Chapter E
BUILDING SEWERS - SANITARY
Code References

1.) GENERAL

a. Definitions Comm 81.01(44) & (45)
b. Size (gravity) Comm 82.30(4)(b)1. & Table 82.30-3
c. Size (pressurized) Comm 82.40(4)(b)2. & b.
d. Materials
   (1) Sanitary building sewer pipe Comm 84.30(2)(c) & Table 84.30-3
   (2) Pressurized drain pipe Comm 84.30(2)(e) & Table 84.30-5
e. Installation & bedding Comm 82.30(11)(e) thru (e)5.
f. Installation depth
   (1) Minimum depth of sewers Comm 82.30(11)(c)1.
   (2) Frost protection Comm 82.30(11)(c)2.
      a) Extruded polystyrene foam insulation Comm 82.30(11)(c)3.a.
      b) Extruded polystyrene foam insulation - box method Comm 82.30(11)(c)3.b.
      c) Lightweight insulating concrete Comm 82.30(11)(c)3.c.
      d) Alternative methods approved by dept Comm 82.30(11)(c)3.d.
   (3) Discharging to septic tanks, holding tanks and grease interceptors Comm 82.30(11)(c)2.c.
g. Pitch Comm 82.30(5)(b)2.a. & 2.b. and Table 82.30-3

h. Connection to public sewers
   (1) Gravity public sewer Comm 82.30(11)(f)1. thru 1.d.
   (2) Pressurized public sewer Comm 82.30(11)(f)2.

i. Prohibited installations
   (1) Harmful discharge Comm 82.30(11)(g)1.
   (2) Storm and clearwater connections Comm 82.30(11)(g)2.

j. Location limitations Comm 82.30(11)(d)
k. Locating requirements Comm 82.30(11)(h)

2.) CLEANOUTS & MANHOLES FOR SANITARY BUILDING SEWERS

a. Definitions:
   (1) Cleanout Comm 81.01(55)
   (2) Manhole Comm 81.01(149)
b. Cleanout size Comm 82.35(6) and Table 82.35
c. Materials for cleanouts Comm 82.35(2), Comm 84.30(6)(d)
   (1) Brass cleanout plugs shall conform to ASTM A74
   (2) Plastic cleanout plugs shall conform to 84.30(5)(a) & Table 84.30-10
d. Materials for manholes Comm 82.35 (2), & 82.35(8)(b), Comm 84.30 (2) (h)
   (1) Piping connections Comm 82.35(8)(b) See Note
   (2) When required Comm 82.35(3)(b)1. thru 2.c.
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e. **Direction of flow** Comm 82.35 (4)
f. **Manholes** Comm 82.35 (8)
   
   (1) Minimum diameter minimum 42 inch diameter with 24 inch access opening Comm 82.35(8)(a)
   
   (2) Design See Comm 82.35(8)(b) & NR 110.13

g. **Where required: sanitary building sewers**
   
   (1) Sanitary building sewers ≤ 6 inches Comm 82.35(3)(b)1.
   
   (2) Storm building sewers ≥ 8 inches Comm 82.35(3)(b)2.
   
   (3) Cleanout at junction of building drain & building sewer Comm 82.35(3)(e) thru 82.35(3)(e)2.
   
   (4) Frost sleeves for cleanout Comm 82.35(5)(a)2.,a.,b.,c. & d.
   
   (5) Concrete pads for cleanouts in traffic areas Comm 82.35(5)(a)2.b. & d.
   
   (6) Sizes Comm 82.35(6) and Table 82.35

**Note!** NR 811 and 812 are reprinted in this chapter (pages E 10 - 12)
Materials for building sewers are under Comm 84.30(2)(c) and Table 84.30-3.

Cleanouts shall be installed in 4" building sewers 100' maximum intervals. See Comm 82.35(3)(b).

The cleanout at the junction of the building sewer and building drain may be located inside or outside the building as indicated below. All cleanouts located outside of a building shall have a frost sleeve. See Comm 82.35(5)(a)2. The material for the frost sleeve shall be approved building sewer material. See Comm 84.30(2)(c) and Table 84.30-3.

The minimum size of the building sewer between the property line and the municipal sewer in the street may be increased in size above the 4" minimum if required by local ordinance. See Comm 82.30(4)(b).

The connection to a city sewer main may be installed with an approved saddle connection if the existing wye is not found. See Comm 82.30(11)(f)1. and 1.a.
Note 1. Comm 82.35 (3) (b)
Note 2. Comm 82.35 (3) (b) 2. c.
Note 3. Comm 82.35 (3) (b) 2. d.
Note 4. Comm 82.35 (3) (b) 2., a., b. & c.
Note 5. Comm 82.35 (3) (b) 2. a.

Manholes are required for 8" and larger sewers for horizontal changes of direction of more than 45° and at intervals of not more than 400'. See Comm 82.35 (3)(b)2.

Note! The municipality or the Department of Natural Resources may require a manhole or a saddle type fitting when connecting the building sewer to the sewer main.
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BUILDING SEWERS - SANITARY
Cleanouts & Manholes
(For 6" & Smaller Sewers)

PLAN VIEW

Note 1. Cleanouts for building sewers shall be installed as per Comm 82.35 (3) (b) 1. thru 2. c.

Note 2. 6" sewers require a 6" extension with a 5" minimum threaded opening.

Note 3. 4" sewers require a 4" extension with a 3-1/2" min. threaded opening.

Note 4. Cleanouts which are over 18" in length shall be connected to the sewer with a long radius fitting. See Comm 82.35 (5) (a) 1. and Table 82.30-4

Note 5. A cleanout located outside of a building shall be provided with a frost sleeve. See 82.35 (5) (a) 2. and Appendix for construction detail.
Top of sufficient thickness and strength. See Comm 82.35 (5) (a) 2. d.

**Material suggestion:** cast iron ferrule with water tight counter-sunk brass plug for traffic areas.

Concrete pads are required in **traffic areas.** See Comm 82.35 (5) (a) 2. b.

**Design suggestion:** Cleanout plug should extend to within 2” of the bottom of the ferrule.

Frost sleeve material of ASTM D-3034 PVC or ABS Comm 82.35 (5) (a) 2. a.

6” to 12” above the top of the drain pipe Comm 82.35(5)(a)2.c.

**Wye pattern fitting** See Comm 82.35 (5) (a) 1.

Frost sleeve access covers located in **non-traffic areas** may be made of ABS or PVC plastic. The connection between the frost sleeve access cover and the frost sleeve may be accomplished with a solvent welded joint, or connected with a Fernco coupling or as shown above. A concrete pad is **not** required in **non-traffic areas.**
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BUILDING SEWERS - SANITARY
Cleanouts with Frost Sleeves
Comm. 82.35 (5)(a) thru 1.d.

Removable watertight cover
Grade
Minimum 4" thick

Frost sleeve
Predicted depth of frost
6" min. below predicted depth of frost

Wye pattern fitting
6" to 12" above the sewer

Removable watertight cover
Grade
Minimum 4" thick

Frost sleeve

Building sewer insulation
A-82.30 (11)(c) 3. b.

Minimum 12" below finished grade

Polystyrene thickness per Table 82.30-5
Cavity filled with tamped sand or gravel
Ditch bottom

Sewer pipe 6" min.
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BUILDING SEWERS - SANITARY
Pressurized Sewer

- Air and water tight
- Accessible cover

- Pump discharge piping size criteria shall conform to requirements identified in Comm 82.30 (4) (b) 2. & Comm 82.30 (10) (b) 3.

- Pump and sump located in building. Grinder pump sized to handle the requirements of the building.

- Comm 82.30 (11) (f) 2. Grinder type pumps (Example: E-One grinder pump - See pump specifications provided at the end of this chapter) located in basement, including control valve & check valve. When using this style of grinder pump with internal or external check valves and a control valve, a curb stop is required. See Comm 82.30 (11) (f) 2. a.
Chapter E
BUILDING SEWERS - SANITARY
Pressurized Sewer

MODEL 2010-57
BUILDERS

1-1/4" schedule 40 PVC discharge with pressure rated fittings

Power/Alarm cable 12-2 N/M/AL.

Electrical quick disconnect (ECD)

Cone control compartment breather

Internal well vent 2.0" dia. (required)

Concrete floor

Discharge 1-1/4" NPT

1-1/4" discharge line (304 S.S.)

Check valve (glass filled Noryl)

Anti-siphon valve (glass filled Noryl)

Gravel bedding

When installed in a crawl space, allow a minimum of 4-8" of clearance above station for pump removal

Semi-positive displacement type pump directly driven by a 1 HP motor capable of delivering 9 gpm at 130' T.O.H. (34 lpm at 42m T.O.H.)

UL

NSF

SCC

Environment One Corporation

Model 2010-57
BUILDERS

ESD 01-0011
A-82.30 (11) (d) SETBACKS FOR VARIOUS CONTAMINANT SOURCES. Setbacks for various contaminant sources as specified in chs. NR 811 and NR 812 read:

NR 811.16 (4) (d) The well shall be adequately separated from potential sources of contamination. Unless a hydrogeologic investigation indicates lesser separation distances would provide adequate protection of a well from contamination, the minimum separation distances provided shall be:

1. Fifty feet between a well and a storm sewer main.
2. Two hundred feet between a well and any sanitary sewer main, sanitary sewer manhole, lift station or single family residential fuel oil tank. A lesser separation distance may be allowed for sanitary sewer mains where the sanitary sewer main is constructed of water main materials and joints and pressure tested in place to meet current AWWA C600 specifications. In no case may the separation distance between a well and a sanitary sewer main be less than 50 feet.
3. Four hundred feet between a well and a septic tank or soil adsorption unit receiving less than 8,000 gallons per day, a cemetery or a storm water drainage pond.
4. Six hundred feet between a well and any gasoline or fuel oil storage tank installation that has received written approval from the department of commerce or its designated agent under s. Comm 10.10.
5. One thousand feet between a well and land application of municipal, commercial or industrial waste; the boundaries of a landspreading facility for spreading of petroleum-contaminated soil regulated under ch. NR 718 while that facility is in operation; industrial, commercial or municipal waste water lagoons or storage structures; manure stacks or storage structures; and septic tanks or soil adsorption units receiving 8,000 gallons per day or more.
6. Twelve hundred feet between a well and any solid waste storage, transportation, transfer, incineration, air curtain destructor, processing, wood burning, one time disposal or small demolition facility; sanitary landfill; any property with residual groundwater contamination that exceeds ch. NR 140 enforcement standards that is shown on the department's geographic information system registry of closed remediation sites; coal storage area; salt or deicing material storage area; gasoline or fuel oil storage tanks that have not received written approval from the department of commerce or its designated agent under s. Comm 10.10; bulk fuel storage facilities; and pesticide or fertilizer handling or storage facilities.

NR 812.08 Well, reservoir and spring location. (1) GENERAL. Any potable or nonpotable well or reservoir shall be located:

(a) So the well and its surroundings can be kept in a sanitary condition.

(b) At the highest point on the property consistent with the general layout and surroundings if reasonably possible, but in any case protected against surface water flow and flooding and not downslope from a contamination source on the property or on an adjacent property regardless of what was installed first, the well or the contamination source. When a contamination source is installed upslope from a well in violation of this section after the well construction has been completed, the violation is not the responsibility of the well driller, except if the well driller knew or should have known of the proposed upslope installation of the contamination source. When there is no location on the property where this requirement can be met, a well may be constructed without a variance if it is constructed with a minimum of 20 or more feet of well casing pipe than is required by ss. NR 812.12 and 812.13 and Tables I and II or with a minimum of 60 feet of well casing pipe provided that the minimum well casing pipe depth requirements of s. NR 812.12 or 812.13 and Table I or II are met. This exception
does not apply to high capacity, school or wastewater treatment plant wells. A well or reservoir is located downslope from a contamination source, regardless of the presence or absence of a structure between the well and the contamination source, if:

1. The ground surface elevation at the well or reservoir is lower than the elevation at the contamination source, and
2. Surface water that washes over the contamination source would travel within 8 feet of the well or reservoir, or over the well or reservoir.

(c) As far away from any known or possible source of contamination as the general layout of the premises and the surroundings allow.

(d) Such that any potential contaminant source, not identified in this section or in Table A, is a minimum of 8 feet from the well or reservoir.

(e) Every well shall be located so that it is reasonably accessible with proper equipment for cleaning, treatment, repair, testing, inspection and any other maintenance that may be necessary.

(2) RELATION TO BUILDINGS. In relation to buildings, the location of any potable or nonpotable well shall be as follows:

(a) When a well is located outside and adjacent to a building, it shall be located so that the center line of the well extended vertically will clear any projection from the building by not less than 2 feet and so that the top of the well casing pipe extends at least 12 inches above the final established ground grade.

(b) When a structure is built over a drilled well, it shall have an access hatch or removable hatch, or provide other access to allow for pulling of the pump. The well casing pipe shall extend at least 12 inches above the floor and be sealed watertight at the point where it extends through the floor.

(c) No well may be located, nor a building constructed, such that the well casing pipe will terminate in or extend through the basement of any building or terminate under the floor of a building having no basement. The top of a well casing pipe may terminate in a walkout basement meeting the criteria of s. NR 812.42 (9) (b) 1. to 4. A well may not terminate in or extend through a crawl space having a below ground grade depression or excavation.

(3) RELATION TO FLOODPLAINS. (a) A potable or nonpotable well may be constructed, reconstructed or replaced in a floodfringe provided that the top of the well is terminated at least 2 feet above the regional flood elevation for the well site.

(b) A well may be reconstructed or replaced in a floodway provided that the top of the well is terminated at least 2 feet above the regional flood elevation for the well site.

(c) A well may not be constructed on a floodway property that is either undeveloped or has building structures but no existing well.

(d) The regional flood elevation may be obtained from the department.

(4) RELATION TO CONTAMINATION SOURCES. Minimum separating distances between any new potable or nonpotable well, reservoir or spring and existing sources of contamination; or between new sources of contamination and existing potable or nonpotable wells, reservoirs or springs shall be maintained as described in this subsection. The minimum separating distances of this subsection do not apply to dewatering wells approved under s. NR 812.09 (4) (a). Greater separation distances may be required for wells requiring plan approval under s. NR 812.09. Separation distance requirements to possible sources of contamination will not be waived because of property lines. Minimum separating distances are listed in Table A and are as follows:
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DEPARTMENT OF COMMERCE
Comm 82 Appendix - NR 812

(a) Eight feet between a well or reservoir and a:
1. Buried gravity flow sanitary or storm building drain having pipe conforming to ch. Comm 84;
2. Buried gravity flow sanitary or storm building sewer having pipe conforming to ch. Comm 84;
3. Watertight clear water waste sump;
4. Buried clear water waste drain having pipe conforming to ch. Comm 84;
5. Buried gravity flow foundation drain;
6. Rainwater downspout outlet;
7. Cistern;
8. Buried building foundation drain connected to a clear water waste drain or other subsoil drain;
9. Noncomplying pit, subsurface pumping alcove, or reservoir;
10. Nonpotable well;
11. Fertilizer or pesticide storage tank with a capacity of less than 1,500 gallons, but only when the well is nonpotable;
   Note: For potable wells see par. (d) 1.
12. Plastic silage storage and transfer tube;
13. Yard hydrant;
14. Swimming pool, measured to the nearest edge of the water; or
15. Dog or other small pet house, animal shelter or kennel housing not more than 3 adult pets on a residential lot.

(b) Twenty-five feet between a well or reservoir and a:
1. Buried grease interceptor or trap;
2. Septic tank;
3. Holding tank;
4. Buried building drain or building sewer having pipe not conforming to ch. Comm 84, wastewater sump, or non-watertight clear water waste sumps,
5. Buried pressurized sanitary building sewer having pipe conforming to ch. Comm 84;
6. Buried gravity manure sewer;
7. Lake, river, stream, ditch or stormwater detention pond or basin measured to the regional high water elevation in the case of a lake or stormwater detention pond, to the edge of the floodway in the case of a river or stream or to the edge in the case of a ditch or stormwater detention basin;
8. Liquid-tight barn gutter;
9. Animal barn pen with concrete floor;
10. Buried pressurized sewer pipe conveying manure provided that the pipe meets ASTM specification D-2241, with standard dimension ratio of 21 or less or pressure pipe meeting the requirements of s. NR 110.13 (6) (f) or 811.62.
   Note: There is no NR 110.13 (6) (f).
11. Buried fuel oil tanks serving single family residences, including any associated buried piping;
12. Discharge to ground from a water treatment device;
13. Vertical shaft installed below grade used for intake of air for a heating or air conditioning system;
   or
14. Buried sanitary or storm collector sewer serving 4 or fewer living units or having a diameter of 6 inches or less.
15. Soil absorption unit receiving less than 8,000 gallons/day, existing, abandoned or alternate, but not including a school soil absorption unit;
   Note: For school soil absorption units see par. (e); for soil absorption units receiving more than 8,000 gallons/day see par. (f) 3.
Chapter E
BUILDING SEWERS - SANITARY
Questions & Answers

1. Question: What sewer pipe materials require bedding when installing a building sewer?
Answer: All sanitary building sewer materials require bedding unless the trench bottom does not contain stone larger than 1" in diameter.

2. Question: May a cleanout for a building sewer, which is normally installed inside the building, be installed outside the foundation wall?
Answer: Yes, provided that you provide the cleanout with a frost sleeve. See Comm 82.35(3)(e)1. and 82.35(5)(a)2.

3. Question: Is it permissible to install rubber gaskets with bell and spigot cast iron pipe?
Answer: Yes, they may be used for the building sewer, building drain, or the drain and vent system, above or below ground. All gaskets must conform to ASTM C564.

4. Question: Who must maintain a private interceptor main sewer?
Answer: The owners(s) of the property which it serves.

5. Question: Is there a thin wall sewer pipe of ABS plastic pipe allowed for use for the building sewer, other than schedule 40?
Answer: Yes, providing it meets the ASTM standard listed in Table 84.30-3.

6. Question: May PVC plastic thin wall sewer pipe be installed for the building sewer?
Answer: Yes, but it must meet the ASTM standards D-3034 listed in Table 84.30-3. Schedule 40 PVC pipe is also approved.

7. Question: Are there any rubber type gaskets which may be used to repair or install a tee or wye in the main sewer?
Answer: Yes, contact the Department of Commerce as to which ones can be used.

8. Question: Must manholes be installed for an 8" or larger building sewer?
Answer: Yes, manholes will be required for all building sewers 8" and larger if the sewer is not more than 400' long. If the sewer is 6" or smaller, a 6" riser pipe with an opening the same size as the pipe will be sufficient. See Comm 82.35(3)(b)2.

9. Question: Does a sanitary sewer, which extends from the city main to the building, have to be insulated against freezing?
Answer: The criteria for insulating sanitary building sewers is quite detailed. If the building sewer does not receive waste during the time of the year when it could freeze, insulation is not required at all regardless of the depth. See Comm 82.30(11)(c)

10. Question: What is the minimum depth of a sanitary building sewer discharging to a septic tank, holding tank or exterior grease interceptor?
Answer: The minimum depth is 18" to the top of the pipe.

11. Question: Must the building sewer, which extends to the septic tank, be insulated if it is located only 18" below grade?
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BUILDING SEWERS - SANITARY
Questions & Answers

Answer: The building sewer will not require insulation when it terminates in a septic tank and is located 18" or more below grade, providing that it does not extend more than 30' from the building and it is located in an area where snow will not be cleared.

12. Question: What type of material shall the cleanout riser which serves the building sewer be made of?
Answer: The riser pipe may be constructed of any approved sewer material and shall be provided with a frost sleeve. See Comm 82.35(5)(a)2.a.

13. Question: How are the cleanouts and the cleanout riser pipes sized for building sewers?
Answer: Refer to Comm 82.35 and Table 82.35 for exact sizes.

14. Question: May a building sewer be installed to serve one building containing a group of condominium units?
Answer: Yes, provided it is properly sized with properly located cleanouts.

15. Question: How far does a building sewer need to be located from a well?
Answer: Eight (8) feet. This measurement is a DNR requirement and is located in the reprinted portion of the manual and located on page E13.
## Table 82.38-1 ALLOWABLE DISCHARGE POINTS BY FIXTURE OR SPECIFIC USES

<table>
<thead>
<tr>
<th>Use or Fixture</th>
<th>POWTS</th>
<th>Municipal Sanitary Sewer</th>
<th>Municipal Storm Sewer</th>
<th>Ground Surface</th>
<th>Combined Sanitary Storm Sewer</th>
<th>Subsurface Dispersal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cross connection control device or assembly [see s. Comm 82.33 (9)(i)]</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X, b, c, e</td>
<td>X</td>
</tr>
<tr>
<td>2. Domestic wastewater</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. Condensate from high efficiency furnace or water heater</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4. Drinking Fountain</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>5. Elevator pit drain [see s. Comm 82.33(9)(f)]</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>6. Enclosed public parking levels</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>7. Industrial wastewater h</td>
<td>X, f</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8. Municipal well pump house floor drain and sink</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>9. One- and 2-family garage floor area [see s. Comm 82.34 (4)(b)]</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>10. Residential living unit air conditioner condensate</td>
<td>X</td>
<td>X, g</td>
<td>X, c</td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>11. Storm water, groundwater, fire sprinkler test discharge and clear water</td>
<td>X</td>
<td>X, g</td>
<td>X, c</td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>12. Secondary roof drain systems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>13. Swimming pool or wading pool – diatomaceous earth filter backwash</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>14. Swimming pool or wading pool – drain wastewater</td>
<td>X</td>
<td>X, b</td>
<td>X, b, c</td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>15. Swimming pool or wading pool – sand filter backwash</td>
<td>X</td>
<td>X, b</td>
<td>X, b, c</td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>16. Water heater temperature and pressure relief valve [see s. Comm 82.40 (5)]</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X, b</td>
<td>X</td>
</tr>
<tr>
<td>17. Wastewater from water treatment device</td>
<td>X</td>
<td>X</td>
<td>X, c</td>
<td></td>
<td>X, b, c</td>
<td>X</td>
</tr>
<tr>
<td>18. Whirlpool backwash drain and wastewater</td>
<td>X</td>
<td>X</td>
<td>X, c</td>
<td></td>
<td>X, b, c</td>
<td>X</td>
</tr>
<tr>
<td>19. Discharges not specifically listed above</td>
<td></td>
<td>Contact the department</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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a Allowed when the POWTS is designed to include designated wastewater.
b Unless prohibited by local municipality and when no nuisance is created.
c A discharge permit may be required by the Department of Natural Resources.
d Allowed for exterior installation and when no sanitary sewer is in the building.
e Refer to the Department of Natural Resources for discharge regulations.
f Fifty gallons per day.
g The Department of Natural Resources may require WPDES permits for industrial discharges and may allow other options.
h Subsurface dispersal must comply with s Comm 82.365
i Discharge separate from the primary system and where observable.