City of Helena

Helena Wastewater Collection System Master Plan

APPENDIX E

Existing System Capacities under Future 2025 Conditions

Capacity Deficiencies in Existing Collection System Under Future Conditions

Pipe ID	From Manhole ID	To Manhole ID	Pipe Diameter (in)	Length (ft)	Slope	Flow (gpm)	Flow Type	Velocity (ft/s)	Water Depth (ft)	Froude Number	Overflow (MG)	q/Q
P1803	445-5	445-6	12	400.4	0.002	3,032	Pressurized	8.60	1.00	1.516	0	4.04
P2915	254-2	254-3	8	178.4	0.002	686	Pressurized	4.38	0.67	0.945	0	2.66
P3052	78-14-9	78-14-8	10	254.7	0.001	940	Pressurized	3.84	0.83	0.741	0	2.58
P1360	94-10-1	94-10-2	10	476.4	0.001	686	Pressurized	2.80	0.83	0.541	0	2.15
P881	003-1	91-1-11	7	164.8	0.005	549	Pressurized	4.58	0.58	1.056	0	2.10
P1602	445-6	445-7	12	394.2	0.008	3,014	Pressurized	8.55	1.00	1.507	0	2.04
P1603	445-7	445-8	12	287.0	0.009	3,008	Pressurized	8.53	1.00	1.504	0	2.03
P1879	533-2	533-6	12	332.8	0.009	3,045	Pressurized	8.64	1.00	1.522	0	2.02
P1441	445-4	445-4A	12	714.7	0.009	3,052	Pressurized	8.66	1.00	1.526	0	1.97
P1604	445-8	64-21	12	309.8	0.009	3,001	Pressurized	8.51	1.00	1.5	0	1.96
P2153	254-3	253-1	8	468.7	0.004	684	Pressurized	4.37	0.67	0.942	0	1.96
P1447	533-8	533-10	12	317.1	0.011	3,062	Pressurized	8.69	1.00	1.531	0	1.83
P343	78-14-5	78-14-5A	10	59.1	0.003	934	Pressurized	3.82	0.83	0.737	0	1.78
P760	538-5	538-4	10	464.2	0.002	680	Pressurized	2.78	0.83	0.536	0	1.68
P342	78-14-6	78-14-5	10	202.3	0.003	935	Pressurized	3.82	0.83	0.738	0	1.68
P1446	533-10	533-12	12	320.2	0.013	3,059	Pressurized	8.68	1.00	1.529	0	1.64
P2126	SI370-43	78-14-11	10	308.9	0.002	773	Pressurized	3.16	0.83	0.61	0	1.63
P1878	533-6	533-8	12	319.8	0.014	3,064	Pressurized	8.69	1.00	1.532	0	1.61
P358	78-14-5A	78-14-4	10	264.3	0.003	934	Pressurized	3.82	0.83	0.737	0	1.60
P3053	78-14-8	78-14-7	10	261.5	0.004	938	Pressurized	3.83	0.83	0.74	0	1.56
P469	78-14-10	78-14-9	10	370.2	0.003	776	Pressurized	3.17	0.83	0.612	0	1.56
P474	78-14-14	78-14-13	10	370.4	0.003	775	Pressurized	3.17	0.83	0.612	0	1.54
P470	78-14-11	78-14-10	10	370.0	0.003	773	Pressurized	3.16	0.83	0.609	0	1.45
P1183	99-16-17	99-16-18	12	273.1	0.001	745	Pressurized	2.11	1.00	0.372	0	1.44
P475	78-14-15	78-14-14	10	370.8	0.003	777	Pressurized	3.17	0.83	0.613	0	1.39
P359	78-14-4	78-14-3	10	324.3	0.005	932	Pressurized	3.81	0.83	0.735	0	1.37
P1436	533-12	445-4	12	471.8	0.02	3,056	Pressurized	8.67	1.00	1.528	0	1.35
P472	78-14-12	SI370-43	10	60.7	0.003	773	Pressurized	3.16	0.83	0.61	0	1.34
P2867	SI293-11	SI293-12	8	409.3	0.017	931	Pressurized	5.94	0.67	1.282	0	1.33
P931	SI293-12	SI293-13	8	360.4	0.017	929	Pressurized	5.93	0.67	1.28	0	1.33
P980	551-6	551-7	24	39.0	0.001	3,117	Pressurized	2.21	2.00	0.275	0	1.29
P933	SI293-13	SI293-7A	10	424.4	0.006	928	Pressurized	3.79	0.83	0.731	0	1.26
P2152	SI293-10	SI293-11	8	264.7	0.019	928	Pressurized	5.92	0.67	1.278	0	1.25
P1497	538-6	538-5	10	475.6	0.003	673	Pressurized	2.75	0.83	0.531	0	1.21
ATP165	ATMH-06-15-7A	ATMH-06-15-8	8	102.8	0.004	403	Pressurized	2.58	0.67	0.556	0	1.18
P1958	376-2	533-2	12	314.8	0.027	3,044	Pressurized	8.64	1.00	1.522	0	1.15
P473	78-14-13	78-14-12	10	370.3	0.005	774	Pressurized	3.16	0.83	0.611	0	1.12
P1600	78-14-2	78-14-1	10	321.2	0.007	930	Pressurized	3.80	0.83	0.733	0	1.11
P1651	73-20-4	73-20-3	8	393.3	0.003	297	Pressurized	1.90	0.67	0.409	0	1.08
ATP160	ATMH-06-15-7	ATMH-06-15-7A	8	229.8	0.005	402	Pressurized	2.57	0.67	0.554	0	1.06
P1359	94-10-2	254-2	10	455.0	0.004	685	Pressurized	2.80	0.83	0.54	0	1.05
P1650	73-20-5	73-20-4	8	418.3	0.003	284	Pressurized	1.81	0.67	0.391	0	1.03
P759	538-4	94-10-1	10	371.6	0.005	684	Pressurized	2.79	0.83	0.539	0	1.03
ATP240	ATMH-06-15-11	ATMH-06-15-12	10	160.0	0.003	538	Pressurized	2.20	0.83	0.424	0	1.01
ATP245	ATMH-06-15-12	ATMH-06-15-13	10	159.0	0.003	539	Pressurized	2.20	0.83	0.425	0	1.01
P1542	99-16-30	99-16-31	12	322.7	0.002	744	Pressurized	2.11	1.00	0.372	0	1.00
P1599	78-14-3	78-14-2	10	324.7	0.009	931	Pressurized	3.80	0.83	0.734	0	1.00

Capacity Deficiencies in Existing Collection System Under Future Conditions

Pipe ID	From Manhole ID	To Manhole ID	Pipe Diameter (in)	Length (ft)	Slope	Flow (gpm)	Flow Type	Velocity (ft/s)	Water Depth (ft)	Froude Number	Overflow (MG)	q/Q
P1202	99-16-40	99-16-41	12	399.8	0	743	Pressurized	2.11	1.00	0.372	0	1.00
P899	99-16-37	99-16-38	12	119.7	-0.003	744	Pressurized	2.11	1.00	0.372	0	1.00
P2239	94-28-1	551-8	24	54.2	0	3,182	Pressurized	2.26	2.00	0.262	0	1.00
ATP235	ATMH-06-15-10	ATMH-06-15-11	10	172.9	0.003	533	Free Surface	2.50	0.68	0.513	0	1.00
P863	73-20-6	73-20-5	8	421.7	0.003	273	Free Surface	2.01	0.54	0.467	0	0.99
ATP225	ATMH-06-15-8	ATMH-06-15-9	10	400.0	0.003	530	Free Surface	2.51	0.67	0.522	0	0.99
P862	73-20-7	73-20-6	8	354.3	0.003	264	Free Surface	2.00	0.52	0.481	0	0.96
P861	73-20-8	73-20-7	8	250.6	0.003	252	Free Surface	1.97	0.51	0.491	0	0.93
P2341	214-1	215-1A	18	185.9	0.005	2,833	Free Surface	4.38	1.14	0.728	0	0.93
P860	73-20-9	73-20-8	8	259.2	0.003	244	Free Surface	1.97	0.49	0.504	0	0.90
P420	551-7	94-28-1	24	403.4	0.001	3,182	Free Surface	2.91	1.45	0.44	0	0.87
P3063	76-41-5	76-41-4	10	399.6	0	150	Free Surface	0.86	0.56	0.214	0	0.79
P1714	551-20	535-26	24	246.5	0.001	2,826	Free Surface	2.81	1.34	0.455	0	0.79
ATP230	ATMH-06-15-9	ATMH-06-15-10	10	170.0	0.005	532	Free Surface	3.06	0.56	0.768	0	0.79
P1483	99-16-34	99-16-35	12	398.9	0.004	744	Free Surface	2.99	0.66	0.689	0	0.78
P1540	99-16-28	99-16-29	12	399.5	0.004	744	Free Surface	2.99	0.66	0.689	0	0.78
P471	78-14-7	78-14-6	12	353.6	0.006	937	Pressurized	3.80	0.66	0.88	0	0.77
P482	78-9-19	78-9-18	10	152.3	0.001	239	Free Surface	1.39	0.55	0.353	0	0.77
P2278	217-4	375-1	18	353.9	0.008	2,966	Pressurized	5.36	0.99	1.014	0	0.77
P1482	99-16-33	99-16-34	12	399.3	0.004	744	Free Surface	3.03	0.66	0.703	0	0.77
P1194	99-16-22	99-16-23	12	316.4	0.004	745	Free Surface	3.07	0.65	0.718	0	0.76
P2971	551-8	551-9	24	503.1	0.002	2,977	Free Surface	3.09	1.29	0.513	0	0.75