

TOWN OF PARADISE LICENSED EVALUATOR TRAINING

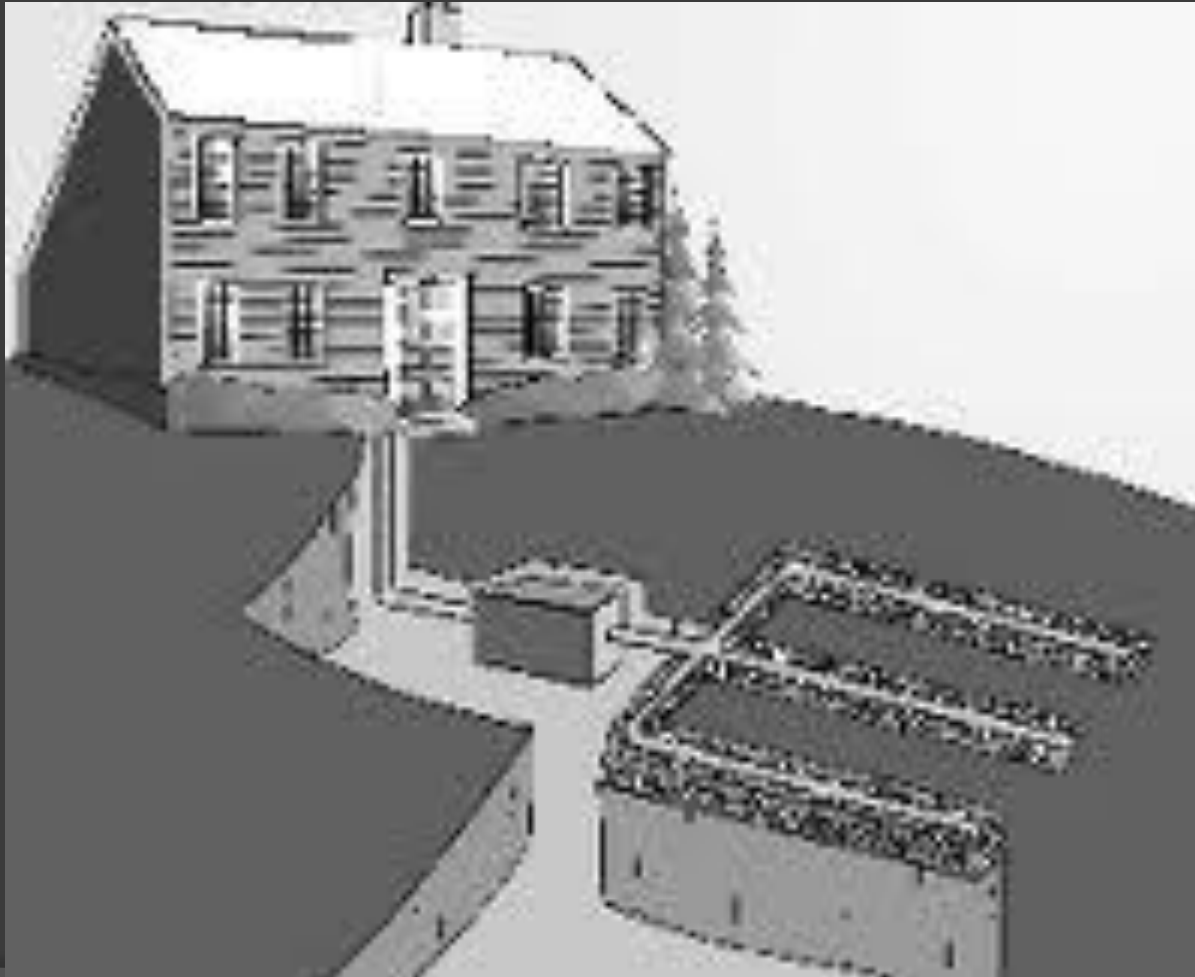
WINTER 2017



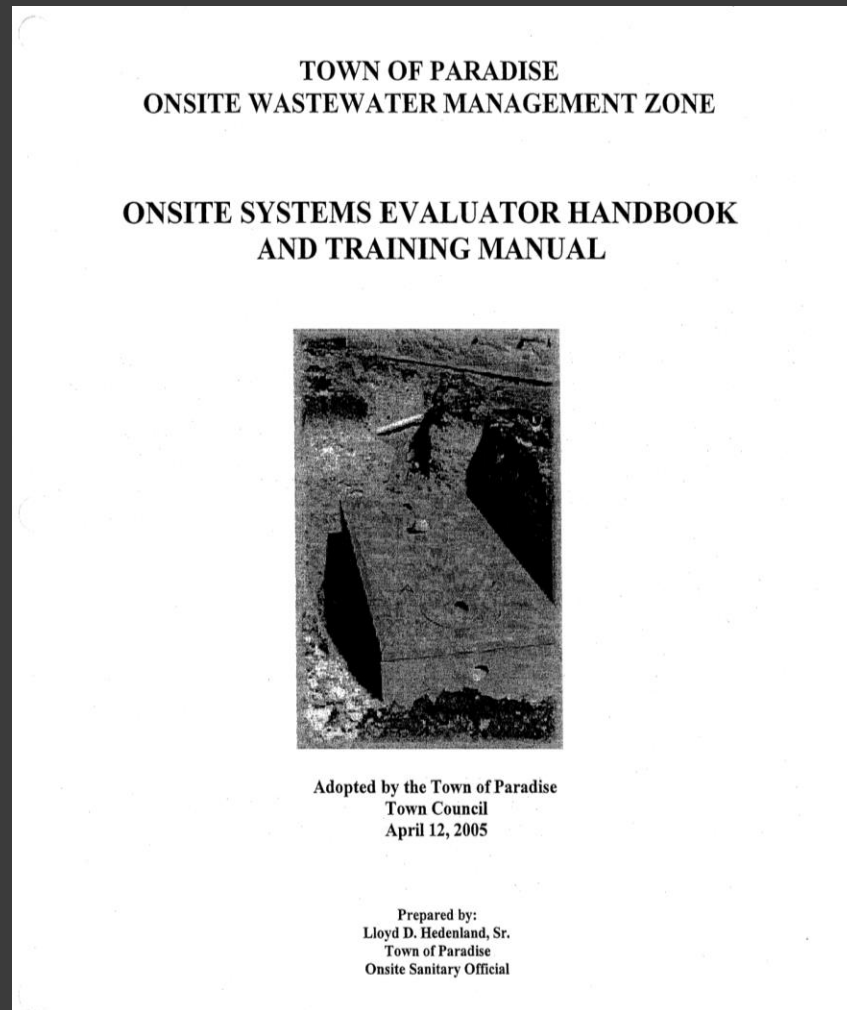
The good old days



Typical Residential system



All Evaluators should have a copy of;



Current version is
April 2005, ONSITE
SYSTEMS EVALUATOR
HANDBOOK AND
TRAINING MANUAL

Town of Paradise Evaluators are:

Licensed by the Town to provide routine evaluations of all onsite sewage disposal systems

Enforce standards found in the Evaluators handbook or

Must report all septic system conditions that indicate improper functioning or use of sewage disposal systems as described in the Evaluators handbook

Must report all conditions observed that are contrary to code (see PMC 5.14.080)

Evaluators help the homeowners understand how their septic system works and gain a better understanding of the 'do's and don'ts'



All Evaluators must have:

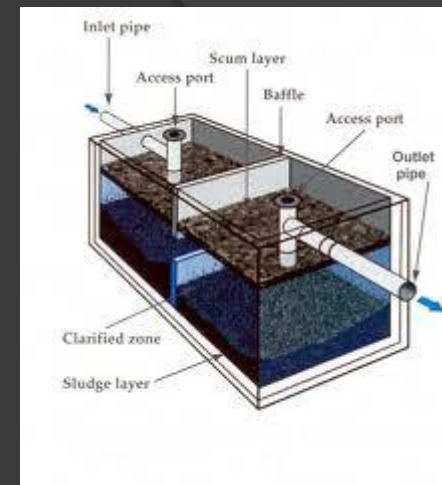
1. Portable water meter *
2. 15 ft garden hose extension
3. Sludge judge or equivalent *
4. 100' measuring tape
5. Flash light
6. Soil probe
7. Ice pick

* License cannot be issued without showing proof of possession



Septic Tank functions:

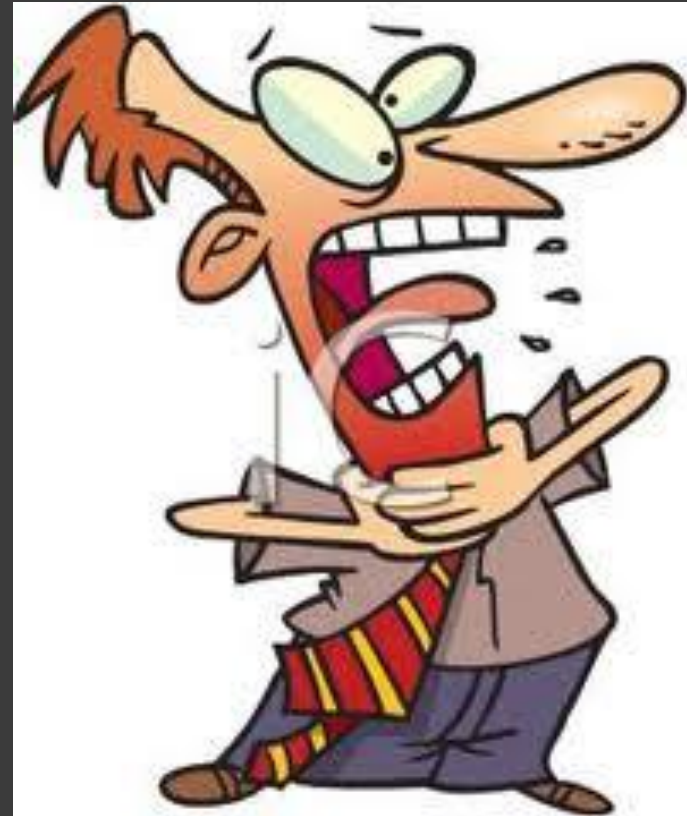
- Solids Removal through Gravity or Density
[IT SINKS OR IT FLOATS]
- Inorganic matter;
SAND, SILT, CLAY
- Organic material (comes from plants or animals);
FECES, TP, OILS, FOOD WASTES



- Anaerobic Decomposition;
Microbial digestion of organic material in an environment that lacks oxygen

Anaerobic decomposition

- Microbes that eat organic substance
- Occurs in environment with no oxygen
- Three by-products are hydrogen sulfide(corrosive), Methane gas(explosive) and Carbon dioxide(suffocant)



URINE

- LOTS OF NITROGEN
- SCHOOLS ARE HIGH IN IT
- High nitrogen in the creeks and groundwater are a major environmental concern

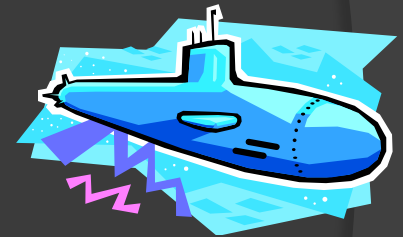


Solids

Floating Solids: Fats, Oils, Grease (FOG), Soaps, Paper



Suspended Solids: Particles neither floating or sinking but suspended in water



Settleable Solids: Sand, soil particles, heavier organic materials, cell phones

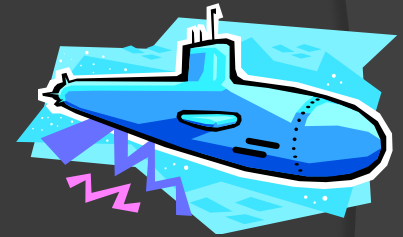


Solids 5 Classifications

- Floating Solids – SCUM Layer



- Suspended Solids – CLEAR Zone



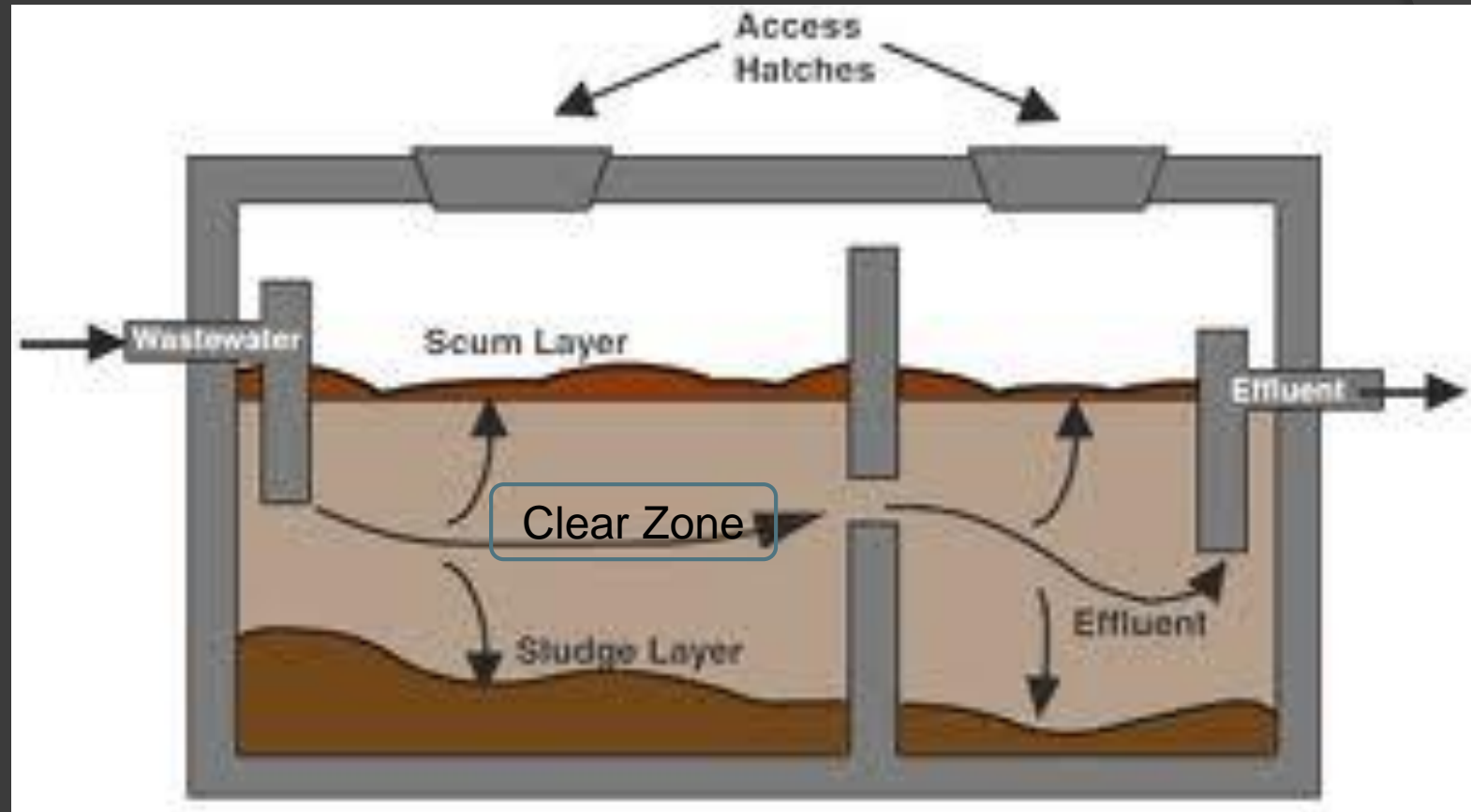
- Settleable Solids – SLUDGE Layer

- (Also Dissolved Solids like Salt)

- (Colloidal Solids between dissolved and suspended)



Solids Separation in Septic Tank



Tank Volume is a key component of effective solids separation

•Septic Tank Risers

- ◎ Risers? Secure to tank, riser lids fit tight, no cracks, bows, separations
- ◎ Corrosion, Cracks, Holes



Plastic Risers

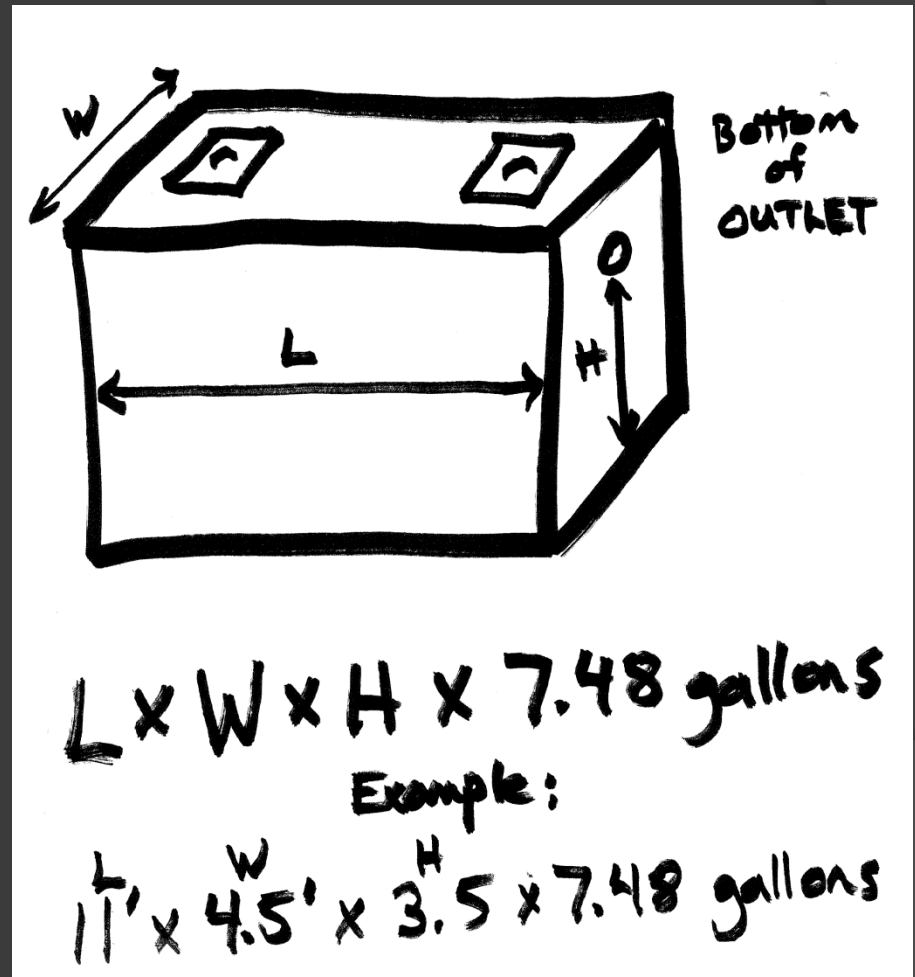


High groundwater can also cause Deformed Access Openings



Measuring Volume Capacity of Septic Tank

- Measure Inside dimensions of Tank
- Length X Width X Height in feet
- This total + cubic ft
- Multiply :
- Cubic feet X 7.48 gal



Measuring Volume Capacity of Septic Tank

- Measure Inside dimensions of Tank
- $\pi \times (D/2)^2 \times L = \text{Ft}^3$
- $\text{Ft}^3 \times 7.48 \text{ gal}/\text{ft}^3$
- Tank size in gal.



$$\pi \times \left(\frac{D}{2}\right)^2 \times L = \text{Ft}^3 \times 7.48 \frac{\text{gal}}{\text{ft}^3} = \text{TANK SIZE}$$

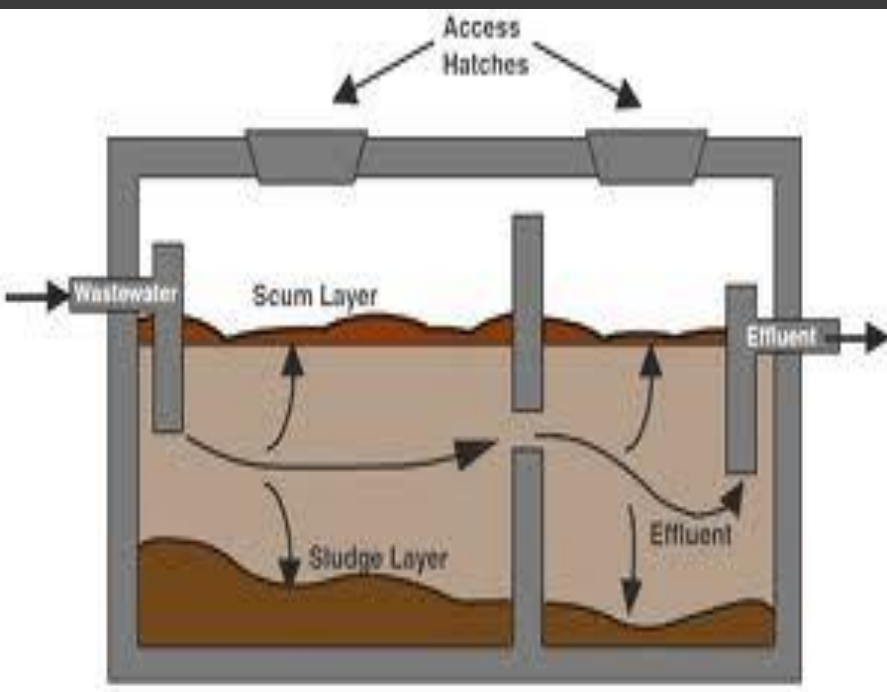
EXAMPLE:

$$3.14(2.6)^2 \times 9 = 191 \text{ft}^3 \times 7.48 \frac{\text{gal}}{\text{ft}^3} = 1428 \text{ gal}$$

1428 gal acceptable margin of error 1500 gal

Other Septic Tank components to inspect;

- Sanitary T's – Downspouts are in place. Must extend below the scum layer into the clear zone and above the sludge
 - 2 ft above the bottom of tank
 - 1.5 ft below the water level
- T is vented on top above the scum level



What is this?

- Baffle:
Rusting
rebar
bleeding
through
degrading
concrete



Corrosion of concrete: Caused by naturally occurring Hydrogen Sulfide gas

- ⦿ Exposed rebar = FAILED
- ⦿ Exposed Aggregate
- ⦿ Note on evaluation form degree of CORROSION:
- ⦿ Less than ½ inch = GOOD
- ⦿ ½ inch to 1 inch = FAIR
- ⦿ Over 1 inch = FAILED



CHECK THE FIELDS FOR SURFACING



SURFACING EFFLUENT

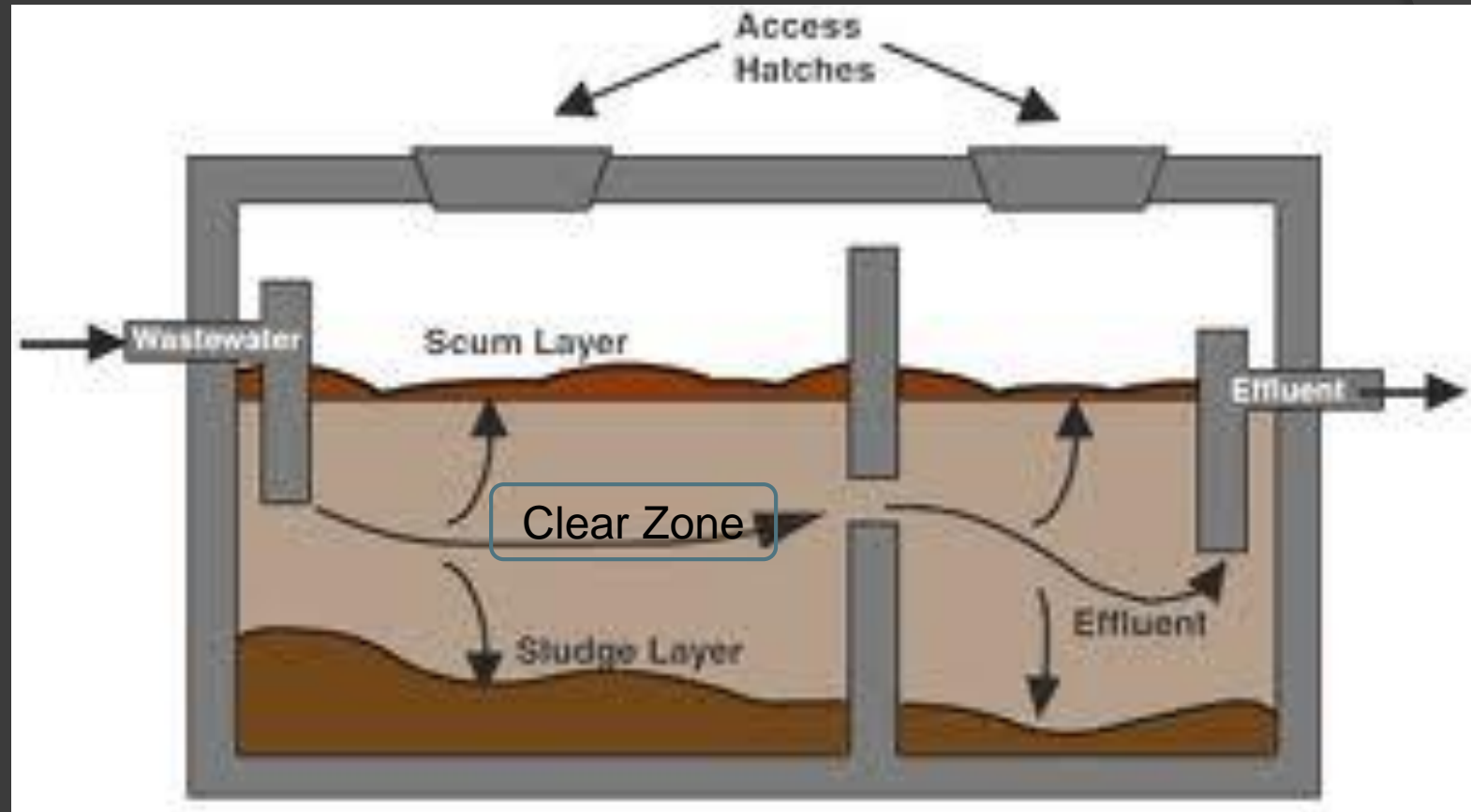


05.07.2008 09:02



**Laundry waste plumbed to
ditch**

Solids Separation in Septic Tank



Tank Volume is a key component of effective solids separation

Using a sludge judge



How measure solids?



- Sludge Judge (or equivalent)
- Measure at thickest portion
- Measure both compartments
- Measure more than once for accuracy
- Record your measurements



Measure next to Sanitary T's



When is pumping required by the Town of Paradise?



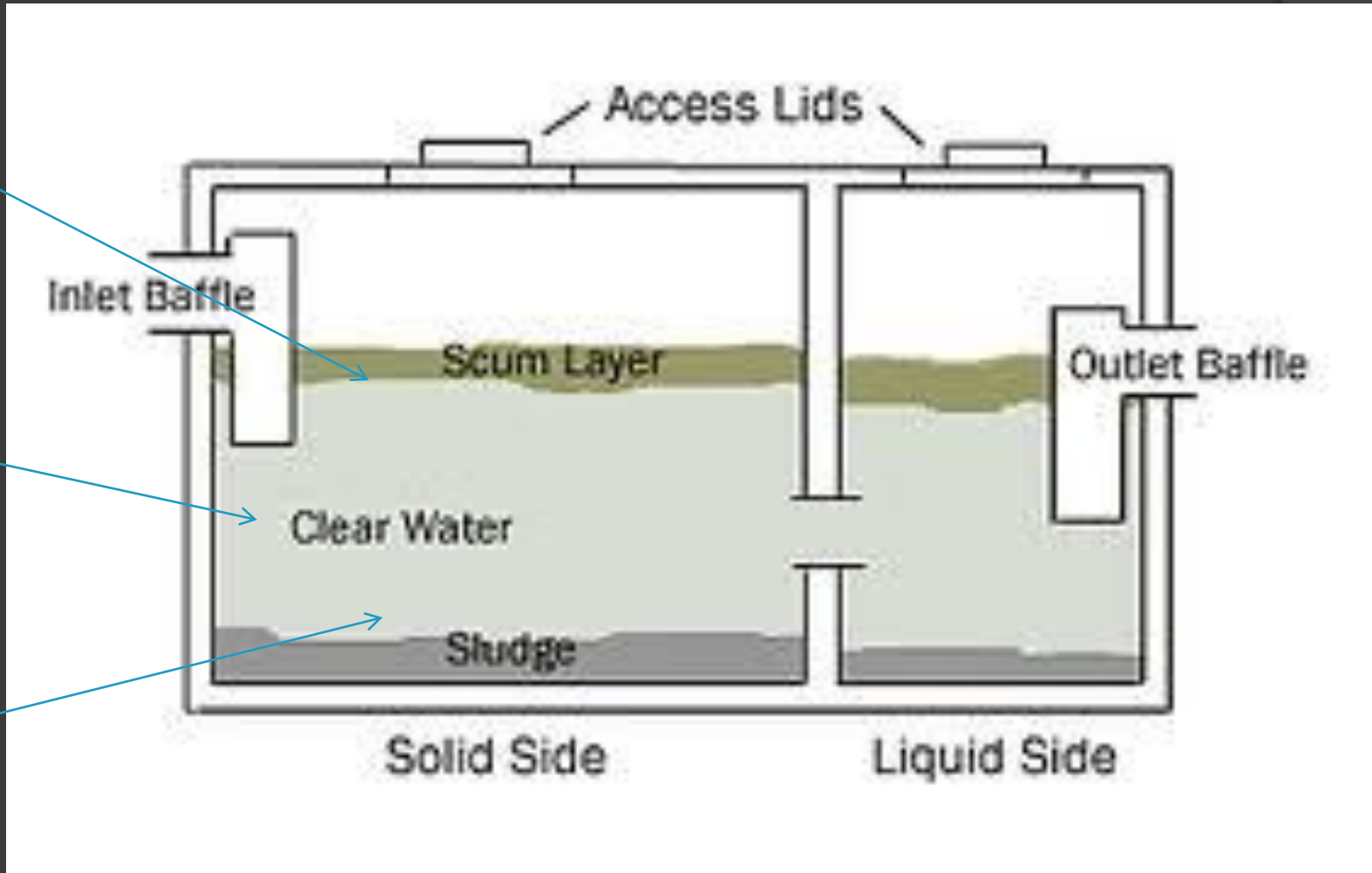
- Scum Layer is greater than 13 inches
13+
- Clear zone is 6 inches or less
6-
- Sludge layer is greater than 16 inches
16+

PUMPING REQUIRED AT;

13"+

0"- 6"

16"+



Tank Inspection

- Operating level in the tank is high - and above the invert of the outlet
What are reasons this could be happening?



- Leachline is clogged
- Effluent tightline is clogged due to roots, crushed pipe, solids
- Effluent tightline has a rise in it due to roots, tank settling
- Groundwater intrusion into fields and tank

Tank Inspection

- Operating level is low: Below the invert of the outlet pipe

Reasons?

The tank leaks:

- Below the water line-
- cracks, deteriorated grout at seam, roots, concrete deterioration

If house vacant and system not in use for very long time (approx 3-4 inches/year water loss depending on site)



Roots In Tank



Roots in Tank



Where is this
root growing?



Crack in outlet compartment wall



Septic Tank components

- Baffle wall in place – secure, flow through hole is in place
- Walls of tank are intact
- Corrosion :
Caused by
Hydrogen Sulfide

Corrosion inside tank



Baffle weakened by corrosion



Corrosion at water line



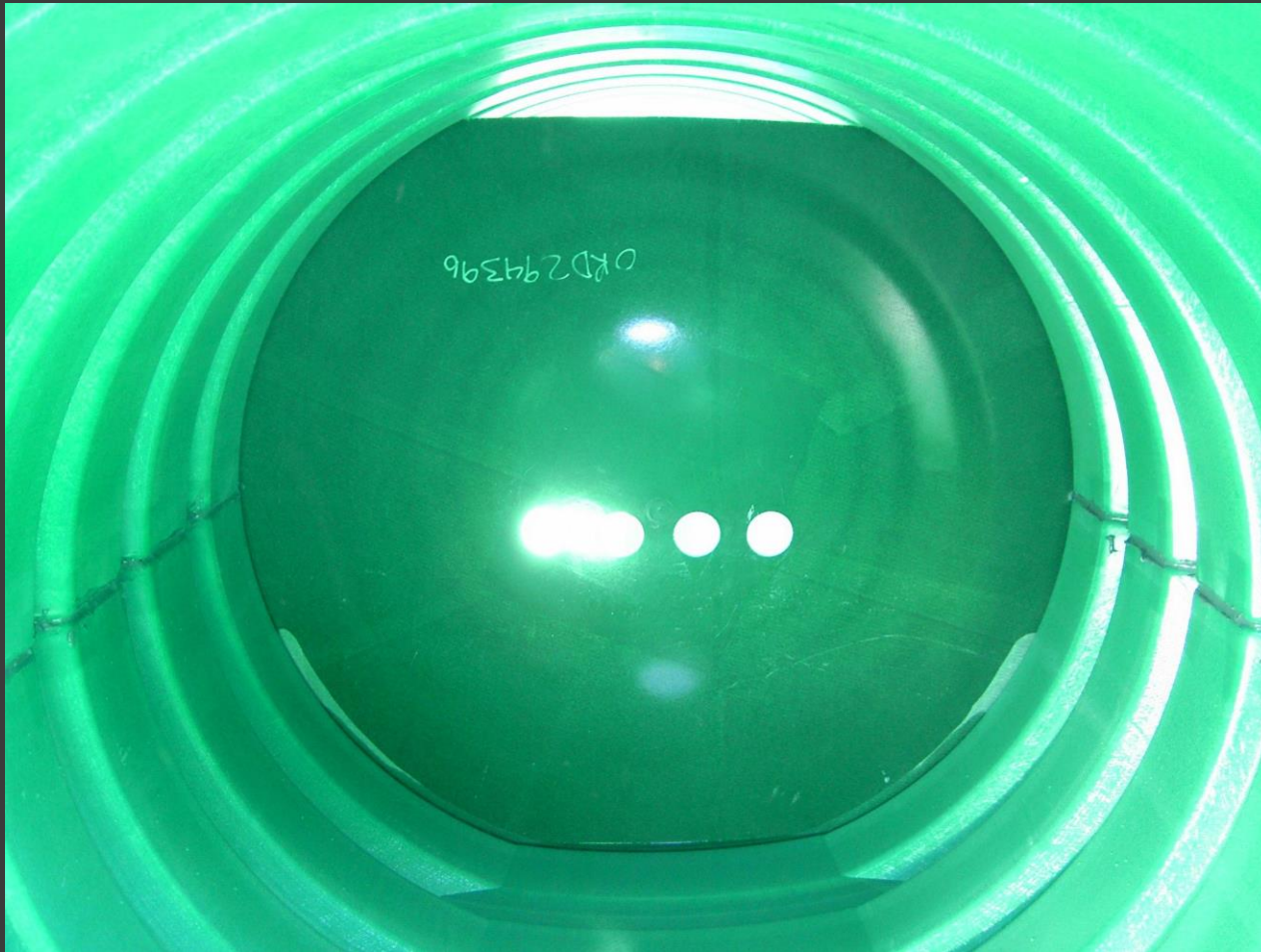
Fiberglass or Plastic Tanks: what to look for...



Poly Tanks



Inside of a OSI Fiberglass Reinforced Plastic Tank



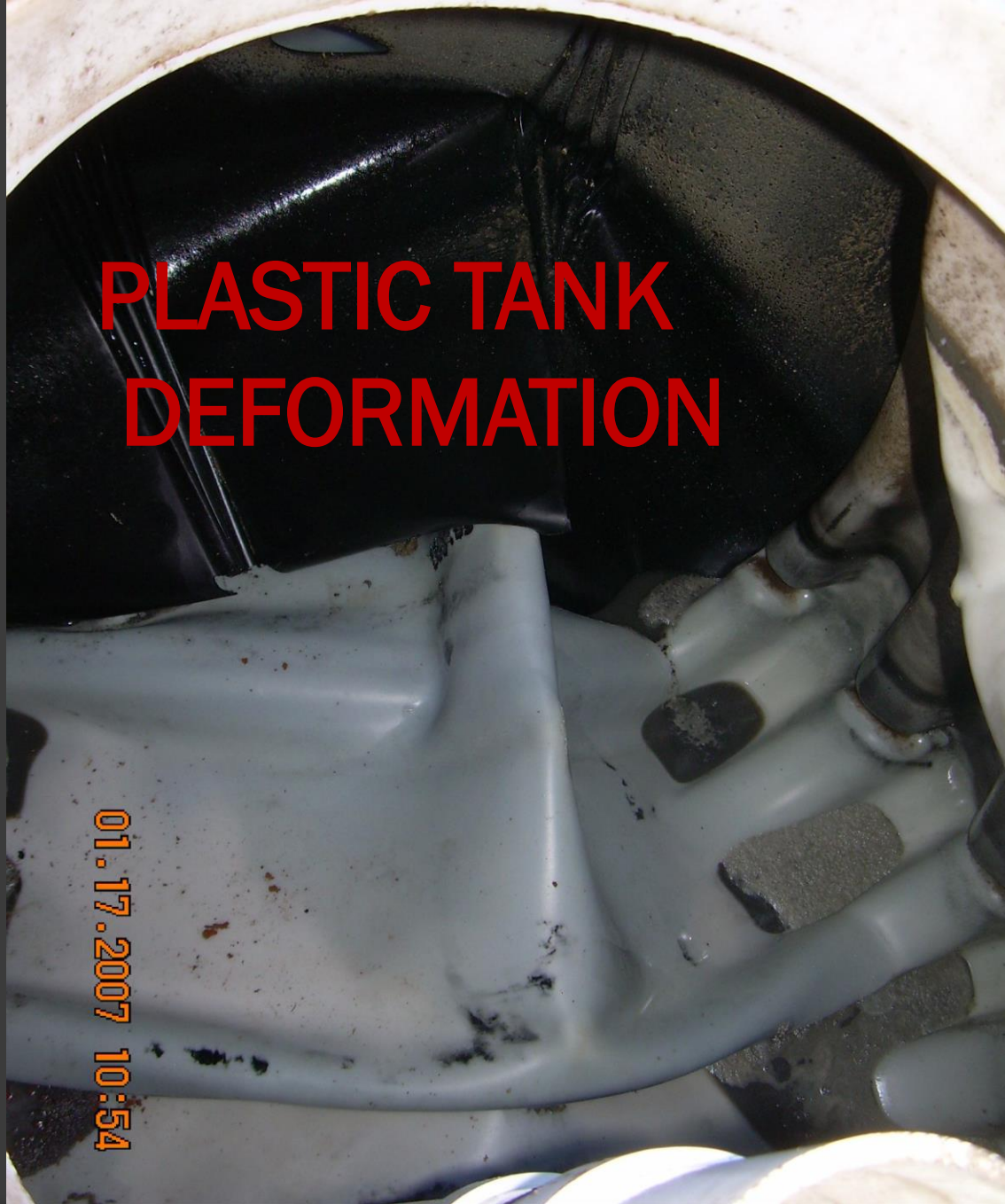
Fiberglass or Plastic tanks

- Must be pumped to evaluate – Why?



PLASTIC TANK DEFORMATION

01.17.2007 10:54



Fiberglass or Plastic tanks

- Cant pump them during wet season: December through April – unless anti-buoyancy is in place.
- WHY?

CONCRETE



Floating Tank in high groundwater



Floating Tank in high Groundwater



What kind of tank is this?

Slab style tank

**Both chambers must
be inspected**



Septic Tank locations: what's wrong in this photo?



Peer too close to tank



Peers too close?



Noted as “deck” over septic tank on the evaluation form: -WRONG-



Bottomless Tank



Illegal Dwelling?



Plumbing into the riser by dropping sewage on top of the scum layer is not acceptable

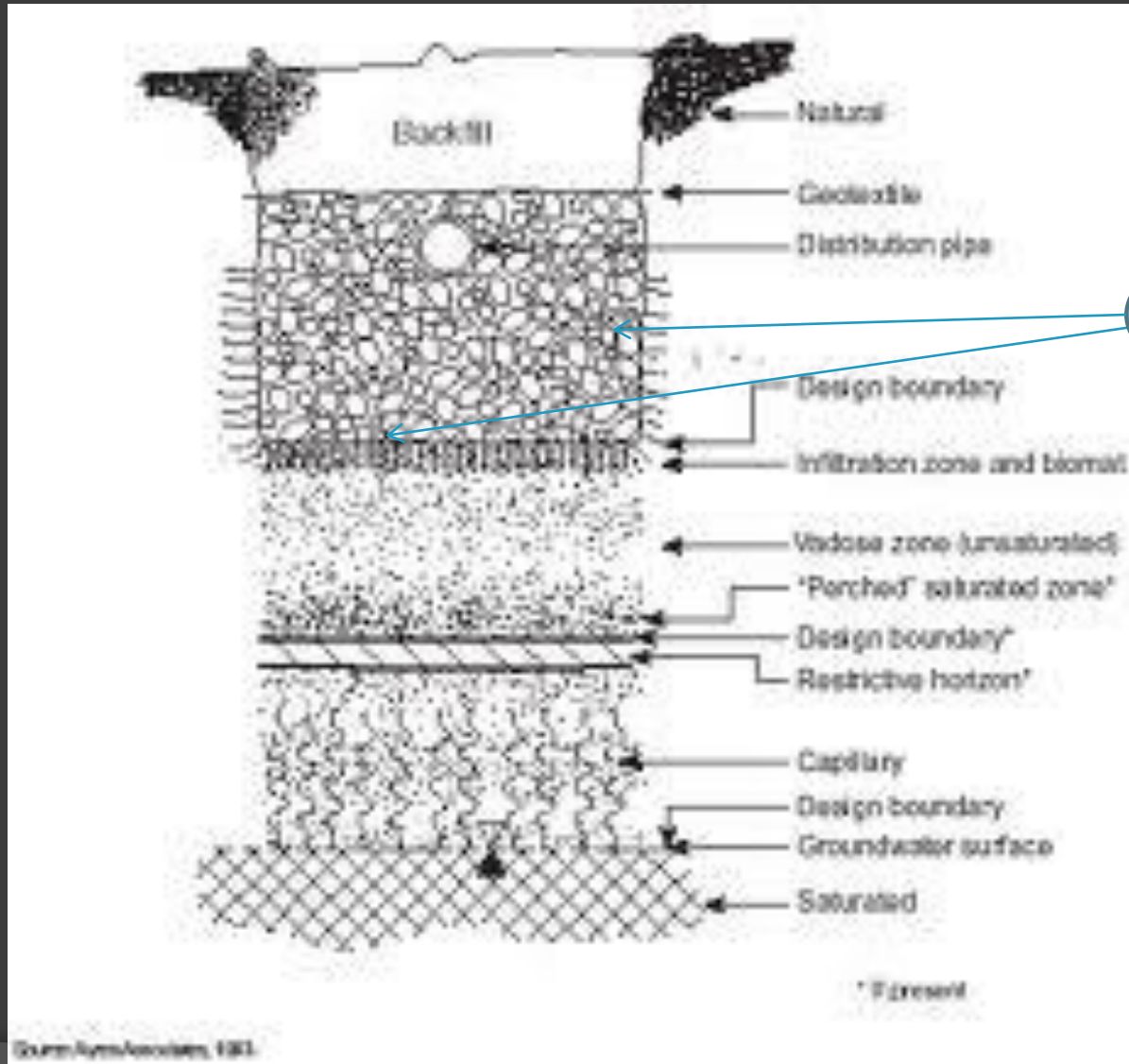
Illegal camper hook up?



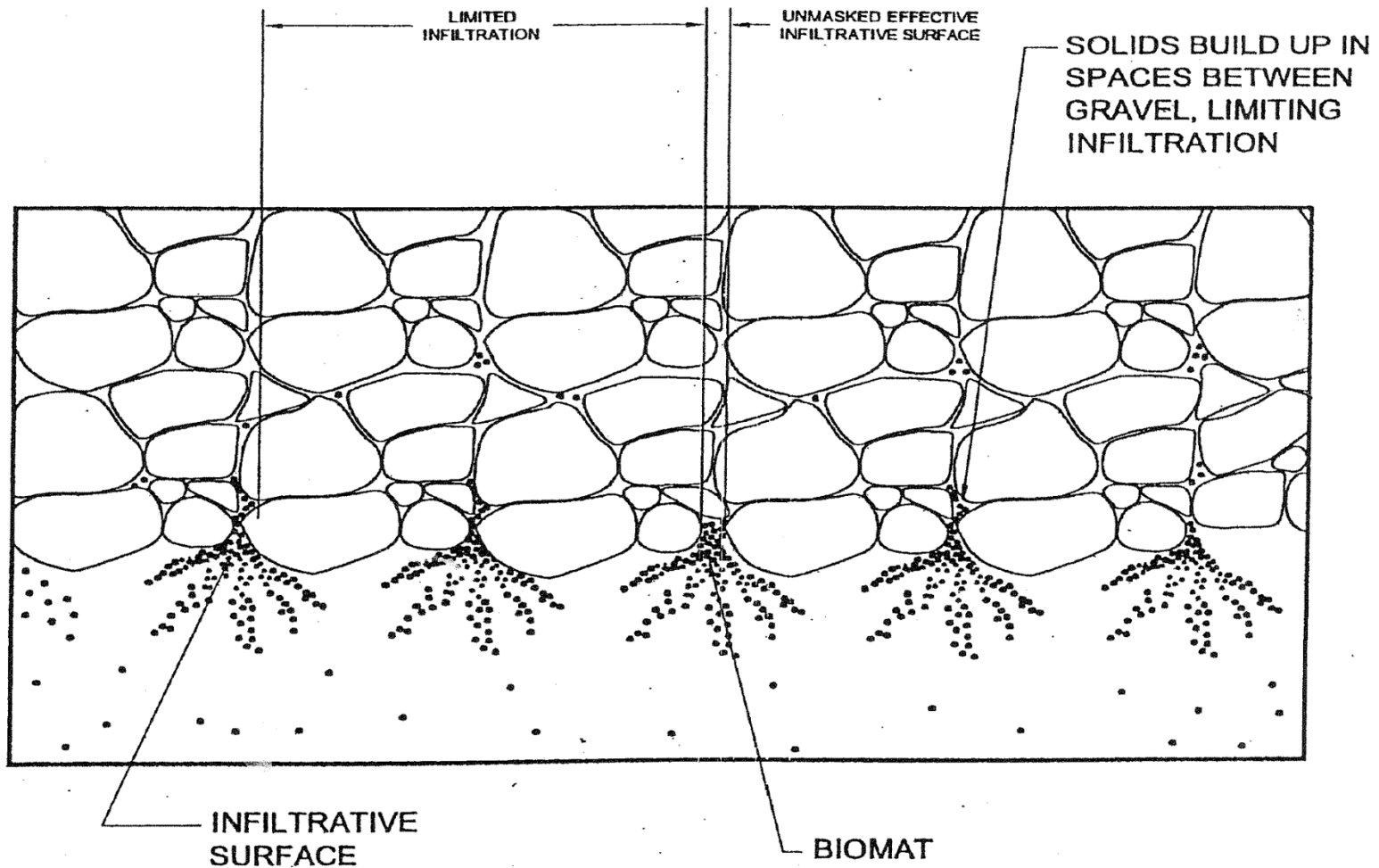
Absorption Fields



Leachtrench Cross-Section



Infiltrative Surface



Biomat forms on Infiltrative surface and is made of Microbes. A healthy Biomat does not clog

INFILTRATIVE SURFACE

FIGURE 58

Reasons for this Infiltrative Surface to get clogged



Too many solids getting into trench:

- High hydraulic head

- Too much wastewater for what system was designed for (overcrowded house)

- Too much flow. Not enough retention time in tank.

- FOG (fats oils grease) is high

- BOD is high. Too much matter is being washed down drain.

- no Sani-T, solids flowing out to field

- no baffle, solids flowing to second compartment

High groundwater – anaerobic conditions

Microbes get killed from an over abundance of cleaners, bleach, salt

Roots in leach pipe



07/22/2008 13:08



Testing the Gravity-fed Leachfields – Hydraulic Load Test

- Measure Static level of liquid in tank
- Use your own hose – not homeowners
- Use Flowmeter – 175 gallons in run of outlet T.

Excellent - No Rise

Good - 1" Rise and returns in 15 min

Satisfactory - 2" Rise and returns in 15 min

Marginal – 3" Rise and returns in 30 min

Poor – Over 3" Rise but not over T,
does not return all the way

Failure – Rises over T, does not return
all the way



Testing Pressure Distribution Leachfields

First-measure levels in piezometers

Second – Run 175 gallons into fields [?]

Third – Check levels in piezometers

- ⦿ Excellent – 1” rise in piezometers, quick return
- ⦿ Good – 1” rise, returns in 15 min
- ⦿ Satisfactory – 2” rise, returns in 15 min
- ⦿ Marginal – 3” rise, returns in 30 min
- ⦿ Poor – 4” rise, returns in 30 min
- ⦿ Fail – Over 4” rise, returns a bit but not all the way. Trench is nearly full

Pump Systems

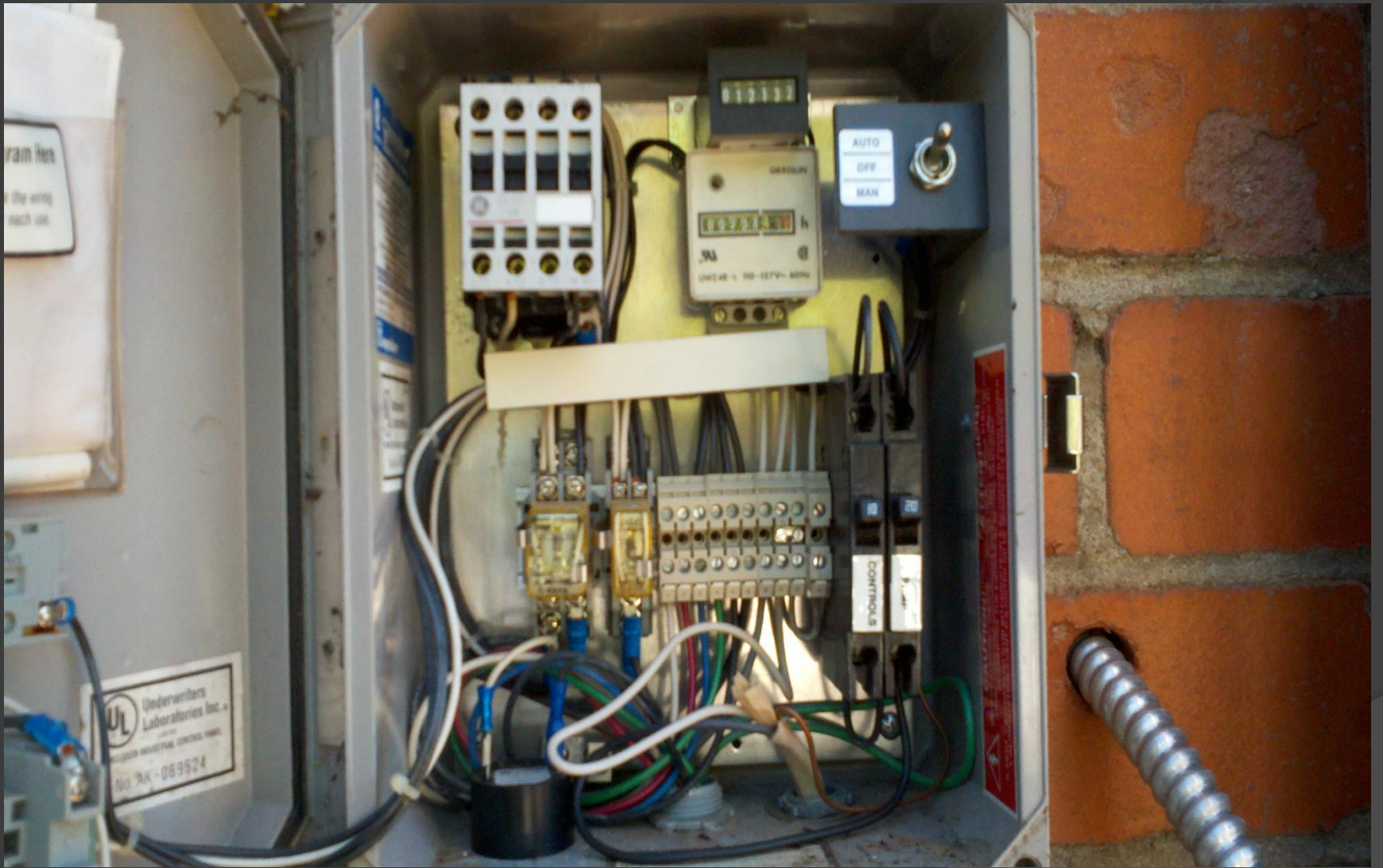
- ⦿ Some general things to look for
- ⦿ Some general maintenance issues;

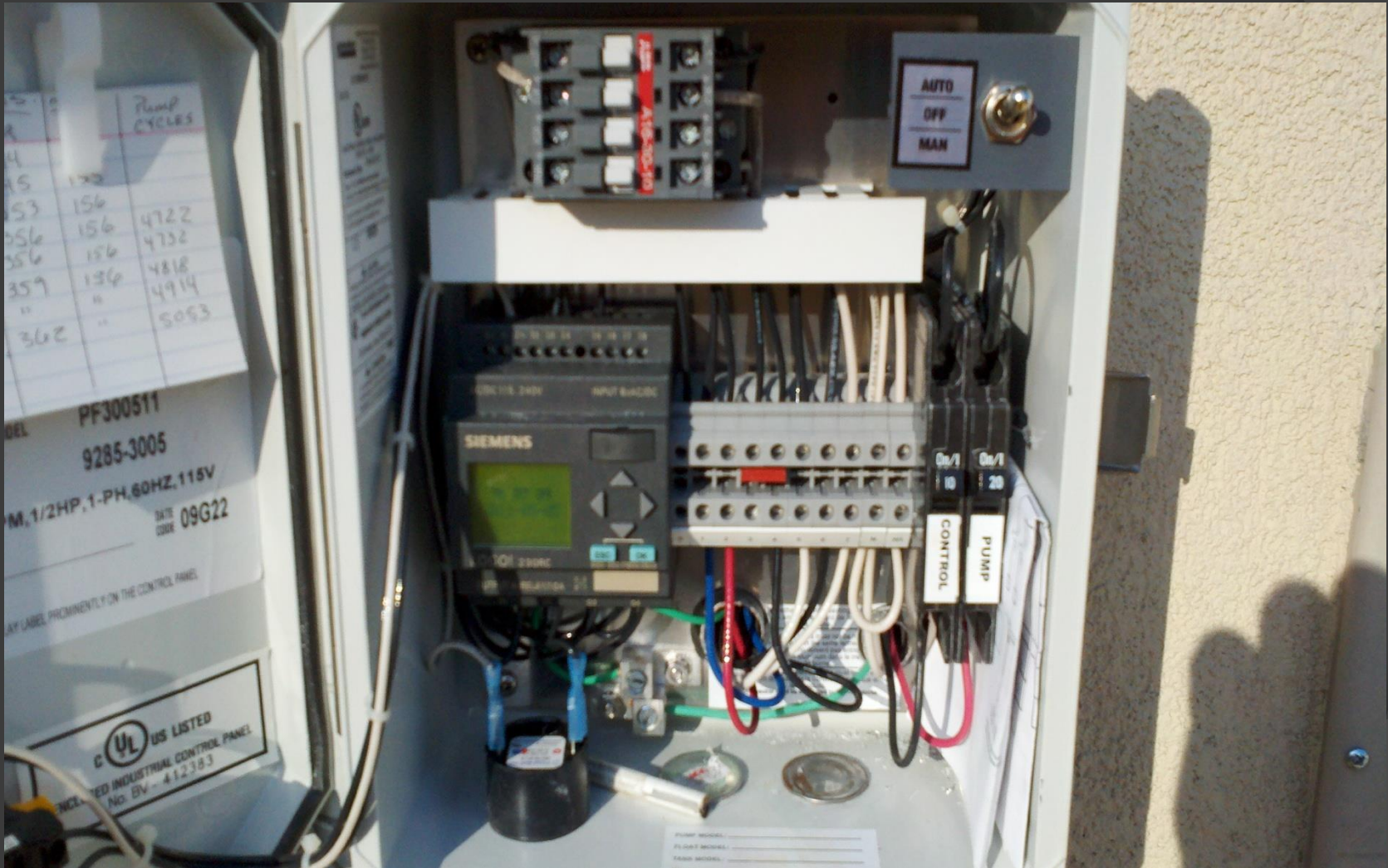


Different Control Panels for Pump Systems;









Dosing Sphere; Pump inside. Concrete Anti-buoyancy around



Diverter Valves:

Mark valve position before moving it



Examples of Good Things Gone Bad:



Lift station inside this shed









03.16.2010 11:43