet	10 feet
Soil Absorption System	100 feet	50 feet	see b. below	10 feet	10 feet
Pit Privy	100 feet	50 feet recommended	see b. below	10 feet	10 feet

a. Recommended minimum horizontal separation distance. All parts, including ground cover for freeze protection must be wholly located on the property with the facility being served. Locating a septic tank or soil absorption system too close to a building foundation may have negative impacts. The septic tank cleanouts or manhole riser must be accessible for maintenance purposes.

b. 6 feet or 2 times the distribution media depth, whichever is greater.

c. Setbacks is from the mean annual high water level of surface water or the mean higher high water level of tidally influenced water

MINIMUM VERTICAL SEPARATION DISTANCES FROM SEWER COMPONENTS		
	Seasonal High Water Table	Impermeable Soil, Permafrost, Bedrock
Septic Tank, Wastewater Holding Tank	need bouyancy protection	--
Subsurface Soil Absorption System	4 feet	6 feet
Pit Privy	4 feet	--

separation distance tables are available in the

2023 Onsite Wastewater Systems Installation Manual (OWSIM) available at septic.alaska.gov

Plan Review Exceptions

Onsite Wastewater Systems under 18 AAC 72.511 and 18 AAC 72.611

- Alternative onsite wastewater systems defined at 72.990(4)
- Conventional onsite wastewater systems defined at 72.990(17)

Important parts of those definitions

- Receives only domestic wastewater
  - ALL nondomestic systems require plan approval
- Located wholly on the property owned by the same entity that also has ownership of the dwellings, buildings, or structures the system serves (condo associations, multiple properties with different owners, etc. still require plan approval)
- Does <u>not</u> discharge to surface water
  - ALL surface water discharges require prior plan approval

Restrictions on who and what for Conventional Onsite Systems:

Approved Homeowner

- Serves their owner-occupied private residence only

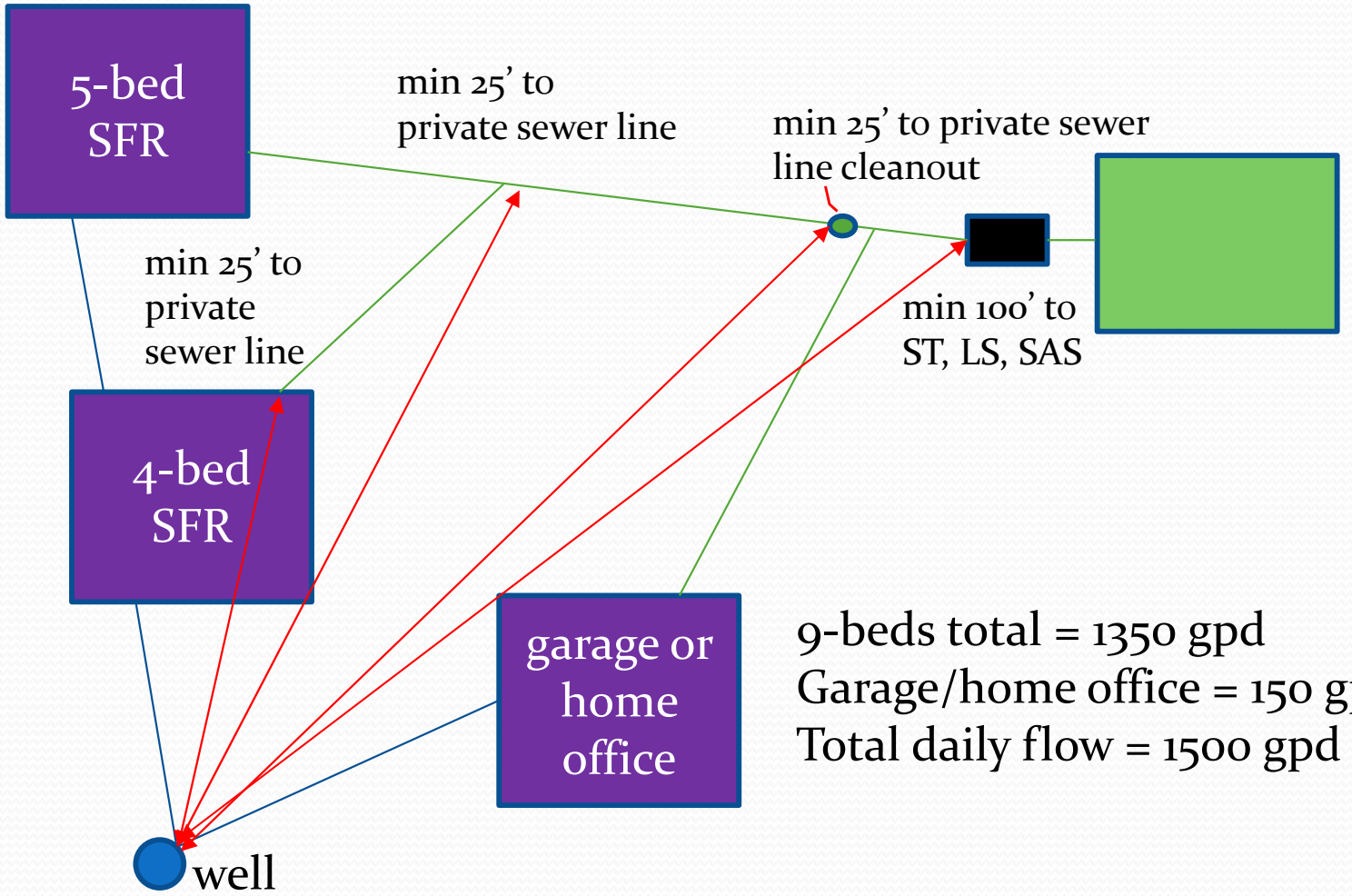
Certified Installer

- New: Total on lot flow must not exceed 1500 gpd
  - Previously applied to private residence only
- Facility types limited to:
  - private residence
  - New: a single multi-family dwelling with up to 4 units
  - a single small commercial facility <500 gpd

Engineers

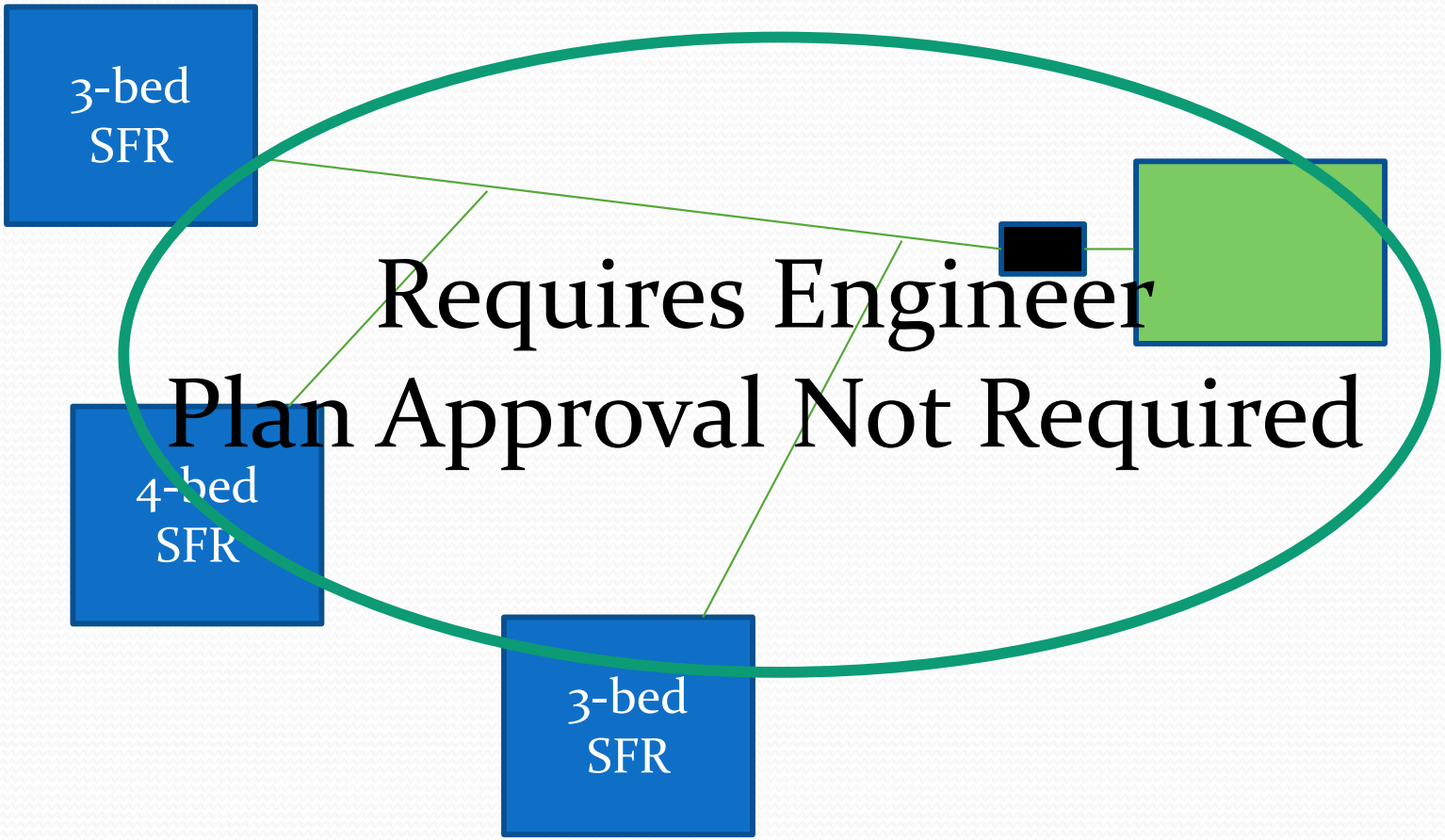
- Any combination of residential and commercial buildings
- Daily calculated flow must not exceed 2500 gpd for the total on lot or facility-wide operations (spans multiple properties under same ownership)

Private Residence Scenario

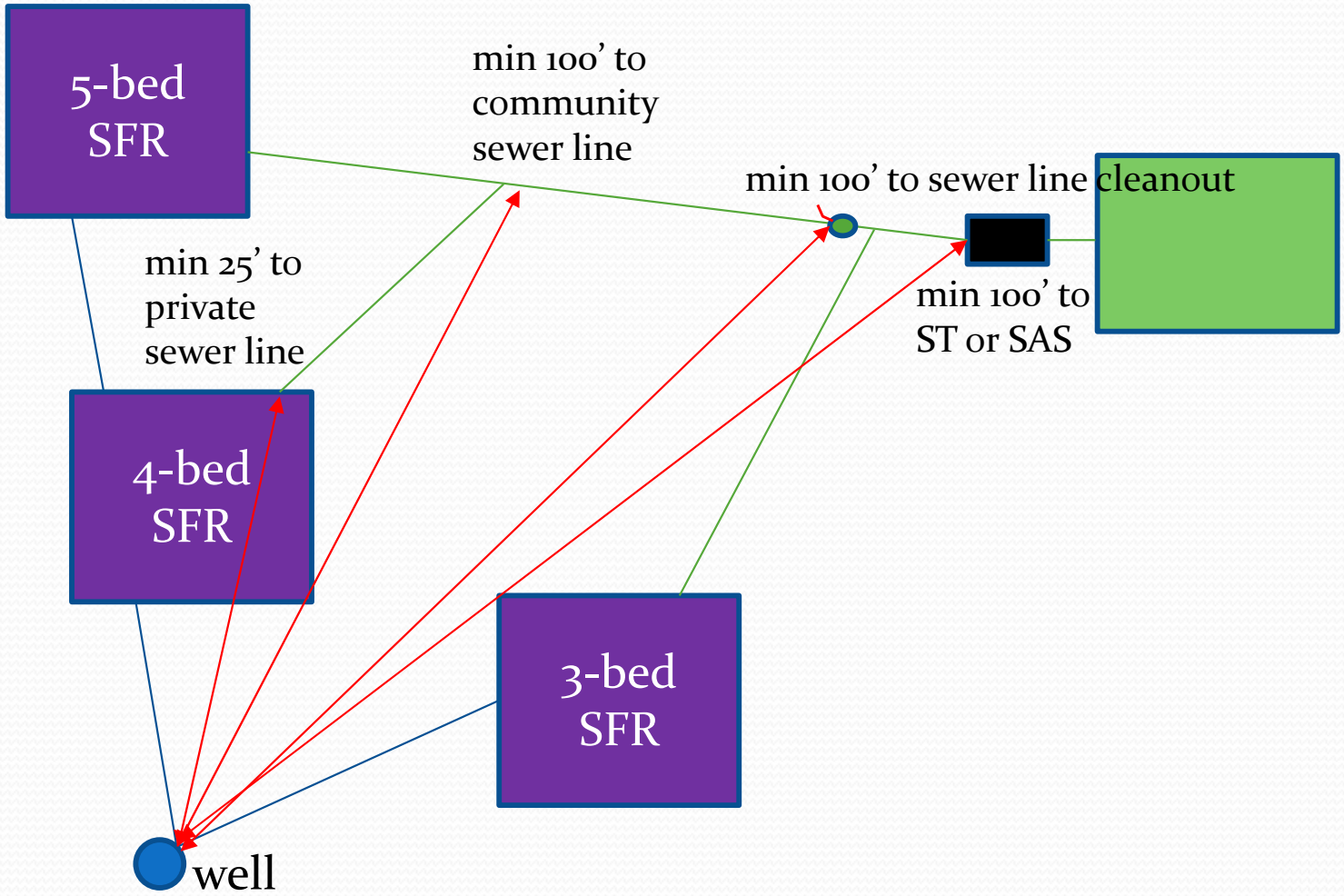


9-beds total = 1350 gpd
Garage/home office = 150 gpd recommended
Total daily flow = 1500 gpd

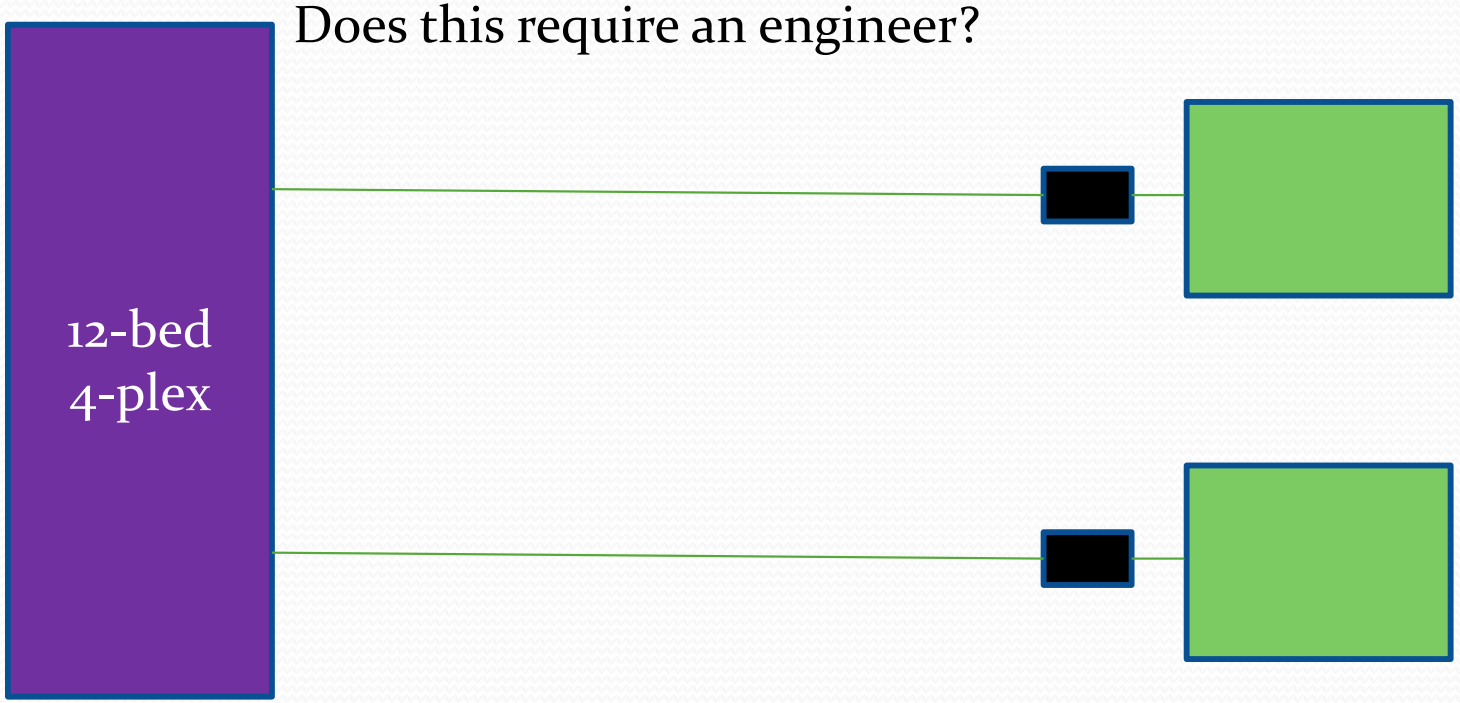
10-beds total = 1500 gpd
more than two families so is
NOT a private residence



Multiple Buildings
Not a Private Residence

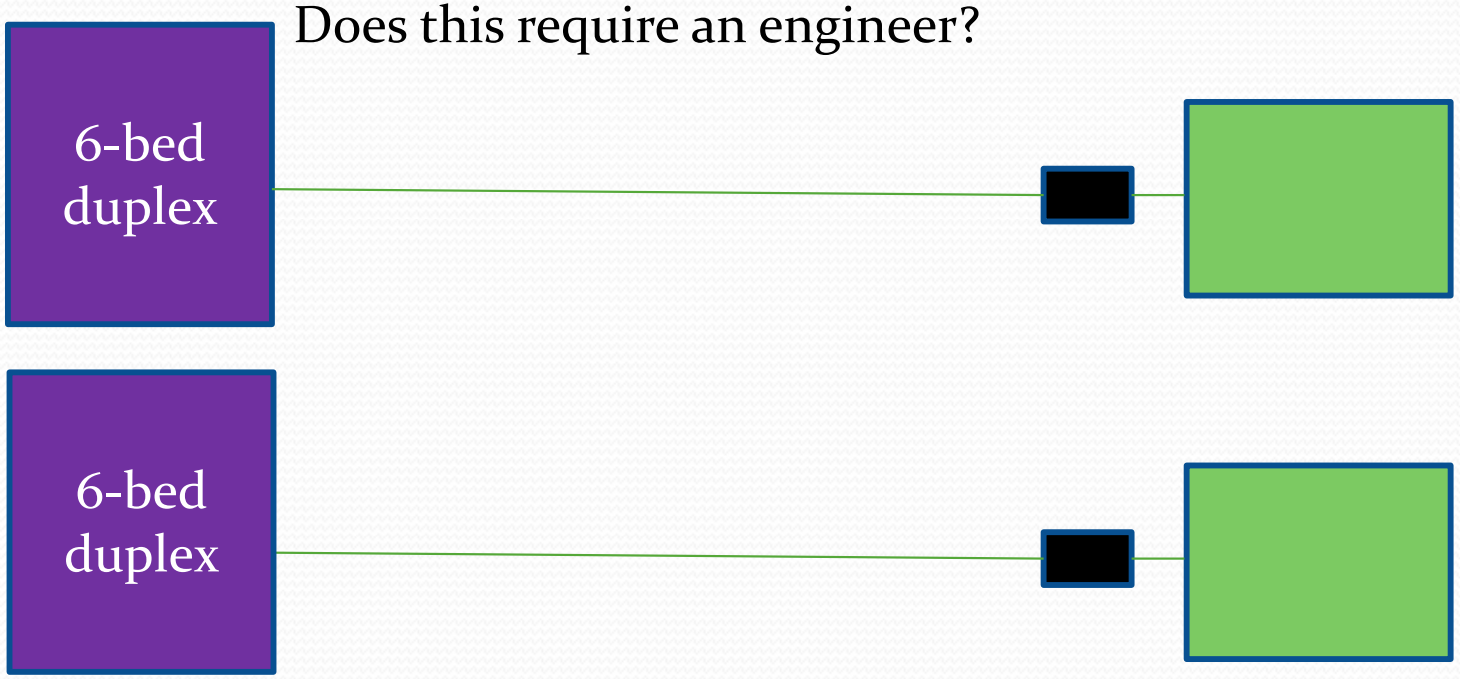


Each system serves half of the building:
Each system serves 6 beds = 900 gpd each
Total on lot flow = 1800 gpd
Does this require an engineer?



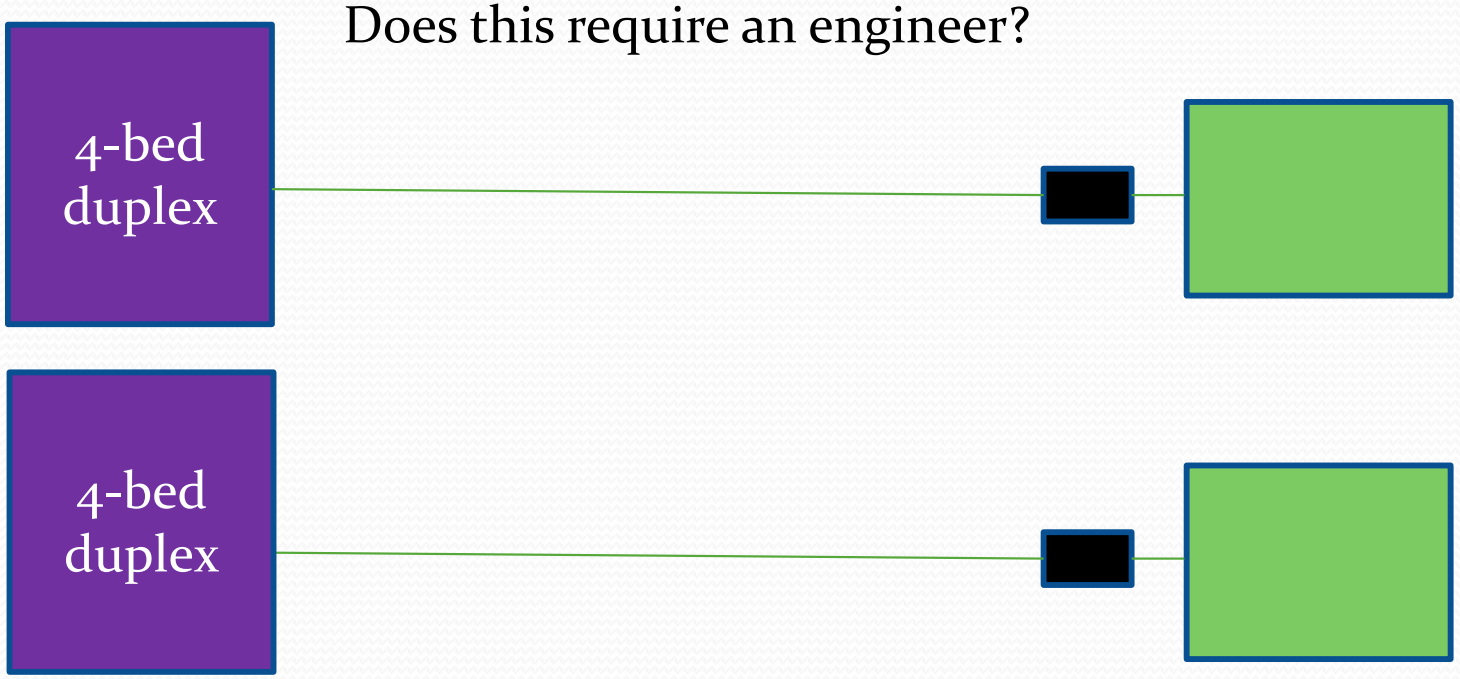
Engineer required but does not require prior plan approval.
Multi-family dwelling with no more than 4 units but total flow >1500 gpd
Less than 2500 gpd so does not require plan approval

Both buildings are on the same lot
Each system serves a 6-bed duplex = 900 gpd each
Total design flow = 1800 gpd
Does this require an engineer?



Engineer required but does not require plan approval.
Each system serves a single multi-family dwelling but the total flow for the lot exceeds 1500 gpd.

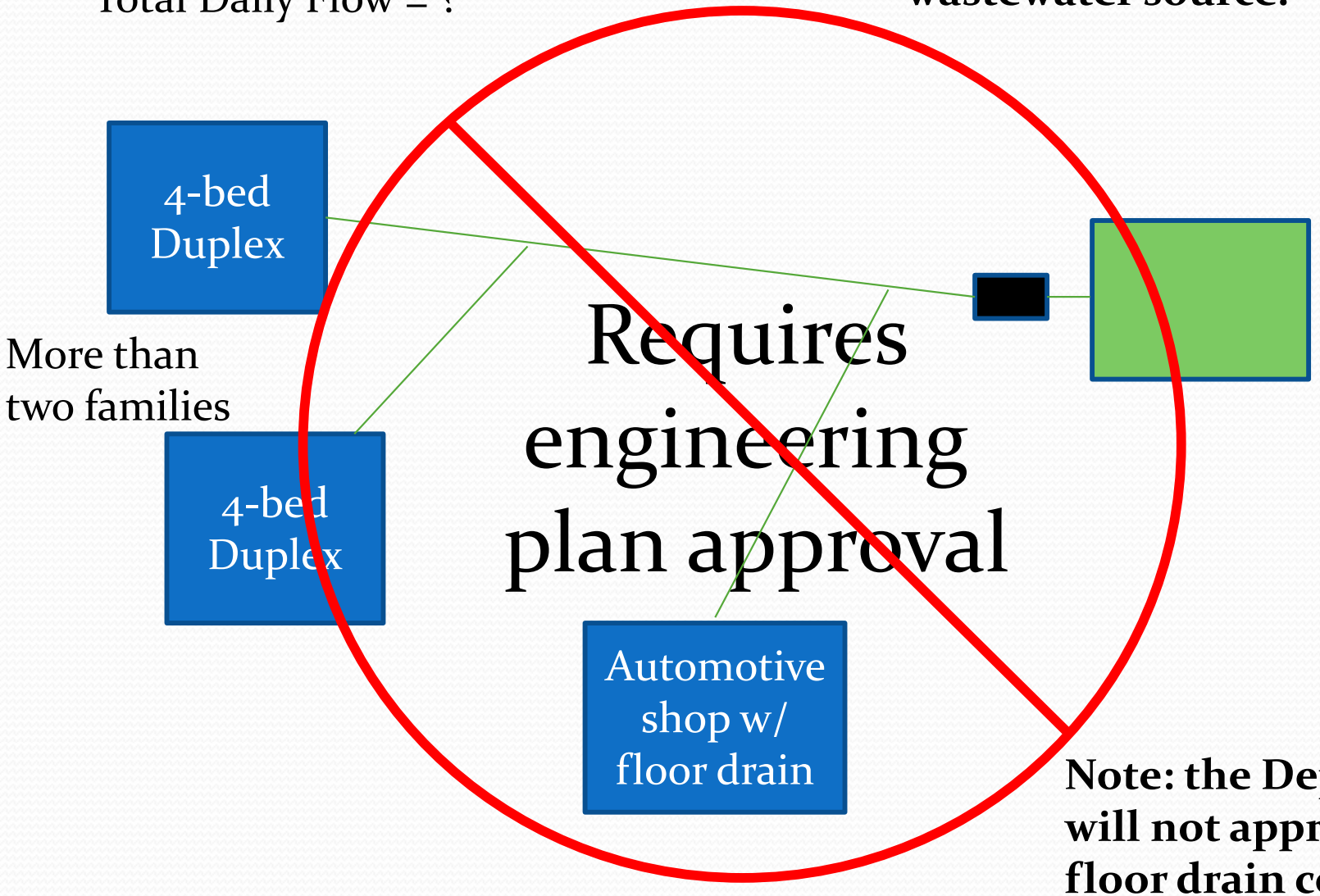
Both buildings are on the same lot
Each system serves a 4-bed duplex = 600 gpd each
Total on lot flow = 1200 gpd
Does this require an engineer?



Can be installed by a Certified Installer
Each system serves a single “multi-family” dwelling and the total flow for the lot is less than 1500 gpd.

8-beds total = 1200 gpd
Auto Shop = ?
Total Daily Flow = ?

Prior plan approval required for systems with a nondomestic wastewater source.



Note: the Department will not approve the floor drain connection.

Conventional WW Systems: Construction Standards

What's Changed:

- Conventional wastewater systems covered by Article 5 in 18 AAC 72
  - Construction standards are covered at 18 AAC 72.530
- Onsite Wastewater System Installation Manual (OWSIM)
  - Publicly identified best management practices
  - Technical guidance supplements regulations
- Certified Installers can perform percolation tests for systems they installing under their certification allowed by 18 AAC 72
  - Summer field training session is required for all Certified Installers in 2024

Collection Systems

What's Changed:

- Manholes must be installed on community sewer lines at changes in pipe slope, size, alignment, and intersections
  - Except where a cleanout can be installed as publicly identified as an approved BMP
  - Currently identified in OWSIM for all onsite systems with sewer lines no larger than 6-inches

Septic Tanks

What changed:

- 5 feet of solid pipe with no joints extending onto undisturbed ground before and after the tank (previously 10 feet)
- Manhole risers required to be extended to the ground surface on all septic tanks larger than 2,000 gallons
- Increase in minimum size when a basement sump or lift station is located before the septic tank
  - 250 gallons for residential dwellings up to 18 bedrooms
  - 250 gallons for commercial facilities up to 1250 gpd
  - 25% for all others

Minimum Septic Tank Size			
Residential Dwellings		**Commercial Facilities**	
Number of Bedrooms	Minimum Tank Size*	Daily Design Flow	Minimum Tank Size*
0 - 3	1,000 gallons	Up to 500 gpd	1,000 gallons
4 - 8	1,000 plus 250 gallons for each bedroom over three	501 to 750 gpd	1,250 gallons
9 - 13	2,500 gallons	751 to 1,000 gpd	1,500 gallons
14 - 18	3,000 gallons	1,001 to 1,250 gpd	2,000 gallons
Greater than 18	1,125 + (0.75 * design flow)	Greater than 1,250 gpd	1,125 + (0.75 * design flow)
*Tanks may be used in series or in parallel to achieve the minimum septic tank volume. The installation and design of more than one tank must be by a method publicly identified by the department as acceptable guidance under 18 AAC 72.070 and protective of public health, public and private water systems, and the environment.			

What changed (affects commercial facilities and multi-family dwellings):

- Eliminated the 1.5*daily flow calculation for 750 – 1500 gpd systems resulting in larger tank size
- Minimum size for 501 to 750 gpd systems increase to 1,250 gallons (was previously 1,000 gallons for up to 750 gpd systems)

Note: some existing systems may not have tanks that meet the new minimum required; the next time the system is modified or replaced, the updated regulation must be met.

Leach Fields

What changed:

- Soil application rates table
  - The application rates are effectively the same as previous Table B
  - Made more clear that the application rate used needs to be the more conservative of either the soil texture/classification or percolation rate
    - Implied and interpreted by previous 72.265(9)(E) now at 72.265(2)(D)
- Detail added in OWSIM for a "cut and fill" construction method

WASTEWATER APPLICATION RATES				
Percolation Rate[a] (minutes/inch)	Soil Texture (Unified Soil Classification)	Application Rate in sf/bedroom	Application Rate in gpd/sf for design flows ≤ 2,500 gpd	Application Rate in gpd/sf for design flows >2,500 gpd
Faster than 1	Gravel (GW/GP)	Not Suitable[b]	Not Suitable[b]	Not Suitable[b]
1 – 5	Gravel (GW/GP)	125	1.2	0.79 – 0.98
1 – 15	Medium to coarse sand (SW/SP)	150	1.0	0.67 – 0.89
6 – 15	Fine sand or loamy sand	190	0.8	0.61 – 0.74
16 - 30	Sandy loam, silty gravel (GM), silty sand (SM)	250	0.6	0.52 – 0.61
31 – 60[c]	Loam, silt loam, silt (ML)	335	0.45	0.25 – 0.52
61 – 120[d]	Silty clay loam, clay loam[e]	Not Suitable[d]	Not Suitable[d]	Not Suitable[d]

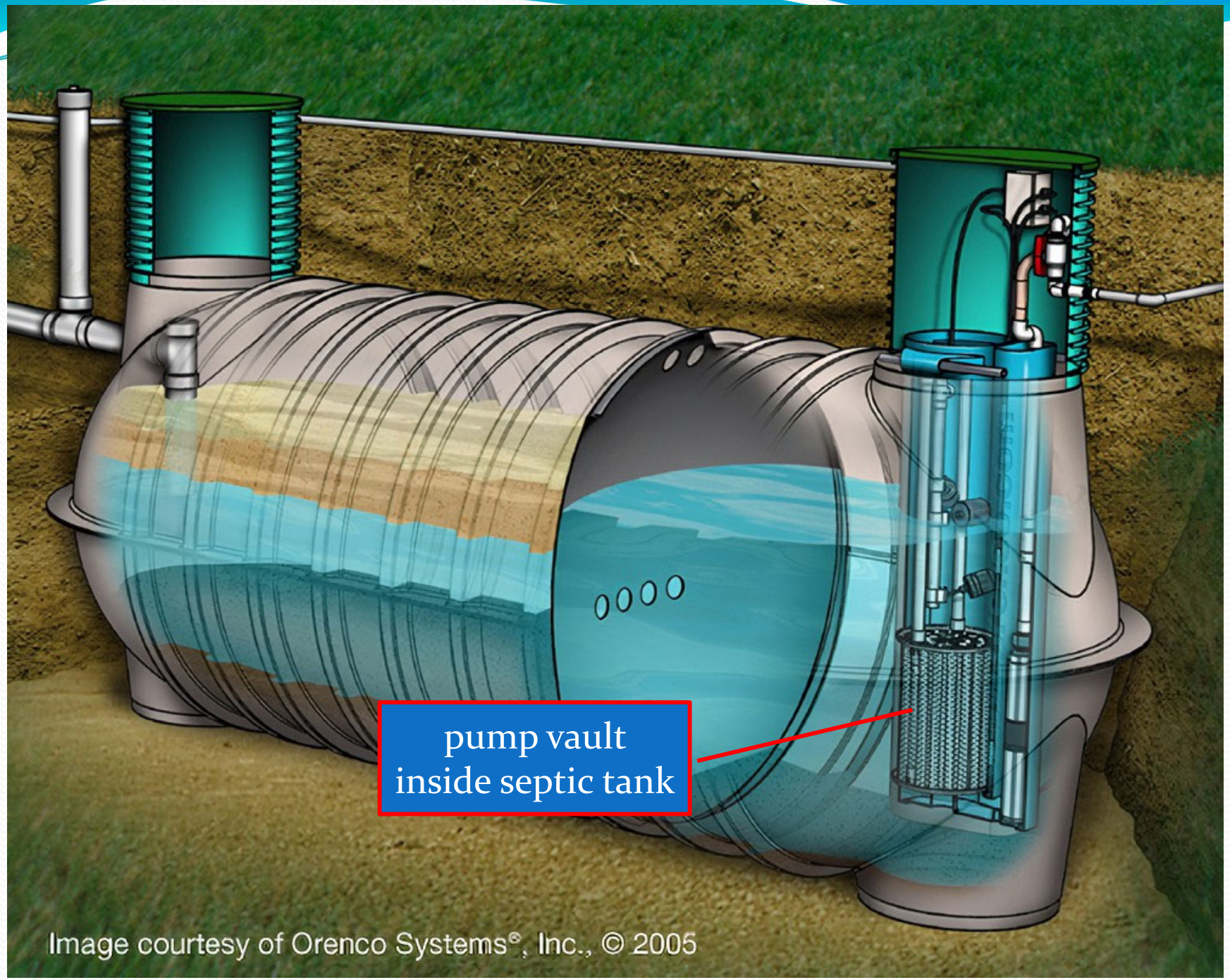
Footnote phrasing is not exactly the same as in regulation

a. Soils classified as silty sand (SM), silty gravel (GM), or silt (ML) must have a percolation test conducted by either an engineer or the certified installer by a method publicly identified as acceptable (refer to OWSIM)
b. Soils classified as gravel (GW or GP) with percolation rate faster than one minute/inch may have a shallow trench or bed type system installed with a 2-foot thick sand liner and sized at 150 sf/bedroom or 1.0 gpd/sf.
c. Soils with percolation rates slower than 30 minutes/inch are unsuitable for seepage pits.
d. Soils with percolation rates slower than 60 minutes/inch require an engineer design and plan approval. Soils with percolation rates slower than 120 minutes/inch are considered impermeable.
e. Soils without expandable clays or soil types not listed require engineer design and prior plan approval.

Lift Stations

Clarifications in regulations (not a change from current practice):

- Can be located inside a septic tank
  - Tank size must be increased by 250 gallons
  - Pump placed in pump vault insert manufactured for that purpose
  - Have manhole riser at least 20 inches in diameter extended to surface
- If installed as a separate vault
  - Must be premanufactured for the purpose of an outside lift station (small sumps intended as basement sumps are not acceptable)
  - Manufactured as a single unit or access provided through manufactured risers extended to the ground surface
  - minimum 24" diameter with locking lid
- If located before the septic tank
  - Increase in tank size previously discussed
  - Pump must be capable of passing 2-inch solids or be a grinder pump (not recommended)
  - Serving multiple dwellings (excluding a private residence) or buildings then must have duplex pumps
- More detail will be added to OWSIM


pump vault
inside septic tank
Image courtesy of Orenco Systems®, Inc., © 2005

Examples of unacceptable lift stations

Other Topics

- New: 18 AAC 72.015(b) cannot install, modify, or repair a wastewater collection or disposal system utilizing wood components in contact with wastewater
  - Means that when a pipe (ex. wood stave) or disposal system (ex. log crib) fails or the system is being replaced or modified, those components must be upgraded to meet current regulations
  - New: (c) of that section says pretty much the same thing but applies to any system being modified or replaced
- New: 18 AAC 72.080 Clarifies when an approval or registration is no longer valid (ex. change of use, system modifications without new registration or approval)
- New: 18 AAC 72.090 Defines failures and spills and requires owner corrective action

Other Important Changes

- Plan review for domestic and nondomestic systems now has the same process and fees
  - Wastewater Discharge Authorization Programs (WDAP) doesn't intend to substantially change how they are currently processing applications related to mining, oil & gas, and stormwater
- 72.050 establishes minimum treatment requirements,
  - (a)(3) requires discharges to surface water to meet secondary treatment and be disinfected
  - (d) specific for nondomestic wastewater

Plan Review Exceptions

72.201 establishes 5 cases for exemption from prior plan approval:

- (a) routine maintenance – defined at 72.990(77)
- (b) Repairs to address an emergency
  - Emergency is defined at 72.990(36)
  - Still required to give notice under 72.940
- (c) "replacement in kind" – not defined, evaluated case-by-case
  - ESPR plans to provide a one-pager for guidance
- (d) service line connections to a utility or POTW
  - must not result in a discharge that overloads and facility must be approved or permitted to accept that type of waste

Plan Review Exceptions

72.201 continued:

- (e) installation or modification of a sewer main when the wastewater utility has been issued a written exception
  - Wastewater Utility is defined at 72.990(107) with meaning at 3 AAC 52.749
  - Utility must have a certified operator (a certified operator is only required for system with at least 100 service connections or serves at least 500 people; however the system may have a certified operator employed even if they are below those thresholds)
  - The intent is to effectively approve the "construction standards" and as long as they follow those construction standards then each individual project doesn't require plan approval

Questions?