

**Residential On-Site  
Sewage Systems:  
Installer Certification Exam Review**  
*Rule 410 IAC 6-8.3*  
*(revised and republished on May 9, 2014)*  
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Indiana State Department of Health

Environmental Public Health Division

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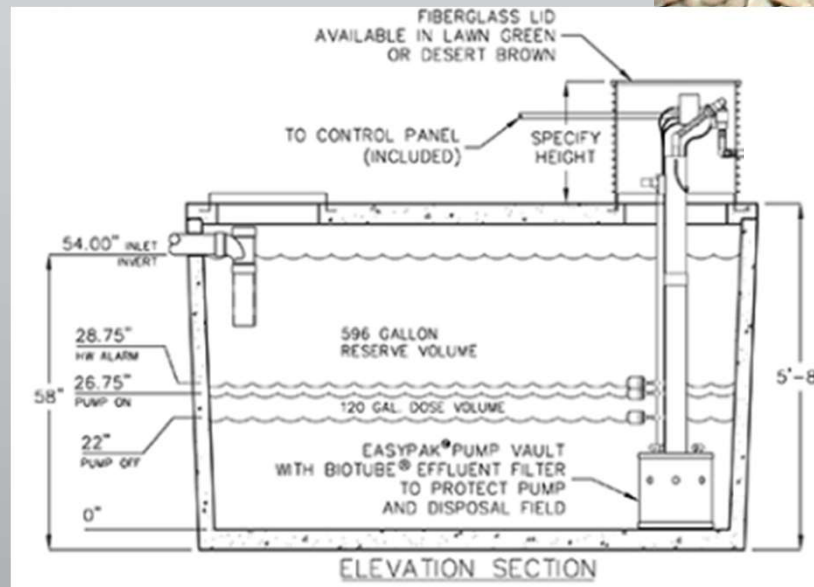
Indiana State  
Department of Health

# Tanks

- Section 60 Septic Tank General Requirements
- Section 61 Septic Tank Construction Details
- Section 62 Dosing Tanks
- Section 63 Septic and Dosing Tank Installation and Maintenance

# Section 62 - Dosing Tanks

- a) Dosing tanks shall be
  - 1) Watertight
  - 2) Protected from Corrosion
- b) No cast in place, concrete block, wood or metal



## Section 62

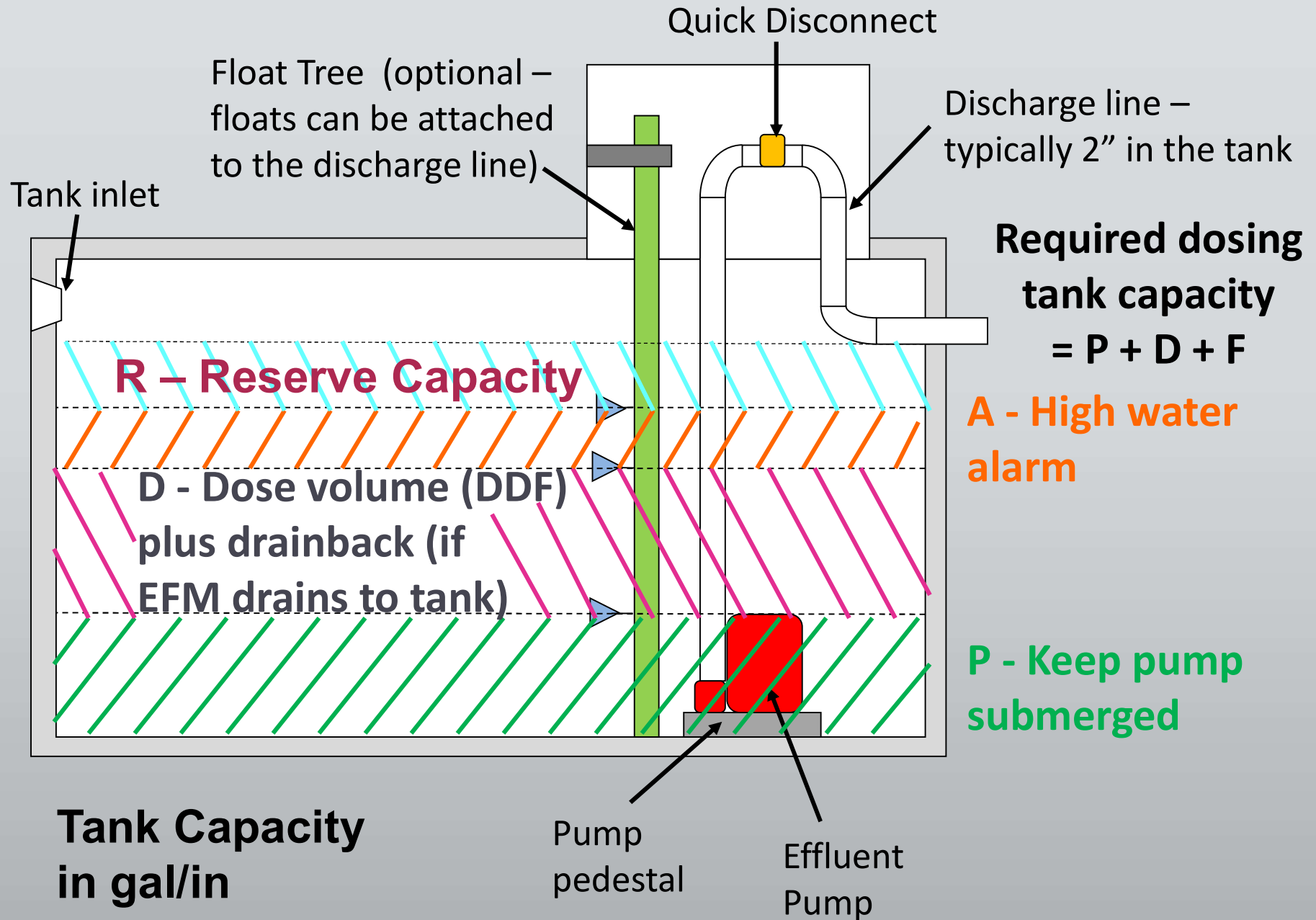
### Dosing Tanks

e) No portion of the dosing tank capacity can be considered part of the required septic tank capacity.

f) The liquid holding capacity

- The dose volume required by this rule for each type of soil absorption field
- Plus drainback
- Plus volume to keep pump submerged
- Plus freeboard for high water alarm

# Section 62(f) Dosing tank holding capacity.



## Section 62 Dosing Tanks

### g) Pipe Connector requirements:

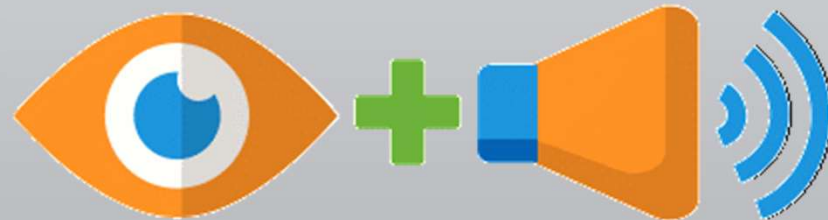
- Each pipe penetration shall be sealed with a flexible, watertight connector
- Precast concrete tanks shall use cast in place connectors conforming to ASTM C1644-06
- Poly tank connectors must conform to ASTM 923-08.



**An example of a Flexible,  
Watertight Connector**

## Section 62 Dosing Tanks

- h) Effluent pump with alarm
  - 1) Separate circuit from pump
  - 2) Audible and visible



# Section 63

## Tank installation and maintenance

- a) Installed level on
  - 1) Undisturbed soil
  - 2) Sand
  - 3) Aggregate  $\leq 1\frac{1}{2}$ "
  - 4) Engineered base
- b) All drain holes plugged
- c) Watertight securely fastened covers
- d) Risers to or above final grade
  - 6) Watertight
  - 7) Childproof plug (IC 16-41-25-3)
- f) Sewer joints between tanks sealed according to manufacturer's instruction to be watertight



# Question 4

## 4. What capacities are required in a properly sized dosing tank?

- A. Dose volume for the system type plus any drainback.
- B. Volume to keep the pump submerged at all times.
- C. Freeboard for high water alarm
- D. All of the above.
- E. A and B only.

# Section 65 - Effluent Pumps

- a) Effluent pumps
  - 1) Submersible
  - 2) Sized for TDH at GPM
  - 3) Attached to secure discharge pipe
  - 4) Installed so can be removed without entering or dewatering tank
- b) Quick, convenient disconnect
  - 3) Readily accessible from ground surface without entering tank
  - 4) Lifting apparatus

**Brass**



**Union Connector**



**Plastic**

# Section 65 - Effluent Pumps

- c) Floats mounted per manufacturer's recommendation with appropriate fasteners
- d) Controls, other than liquid level sensors, not located in dosing tank
- e) Junction boxes – NEMA 4X rated
  - all connectors with watertight seals
- f) Plug all connectors not used.

NEMA-4X  
J-Box



## Section 67 - Pipe Specs

### a) Piping in OSS

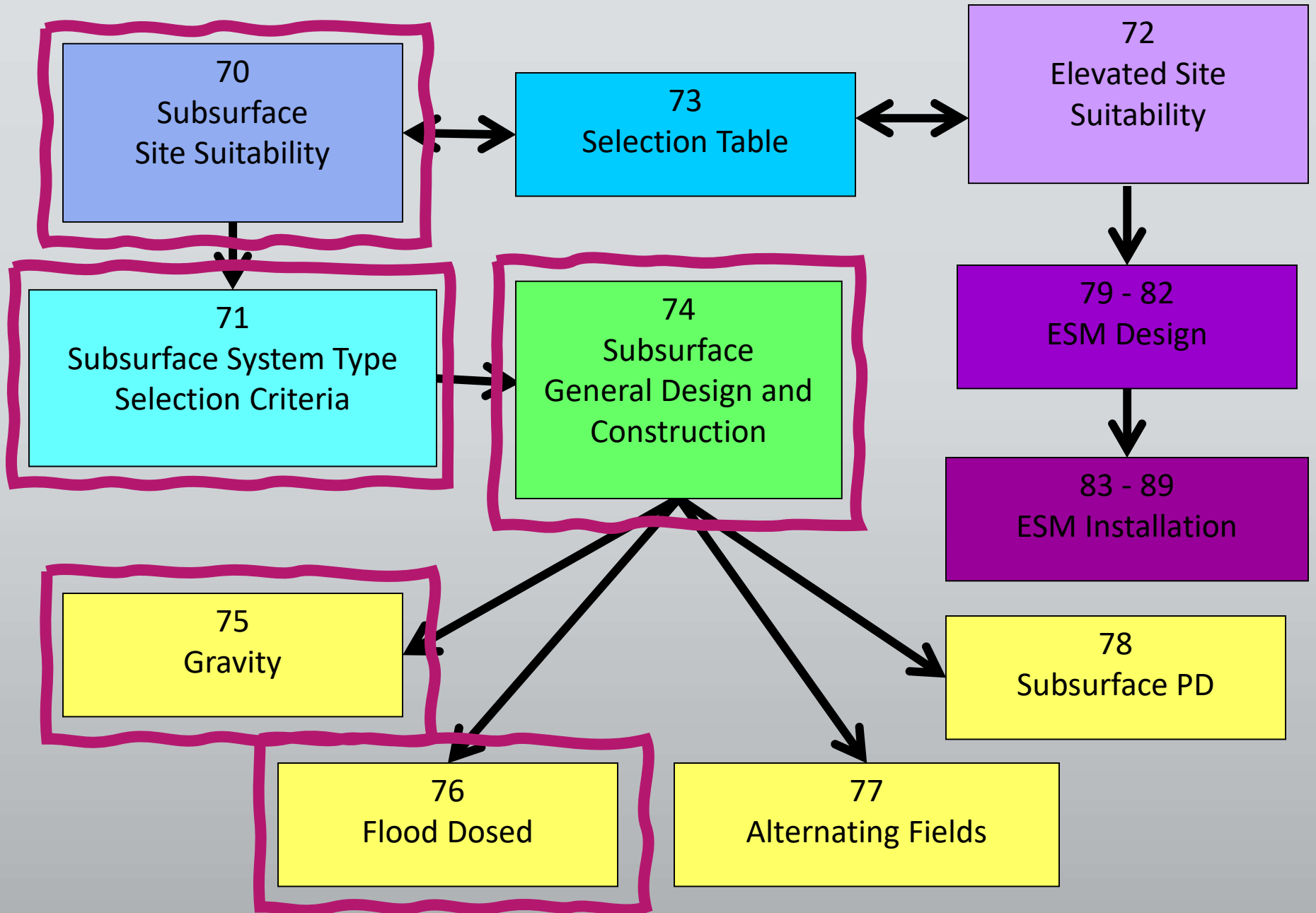
1) Gravity Sewer pipe (PVC and ABS)

2) Pressure sewer, effluent force main, manifold, pressure distribution laterals (PVC and ABS)

b) Gasketed compression joints used on sewers  $\leq 10'$  from water lines

c) SAS gravity distribution laterals

# Sections 70-89



# Subsurface Trench OSS

## **Site Suitability – Section 70**

(a) Site evaluation, soil evaluation and DDF.

(b) Site conditions must be met:

1) Sufficient area (separation and dispersal)

2) Appropriate topographic position

3)  $\leq 15\%$  slope

4) Proportionate loading of effluent.

5) Seasonal high water table

6) 7 & 8) Limiting layers identified and addressed

- Wisconsin glacial till soils WITH EFFERVESCENCE
- Coarse fragments
- Soil loading rates  $\geq 0.25$  and  $\leq 1.2$

# Subsurface trench OSS

## Site Suitability – Section 70

(c) subsurface trench soil absorption systems shall NOT be constructed as follows:

- 1) In areas of runoff
- 2) Trench bottoms below RFE
- 3) Areas that pond
- 4) Drainage ways (wholly or partly)
- 5) On sites with compacted soil at a depth greater than 12 inches (unless an ISDH approved method is used).





## Subsurface Trench OSS Selection Criteria – Section 71

d) Alternating Fields or dosed using a pump:

1. SLR between 0.25 and 0.75 gpd/ft<sup>2</sup>
2. 24” of soil between trench bottoms and limiting layer

e) >500 LF of trench length requires pump assisted distribution.

410 IAC 6-8.3-73 Table for on-site sewage system selection

Sec. 73. On-site sewage system selection may be summarized in Table VI as follows:

| Table VI - Table for On-site Sewage System Selection  |        | Subsurface Trench OSS |                       |        |                                      | Elevated Sand Mound On-site Sewage Systems (Sec. 72) |
|---|--------|-----------------------|-----------------------|--------|--------------------------------------|--|
| Site Requirements   | Gr (S) | G (S)                 | Alt /FD               | FD     | PD                                   |  |
| <b>DDF</b> Slope  | ≤ 15%  | ≤ 15%                 | ≤ 15%                 | ≤ 15%  | ≤ 15%                                | ≤ 6%   |
| Design Daily Flow   | ≥ 450  | < 450                 | Any                   | Any    | Any                                  | Any  |
| 0.25-0.75 SLR   | ≥ 0.25 | ≥ 0.25                | ≥ 0.25                | ≥ 0.25 | ≥ 0.25                               | ≥ 0.25   |
|   | ≤ 0.75 | ≤ 0.75                | ≤ 0.75                | ≤ 0.75 | ≤ 1.20                               | ≤ 1.20   |
| Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil < 0.25 gpa/ft                    | ≥ 30   | ≥ 24                  | ≥ 24                  | ≥ 24   | ≥ 24                                 | ≥ 20   |
| Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil > 1.20 gpa/ft                    | ≥ 30   | ≥ 24                  | ≥ 24                  | ≥ 24   | ≥ 24                                 | ≥ 20   |
| Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil = 1.20 gpa/ft                    | ≥ 30   | ≥ 24                  | ≥ 24                  | ≥ 24   | Press. Dist. required for SLR = 1.20 | ≥ 0  |
| Distance from Trench Bottom (ground surface for mounds) to Soil Horizon That Shows Effervescence <sup>1</sup> | ≥ 30   | ≥ 24                  | ≥ 24                  | ≥ 24   | ≥ 24                                 | ≥ 20   |
| Distance from Trench Bottom (ground surface for mounds) to Soil Horizon with < 35% Coarse Fragments by Volume | ≥ 30   | ≥ 24                  | ≥ 24                  | ≥ 24   | ≥ 24                                 | ≥ 20   |
| Distance from Trench Bottom (ground surface for mounds) to Soil Horizon with > 60% Coarse Fragments by Volume | ≥ 30   | ≥ 24                  | ≥ 24                  | ≥ 24   | ≥ 24                                 | ≥ 20   |
| Distance from Trench Bottom (ground surface for mounds) to High Water Table                                   | ≥ 24   | ≥ 24                  | ≥ 24                  | ≥ 24   | ≥ 24                                 | ≥ 20   |
| Lineal ft. limit  | ≤ 500  | ≤ 500                 | ≤ 500 for Alt. Fields | Any    | Any                                  | N/A  |

## Section 74

# Subsurface Trench General Design

(a) Minimum absorption area based on:

- 1) # of bedrooms and equivalents
- 2) Most restrictive SLR within 24 inches of trench bottom
- 3) Absorption area =  $DDF/SLR = FT^2$

(b) Long and narrow

(c) Meet separation distances

(d) Protect the site from vehicular disturbance before, during and after construction

## Section 74

### Subsurface Trench General Design

- (e) Proper soil plasticity for installation
- (f) Vegetation removed without causing compaction.
- (g) Proper design or removal of trees
- (h) Do not smear the sidewalls or bottom of the trenches
- (n) Trenches constructed along contour
- (o) Trench min/max depth  
10" from original grade ~ 36" from final grade

## Section 74

### Subsurface Trench General Design

- (p) Trench min/max width: 18in-36in.
- (q) Min. separation distance: 7.5 ft oc
- (r) Max length 100 ft (except Pressure Distribution)
- (s) Trench & distribution laterals to be level throughout length & width
- (t) Distribution laterals & trenches shall NOT be tied together at distal ends.

## Section 74

### Subsurface Trench General Design

(u) Distribution lateral distal ends capped

(v)-(w) Aggregate envelope for perforated pipe

6" – 4" – 2"

(x) Barrier material over Aggregate

(y) 12" of cover over aggregate and crowning over SAF.

(z) Tire chips, if used, shall be removed from ground surface at cleanup

## Section 75

### Subsurface Trench Gravity OSS Design and Construction

- (a) Section 74 and this section
- (b) D-box between septic tank and SAF with each trench connected directly to d-box with effluent sewer.
- (c) Installed level / materials
- (d) Effluent sewer pipe backfill requirements prior to and after the d-box.
- (e) Outlets with same invert elevation



## Section 75 (d)

- Installation of effluent sewer pipe
  - When installed **prior to the distribution box**, effluent sewer pipe shall be bedded according to manufacturer requirements with debris-free soil material or aggregate without damaging the pipe
  - When installed **after a distribution box**, effluent sewer pipe shall be stabilized, bedded and backfilled without damaging the pipe with debris-free soil material to prevent the migration of effluent along the outside of the pipe



## Section 75

### Subsurface Trench Gravity OSS Design and Construction

- (f) Effluent sewer extends into aggregate in trench
- (g) Gravity distribution laterals 4 in. diameter
- (h) Gravity distribution laterals shall be level / hole placement
- (i) 5 ft. between d-box and proximal end of trench



# Section 76

## Subsurface Flood Dosed OSS Design and Construction

(a) Sections 74, 75 & this section

(b) The pump shall deliver 1 DDF in each dose.

Effluent pump selection based on required discharge rate and total head on pump.

**Table VII – Discharge Rates for Flood Dosed systems**

| Number of Bedrooms | Discharge Rate (gpm) |
|--------------------|----------------------|
| 1                  | 30-35                |
| 2                  | 30-35                |
| 3                  | 30-45                |
| 4                  | 30-60                |
| 5                  | 38-75                |
| 6                  | 45-90                |

**Dose Volume = 1 DDF**

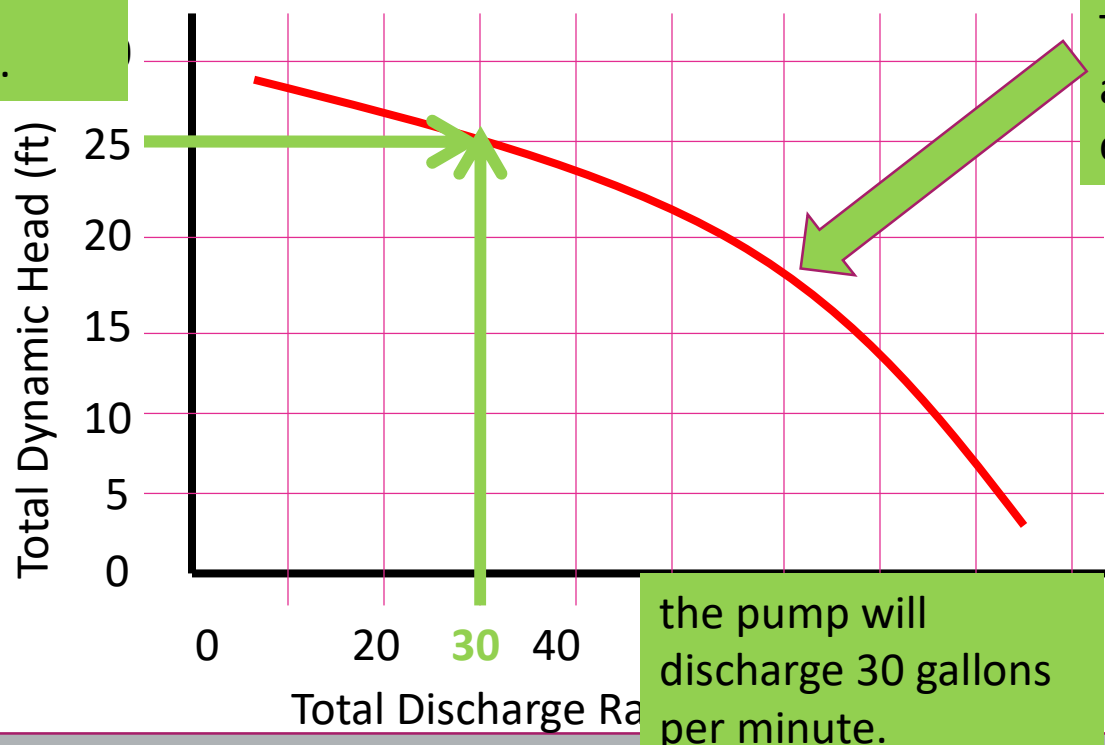
**The system will be dosed, at a maximum, once per day**

## Section 76

# Subsurface Flood Dosed OSS Design and Construction

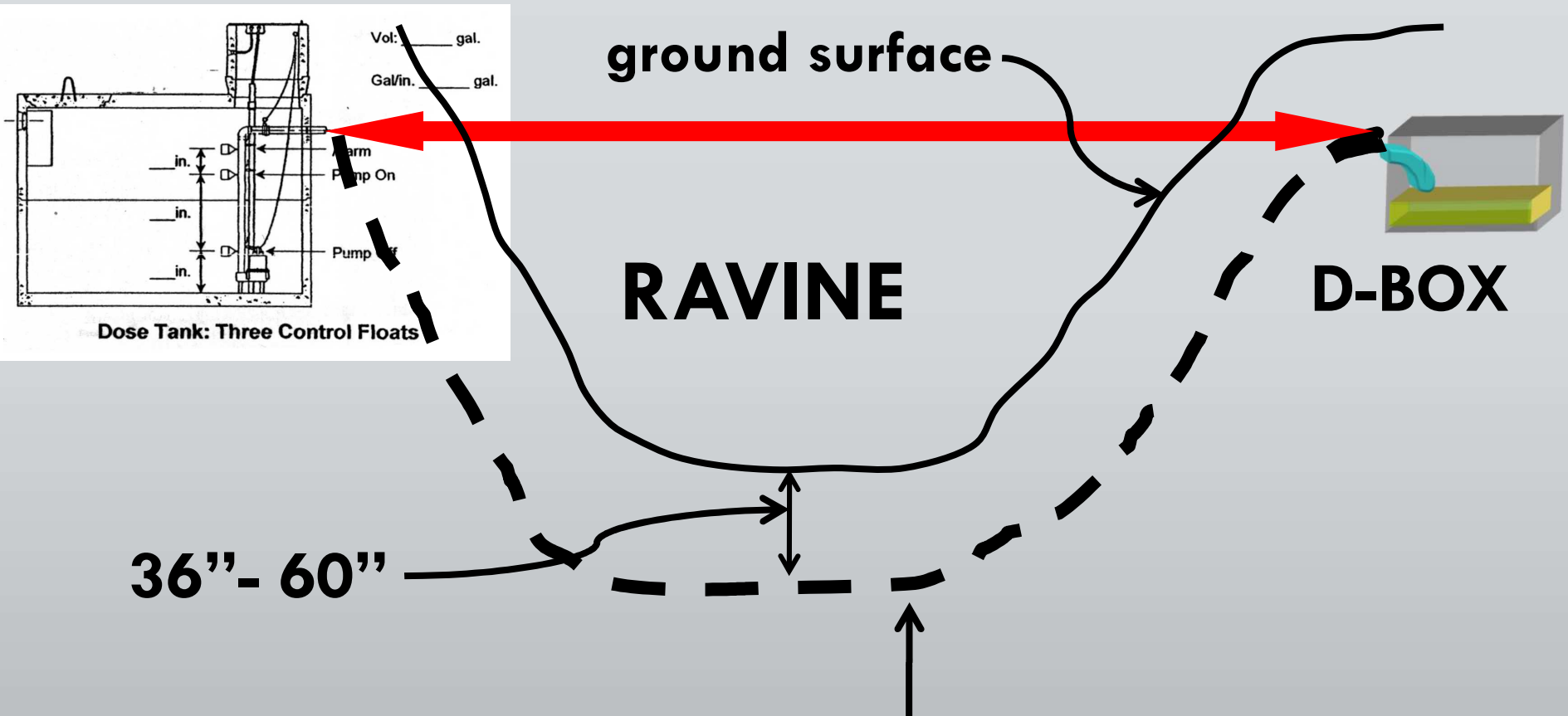
(c) Total head sizing for the effluent pump = **static head plus friction loss.**

At 25' of Total Dynamic Head...



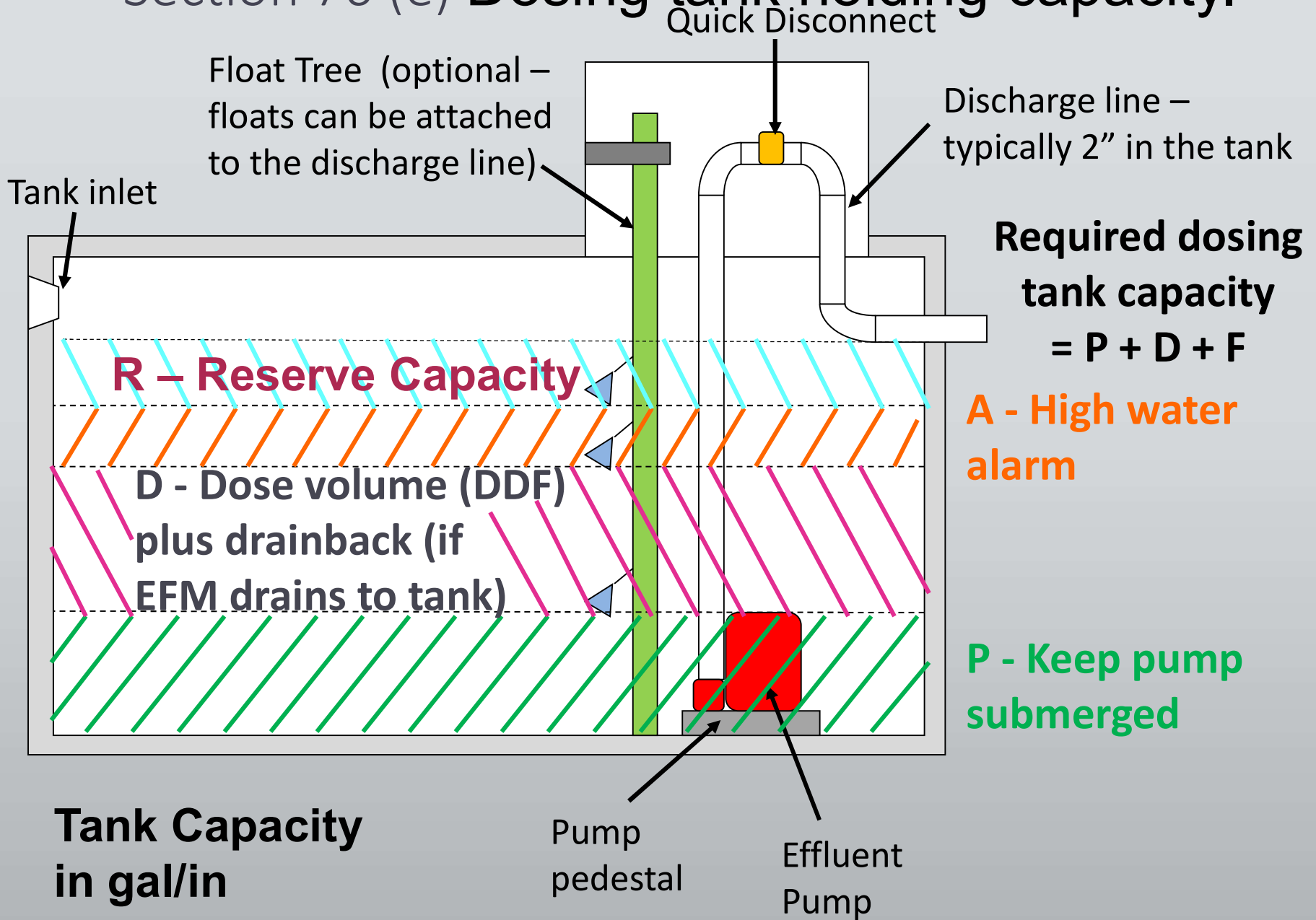
The pump performs anywhere along this curve

(d) Effluent force main shall drain between dosed or buried below frost line



Depth of delivery line that does not drain must be 36 to 60'' [Table VIII]

# Section 76 (e) Dosing tank holding capacity.



## Section 76

# Subsurface Flood Dosed OSS Design and Construction

### (f) Distal end of effluent force main

- Elbow turned down with weep hole
- Sanitary Tee
- Baffle

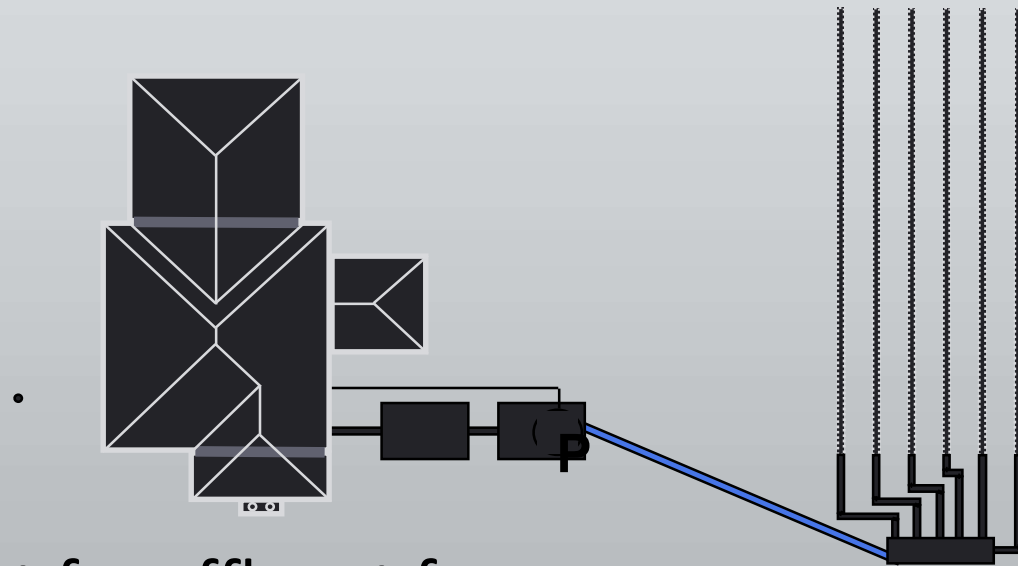


## Section 76

# Subsurface Flood Dosed OSS Design and Construction

Effluent Force Main

- (g) Minimum 1 inch diameter
- Maximum 4 inch diameter



- (h) Friction loss chart for effluent force mains and manifold.

# Question 5



## 5. What 3 things are required to correctly size an effluent pump?

- A.** Total dynamic head (TDH), system discharge rate (gpm), a pump performance curve.
- B.** Dose volume, TDH, pump manufacturer.
- C.** Total dynamic head, required flow (gpm), the depth of subsurface drainage.
- D.** Dose volume, elevation of the d-box, the pump manufacturer.
- E.** Diameter of the force main, hp of the pump, depth of drainage.