INSTALLER BASICS - SECONDARY TREATMENT

"Secondary Treatment" material will not be on the installer test. If you plan to install or perform maintenance on any secondary treatment system (ATU, ABG, drip, etc.) you must be training in that specific product. Online trainings are usually available from the manufacturers.

If you are interested in installing or designing a drip system, please contact Cole Kitchens (nicholas.kitchens@arkansas.gov) or Ryan Christensen (ryan.christensen@arkansas.gov). Training is required before working on or designing drip absorption areas.

Secondary Wastewater Treatment

Removes dissolved and suspended biological matter. Secondary treatment is typically performed by indigenous water-borne micro-organisms in a **managed** habitat.

Examples:

- **RSF (Recirculation Sand Filter)**
- **RGF (Recirculation Gravel Filter)**
- ***ABG (Aerobic Biological Generator)**
- ***ATU (Aerobic Treatment Unit)**
- ***PMF (Proprietary Media Filter)**

*Proprietary Components

High Strength Effluent Reduction or Dispersal Field Remediation Devices
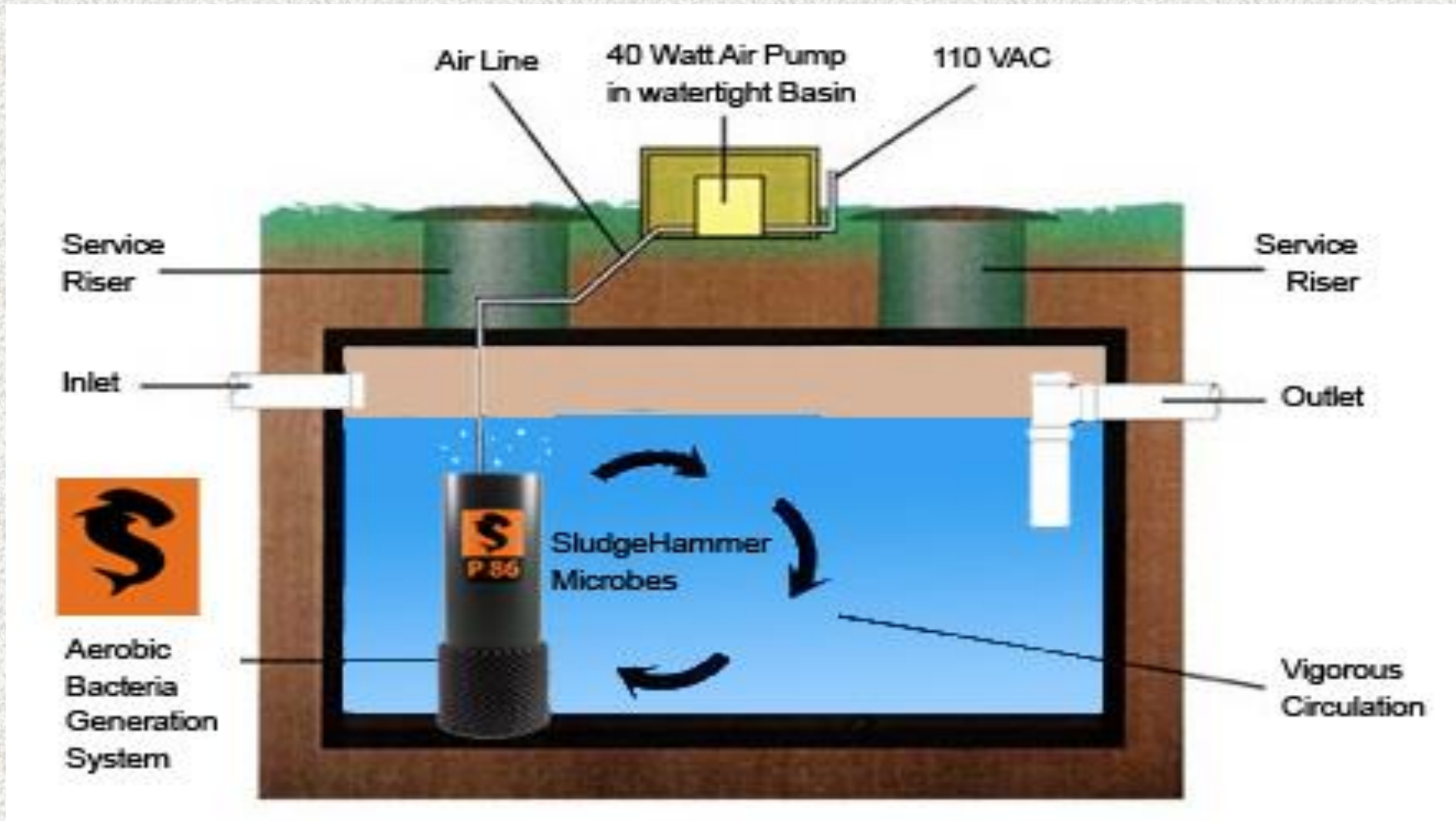
LOW PRESSURE DISTRIBUTION

Effluent Pump Located In:
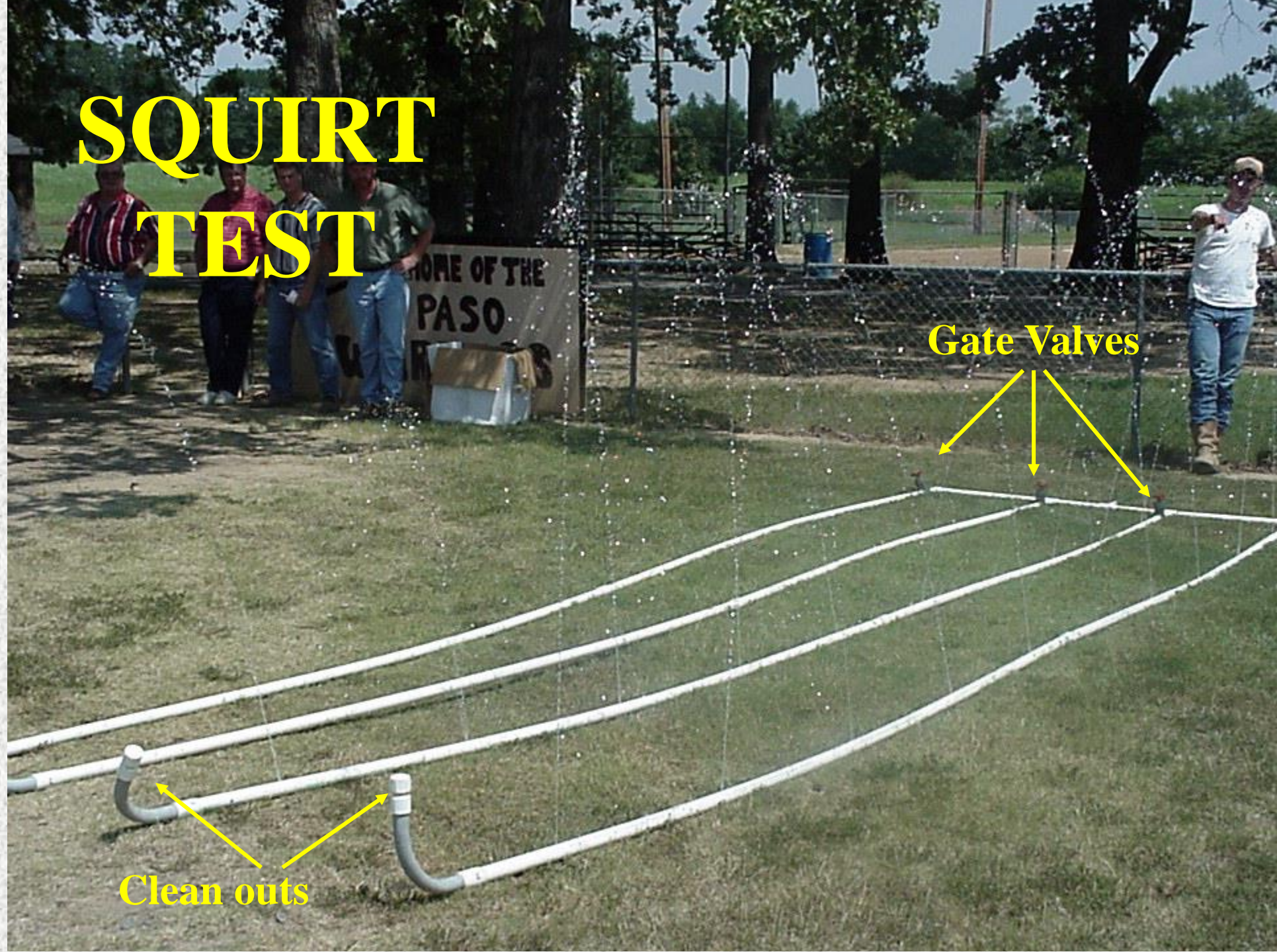
Pump Tank or

Filtered Pumped Vault

Distribution Grid

1¼ to 2 Inch Schedule 40 PVC Pipe

$^{3}/_{16}$ to $^{1}/_{8}$ Inch Holes

Orifice Shields

DR Specifies Construction & All Components

SQUIRT TEST

Gate Valves

Clean outs

LPD Design Issues

Increase in orifices #   =   Decrease residual head

Increase in orifice spacing =   Increase residual head

Increase in orifice size   =   Decrease residual head and increase dose volume

Decrease in orifice size   =   Increase residual head and decrease the dose volume

Dosed or Pumped Distribution

Need to know:

- Tank size (60" x 36")
- Dose Volume (30 gallons)
- Total Dynamic Head (TDH) (31 ft.)
- TDH =Elevation Head +Friction Loss +Residual Head

Cool factor! 1 gallon of water = 231 cubic inches

FLOW RATE FOR ONE ORIFICE			
ORIFICE HEAD FT.			
	ORIFICE DIAMETER		
	1/8"	5/32"	3/16"
3	GPM	GPM	GPM
4			
5	0.32	0.50	0.72
6	0.37	0.58	0.83
7	0.41	0.64	0.93
8	0.45	0.70	1.02
9	0.49	0.76	1.10
10	0.52	0.82	1.17
11	0.55	0.86	1.24
12	0.58	0.91	1.31
	0.61	0.94	1.37
	0.64	0.99	1.44

EXAMPLE

5 ft.... squirt height

3/16" orifice size

75 orifices total

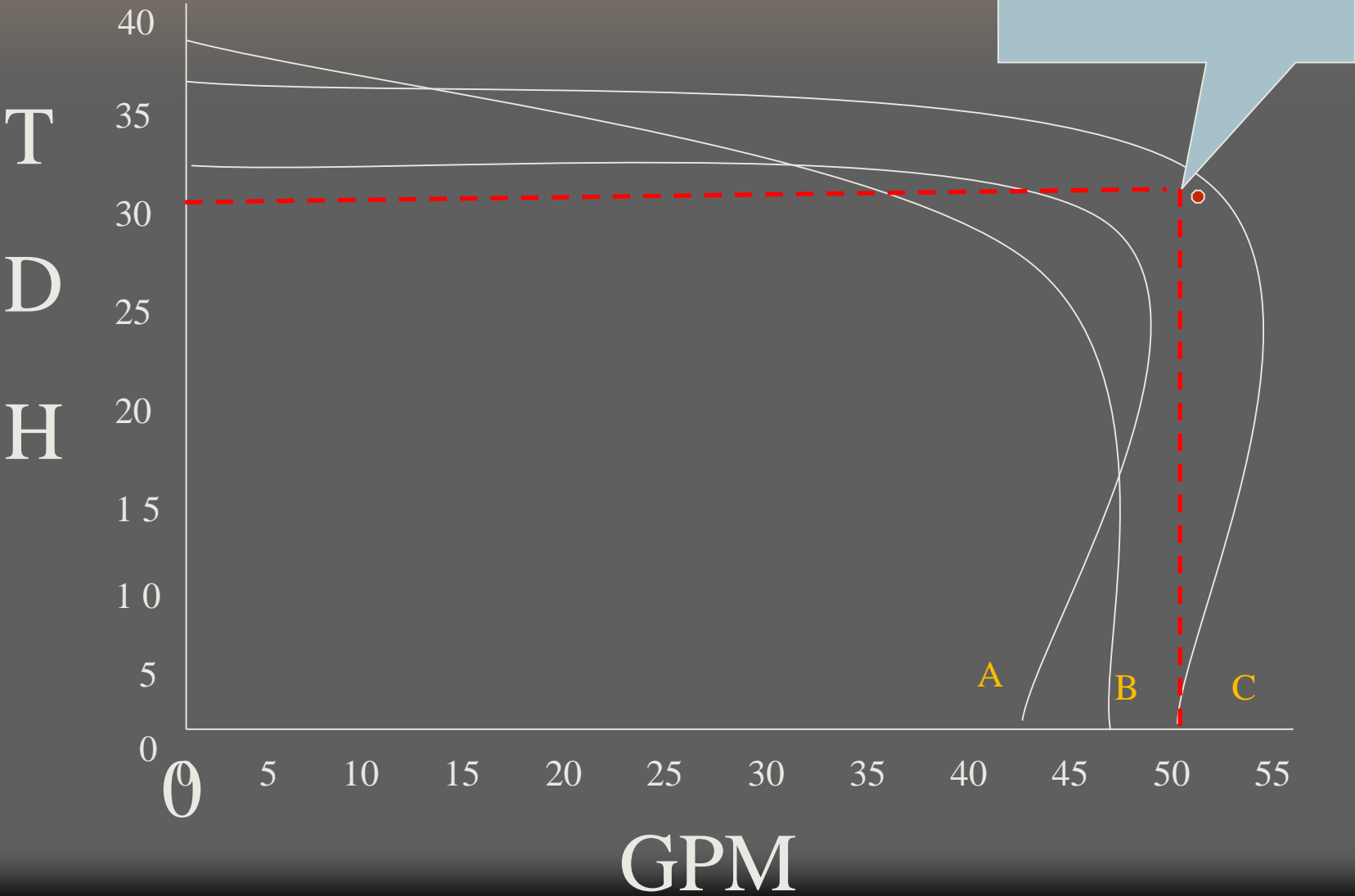5' squirt from a 3/16 orifice is .72 gpm

.72 gpm x 75 orifices=

54 gallons per minute

SELECTING THE PUMP

#1.   Plot the point where 54 GPM intersects 31.0 ft.... TDH on the pump curve(s) chart

#2.   The point must be below the pump curve

#3.   Select the pump best suited for the job.

SETTING the PUMP TIMERS

Need to Know:

#1.   Dose Volume (step 1) --------- 30 gal.

#2.   Number of Doses per Day---- 12.3
        (Assume 370 gpd for daily flow)
        370 gpd ÷30 gal=12.3 doses per day

#3.   Dose Interval

Calculating Dose Interval

60 min. per hour x 24 hrs= <u>1440 </u>min. per day

Dose Interval is Pump On + Pump Off

1440 min.per day÷12.3 doses per day=117.0 minutes between doses (Dose Interval)

Pump On=30 gal per dose @ 54 gpm=0.56 minute or 33 seconds ((30/54)60)

Timer is set for the pump to run for 33 seconds and be off for 116 minutes and 27 seconds

GATE VALVES

Used to ensure equal distribution (squirt height) in a low pressure distribution system

Located at Manifold / Lateral Line Junction

Allow Adjustment During Squirt Test

Require Box or Cover