Nozzle Discharge in G.P.M. at 100% Efficiency

	Nozzle Diameter in Inches												
P.S.I.	1/16"	5/64"	3/32"	7/64"	1/8"	9/64"	5/32"	11/64"	3/16"	13/64"	7/32"	1/4"	9/32"
20	0.52	0.81	1.17	1.59	2.09	2.65	3.26	3.92	4.69	5.51	6.37	8.35	10.50
25	0.58	0.90	1.31	1.78	2.34	2.96	3.64	4.38	5.25	6.16	7.13	9.34	11.80
30	0.64	1.00	1.44	1.96	2.56	3.26	4.01	4.83	5.75	6.80	7.85	10.20	13.00
35	0.69	1.08	1.55	2.11	2.77	3.50	4.31	5.18	6.21	7.30	8.43	11.10	13.90
40	0.74	1.15	1.66	2.25	2.96	3.74	4.61	5.54	6.64	7.80	9.02	11.80	14.90
45	0.78	1.22	1.76	2.40	3.13	3.99	4.91	5.91	7.03	8.30	9.60	12.50	15.90
50	0.83	1.28	1.85	2.52	3.30	4.18	5.15	6.19	7.41	8.71	10.10	13.20	16.60
55	0.87	1.36	1.94	2.63	3.46	4.37	5.39	6.48	7.77	9.12	10.50	13.80	17.40
60	0.90	1.40	2.03	2.76	3.62	4.50	5.65	6.80	8.12	9.56	11.05	14.50	18.30
65	0.94	1.47	2.11	2.86	3.77	4.76	5.87	7.06	8.45	9.92	11.45	15.10	19.00
70	0.98	1.53	2.19	2.98	3.91	4.96	6.10	7.34	8.78	10.32	11.95	15.70	19.80
75	1.01	1.58	2.27	3.08	4.05	5.12	6.30	7.58	9.08	10.66	12.32	16.20	20.40
80	1.05	1.64	2.35	3.18	4.18	5.29	6.52	7.84	9.39	11.02	12.74	16.70	21.10
85	1.08	1.68	2.42	3.28	4.31	5.45	6.71	8.07	9.67	11.35	13.11	17.30	21.70
90	1.11	1.73	2.49	3.38	4.43	5.61	6.91	8.31	9.95	11.69	13.51	17.70	22.30
95	1.14	1.78	2.56	3.46	4.56	5.76	7.09	8.53	10.20	11.99	13.86	18.20	22.90
100	1.17	1.83	2.63	3.56	4.67	5.91	7.29	8.76	10.50	12.32	14.23	18.70	23.50

(on a 100% delivery)

Handy Water Equivalents

1 Cubic Foot..... 7.48 Gallons (per min.)..... 62.4 Lbs of Water

43,560 Cubic Feet..... 325,900 Gallons..... 1 Acre-Foot

(an acre-foot covers one acre of land, one foot deep)

1 Cubic Foot per Second (CFS)..... 450 Gallons per Minute

1 CFS..... 646,360 Gallons per Day

For 24 Hours..... 1,983 Acre-feet

For 30 Days..... 59.5 Acre-feet

For 1 Year..... 724 Acre-feet

1 Million Gallons..... 3.07 Acre-feet

1,000 Gallons per Minute (GPM)..... 2.23 CFS

1,000 GPM..... 4.42 Acre-feet per Day

Using the Nozzle Chart

To use the Nozzle Chart to the right you first must understand the basics of your water right and learn a few acronyms and terms.

- **Certificate** - A piece of paper issued by the State of Oregon stating the Rate, Duty and location of your water right, along with its source and the season or time of year you may use the water right.
- **Rate** - The rate at which your water is delivered, expresses in Cubic Feet per Second (CFS) or Gallons Per Minute (GPM). I.e.: 1 CFS = 480 GPM.
- **Duty** - The total amount of your water right allowed in any one season expressed in acre-feet.
- **CFS** - The number of one cubic foot blocks of water which passes a point in one second.
- **GPM** - The number of gallons of water which passes a point in one minute.
- **Acres** - When the District uses the term "Acres" we mean certificate rate acres. The District delivers water at a rate of 7.48 GPM (1/60th of a CFS) per acre.
- **Constant Delivery** - The District delivers water twenty-four hours a day, seven days a week throughout the season.
- **Percentage** - During a season the percentage of you rate may change due to certificate requirements or supply amounts.
- **Nozzle** - Sprinkler heads have a screw on the tip of the nozzle which can be changed to adjust the water flow.

To use the chart first you must know how many acres of water right you own, let us keep it simple and use 5 acres as an example. Next, we need to understand the percentage of our water right being delivered: here we will use 70%, a common percentage in a normal season.

5 acres at 70% = 3.5 acres

So, we have 3.5 acres at our pond, now how much is that? Well, the District is delivering 7.48 GPM per acre, so..

3.5 acres at 7.48 = 26.18 GPM filling our hypothetical pond.

Next, we need to collect a bit more information so the first thing to do is check the pressure your system is running. Now technically we should check the pressure at each sprinkler head but let's just go to the pump house and check the gauge. It should get us close enough for now since you probably do not own a gauge that will work at the sprinkler heads. For this example, we will use 50 P.S.I. Now count the sprinkler heads you are running at any one time, say you use hand lines and run 6 heads pet set.

What we have so far is:

- 26.18 GPM coming into the pond.
- Pumps at 50 P.S.I.
- 6 heads at a set.

Now since running 6 heads is the goal, let's divide 6 into our GPM of 26.18

26.18 GPM / 6 heads = 4.3 GPM per head.

We cannot take this as gospel because there are some inefficiencies in the system, you may have a gasket leak, your pond leaks, or maybe water evaporates from the pond, etc.

Now we get to the chart. First find the PSI column and scan down until you find 50 (your pressure). Next along the 50 PSI row find the next lowest number to our calculated number of 4.3 – looks like its 4.18. Now follow this column up to the size line. This is the size nozzle you should have on your Sprinkler heads.