Public Works and Environmental Services Department
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WWS LIFT STATION WETWELL SIZING REQUIREMENTS

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Steven W. Uhrick, P.E, Chair

The Wastewater Peaking Factors table will be used to determine peak flows into a lift station unless data exists to substantiate a different peaking factor.

Number of Equivalent Residential Units	Peaking Factor
1 to 250	4.2
251 to 600	4.0
601 to 1200	3.8
1201 and above	3.5

For collection system design purposes, one Equivalent Residential Unit equals 213 gallons per day average flow which includes a 10% infiltration/ inflow allowance.

The following *WWS Lift Station Wetwell Sizing Requirements* table contains maximum starts per hour, maximum lead pump operating range, minimum wetwell diameter, minimum distance between pumps off and wetwell bottom and minimum distance between influent pipe invert and wetwell bottom for WWS lift stations.

Maximum Pumping Rate is the right most pumping point from the WWS product specifications standard curve.

Maximum Starts Per Hour is for the lift station in total, not for each pump. *Maximum Starts Per Hour* is set to allow for calculation of influent flow using

SCADA data. Pump cycle time equals 60 minutes divided by the starts per hour, so a maximum pump starts per hour of 6 equals a 10 minute cycle time.

Maximum Lead Pump Operating Range equals minimum cycle time multiplied by the *Maximum Pumping Rate* divided by 4. This calculation is used to calculate the *Minimum Distance Between Influent Pipe Invert and Wetwell Bottom*. The actual lead pump operating range is to be set so that there are at least two starts per hour on average based on actual flow conditions.

Minimum Distance Between Pumps Off and Wetwell Bottom is calculated to keep 50% of pump motor submerged, plus 2 inches to allow for variance in size of pumps between manufacturers.

Minimum Distance Between Influent Pipe Invert and Wetwell Bottom includes 12 inches between first pump on and second pump on, 6 inches between second pump on and alarm and 1 inch between alarm and influent pipe invert. Two numbers are under this heading in the table. The first number is the actual minimum distance requirement. The second number is the calculated minimum distance. The actual minimum distance requirements were set to allow WWS to change pumps for a lift station should future conditions require.

The *WWS Lift Station Wetwell Sizing Requirements* table below will be used to determine the diameter and depth of a wetwell. Actual control settings may vary based on specific conditions.

- influent pipe invert – 1” above alarm at a minimum
- alarm - 6” above lag pump on at a minimum
- lag pump on – 12” above lead pump on at a minimum
- lead pump on – set to specific conditions
- all pumps off – use table value as a minimum
- wetwell bottom

WWS LIFT STATION WETWELL SIZING REQUIREMENTS

Curve #	Maximum Pumping Rate (gpm)	Maximum Starts Per Hour	Minimum Distance Between Pumps Off and Wetwell Bottom (inches)	Wetwell Diameter (feet)	Maximum Lead Pump Operating Range (inches)	Minimum Distance Between Influent Pipe Invert and Wetwell Bottom (inches)	
1	382	10	22	6	33	100	(74)
				8	18	84	(59)
2	324	10	25	6	28	100	(72)
				8	16	84	(60)
3	580	6	29	8	46	100	(94)
				10	30	84	(78)
4	457	6	29	8	36	100	(84)
				10	23	84	(71)
5	910	6	26	10	46	128	(91)
				12	32	104	(77)
6	621	6	24	8	50	100	(93)
				10	32	84	(75)
7	974	6	28	10	50	128	(97)
				12	35	104	(82)
8	641	6	25	8	51	100	(95)
				10	33	84	(77)
9	600	6	24	8	48	100	(91)
				10	31	84	(74)
10*	970	6	31	10	50	128	(100)
				12	44	104	(84)
11	625	6	27	8	50	100	(96)
				10	32	84	(78)
12	859	6	27	10	44	128	(90)
				12	30	104	(76)

Curve #	Maximum Pumping Rate (gpm)	Maximum Starts Per Hour	Minimum Distance Between Pumps Off and Wetwell Bottom (inches)	Wetwell Diameter (feet)	Maximum Lead Pump Operating Range (inches)	Minimum Distance Between Influent Pipe Invert and Wetwell Bottom (inches)	
13	1494	6	32	10	76	128	(127)
				12	53	104	104)
14	1340	6	29	10	68	128	(116)
				12	48	104	(96)
15*	1555	6	30	10	79	128	(128)
				12	55	104	(104)