Pressure Calculations for Water Treatment

Pressure/Feet of Head

Lbs. Per Sq. In.	Feet Head	Feet Head	Lbs. Per Sq. In.
1	2.31	1	.43
2	4.62	2	.87
3	6.93	3	1.30
4	9.24	4	1.73
5	11.54	5	2.17
6	13.85	6	2.60
7	16.16	7	3.03
8	18.47	8	3.46
9	20.78	9	3.90
10	23.09	10	4.33
15	34.63	20	8.66
20	46.18	30	12.99
25	57.72	40	17.32
30	69.27	50	21.65
40	92.36	60	25.99
50	115.45	70	30.32
60	138.54	80	34.65
70	161.63	90	38.98
80	184.72	100	43.31
90	207.81	110	47.65
100	230.90	120	51.97
110	253.98	130	56.30
120	277.07	140	60.63
125	288.62	150	64.96
130	300.16	160	69.29
140	323.25	170	73.63
150	346.34	180	77.96
160	369.43	190	82.29
170	392.52	200	86.62
180	415.61	225	97.45
190	438.90	250	108.27
200	461.78	275	119.10
225	519.51	300	129.93
250	577.24	325	140.75
275	643.03	350	151.58
300	692.69	400	173.24
325	750.41	500	216.55
350	808.13	600	259.85
375	865.89	700	303.16
400	922.58	800	346.47
500	1154.48	900	389.78
1000	2309.00	1000	433.09

A column of water 1 inch square by 2.31 feet high weighs 1 pound. Therefore, one pound of pressure per square inch (PSI) is equal to 2.31 feet of head.

A pressure of .433 pounds per square inch will support a column of water 1 inch square by 1 foot high. Therefore, one foot of head is equal to .433 PSI.

To convert pressure in pounds per square inch (PSI) to head in feet: multiply by 2.31.

To convert head in feet to pressure in pounds per square inch (PSI): multiply by .433.

Storage Capacity of Well Casing and Vertical Tanks

Diameter	Gal. Per Ft.	Diameter	Gal. Per Ft.
2 in.	.16	8.5 ft.	424.50
3 in.	.37	9 ft.	475.90
4 in.	.65	9.5 ft.	530.20
5 in.	1.00	10 ft.	587.50
6 in.	1.50	11 ft.	711.00
8 in.	2.60	12 ft.	846.00
10 in.	4.10	13 ft.	993.00
12 in.	5.90	14 ft.	1151.00
16 in.	10.40	15 ft.	1322.00
18 in.	13.20	16 ft.	1504.00
20 in.	16.30	17 ft.	1698.00
24 in.	23.50	18 ft.	1904.00
30 in.	36.70	19 ft.	2121.00
36 in.	52.90	20 ft.	2352.00
42 in.	72.00	21 ft.	2591.00
48 in.	94.00	22 ft.	2845.00
54 in.	119.00	23 ft.	3109.00
60 in.	147.00	24 ft.	3384.00
66 in.	177.80	25 ft.	3672.00
72 in.	211.50	26 ft.	3971.00
78 in.	248.20	27 ft.	4283.00
84 in.	287.90	28 ft.	4606.00
90 in.	330.50	29 ft.	4941.00
96 in.	376.00	30 ft.	5288.00

Flow of Water/Gravity or Tank Pressure

The approximate flow of water in GPM through a length of pipe due to the force of gravity can be easily determined by the formula:

$$\frac{D \times 100}{L}$$

Determine the vertical distance in feet (D) between the pipe inlet and the pipe outlet. Multiply this distance by 100 and divide that amount by the total length of the pipe in feet (L).

Refer to the appropriate friction loss table for the size and type of pipe. Read down the appropriate column to the number of feet as determined by the formula above. Read across to the left to determine the approximate flow rate through the pipe. The flow at the lower end of the pipe will be at zero pressure.

Example:
a 300' length of 1" plastic pipe runs from an inlet point to a point to discharge 40 feet lower. The approximate flow rate would be 40 x 100 divided by 300 = 13.3. Referring to the friction loss tables gives a flow rate between
14 and 16, or about 15 GPM.
For pressure tanks the formula is the same, except that the pressure in the tank should be converted to vertical feet of head and added to the vertical distance if any. Again the flow at the end of the pipe will be at zero pressure.