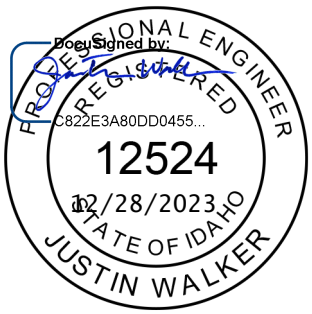
EAGLE SEWER DISTRICT
WASTEWATER COLLECTION SYSTEM MASTER PLAN

December 2023 | Project No. 222250-001



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ERU	Equivalent residential units
I/I	Inflow and infiltration
AAGRs	Average annual growth rates
AADF	Average annual daily flow
ADWF	Average annual dry-weather flow
AWWF	Average annual wet-weather flow
MMF	Max month flow
PDF	Peak day flow
PHF	Peak hour flow
GPEPD	Gallons per ERU per day
SCADA	Supervisory control and data acquisition
FPS	Feet per second
WWTP	Wastewater treatment plant
LS	Lift station
CCTV	Closed-camera television
PVC	Polyvinyl chloride
d/D	Depth divided by full depth
ACHD	Ada County Highway District
HOA	Home-owners association
AACE	Association for the Advancement of Cost Engineering
USACE	U.S. Army Corps of Engineers
ACHD	Ada County Highway District

CHAPTER 1 - EXECUTIVE SUMMARY

The Eagle Sewer District (District) contracted with Keller Associates, Inc. (Keller) to update their wastewater collection system master plan. This chapter provides a summary of the findings and recommendations for the collection system to accommodate growth anticipated within the District's service area.

1.1. EXISTING CONDITIONS

The District owns and maintains 13 lift stations, 20 miles of pressure sewer pipe (force main), and 180 miles of gravity sewer pipe. A majority of the District's gravity pipeline consists of 8-inch PVC pipe with some of the older parts of the system being made of transite or concrete pipe.

The District's hydraulic model was updated with new pipelines and lift stations since the previous master plan and flows. The basin patterns were updated based on data collected from lift station supervisory control and data acquisition (SCADA) and temporary flow monitors placed in the collection system in the winter of 2023.

Figure 1-1 on the next page illustrates the maximum depth divided by the full depth (d/D) for the existing collection system under peak flows. As shown in the figure, there are no areas where the d/D exceeds 75% full indicating there are no existing capacity deficiencies within the existing system. Table 1-1 compares the peak hour flows into each lift station to the lift station firm pumping capacity. The Fred Meyer Lift Station has a reduced capacity when pumping at the same time as the Ashbury Lift Station and if this were to occur during peak hour flows, the peak inflow would exceed the pumping capacity.

TABLE 1-1: EXISTING PEAK HOUR FLOWS VS. LIFT STATION CAPACITIES

Lift Stations	Firm Capacity (gpm)	Peak Hour Inflow (gpm)	Capacity > Peak Inflow	Capacity Remaining (gpm)	ERU's Remaining[1]
Ashbury	200	109	Yes	91	425
Ashbury (reduced)[4]	150	109	Yes	41	192
Bob	480	108	Yes	372	1,735
Creighton Woods	100	11	Yes	89	415
Crestpoint	170	5	Yes	165	771
Element Skye	100	4	Yes	96	446
Estrada	105	9	Yes	96	450
Fred Meyer	265	182	Yes	83	389
Fred Meyer (reduced)[4]	170	182	Over Capacity	0	0
Lakemoor	300	111	Yes	189	880
Mace Road	1,190	785	Yes	405	1,888
Moon Lake	40	6	Yes	34	160
Old Valley[2]	1,850	825	Yes	1,025	4,781
Palmer Road[3]	1,350	373	Yes	977	4,557
Stillwater	120	9	Yes	111	517

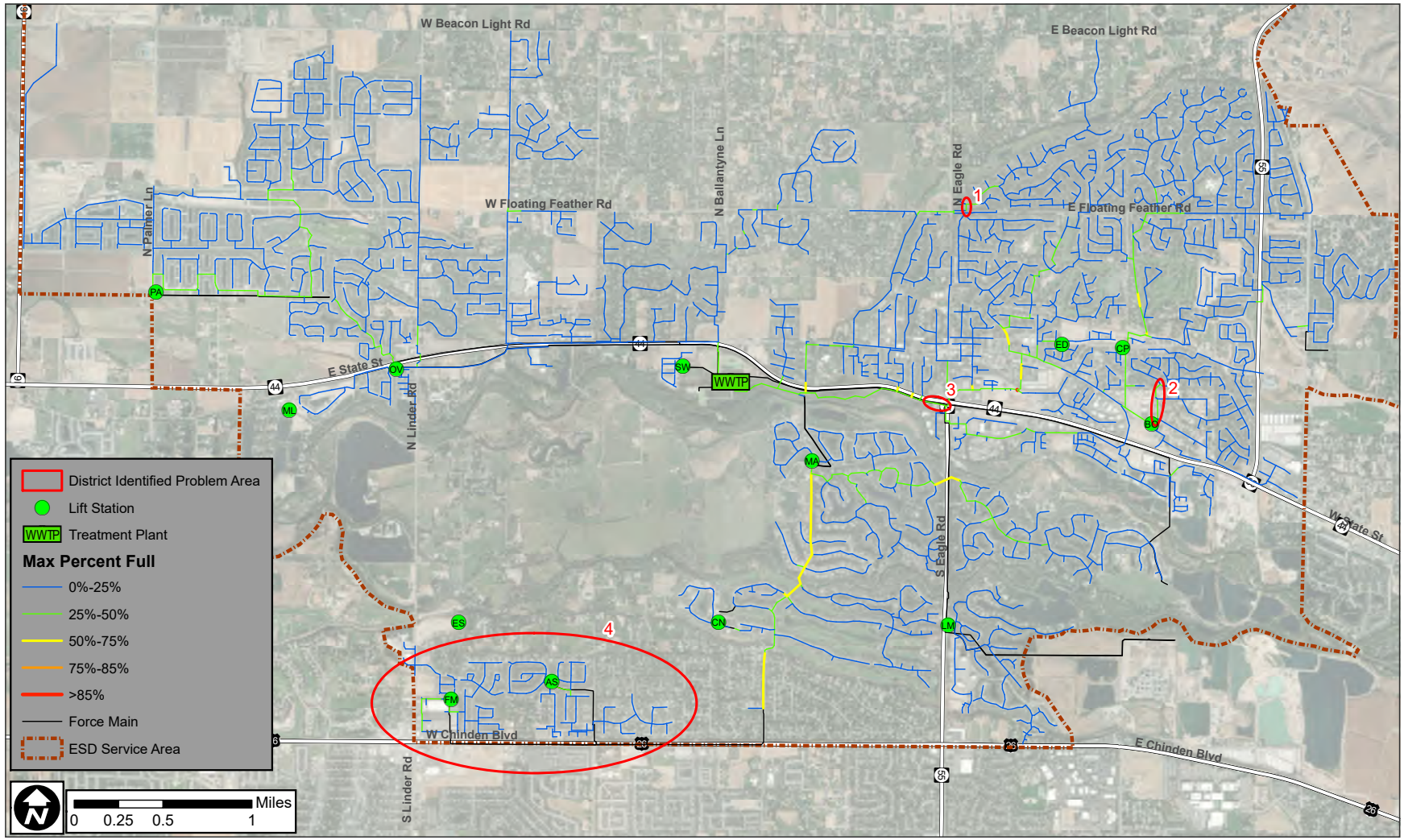
1) As of December 2022. Based on a PHF of 0.21 gpm per ERU.

2) Old Valley firm capacity equal to combined capacity of two of the three pumps.

3) Palmer firm capacity equal to combined capacity of three of the four pumps.

4) Reduced capacity for Ashbury and Fred Meyer reflects when both lift stations are pumping and the capacity is reduced.

FIGURE 1-1: EXISTING PEAK FLOW MAX DEPTH / FULL DEPTH

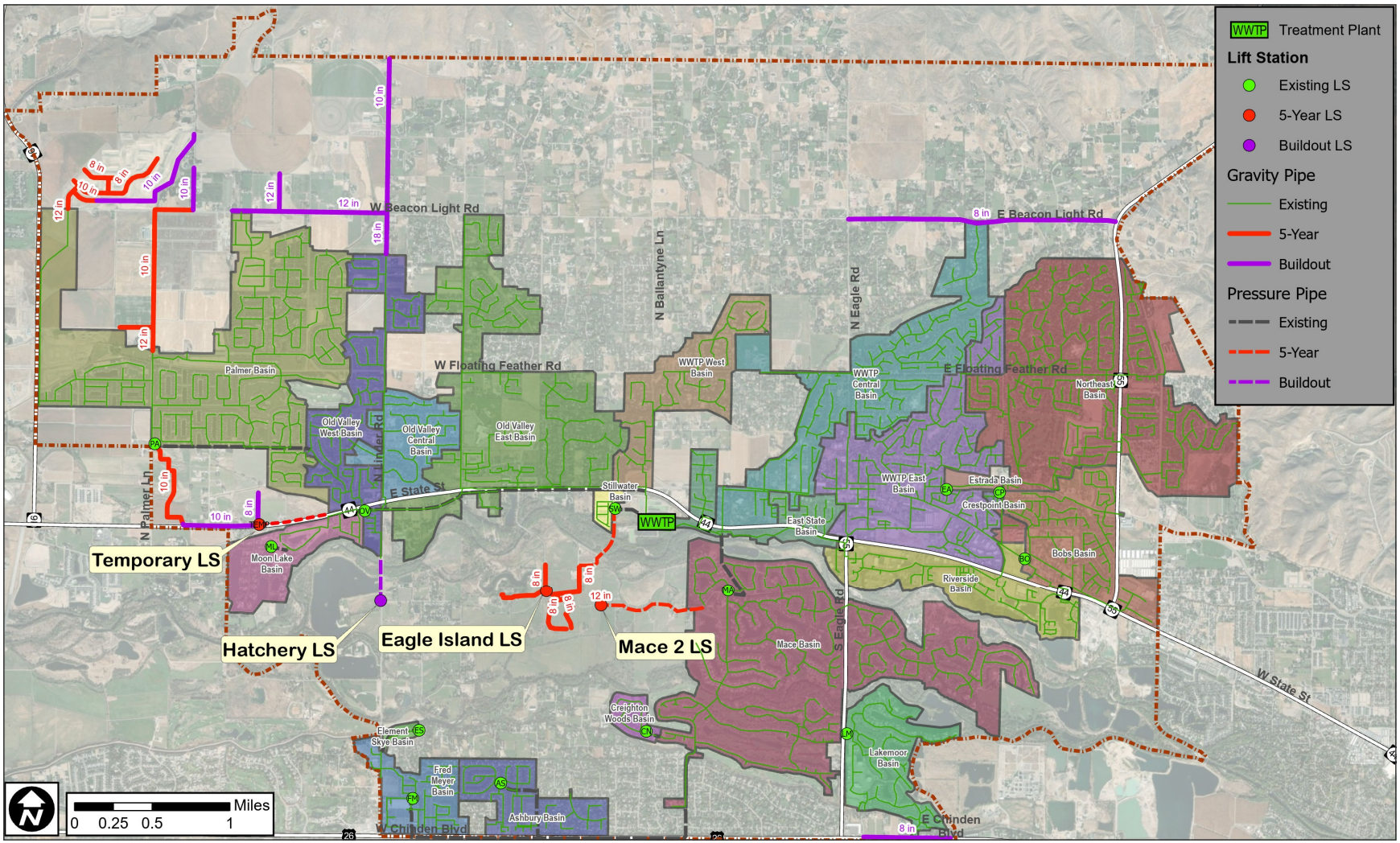


1.2. FUTURE SYSTEM CONDITIONS

Future flows were established based on input from the District on planned development and densities. This included a 5-year projection and a buildout projection. The future flows were assigned to the hydraulic model in order to identify future capacity deficiencies. Future trunkline alignments and lift stations were also added to the model to simulate future conditions. The proposed future buildout collection system is illustrated in Figure 1-2 on the next page.

No gravity pipeline deficiencies were identified under the 5-year or buildout future flow scenarios. All the lift stations with the exception of the Old Valley, Palmer, Fred Meyer, and Ashbury Lift Stations have sufficient capacity to convey the projected buildout peak flows without any improvements. Larger pumps are recommended for the Ashbury and Fred Meyer Lift Stations to convey peak flows. Increased pumping capacities are also recommended for the Palmer and Old Valley Lift Stations. However, both of these lift stations were designed to be expanded in the future and therefore improvements are relatively straightforward.

FIGURE 1-2: PROPOSED FUTURE COLLECTION SYSTEM



1.3. CAPITAL IMPROVEMENT PLAN

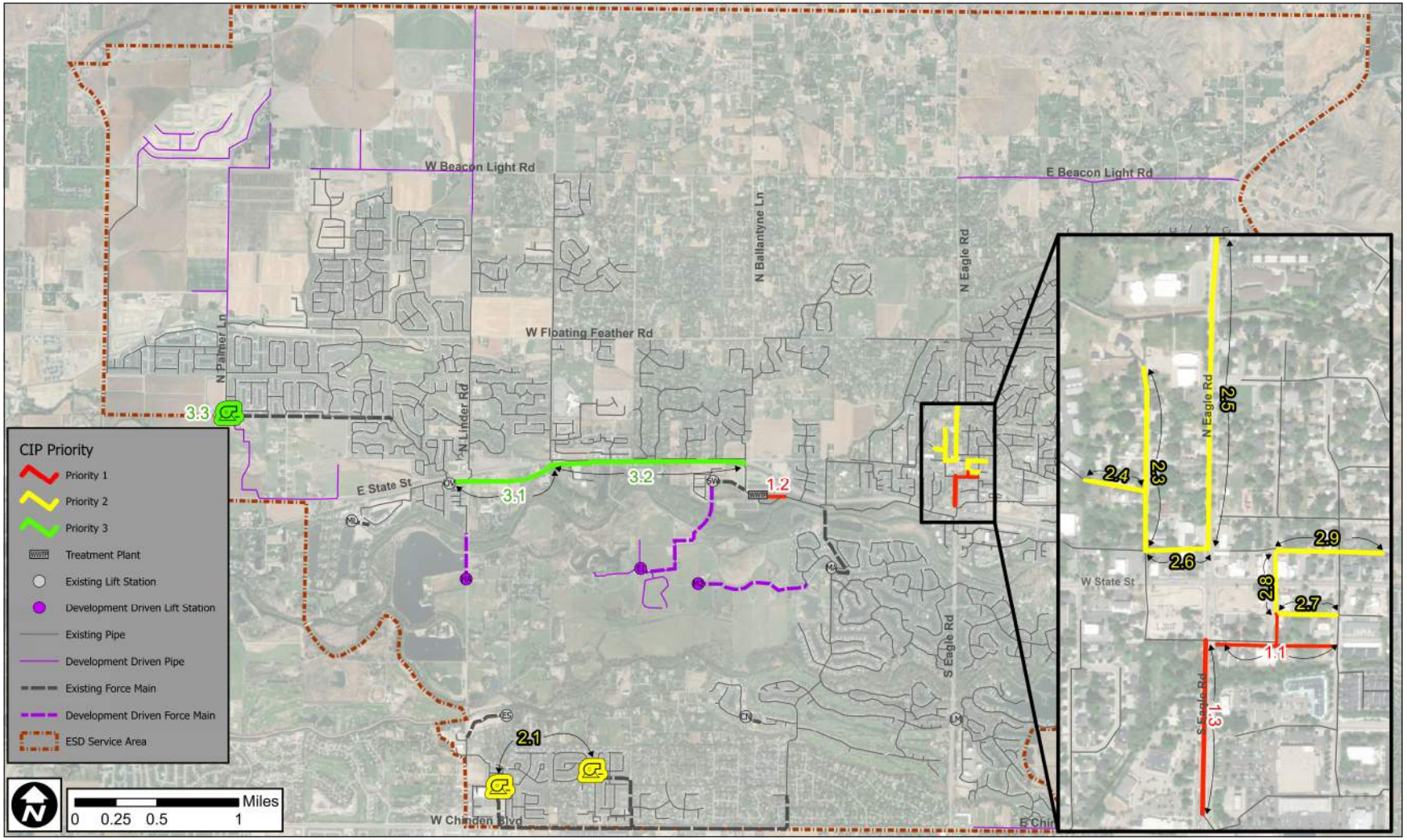
A summary of the recommended capital improvements to address hydraulic deficiencies and correct age and condition deficiencies are provided in Table 1-2.The corresponding projects are illustrated graphically in Figure 1-3.

TABLE 1-2: CAPITAL IMPROVEMENT PLAN SUMMARY

Project ID#	Project Name	Project Trigger	Total Estimated Cost (2023 Dollars)
Priority 1 Improvements (2024-2029)			
1.1	Aikens Road Re-Route & Replacement	Infrastructure reached end of useful life	$440,000
1.2	WWTP Main East Trunkline Re-Route	Improve resiliency	$590,000
1.3	South Eagle Road Replacement	Infrastructure reached end of useful life	$590,000
		Total Priority 1 Improvements (rounded)	**$1,620,000**
Priority 2 Improvements (2030-2035)			
2.1	Fred Meyer & Ashbury Lift Station Upgrades	Capacity deficiency from 5-year flows	$520,000
2.2	Collection System Plan Update	Recommended every 5 years	$150,000
2.3	Old Park Road Replacement	Infrastructure reached end of useful life	$640,000
2.4	Old Park Road Spur Replacement	Infrastructure reached end of useful life	$250,000
2.5	North Eagle Road Replacement	Infrastructure reached end of useful life	$1,680,000
2.6	North Eagle Road to Old Park Road Replacement	Infrastructure reached end of useful life	$220,000
2.7	Cedar Ridge Street Replacement	Infrastructure reached end of useful life	$250,000
2.8	1st Street Replacement	Infrastructure reached end of useful life	$240,000
2.9	1st Street to 2nd Street Replacement	Infrastructure reached end of useful life	$420,000
		Total Priority 2 Improvements (rounded)	**$4,370,000**
Priority 3 Improvements (2036-2044)			
3.1	Old Valley Force Main Upsize Phase 1	Capacity deficiency from buildout flows	$2,690,000
3.2	Old Valley Force Main Upsize Phase 2	Capacity deficiency from buildout flows	$5,720,000
3.3	Palmer Lift Station Upgrades	Capacity deficiency from buildout flows	$340,000
		Total Priority 3 Improvements (rounded)	**$8,750,000**
		TOTAL SYSTEM IMPROVEMENTS COSTS (rounded)	**$14,740,000**

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented herein.

FIGURE 1-3: CAPITAL IMPROVEMENT PLAN MAP



CHAPTER 2 - PROJECT PLANNING

This chapter discusses population projections for the 5-year and build-out time periods as well as establishes flow-based planning criteria in usage per equivalent residential units (ERUs) based on historical wastewater flows. The flow-based planning criteria were used to project future wastewater flows based on the anticipated growth. The future spatial allocation of growth projections (in the form of ERUs) in this study were provided by the Eagle Sewer District (District). This chapter also includes a high-level review of inflow and infiltration (I/I) impacts to the wastewater system. It is noted that this chapter does not include wastewater strength or load evaluation.

2.1. STUDY AREA

The study area for this plan consists of approximately 20,700 acres which includes approximately 12,900 acres of Eagle city limits. While a significant portion of the study area is not within the Eagle city limits, land is frequently annexed into the city limits. The study area is bordered to the east by Boise and Garden City, to the south by Meridian, and to the west by Star. The study area is illustrated in Figure 1 in Appendix A.

2.2. HISTORICAL ERUS AND FUTURE GROWTH PROJECTIONS

Growth projections were developed based on input from the District which resulted in a 5-year growth ERU count of 19,465 ERUs and a build-out ERU count of 23,255 ERUs. The historical and projected ERU values are presented in Table 2-1 and Figure 2-1. Additional details regarding the 5-year and build-out growth areas are included in Appendix B.

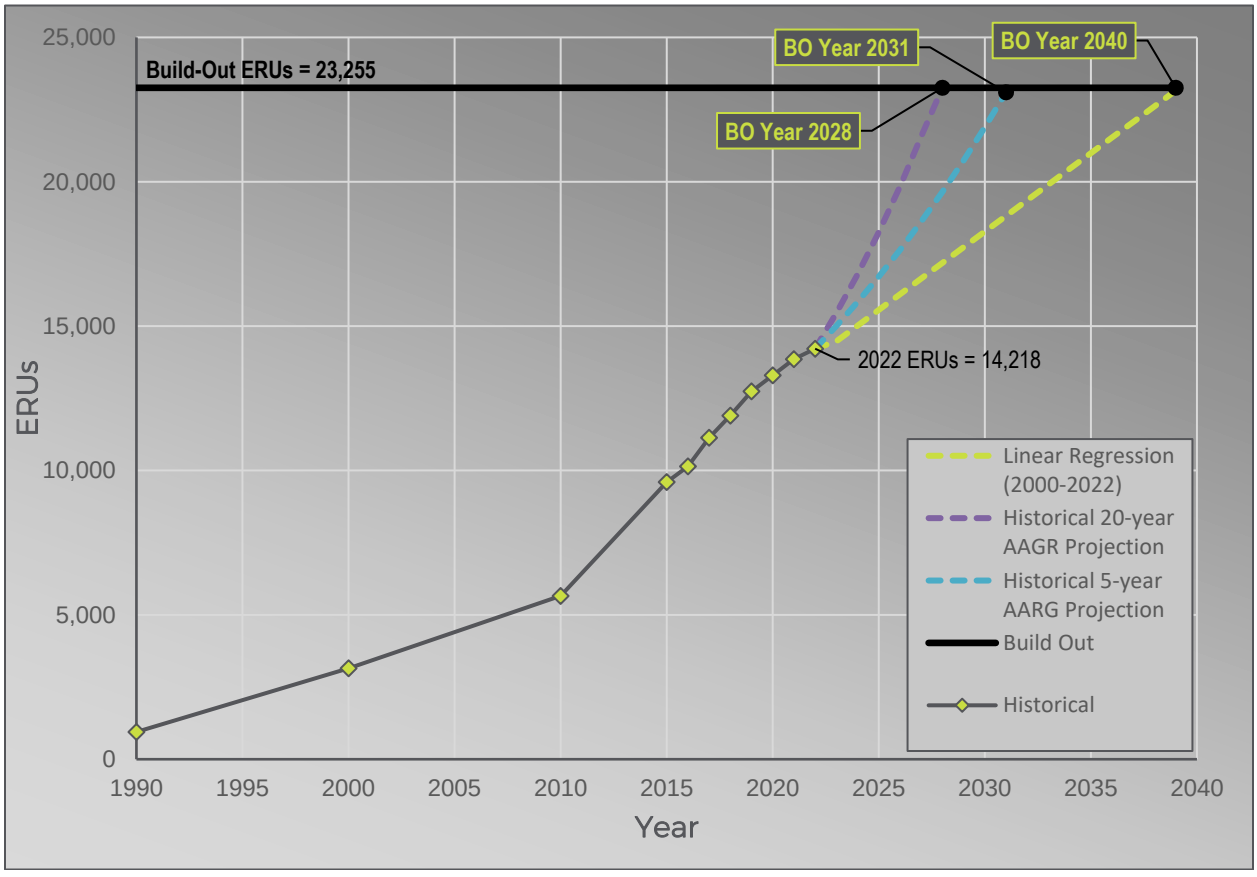
The District has seen tremendous growth within the last two decades with the number of ERUs increasing by more than 4x from 2000 to 2020. The District maintains an active record of total ERUs connected to the system rather than total population served and for this reason, future flows and growth are based on ERU counts, rather than population. Historically, the District has provided sewer service to approximately 75% of the City of Eagle's population and therefore this assumption was used by the District to approximate historical ERUs before 2015. ERU counts from 2015-2022 were based on actual ERUs connected to the system as recorded by the District. Average annual growth rates (AAGRs) within the last couple years have ranged from almost 10 percent in 2017 to less than 3% in 2022.

Future ERU counts were established for a 5-year projection and a build-out projection. The 5-year projections primarily consist of growth areas where the District has either seen preliminary plans from a developer or has had discussions with a developer regarding potential development. The District is relatively confident in the anticipated ERUs and when they are likely to happen for these growth areas. Additional growth areas throughout the service area were identified by the District and represent the build-out projection. These areas were assigned ERU counts based on the District's best estimate of development densities and equivalent ERU flows based on observed flows from recent new development. It is not certain what year the build-out condition will occur due to constantly changing growth rates, and therefore, three AAGRs were considered: linear regression (3.0%), 20-year AAGR (8.7%), and 5-year AAGR (5.5%). These different growth rates are illustrated in Figure 2-1 along with the build-out year associated with each growth rate.

TABLE 2-1: HISTORICAL AND PROJECTED ERUS

	Year	ERUs	AAGR (calculated)	Data Source
Historical	1990	945	-	Assumes 75% of City of Eagle is sewered and 2.64 people per ERU
	2000	3,149	23.3%	Assumes 75% of City of Eagle is sewered and 2.64 people per ERU
	2010	5,656	8.0%	Assumes 75% of City of Eagle is sewered and 2.64 people per ERU
	2015	9,599	13.9%	Reported by Eagle Sewer District
	2016	10,141	5.6%	Reported by Eagle Sewer District
	2017	11,134	9.8%	Reported by Eagle Sewer District
	2018	11,901	6.9%	Reported by Eagle Sewer District
	2019	12,742	7.1%	Reported by Eagle Sewer District
	2020	13,296	4.3%	Reported by Eagle Sewer District
	2021	13,859	4.2%	Reported by Eagle Sewer District
	2022	14,218	2.6%	Reported by Eagle Sewer District
Future	**2028**	**19,470**	**6.2%**	**5-Year estimate based on Eagle Sewer District growth estimates**
	Build-Out	**23,255**	**-**	**Based on Eagle Sewer District growth estimates**

FIGURE 2-1: ERU PROJECTIONS



2.3. HISTORICAL FLOWS

Historical flow data from the wastewater treatment plant and lift stations was utilized to summarize typical flows within the system under multiple flow scenarios. The flow scenarios considered in this planning study include the following:

Average Annual Daily Flow (AADF): The average annual daily flow for an entire year.

Average Annual Dry-Weather Flow (ADWF): Average daily flow for periods where there is historically minimal precipitation. Assumed to be from June through September for this study. See Section 2.3 for additional discussion on this flow scenario.

Average Annual Wet-Weather Flow (AWWF): Average daily flow for periods where there is historically more precipitation. Assumed to be from December through March for this study. See Section 2.3 for additional discussion on this flow scenario.

Max Month Flow (MMF): The average daily flow from the month with the highest total flows.

Peak Day Flow (PDF): The peak total daily flow reasonably anticipated for the system to experience.

Peak Hour Flow (PHF): The maximum hourly flow rate reasonable anticipated for the system to experience.

Table 2-2 summarizes the resulting planning flows used to evaluate the existing wastewater system and the following sections document additional details regarding how the criteria were developed. Supporting information is presented in the following sections and daily influent and effluent flows from 2015 to 2022 are included in Appendix C.

TABLE 2-2: EXISTING PLANNING FLOWS

Criteria	AADF	ADWF	AWWF	MMF	PDF	PHF
Total Flow (MGD)	2.32	2.45	2.19	2.50	2.87	4.39
Gal/ERU/Day	163	172	154	176	202	309
Peaking Factors[1]	1.00	1.06	0.94	1.08	1.24	1.89

1) Equal to the given scenario divided by the AADF total flow volume.

2.3.1. EXISTING AADF, ADWF, AWWF, & MMF

The final planning criteria presented in Table 2-3 were calculated by selecting the 5-year average gallons per ERU per day (GPEPD) for each flow scenario and multiplying it by the number of ERUs documented in 2022.

The AADF, ADWF, AWWF, and MMF flow scenarios from the previous 13 years are presented in Table 2-3. The total daily flows from 2010-2014 were obtained from the District's previous master plan and were included to show how the overall system flows are increasing over time for each of the four scenarios presented. While the overall system flows are increasing as additional development occurs, the GPEPD are steadily declining. This is decrease is likely due to better construction of new sewer systems that have lower I/I compared to older parts of the system. Additionally, flows are likely decreasing on a GPEPD basis due to the increased efficiency of home appliances and plumbing fixtures such as washers, dishwashers, toilets, and sinks. Thirdly, GPEPD are also declining because the of the District's focused I/I reduction efforts. The ADWF and AWWFs are presented in the table below, however additional discussion regarding the influence of I/I is included in Section 2.5.

TABLE 2-3: HISTORICAL WASTEWATER FLOWS

Year[1]	ERUs[2,3]	AADF		ADWF		AWWF		MMF	
		MGD	gal/ERU/day	MGD	gal/ERU/day	MGD	gal/ERU/day	MGD	gal/ERU/day
2010	*N/A*	1.68	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1.76	*N/A*
2011	*N/A*	1.75	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1.84	*N/A*
2012	*N/A*	1.75	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1.92	*N/A*
2013	*N/A*	1.74	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1.91	*N/A*
2014	*N/A*	1.80	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	1.96	*N/A*
2015	9,599	1.81	188	1.89	197	1.72	180	1.93	201
2016	10,141	1.90	188	1.99	197	1.81	179	2.03	200
2017	11,134	2.10	188	2.14	193	2.07	186	2.35	211
2018	11,901	2.01	169	2.12	178	1.89	158	2.16	181
2019	12,742	2.11	165	2.21	174	1.99	156	2.25	177
2020	13,296	2.19	165	2.37	178	2.03	153	2.41	181
2021	13,859	2.20	158	2.32	167	2.08	150	2.35	169
2022	14,218	2.25	158	2.35	165	2.17	153	2.42	170
13-year average (2010-2022)	-	1.94	172	2.17	181	1.97	164	2.10	186
5-year average (2018-2022)	-	2.15	163	2.27	172	2.03	154	2.32	176
13-year max (2010-2022)	-	2.25	188	2.37	197	2.17	186	2.42	211
Final Planning Criteria[4]	**14,218**	**2.32**	**163**	**2.45**	**172**	**2.19**	**154**	**2.50**	**176**

1) Flow statistics from 2010-2014 are from the Districts previous master plan completed in 2015.

2) ERU = equivalent residential unit

3) ERU estimates from the previous planning period 2010-2014 were not available.

4) Final planning criteria are equal to the 5-year average flow per ERU. The total flow in MGD is equal to the gal/ERU/day multiplied by the 2022 ERUs (14,218).

2.3.2. PEAK DAY FLOWS

Daily influent flows from the previous 8 years were reviewed and the top 10 highest flow days were identified. The District reviewed their records and notes from each of these top flow days to determine if the flows were representative of an actual peak day, or if there were other factors resulting in the higher flow rates. Several of the top flow days were from January 2017 when snowfall was above average for the entire region. The sewer system experienced higher inflows from snowmelt and surface runoff due to ongoing construction and development which left direct inlets for surface runoff to flow into the sewer system. Similarly, there were some days during the June 2020 when ongoing development created a direct inlet from surface runoff into the sewer system. The District does not anticipate these atypical flows to happen again due to changes in their policies and practices to avoid the likelihood of recurrence, and therefore they were not considered a representative data point for projecting future peak day flows. After discounting the days with anomalies, the 5th highest flow day was selected as the peak day for the existing planning criteria.

The peak day selected for the existing planning flows was from June 5, 2022 and was equal to 2.87 MGD. A summary of the top 10 highest flow days is shown in Table 2-4 along with comments as to whether the peak day flows are representative of actual system flows. The selected peak day results in a AADF to PDF peaking factor of 1.24. This peaking factor is relatively low compared to surrounding similar sized sewer systems; however the District maintains an aggressive program to reduce I/I which leads to low seasonal variability throughout the year. Additional discussion regarding I/I is discussed in Section 2.5.

TABLE 2-4: TOP 10 PEAK DAYS FROM RAW DATA

Rank	Date	Influent (MGD)	Precipitation (in)	Representative Data? (Y/N)	Comments
1	Tuesday, January 10, 2017	3.78	0.64	No	Snowmelt influence and atypical inflow from construction
2	Saturday, June 13, 2020	3.20	0.00	No	Atypical inflow from new construction
3	Sunday, June 14, 2020	3.12	1.32	No	Atypical inflow from new construction
4	Wednesday, January 11, 2017	3.06	0.83	No	Snowmelt influence and atypical inflow from construction
5	**Sunday, June 5, 2022**	**2.87**	**0.12**	**Yes**	**Basis for PDF. Equals 202 gal/ERU/day based on 2022 ERUs**
6	Sunday, February 5, 2017	2.77	0.08	Yes	Useable data point
7	Monday, June 12, 2017	2.67	0.25	Yes	Useable data point
8	Monday, July 27, 2020	2.64	0.00	Yes	Useable data point
9	Monday, July 27, 2020	2.64	0.00	Yes	Useable data point
10	Thursday, January 19, 2017	2.62	1.00	Yes	Useable data point

2.3.3. PEAK HOUR FLOWS

The PHF at the WWTP influent was determined to be 3,050 gpm which is a 1.53 peaking factor from PDF to PHF. The unit diurnal curve is illustrated in Figure 2-2.

Flow meter data from the WWTP's influent pump station was used to develop a unit diurnal curve for the influent at the WWTP. The WWTP has a flow meter on the discharge side of the influent pump station, however, the supervisory control and data acquisition (SCADA) system has historically only recorded instantaneous flow every 5 minutes. The District adjusted the SCADA settings to log flow every 1-minute (rather than 5-minutes) beginning in December 2022. Based on systemwide flow monitoring and lift station flows, January 28th-30th were selected as the peak days for which a unit diurnal curve was developed.

The flow meter is located on the pump discharge side and therefore, the exact inflow into the influent wetwell had to be approximated. The influent pumps turn on and off based on the levels within the wetwell. The average volume pumped per cycle was calculated and the time between pump starts was used to approximate the inflow to the wetwell. A diurnal curve was developed for all three of the peak days and the average of the three was used to establish the diurnal curve. However, the maximum peaking factor of the three days was maintained. The peak hour flow occurred between 11:00am–1:00pm for all three of the days and the lowest flows occurring from 3:00am–6:00 am. The resulting PHF to PDF factor was applied to the established PDF flow resulting in a PHF of 4.39 MGD or 3,050 gpm. Supporting details and data used in developing the PHF is included in Appendix C.

FIGURE 2-2: WWTP INFLUENT DIURNAL CURVE

2.4. LIFT STATION BASIN FLOWS

Flow characteristics specific to lift station basins were developed in addition to the systemwide flow characteristics summarized above. AADF, MMF, and PDF flows are for each lift station are presented in this section, however it should be noted that these daily flows were not used as evaluation criteria and are included for documentation purposes only. Lift station flows were used for the model calibration process. The systemwide daily flows were used as the evaluation criteria.

Table 2-5 summarizes the wastewater flows by lift station basin. The table was developed based on totalized daily lift station flows from 2020 through 2022. Similar to the PDF at the WWTP, the highest daily flow days were identified and compared to other daily flows. Some of the peak day flows were excluded from the evaluation where the flows were significantly higher than the typical daily flows. The determination to remove the data point was made by plotting the three years of daily data and where the daily flows were visibly 2x-3x or higher than the immediate surrounding days, the data point was removed. The District confirmed there have been historical issues with the flow meter that may explain these outlying data points. Appendix C includes a summary of monthly flows, the top flow days, and a plot of the daily lift station flows from the last two years.

Some of the noteworthy trends observed from the daily lift station data include the steady increase in flows in the Palmer Basin. The AADF from 2020 was 148,000 GPD compared to the AADF from 2022 which was 217,000 GPD. This increase in flows correlates with recent development occurring within its sewer basin. The Stillwater, Old Valley, Crestpoint, Creighton Woods basins also show a relatively constant increase in flows as growth continues to happen in these basins. Secondly, the Bobs Basin appears to have significantly more seasonal fluctuations in flows than the other basins. The average daily flows from June through August are almost 70,000 GPD compared to the average daily flows from January through April of 43,000 GPD. This indicates the Bobs Basin has a higher influence from I/I than the other basins.

TABLE 2-5: LIFT STATION BASIN FLOW CHARACTERISTICS

Lift Station Name[1]	ERUs[2]	AADF (3-yr average)		MMF (3-year max month)		PDF (3-year peak day)[3]		Peaking Factor
		GPD	gal/ERU/day	GPD	gal/ERU/day	GPD	gal/ERU/day	AADF/PDF
Stillwater	31	2,881	93	4,789	154	6,732	217	2.34
Crestpoint	39	1,915	49	2,332	60	3,945	101	2.06
Creighton Woods	59	3,550	60	6,010	102	9,067	154	2.55
Fred Meyer	324	79,486	246	97,465	301	121,440	375	1.53
Ashbury	333	46,344	139	49,975	150	60,360	181	1.30
Lakemoor	390	54,982	141	75,994	195	85,385	219	1.55
East Side (Bob)	700	51,869	74	84,443	121	94,035	134	1.81
Palmer Road	1,341	183,398	137	243,124	181	277,072	207	1.51
Mace Road	2,210	416,567	189	494,310	224	616,240	279	1.48
Old Valley	2,865	500,777	175	554,127	193	606,216	212	1.21
Systemwide (rounded)	**14,218**	**2,320,000**	**163**	**2,500,000**	**176**	**2,870,000**	**202**	**1.24**

1) 2020 flow data for Creighton Woods and Crestpoint were not representative of actual flows. Summary is based on 2021 and 2022 flows.

2) ERUs calculated based on number of residential and commercial parcels within each sewer basin. Assumes 3.5 ERUs per commercial lot. The Fred Meyer basin assumes 63 ERUs in the Fred Meyer complex and 7 ERUs for the LDS Temple

3) Outliers were removed from daily lift station data. Notes regarding the values removed are included in Appendix C.

2.5. INFILTRATION AND INFLOW ANALYSIS

The impacts of I/I on the District's system are minimal with only 12% higher flows during ADWF than AWWF. The primary cause of I/I in the District's collection system is not precipitation, but instead is likely due to high groundwater during the dry weather months when the Boise River flows are higher and the irrigation canals are filled. The District noted the increase in flows during the summer month may also be attributed swimming pool backwash discharges.

I/I generally consists of stormwater or groundwater that enters the sanitary sewer system from a variety of sources, such as storm sewers connected to the sanitary sewer, storm inflow through manhole lids, and groundwater infiltration into cracked/broken pipelines, services, or manholes. I/I impacts in Idaho are often minimal due to its dry climate, however, there are instances where significant I/I may exist due to other reasons such as high groundwater, surface water irrigation influences, or nearby rivers or streams.

The impacts of I/I to the District's sewer system were summarized using several graphics. First, Figure 2-3 illustrates the minimal fluctuation in average daily flows throughout the years from 2015-2022. The figure shows the peak flows typically occurring sometime between June and September, however, the peaking factor between ADWF and AWWF is only 1.12.

Second, Figure 2-4 plots the daily influent volumes at the WWTP and the total daily precipitation events over the last three years on the same axis. The figure shows a handful of precipitation events that appear to have resulted in higher influent flows, however, the majority of the precipitation events have minimal impact on the daily flows.

Lastly, Figure 2-5 shows a plot of precipitation events over 0.2 inches on the x-axis and their corresponding daily influent on the y-axis. Generally, a system experiencing significant I/I will show an inclining linear correlation between precipitation and flowrate with increasing flows corresponding to increasing precipitation events. The points illustrated in Figure 2-5 do not follow a linear patter and therefore indicates precipitation does not have a significant effect on wastewater flows.

FIGURE 2-3: AVERAGE DAILY FLOWS BY MONTH

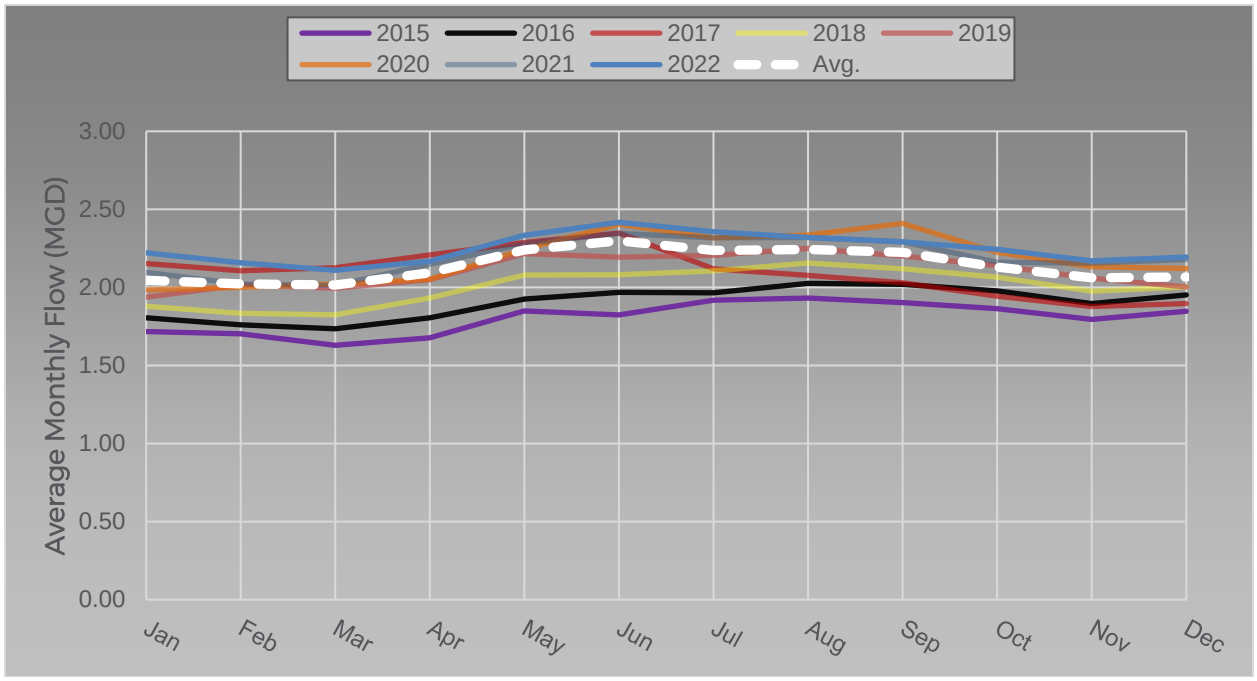


FIGURE 2-4: WWTP INFLUENT FLOWS VS. DAILY PRECIPITATION

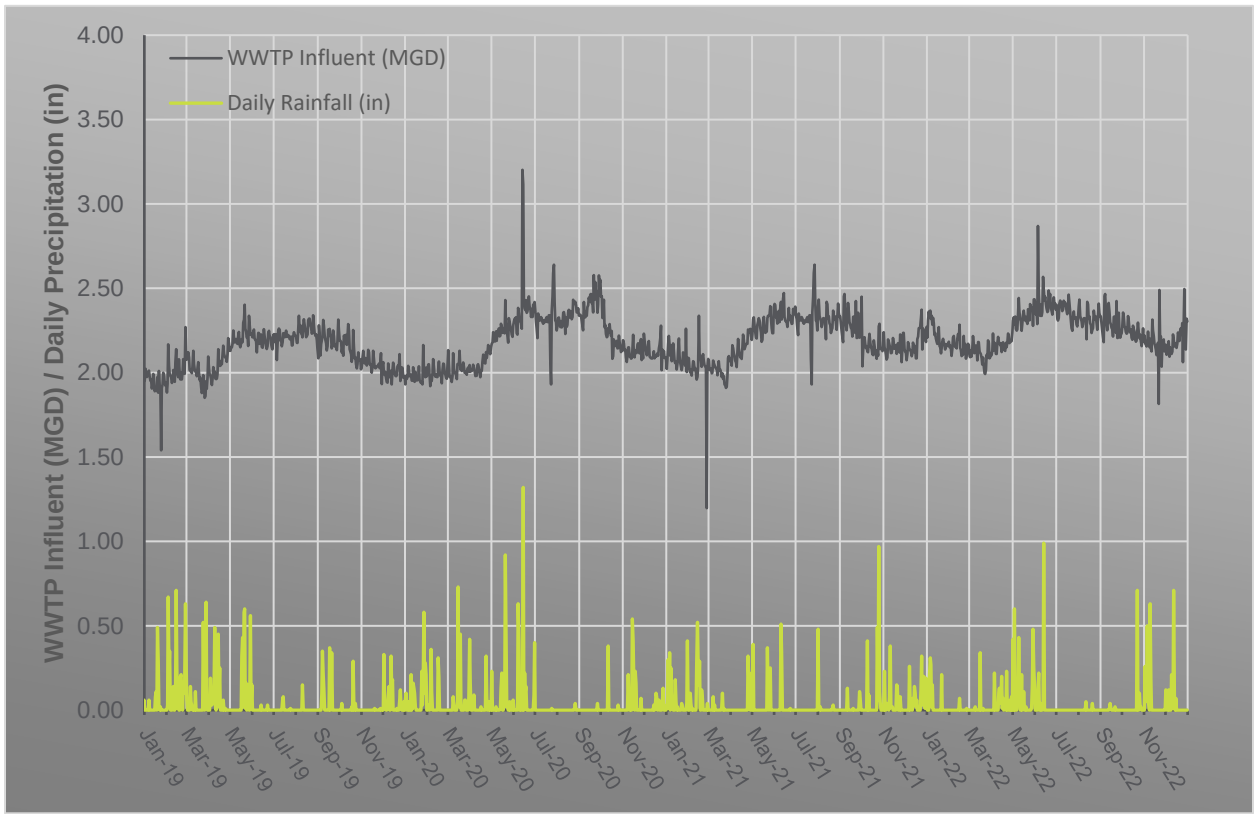
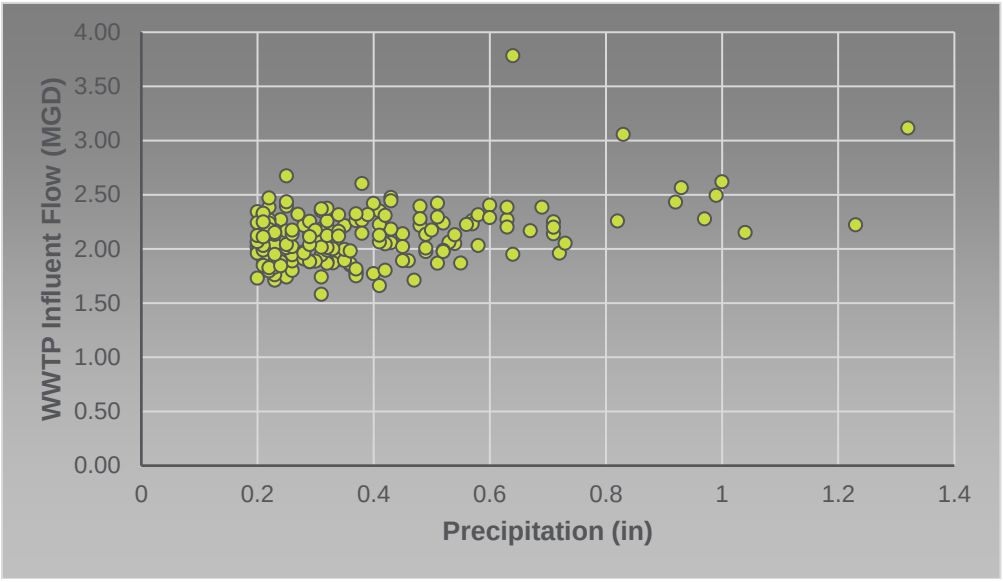


FIGURE 2-5: CORRELATION BETWEEN PRECIPITATION AND WWTP FLOWS



2.6. FUTURE FLOW PROJECTIONS

Based on the information established in the proceeding sections of this chapter, the flows used in evaluating the existing and future wastewater system are presented in Table 2-6. The ERU projections discussed in Section 2.1 were used in conjunction with the existing flow-based criteria to calculate projected flow rates for the 5-year and the build-out flow scenarios.

TABLE 2-6: FLOW PROJECTION SUMMARY

Scenario	ERUs	AADF (MGD)	ADWF (MGD)	AWWF (MGD)	MMF (MGD)	PDF (MGD)	PHF (MGD)
Existing	14,218	2.32	2.45	2.19	2.50	2.87	4.39
5-Year	19,465	3.17	3.36	3.00	3.42	3.93	6.01
Build-Out	23,255	3.79	4.01	3.58	4.09	4.69	7.18

2.7. REGULATORY REQUIREMENTS

In addition to the planning criteria, this study also considers regulatory requirements relating to the collection system which may influence the capital improvement projects. A summary of the regulatory requirements and recommended industry standards which were used as evaluation criteria in this study are summarized below.

Minimum Pipes Slopes (IDAPA 58.420.02.d): The Ten State Standards are a widely used guidance document for wastewater systems and recommend a minimum velocity of 2.0 feet per second (fps) in gravity pipes when flowing full to reduce the likelihood of build-up in the pipeline (Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environment Managers, 2014). The minimum slopes for pipes 8-inch to 42-inch diameter pipes are summarized in Table 2-7.

TABLE 2-7: MINIMUM PIPE SLOPES

Pipe Diameter (in)	10 State Standards Minimum Slope (%)
8	0.4
10	0.28
12	0.22
15	0.15
18	0.12
21	0.1
24	0.08
30	0.058
36	0.046
42	0.037

Minimum mainline diameter of 8-inches (IDAPA 58.430.02.a)

Lift station electrical and mechanical equipment should remain protected from physical damage from the 100-year flood (IDAPA 58.440.01.a)

Back-up power or emergency storage at lift stations (IDAPA 58.440.07.b)

Lift stations should have pumping capacity to meet the peak hour flows with one unit out of service (IDAPA 58.440.02.c.i)

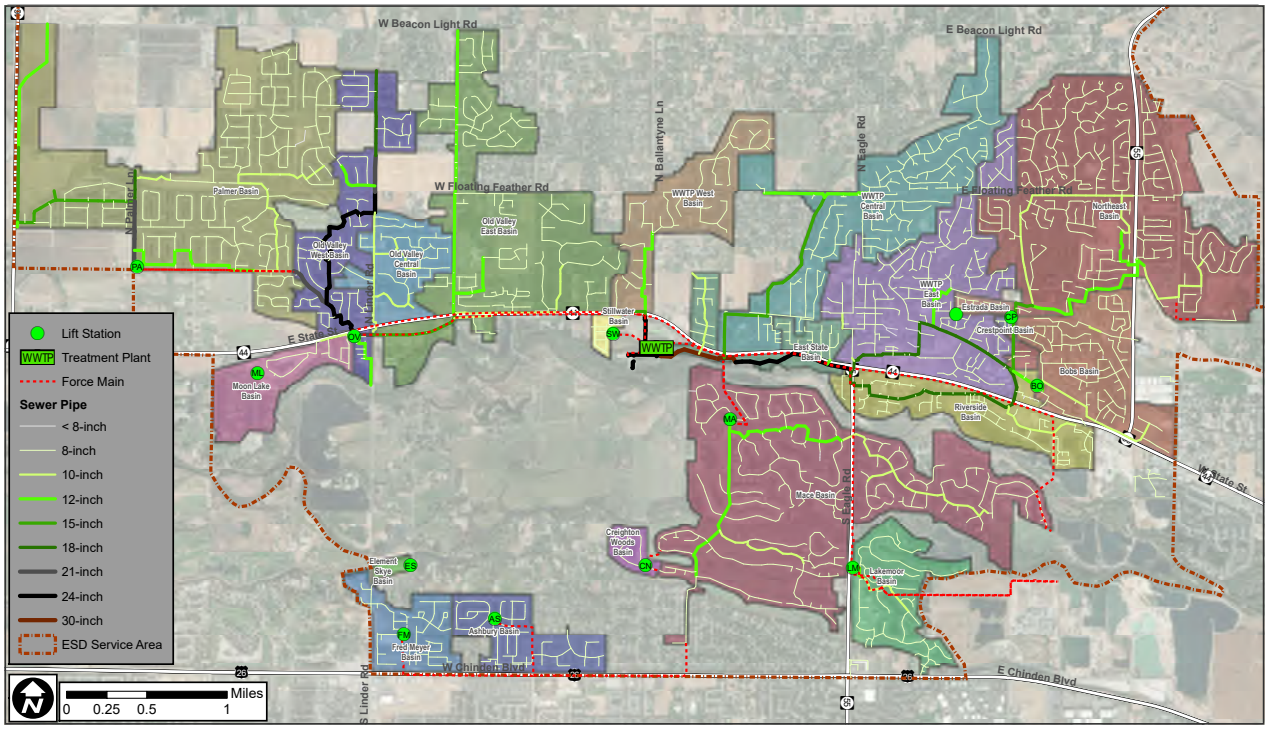
Force main velocities should not be lower than 2 fps at their design flow rate (IDAPA 58.440.10.a)

Maximum flow depth divided by full flow depth (d/D) of less than 75% for pipes 12-inch and smaller in diameter. Maximum d/D of 85% for pipelines 15-inch and larger in diameter.

CHAPTER 3 - EXISTING COLLECTION SYSTEM CONDITIONS

The Eagle Sewer District owns and operates a sanitary sewer collection system and wastewater treatment plant (WWTP) which serves approximately 14,218 ERUs within its service area. The collection system consists of 13 lift stations (LS), 20 miles of pressure sewer pipe, and 180 miles of gravity sewer pipe. Figure 3-1 illustrates the existing collection system and a larger version is shown in Figure 2 in Appendix A.

FIGURE 3-1: EXISTING COLLECTION SYSTEM



3.1. EXISTING SYSTEM CONDITIONS

This master plan did not include physical inspections or observations of the lift stations nor a review of closed-camera television (CCTV) footage to assess pipeline conditions. The District conducts frequent inspections of lift stations and periodic cleaning and CCTV recordings of the collection system. This section includes a general description of the existing collection system facilities based on available record drawings, reported conditions, and GIS data.

3.1.1. LIFT STATIONS CONDITIONS

A summary of the collection system's 13 LS and their attributes is presented in Table 3-1 on Page 3-3. At the time of this study, the system consisted of 11 active lift stations and 2 under construction including the Estrada and Moon Lake LSs. For the purpose of this study, it was assumed these lift stations were completed and operational. All but one of the lift stations pump either directly to the WWTP or to a sewer basin which flows to the WWTP. The Lakemoor LS is located toward the eastern boundary of the service area and pumps wastewater directly to the West Boise Water Renewal Facility rather than to the District's WWTP.

The District's oldest active facility is the Bob LS which was constructed in 1989. The Bob LS is the only facility that does not have a flow meter nor a back-up power source. The Old Valley LS and Palmer LS were constructed with room for additional pumps as the system grows. All of the lift stations, with the exception of the Palmer LS, have cylindrical wetwells with submersible pumps. The Palmer LS has a rectangular vault with self-priming centrifugal pumps outside of the wetwell.

It should also be noted that the Boise River flows through the District's service area from the east to west. The 100-year and 500-year floodplains encapsulate a sizable portion of the collection system including four lift stations. The Mace LS and Lakemoor LS are both within the 100-year floodplain and the Estrada LS and Moon Lake LS are within the 500-year floodplain. However, the Mace LS and Lakemoor LS buildings and wetwell rims are located above the 100-year base flood elevation. The 100-year and 500-year floodplain and lift stations are illustrated in Figure 3-1 (full size Figure 4 in Appendix A).

FIGURE 3-2: FLOODPLAINS

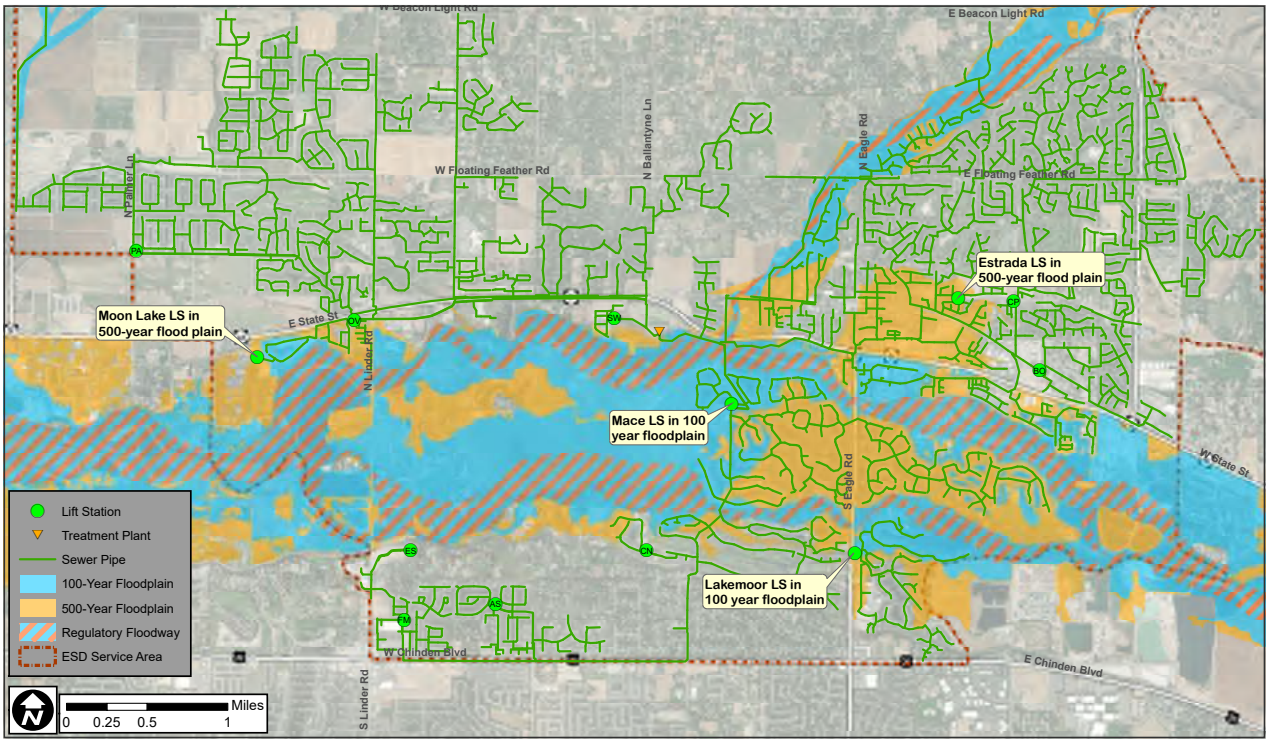


TABLE 3-1: EXISTING LIFT STATION INVENTORY

Attribute	Ashbury	Bob	Creighton Woods	Crestpoint	Element Skye	Estrada	Fred Meyer	Lakemoor	Mace	Moon Lake	Old Valley	Palmer[5]	Stillwater
Pump Type	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Submersible	Vertical Turbine	Submersible
Number of Pumps	2	2	2	2	2	2	2	2	3	2	3	4	2
Year Constructed	2014	1989	2020	2016	2023	2021	2012	2007	2015	2022	2020	2010	2017
Motor Size (HP)	11	5	2.5	3	5.5	2	11	14	50	2	70	14	3
Firm Capacity (gpm)[1,2]	200	480	100	170	100	105	265	300	1,190	40	1,850	1,350	120
Design Head (ft)	89	21	36	21	95	16	93	82	102	53	139	90	28
Wetwell Diameter (ft)	6	6	6	6	6	8	6	6	12	8	12	n/a	8
Wetwell Depth (ft)[3]	34.3	17.31	24.89	17.5	25.96	18.86	26	29.59	38.08	10	27.52	10	26.59
Lead Pump On (ft)	5.0	3.3	5.0	3.8	7.4	3.0	3.6	6.0	7.0	2.3	10.5	5.0	3.0
Lead Pump Off (ft)	3.0	1.0	2.0	1.8	3.8	2.0	1.6	3.1	3.5	1.3	3.0	3.5	2.0
Lag Pump On (ft)	7.5	4.3	6.0	4.2	7.7	5.0	3.8	6.4	7.5	NS	11.0	6.0	3.5
Lag Pump Off (ft)	3.0	1.0	2.0	1.8	3.8	2.0	1.6	3.1	3.5	NS	3.0	3.5	2.0
Depth to Inlet Pipe Invert (ft)[4]	14.5	4	4.36	4.75	8.59	5.5	6	1.52	1.76	6.5	8.88	5.04	5.8
Level Indicator Type	Pressure transducer	Pressure transducer	Pressure transducer	Pressure transducer	Pulse Radar	Pressure transducer	Pressure transducer	Pressure transducer	Pressure transducer	Pressure transducer	Pressure transducer	Pressure transducer	Pressure transducer
Flow Meter (Y/N)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pressure Gauge (Y/N)	No	No	No	No	No	Yes	No	No	Yes	Yes	Yes	No	No
Back-up Power	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Transfer Switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch	auto switch
Odor/H2S Control	No	No	No	Yes	No	Yes	No	No	Yes	Yes	Yes	No	Yes
Room for Expansion (Y/N)	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No
Force Main Diameter (in)	6"	6"	4"	4"	3"	4"	6"	8"	two 8"	2"	10" & two 6"	8" to 6" & 10" to 8"	4"
Force Main Length (ft)	9,100	<15	560	30	1,600	130	11,700	7,500	3,000	180	9,800	5,400	1,080

1) Equal to reported flow from the pump curve or pump test if pump curve was unavailable.

2) Total pumping capacity with the largest pump offline. Bob LS capacity based on pump test completed by the District in April 2023. Mace capacity based on only one pump running.

3) From sump elevation to top of slab elevation.

4) Distance from sump elevation to invert of the lowest incoming pipe.

5) Palmer LS consists of a total of four pumps; three at 450 gpm and one at 720 gpm.

3.1.2. PIPELINE CONDITIONS

The District's gravity pipelines mostly consist of 8-inch pipe accounting for about 80% of the system. The length of pipeline by diameters is shown in

Table 3-2. The District's GIS does not include attributes for pipe material nor installation dates, however, based on the amount of growth the City of Eagle has experienced recently, it is likely that a significant portion of the system consists of polyvinyl chloride (PVC) pipe and is less than 20-30 years old.

The District's annual pipeline replacement program focuses on areas in the system which are known to be older. The highest priority area (and one of the older parts of the system) is within the Old Towne Basin. The District has identified several pipelines that are in need of replacement due to their condition. It should be noted that an evaluation of these pipe segments was completed in 2017 which included CCTV and recommendations for improvements. The results of the evaluation showed the majority of these segments of pipe are in relatively good condition and immediate replacement is not recommended. These pipelines should be replaced as opportunities such as new development or local roadway improvements occur within the vicinity of these pipe segments. These pipe segments are illustrated in Figure 3-3. In addition to the District's condition based replacement program, they have also previously identified a re-alignment of one of the trunklines flowing to the WWTP. This section of pipe is near the Boise River and the District would like to re-align it to improve system resiliency. The extents of this project are illustrated in Figure 3-4. Projects identified in this chapter will be included in the capital improvement plan detailed in Chapter 6.

TABLE 3-2: GRAVITY PIPE DIAMTERS

Diameter	Length Rounded (ft)	% of System
6-inch and less	1,200	0.1%
8-inch	750,600	80%
10-inch	62,000	6.6%
12-inch	53,300	5.7%
15-inch	21,500	2.3%
18-inch	18,600	2.0%
21-inch	5,800	0.6%
24-inch	15,000	1.6%
30-inch	3,000	0.3%
Unknown	4,000	0.4%
Total	**935,000**	**100%**

FIGURE 3-3: CONDITION BASED REPLACEMENT PIPELINES (SHOWN IN RED)

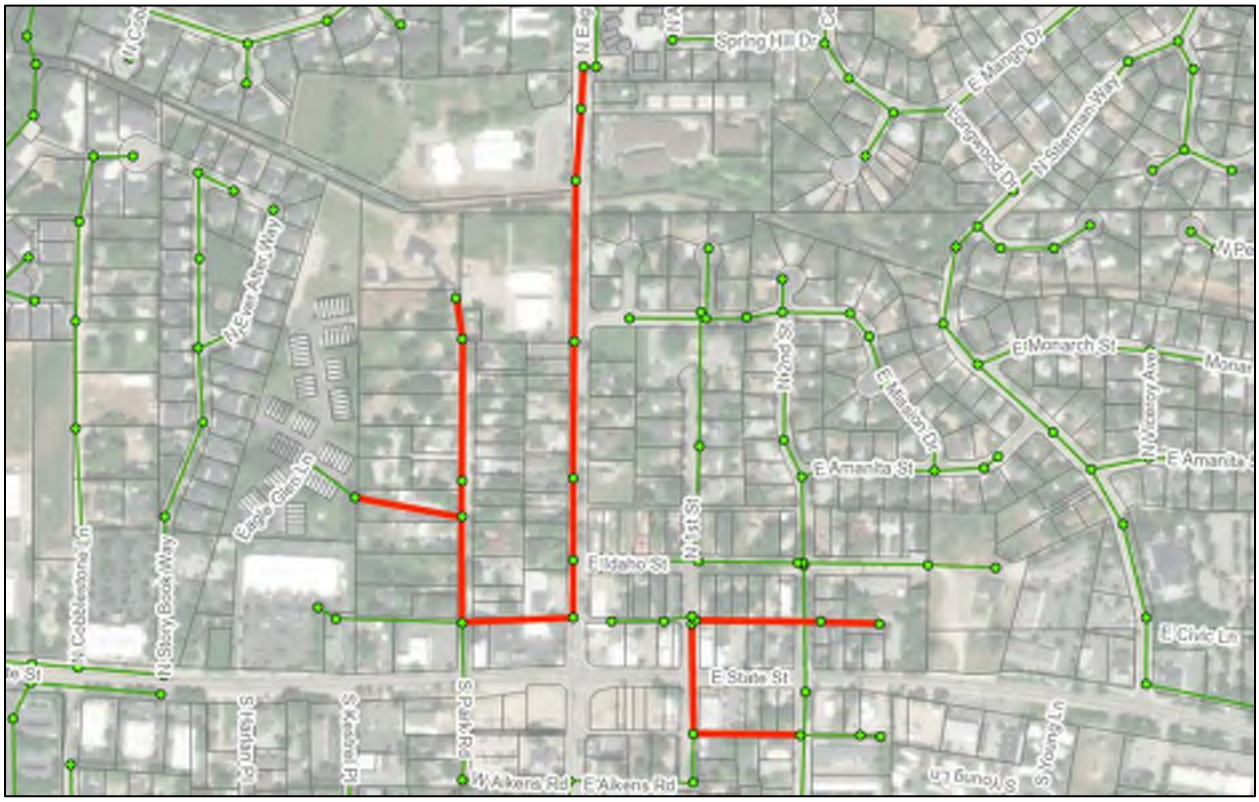
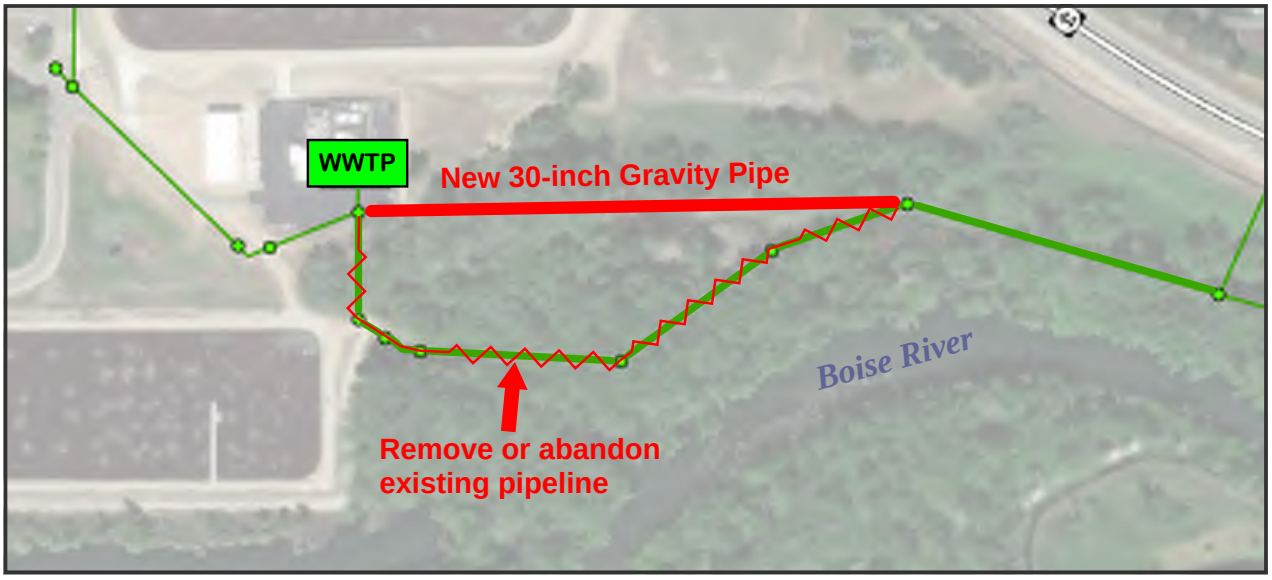


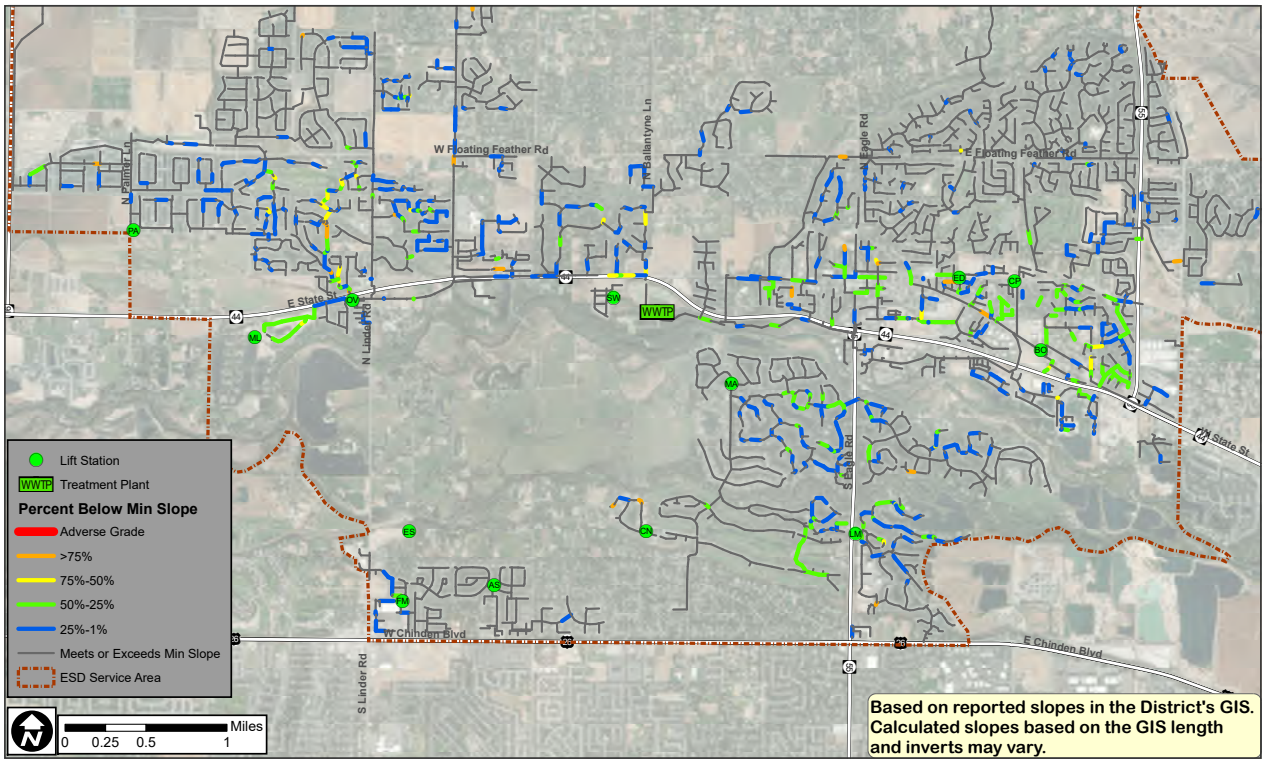
FIGURE 3-4: WWTP TRUNKLINE REALIGNMENT



The pipeline slopes were compared to the recommended minimum slopes, Table 2-7 in Chapter 2, and Figure 3-5 shows pipes with pipes that do not meet the recommended minimum slopes. The slopes are based on the value reported in the District's GIS data which is likely taken from the pipeline record drawings. The calculated slope based on the GIS length and elevations may vary, either greater or lower, from the reported slopes due to discrepancies in the GIS length.

There are numerous pipelines with slopes below the minimum recommended value, and therefore, the figure is color-coded to show how far below the minimum slope each pipe segment is. Pipes shown in blue are only 25% below the minimum recommended slope. For example, an 8-inch pipe with a reported slope between 0.4 (recommended minimum slope) and 0.3% would fall within this category/color.

FIGURE 3-5: REPORTED PIPE SLOPES



The lift station force mains vary in size from 2-inches to 14-inches. An inventory of the force mains size, length, and velocity at their firm pumping capacity is summarized in Table 3-3. Idaho DEQ requires that velocities at the firm capacity be a minimum of 2 fps to minimize sediment build-up in the pipe. Also, the maximum recommended velocity is 6 fps to avoid excessive headloss and water hammer.

As seen in the table, all of the lift stations achieve a velocity between 2 fps and 6 fps at their reported firm capacity. The Old Valley LS has parallel force main lines but are controlled by an actuator valve to only pump into the 10-inch pipe when one pump is on. If a second pump turns on, the valve will open, and flow will go through the additional parallel 6-inch force mains. Similarly, the Palmer LS has a parallel 8-inch that is reduced to a 6-inch and 10-inch pipe that is reduced to an 8-inch. The lift station is currently operated to only pump through the 8-inch/6-inch force main but will open the 10-inch/8-inch if a second pump turns on. The range of velocities presented for the Palmer LS are for any of the potential pumping configurations. This operational strategy will likely change as additional pumps are added to the lift station.

TABLE 3-3: FORCE MAIN SUMMARY

Lift Stations	Force Main Size (in)	Force Main Length (ft)	Reported Capacity (gpm)	Pipe Velocity (fps)
Ashbury	6"	9,100	200	2.3
Bob[1]	6"	<15	480	5.4
Creighton Woods	4"	560	100	2.6
Crestpoint	4"	30	170	4.3
Element Skye	3"	1,600	100	4.5
Estrada	4"	130	105	2.7
Fred Meyer	6"	11,700	265	3.0
Lakemoor	8"	7,500	300	1.9
Mace[2]	two 8"	3,000	1,190	3.8
Moon Lake	2"	180	40	4.1
Old Valley[3]	10" & two 6"	9,800	1,850	4.4
Palmer[4]	8" to 6" & 10" to 8"	5,400	1,350	5.7 - 2.9
Stillwater	4"	1,080	120	3.1

1) Bob LS reported capacity is based on a pump test completed by the District in April 2023.

2) Mace has total of three pumps but was sized for one pump to meet PHF. Table reflects firm capacity as only one pump on. Consists of two 8-inch forcemains.

3) Old Valley forcemain consists of two parallel 6-inch pipes and a 14-inch pipe that transitions to a 10-inch pipe. Velocity based on two pumps on and all three pipes open. Old Valley has 3 pumps installed in the primary wetwell and space for another 2 future pumps in the overflow wetwell.

4) Palmer LS has two paralell force mains. One which is a 10-inch that is reduced to 8-inch and the other which is 8-inch and is reduced to 6-inch. Velocities presented are range for any of the expected pumping configurations.

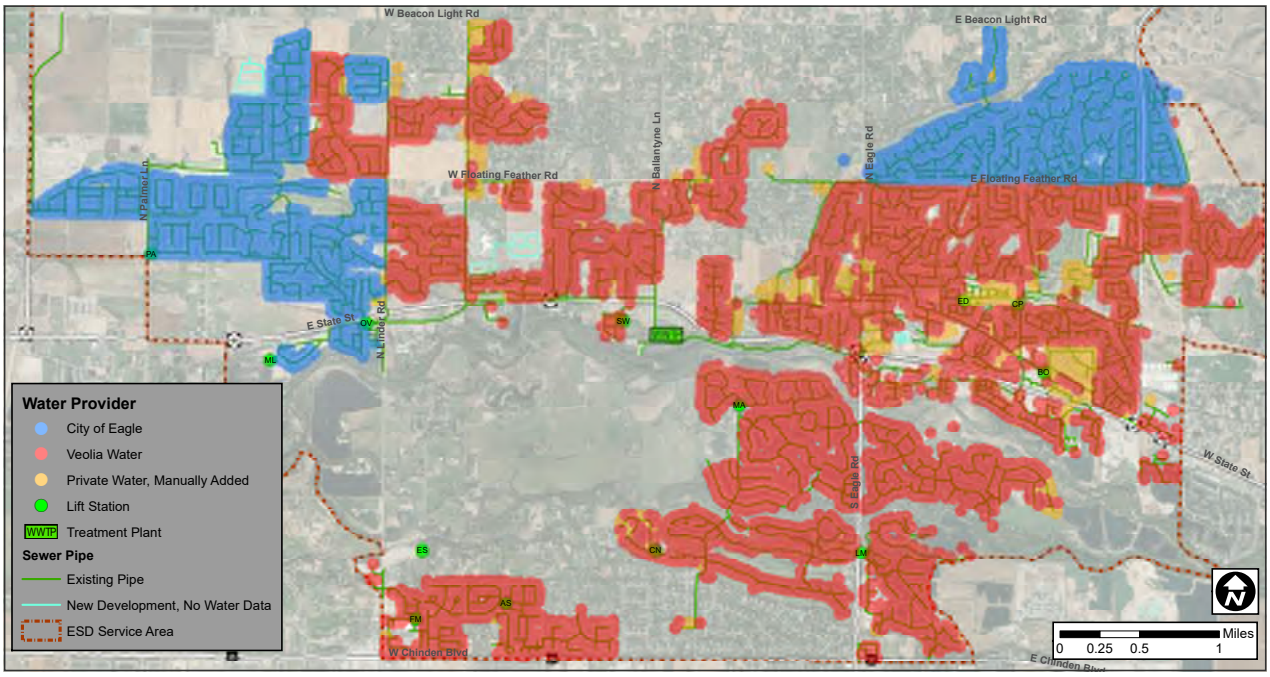
3.2. MODEL DEVELOPMENT

An accurate computer model of the wastewater system serves as an important planning tool and provides the basis for identifying existing and future collection system deficiencies. The previous hydraulic model from 2015 was updated to evaluate the existing and future collection system to identify potential bottlenecks and capacity deficiencies. InfoSWMM Suite 14.7 Update #2 was selected as the modeling software for this project. InfoSWMM is a fully dynamic model which operates in conjunction with Esri ArcGIS and allows for evaluation of complex hydraulic flow patterns. The updates to the model included adding new pipes and lift stations which were installed since 2015 as well as updating the systemwide flows. A variety of sources were used in developing the hydraulic model and are described below:

- Pipes and Manholes: The District's GIS data was used as the basis for updating the pipeline characteristics in the model. The pipelines were imported to the model and reviewed for suspicious attributes such as adverse slopes, connectivity, smaller downstream pipes, and more. Minor adjustments were made such as lowering the manhole invert to match the outgoing pipe, connecting pipes to their respective downstream pipe, or obvious typos in elevations. More significant adjustments such as vertical datum discrepancies, adverse grades, and questionable diameters were also made to match either the previous model or by making datum shift assumptions. A summary of the changes to the GIS was provided to the District as a part of this master plan.

- Lift Stations: The lift station attributes including wetwell dimensions, pumping rates, and operational settings were based on record drawings, pump curves, and reported settings.
- Flow Distribution: The model flows were assigned based on potable water wintertime consumption provided by Veolia Water (Veolia) and the City of Eagle water consumption records. Additionally, there are some areas within the study area which are not served by Veolia nor City of Eagle and are served by a private water system. Flows were manually assigned to these areas based on typical consumption values. The Veolia, City of Eagle, and private water service areas are illustrated in Figure 3-6. Veolia serves the majority of the system accounting for about 60% of the water connections. It should also be noted there are some areas where sewer pipes are shown in the GIS, but the services are not active yet, therefore no water consumption data was available. The flows from these developments should not have a significant impact on the existing evaluation and will be reflected in the 5-year model flows. The water consumption data for each address point was assigned to the nearest modeled junction resulting in a highly accurate load allocation. The water consumption data was then factored up or down so the systemwide volumes were equal to the flow scenario planning flows.

FIGURE 3-6: WATER SERVICE PROVIDERS



It is important to note that one of the basic assumptions of the hydraulic model is that all pipelines are free from physical obstructions such as roots and accumulated debris. Such maintenance issues, which certainly exist, must be discovered, and addressed through consistent maintenance efforts. The modeled capacities discussed in this chapter represent the capacities assuming the wastewater collection lines are in good working order.

3.2.1. FLOW MONITORING SUMMARY

Flow monitoring for this study was conducted for approximately four weeks in the winter of 2023 from January 19 to February 17. Flow monitors were installed at six locations throughout the collection system. The flow monitoring plan and processed data is included in Appendix D.

For the purpose of this study, flow monitoring refers to the temporary installation of a sensor in a sewer pipe to measure wastewater flows. Specifically, the sensors measure the depth of water in the pipe and the velocity of the wastewater flows for use in calculating the flow going through the pipe. The flow monitors were programmed to record data points every 5 minutes to capture fluctuations in system flows. It should be noted, while flow monitoring is an effective way of measuring sewer flows, there is the potential for error in the output data. Malfunctioning equipment and debris accumulation on the sensor are some of the most common errors encountered as a part of the flow monitoring process. The flow data was checked at a minimum of once per week in an attempt to identify poor data quality and address issues if possible.

The flow monitoring data was processed, and the data quality was reviewed. Scattergraphs were developed by plotting velocity on the x-axis and depth on the y-axis. This is a common way to evaluate the data quality and identify potential issues. The theoretical Manning Equation was also plotted on the scattergraph to indicate if the observed data matches the theoretical values. Tightly clustered data points along the Manning curve indicate good quality data. Where the Manning Equation did not match well, an adjusted version of the Manning Equation called the Stevens-Schutzbach Method was used. This method is applicable for pipes with downstream obstructions, offset joints, debris, or other related conditions. This method was used when the scattergraph shows no velocity, but a depth greater than zero. A brief description of the flow monitoring results is provided below:

- Site 1 was installed upstream of the Old Valley LS and downstream of the Palmer LS Basin. The data quality at this site was particularly good with tightly clustered data points in the scattergraph. The average flows were around 150 gpm and flows show a clear diurnal pattern which is relatively consistent each day. There were no major concerns with the data gathered at this site.

- Site 2 was also installed upstream of the Old Valley LS but captured flows from the eastern part of the basin. The data quality at this site was poor for the first week, and therefore the sensor was recalibrated during the first site visit. After recalibrating the sensor, the data quality was good with average flows of around 100 gpm. There were a couple of outlying data points, however the majority of the data showed a clear diurnal pattern throughout the monitoring period. The scattergraph showed a depth of around 2 inches with around 0 fps velocity indicating there may be standing water downstream as a result of a sagging pipe, or debris build-up downstream.

- Site 3 was installed to capture flows from the WWTP West Basin. The data quality at this site was very good with tightly clustered data points in the scattergraph. This site captured flows from less ERUs than Sites 1 and 2 and the average daily flows were around 20 gpm. A diurnal pattern was clear and there were no major concerns with the data gathered from this site.

- Site 4 was installed upstream of the WWTP and gathered flows from the WWTP Central Basin. The scattergraph indicates very good data quality with the average daily flows of around 40 gpm which is significantly lower than the expected flows based on typical flows per ERU.

- Site 5 was installed upstream of the WWTP and consisted of flows from a number of basins. The scattergraph shows there may have been an issue with the sensor's pressure transducer because the depth throughout the entire monitoring period did not vary more than a half of an inch. Overall flows are within the expected range and a diurnal pattern is clear.

- Site 6 was installed upstream of Site 5 and captured flows from the Northeast Basin and Crestpoint LS Basin. Several attempts to recalibrate and adjust the sensor settings were made, however the majority of the data from this site was poor quality. However, the data from the peak calibration day turned out to be within the expected values and a diurnal pattern was able to be developed.

The District also provided SCADA data for each of the lift stations for the same time period that the monitors were installed, and these lift stations served as additional monitoring points throughout the collection system. Therefore, between the flow monitors and the lift stations, there were a total of 16 locations plus the WWTP which were used as data points to calibrate the model.

3.2.2. MODEL CALIBRATION

The model calibration results are summarized below in Table 3-4 and additional details are included in Appendix D. The green values represent flows calibrating within +10% or -5% while the red values indicate flows outside of this range. In summary, the model calibrated very well, and the majority of the peak flows were matched within the targeted ranges. The observed flows at Site 4 were significantly lower than the expected flows based on typical flows per ERU. To be conservative, the model flows were not reduced to match the observed flow and therefore the percent difference is shown as 70%. Also, the flows at Old Valley LS were not matching well and it was assumed to be a discrepancy in the SCADA data versus the flow monitoring data. There were two flow monitor locations (Site 1 and 2) almost directly upstream of the Old Valley Wetwell and these two sites were calibrated within the target tolerances. Additionally, the Palmer LS is also upstream of the Old Valley LS and calibrated well. Increasing the flows to match the SCADA at the Old Valley LS would result in worse calibration at Site 1, Site 2, and Palmer LS, therefore, no additional changes were made.

TABLE 3-4: MODEL CALIBRATION SUMMARY

Location	Observed Daily Flow Volume (gal)	Modeled Daily Flow Volume (gal)	Percent Difference		Observed Peak Flow (gpm)	Modeled Peak Flow (gpm)	Percent Difference
Flow Monitor Site 1	250,600	327,058	30.5%		370	409	10.4%
Flow Monitor Site 2	123,791	131,389	6.1%		156	151	-3.3%
Flow Monitor Site 3	32,789	39,764	21.3%		60	58	-3.3%
Flow Monitor Site 4	64,838	136,657	110.8%		102	174	70.4%
Flow Monitor Site 5	934,492	946,650	1.3%		759	836	10.2%
Flow Monitor Site 6	237,069	235,144	-0.8%		352	340	-3.4%
WWTP Influent	2,204,000	2,107,800	-4.4%		2,268	2,408	6.2%
Fred Meyer LS	84,131	91,483	8.7%		141	145	2.5%
Ashbury LS	50,502	56,234	11.3%		88	94	6.4%
Mace LS	473,876	482,771	1.9%		557	593	6.4%
Creighton LS	7,070	7,300	3.3%		9	8.75	-2.8%
Bob LS	44,740	48,500	8.4%		55	55	0.2%
Lakemoor LS	67,196	62,849	-6.5%		88	88	-0.8%
Crestpoint LS	2,540	2,500	-1.6%		4	4	0.0%
Palmer LS[1]	242,746	238,832	-1.6%		276	289	4.8%
Old Valley LS	590,757	500,693	-15.2%		868	602	-30.7%
Stillwater LS	5,070	5,100	0.6%		7	7	0.0%

1) Observed daily flow based on 1-minute SCADA data rather than daily reported value.

Calibrating the hydraulic model is a critical step to build confidence in the output model results. The goal of the calibration process is to adjust the model inputs to match the observed data points from the flow monitoring and lift station SCADA. The peak day from the flow monitoring period was observed to be January 29th, and therefore this day was used as the calibration day.

Diurnal curves were developed for the six flow monitor sites and seven lift stations based on the observed flows. These diurnal curves were assigned to the junctions in their respective basins to simulate the changes in flows throughout the day. The base flows were adjusted globally up or down from the initial flow allocation based on the water meters, so the average flows matched the system flows observed on the calibration day. The model was then exercised, and the output results were compared to the observed data from the monitoring period. The base flows, diurnal patterns and other model inputs were adjusted with each model run until the outputs matched the observed data.

The model peak flows were targeted to be within -5% or +10% of the observed flows to be considered calibrated. It should be noted that matching the peak flows was given more weight than the daily volume because the peak flows are the primary evaluation criteria to determine if there are capacity deficiencies. Additionally, the lift station pump outflows were compared to the observed SCADA pumping rates to match the model with the observed data. An example of the original model results compared to the calibrated model results are illustrated in Figure 3-7 and Figure 3-8. Model results are shown in red and observed flow monitoring in blue.

FIGURE 3-7: ORIGINAL MODEL RESULTS COMPARED TO THE OBSERVED DATA

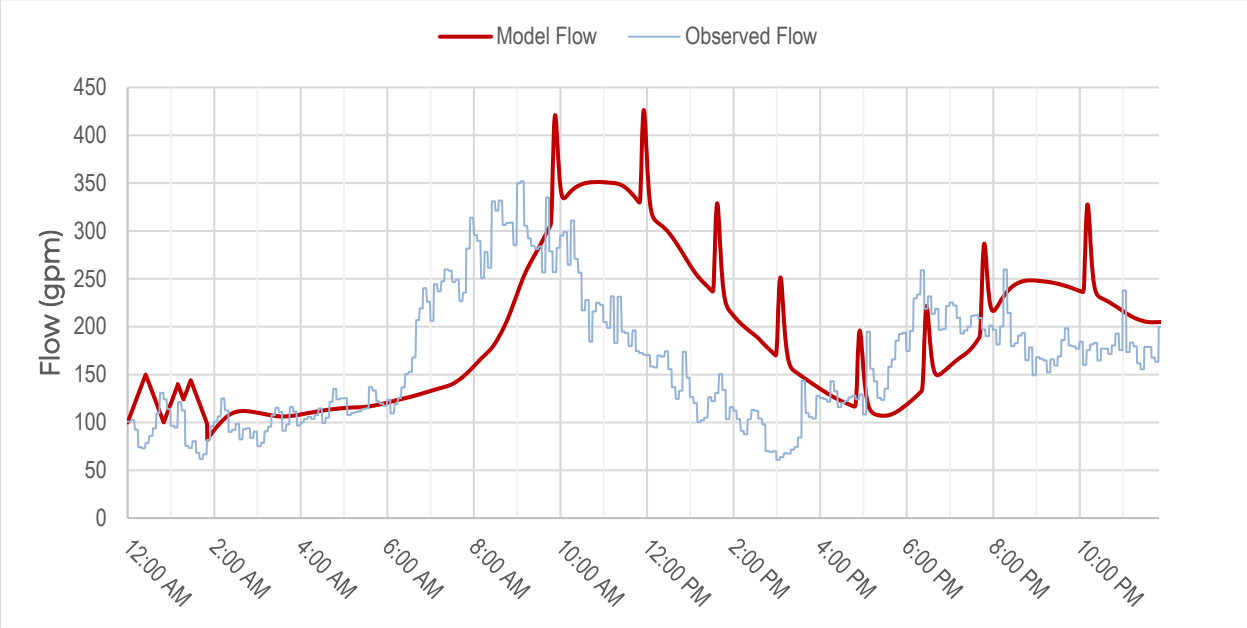
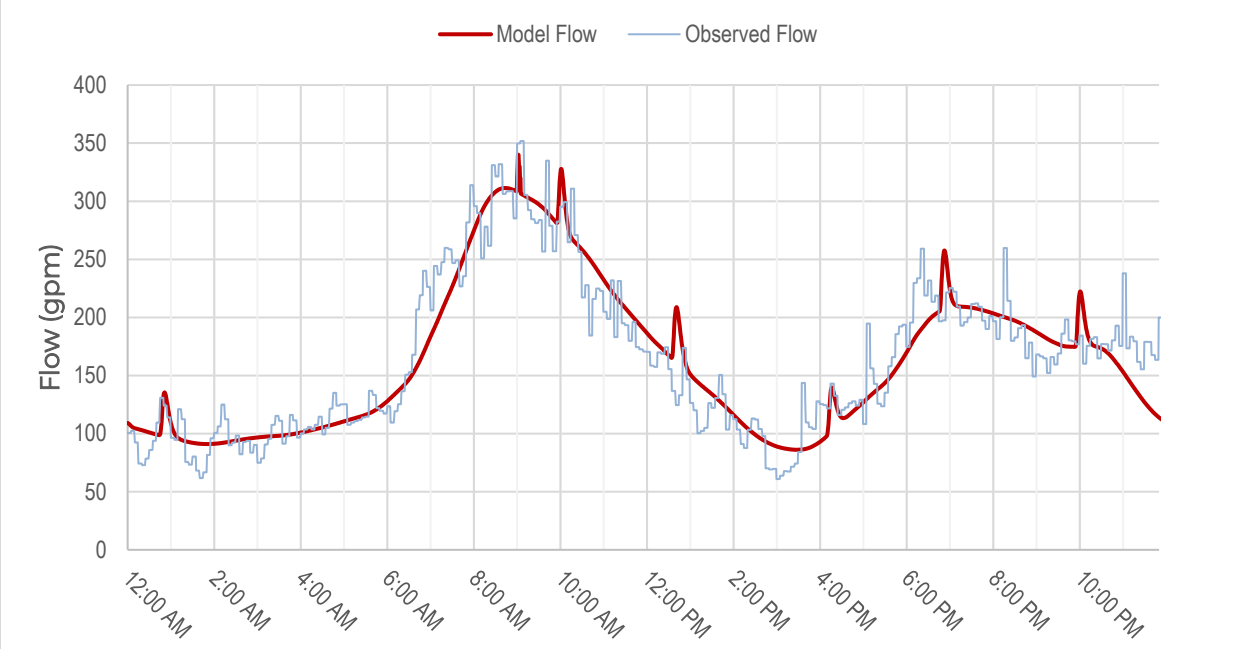


FIGURE 3-8: CALIBRATED MODEL RESULTS COMPARED TO THE OBSERVED DATA



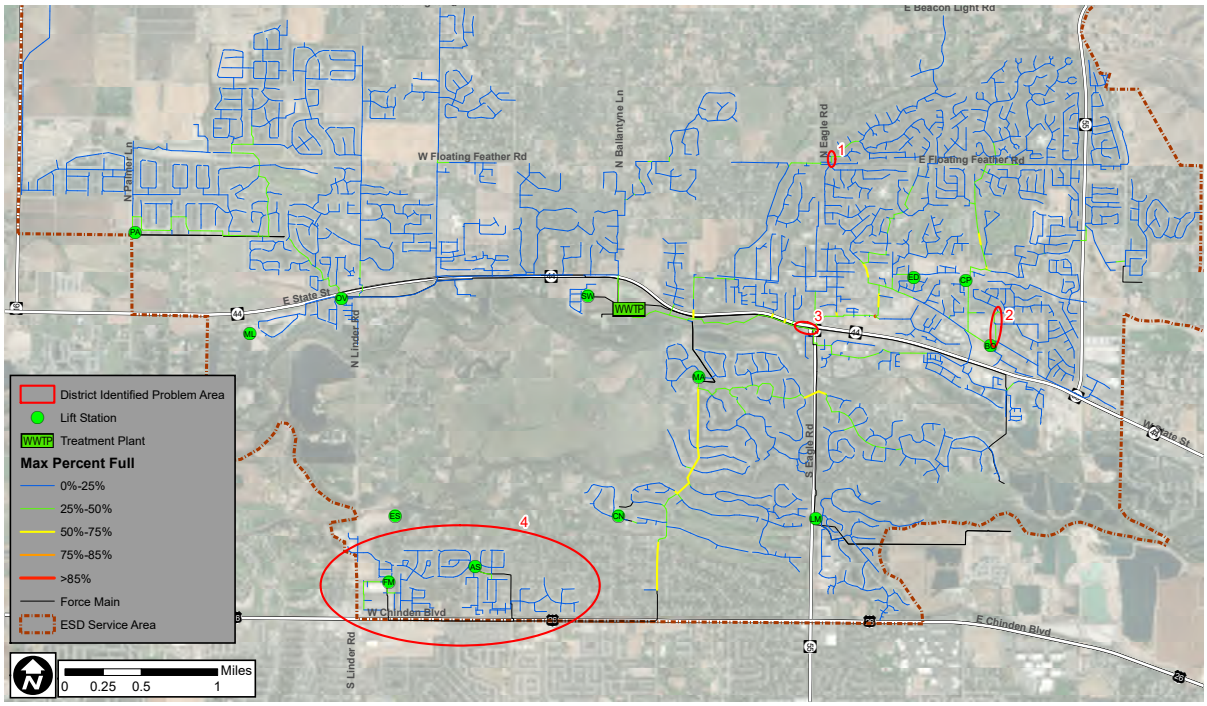
3.3. EXISTING SYSTEM CAPACITY EVALUATION

Figure 3-9 illustrates the existing PDF maximum depth divided by full depth (d/D). A larger version of the figure are provided in Appendix A.

The remaining capacity of the trunklines (>10 inch) was calculated for each pipe segment within the collection system and Figure 6 in Appendix A presents the results. It should be noted that the remaining ERUs presented in the figure do not consider the impacts from upstream or downstream flows and are strictly based on the remaining capacity of each individual pipe segment. Due to the complex hydraulics within a sewer system, an exact number of remaining ERUs cannot be calculated unless the location and flow characteristics for each growth area are provided. The reported remaining ERUs can be used as a general basis for remaining ERUs, however, the impact of developments should be evaluated on a case-by-case basis using a hydraulic model to better assess the resulting pipe capacities.

Additionally; Figure 3-9 shows areas where the District expressed concern for bottlenecks and where previous efforts have indicated the potential for upsizing the pipes. A description of the problem areas is provided below:

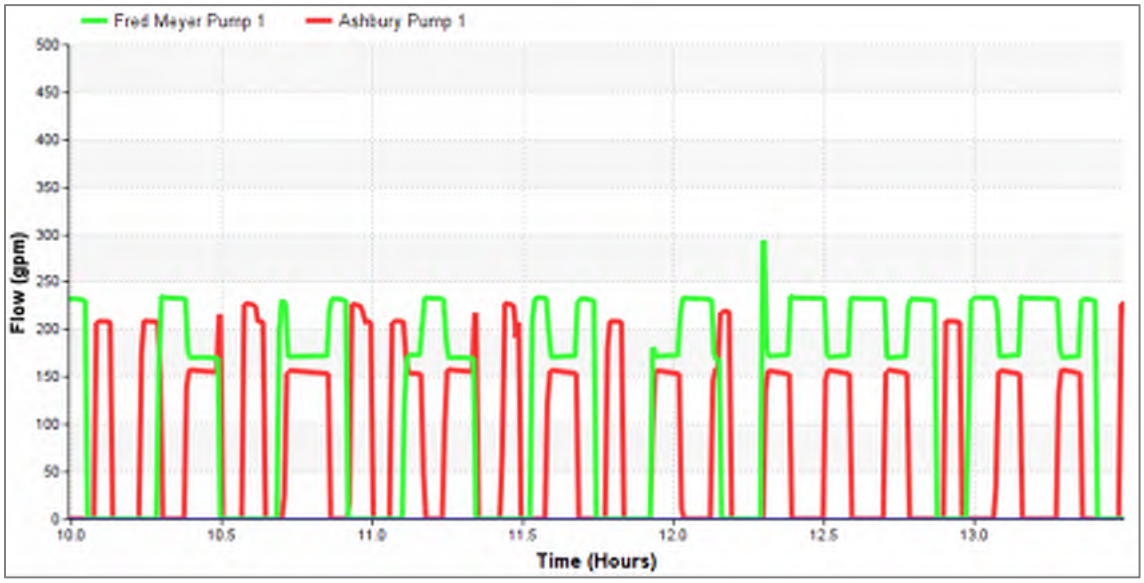
FIGURE 3-9: EXISTING PEAK FLOW MAX DEPTH/FULL DEPTH



Area 1, 2, and 3 – Do not appear to have capacity issues under existing flows, and pipes less than 50% full.

Area 4 – The Fred Meyer and Ashbury Lift Stations pump into a combined force main and the pumps compete with each other which reduces the capacity when both are running. The Fred Meyer LS has a reported capacity of 265 gpm and the Ashbury LS has a reported capacity of 200 gpm. However, due to the shared force main, the actual pumping rates of both lift stations are lower when both lift station pumps are running at the same time. Figure 3-10 illustrates the modeled operation of the two lift stations and shows the reduced capacity of both lift stations pumps when they are both pumping simultaneously. The model predicts that the existing flows cannot be handled with one pump running at each lift station (even if the two lift stations pumps are running simultaneously) while maintaining the operation setpoints for the water levels in the wetwells. When a single pump is running simultaneously at both lift stations, the Fred Meyer LS pumping rate is reduced to about 170 gpm (less than the 180 gpm existing peak hour flow) and the Ashbury LS pumping rate is reduced to about 150 gpm (greater than the 110 gpm existing peak hour flow). SCADA data shows times when both pumps are pumping, and the capacity of both lift stations are reduced, similar to what is predicted by the model.

FIGURE 3-10: FRED MEYER & ASHBURY EXISTING PUMPING RATES



The peak inflows into the lift stations were also compared to the lift station firm capacities and are presented in Table 3-5. The table also shows the remaining capacity for additional ERU connections based on the peak hour flow per ERU established in the planning criteria.

TABLE 3-5: EXISTING PEAK HOUR FLOWS VS. LIFT STATION CAPACITIES

Lift Stations	Firm Capacity (gpm)	Peak Hour Inflow (gpm)	Capacity > Peak Inflow	Capacity Remaining (gpm)	ERU's Remaining[1]
Ashbury	200	109	Yes	91	425
Ashbury (reduced)[4]	150	109	Yes	41	192
Bob	480	108	Yes	372	1,735
Creighton Woods	100	11	Yes	89	415
Crestpoint	170	5	Yes	165	771
Element Skye	100	4	Yes	96	446
Estrada	105	9	Yes	96	450
Fred Meyer	265	182	Yes	83	389
Fred Meyer (reduced)[4]	170	182	Over Capacity	0	0
Lakemoor	300	111	Yes	189	880
Mace Road	1,190	785	Yes	405	1,888
Moon Lake	40	6	Yes	34	160
Old Valley[2]	1,850	825	Yes	1,025	4,781
Palmer Road[3]	1,350	373	Yes	977	4,557
Stillwater	120	9	Yes	111	517

1) As of December 2022. Based on a PHF of 0.21 gpm per ERU.

2) Old Valley firm capacity equal to combined capacity of two of the three pumps.

3) Palmer firm capacity equal to combined capacity of three of the four pumps.

4) Reduced capacity for Ashbury and Fred Meyer reflects when both lift stations are pumping and the capacity is reduced.

CHAPTER 4 - FUTURE COLLECTION SYSTEM EVALUATION

This chapter provides an evaluation of the collection system under future projected flows. It includes an evaluation of the existing system capacity under future flows and recommendations for future trunkline alignments and pipe sizes to accommodate future growth. The following sections document the future model development and the specific results from the future scenarios. A summary of the observations and deficiencies under the future model scenarios are presented below. Recommendations to resolve deficiencies described below are discussed in the following Chapters 5 and 6.

- Deficiencies requiring improvements:
  - Peak hour flows into Old Valley Lift Station exceed the current pumping firm capacity under buildout flows. Note, the lift station pumps were designed with the intent to upsize pumps once buildout flows were reached.
  - Peak hour flows into Palmer Lift Station are approaching the current pumping firm capacity (within 5%) during buildout flows. Note, the lift station pumps were designed with the intent to upsize pumps once buildout flows were reached.
- Observations not requiring improvements:
  - Peak hour flows into Fred Meyer Lift Station may exceed the firm capacity if the Element Skye Lift Station pumps during peak hour.
  - Stillwater Lift Station pumping capacity is reduced by approximately 50% when running at the same time as the future Eagle Island Lift Station because both lift stations pump into a shared force main.

4.1. FUTURE MODEL DEVELOPMENT

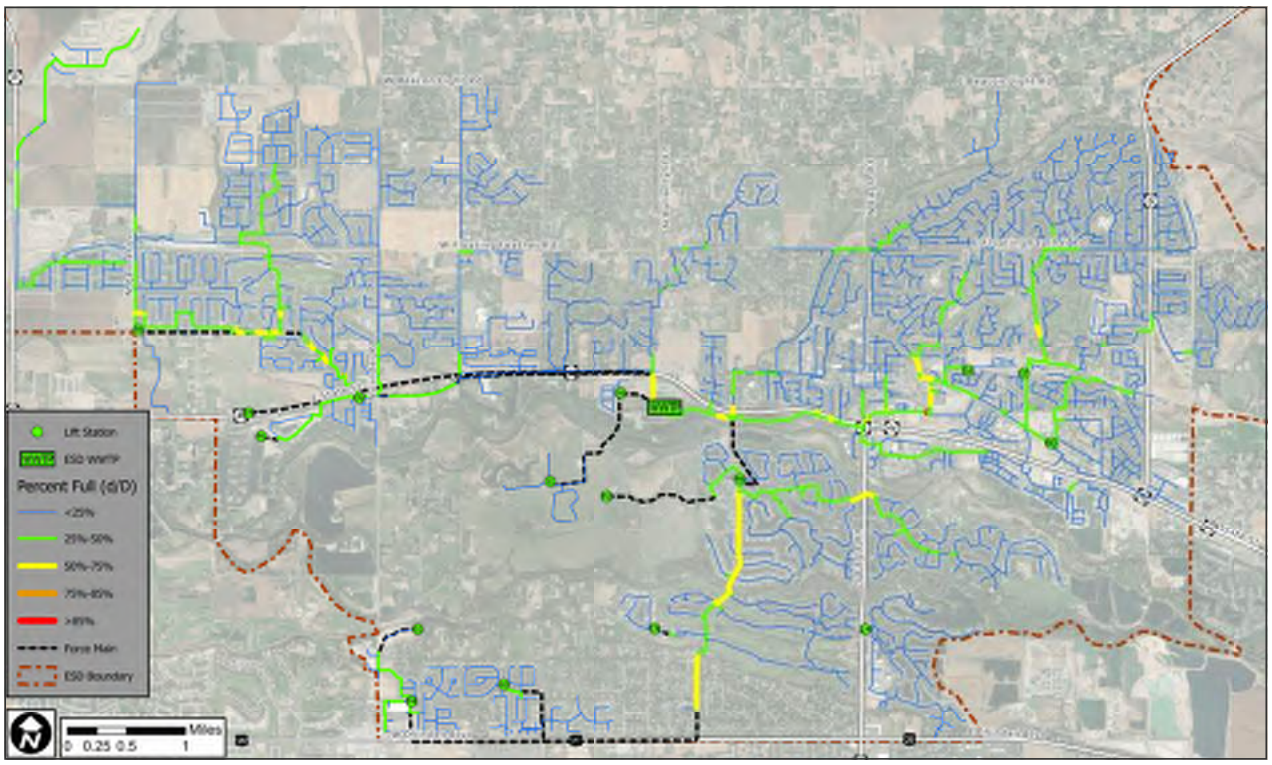
In order to effectively plan for the future development and expansion of the collection system, the hydraulic model was expanded to include growth areas identified by the District. Each growth area included an estimated number of ERUs which was used in conjunction with the planning criteria (flow per ERU) to calculate a total flow for each growth area. These flows were assigned to manholes within the existing collection system as well as future trunklines which were added to serve the growth. The future trunklines were primarily based on the layout proposed in previous planning efforts but were updated to reflect the specific growth identified in this plan. The manholes which the flows were assigned to were based on topography as well as preliminary or approved construction plans for developments. The District provided valuable input to where the developments were likely to tie in resulting in an accurate future load allocation. Note that there were a couple of areas where the growth areas could connect at multiple locations. The areas where the connection location is not straightforward are evaluated in Chapter 5.

A future lift station located within Eagle Island State Park (Eagle Island LS) was currently in design at the time of this study and was therefore added to the 5-year model. This lift station will collect flows from numerous park facilities in the park including a new Recreational Vehicle (RV) Site. The lift station was added to the model based on design plans provided. Therefore, if major changes to the Park collection system are made during construction, the model should be updated. Two additional lift stations, Temporary State LS and Mace 2 LS were also added to the model to serve the identified growth areas. The Temporary State LS will pump to the Old Valley LS until a gravity trunkline is constructed to the Palmer LS. The Temporary State LS is active in the 5-year model but was assumed to be abandoned in the build-out model. The Mace 2 lift station is needed to pump flows from several growth areas near Eagle Island Park. Gravity flow to the existing Mace LS is not possible and therefore the new Mace 2 lift station is proposed in the 5-year and buildout model. Additionally, the District is currently re-routing flows near Aikens Street and Eagle Road; these improvements were modeled as complete in the 5-year and build-out models. Figure 7 in Appendix A illustrates the added trunklines and lift stations modeled in the future scenarios.

4.2. 5-YEAR MODEL RESULTS

A significant portion of the future flows are anticipated to happen within the next 5 years with the peak day flows increasing by approximately 1.1 MGD from the existing peak day scenarios. The resulting d/D for the system is presented in Figure 4-1. A full size figure is included in Appendix A. The District's system has sufficient capacity to convey flows from the projected 5-year flows with no improvements other than those currently in progress.

FIGURE 4-1: 5-YEAR PEAK FLOW MAX DEPTH/FULL DEPTH



The updated peak inflow into the lift stations was compared to the firm capacity and the results are presented in Table 4-1. The increase in flows from the 5-year development does not create new capacity issues at the lift stations.

TABLE 4-1: 5-YEAR PHF VS LIFT STATION CAPACITIES

Lift Stations	Firm Capacity (gpm)	Peak Hour Inflow (gpm)	Capacity > Peak Inflow	Capacity Remaining (gpm)	ERU's Remaining[1]
Ashbury	200	110	Yes	90	420
Ashbury (reduced)[6]	150	110	Yes	40	187
Bob	480	166	Yes	314	1,466
Creighton Woods	100	11	Yes	89	415
Crestpoint	170	5	Yes	165	771
Eagle Island[4]	100	12	Yes	88	410
Element Skye	100	3	Yes	97	451
Estrada	105	34	Yes	71	332
Fred Meyer	265	180	Yes	85	395
Fred Meyer (reduced)[6]	170	180	Over Capacity	0	0
Lakemoor	300	111	Yes	189	881
Mace Road	1,190	792	Yes	398	1,855
Mace Road 2[5]	120	13	Yes	107	500
Moon Lake	40	5	Yes	35	164
Old Valley[2]	1,850	1,750	Yes	100	469
Palmer Road[3]	1,350	1,130	Yes	220	1,026
Stillwater	120	9	Yes	111	517

1) Based on a PHF of 0.21 gpm per ERU.

2) Old Valley firm capacity equal to combined capacity of two of the three pumps pumping into the parallel 6-inches and the 10/14-inch.

3) Palmer firm capacity equal to combined capacity of three of the four pumps.

4) Eagle Island Firm capacity based on preliminary reported capacity

5) Mace Road 2 firm capacity equal to projected build-out PHF plus a 20% safety factor

6) Reduced capacity for Ashbury and Fred Meyer reflects when both lift stations are pumping and the capacity is reduced.

4.3. BUILDOUT MODEL RESULTS

An additional 1.82 MGD on top of the existing PDF flows were added to account for the full buildout of the system. The resulting d/D for the system is illustrated in Figure 4-2. A full size figure is included in Appendix A. Under buildout flows, there are no new capacity issues identified in the collection system pipes.

FIGURE 4-2: BUILDOUT PEAK FLOW MAX DEPTH/FULL DEPTH

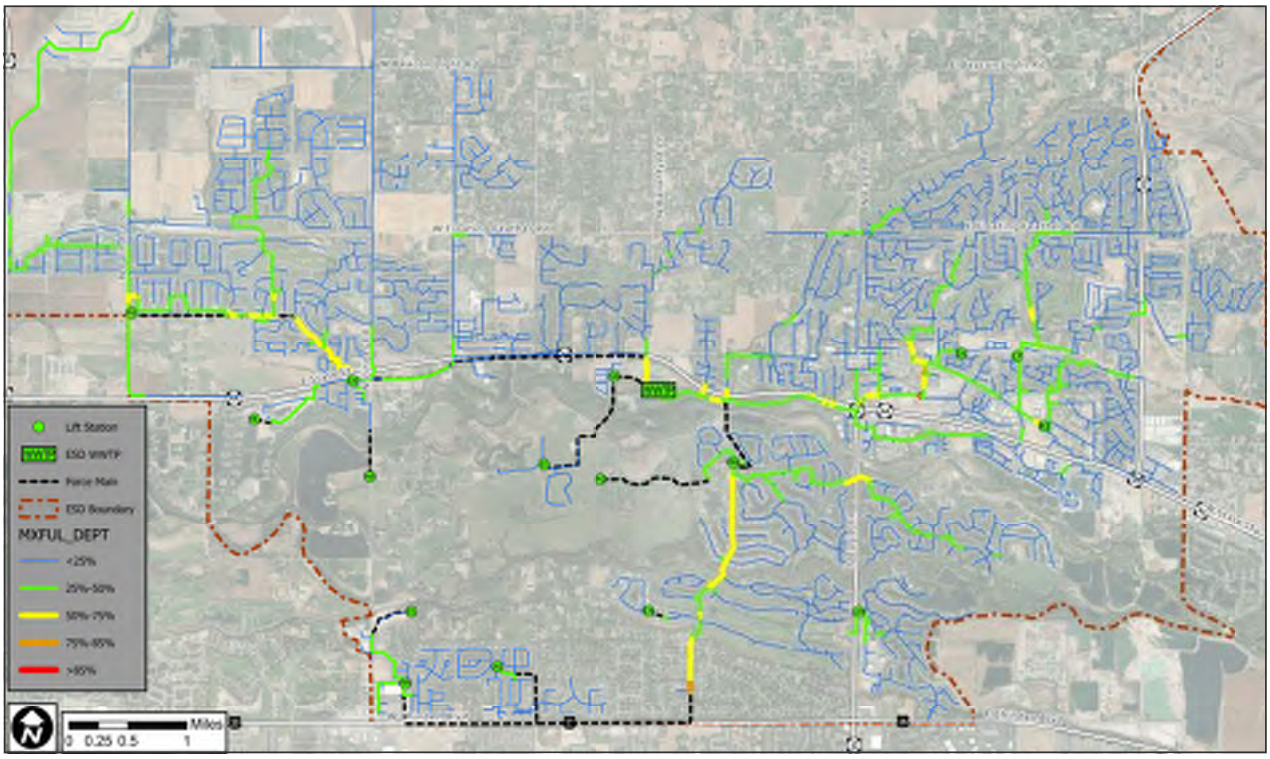


Table 4-2 summarizes the buildout PHF compared to the lift station capacities. The table shows the Palmer LS will need additional pumping capacity to meet the buildout flows. As the Palmer LS pumping capacity increases, the flows into the Old Valley LS also increase. It should be noted that firm capacities of the lift station presented below are based on the current capacity and not the buildout capacity of the lift station. The Palmer and Old Valley lift stations were both constructed with room for additional pumps and therefore improvements to increase the capacity of the lift stations will not consist of a full replacement of the lift station but rather adding or upsizing pumps as needed. Additional details regarding the improvement alternatives for Old Valley LS and Palmer LS are provided in Chapter 5.

TABLE 4-2: BUILDOUT PHF VS LIFT STATION CAPACITIES

Lift Stations	Firm Capacity (gpm)	Peak Hour Inflow (gpm)	Capacity > Peak Inflow	Capacity Remaining (gpm)	ERU's Remaining[1]
Ashbury	200	123	Yes	77	360
Ashbury (reduced)[7]	150	123	Yes	27	126
Bob	480	209	Yes	271	1,265
Creighton Woods	100	11	Yes	89	415
Crestpoint	170	5	Yes	165	771
Eagle Island[4]	100	25	Yes	75	349
Element Skye	100	3	Yes	97	451
Estrada	105	34	Yes	71	332
Fred Meyer	265	228	Yes	37	173
Fred Meyer (reduced)[7]	170	228	Over Capacity	0	0
Hatchery[6]	110	90	Yes	20	94
Lakemoor	300	172	Yes	128	595
Mace Road	1190	952	Yes	238	1,111
Mace Road 2[5]	120	96	Yes	24	113
Moon Lake	40	5	Yes	35	164
Old Valley[2]	1,850	2,110	Over Capacity	-260	0
Palmer Road[3]	1,350	1,339	Yes	11	52
Stillwater	120	19	Yes	101	469

1) Based on a PHF of 0.21 gpm per ERU.

2) Old Valley firm capacity equal to combined capacity of two of the three pumps pumping into the parallel 6-inches and the 10/14-inch.

3) Palmer firm capacity equal to combined capacity of three of the four pumps.

4) Eagle Island Firm capacity based on preliminary reported capacity

5) Mace Road 2 firm capacity equal to projected build-out PHF plus a 20% safety factor

6) Hatchery Road firm capacity equal to projected build-out PHF plus a 20% safety factor

7) Reduced capacity for Ashbury and Fred Meyer reflects when both lift stations are pumping and the capacity is reduced.

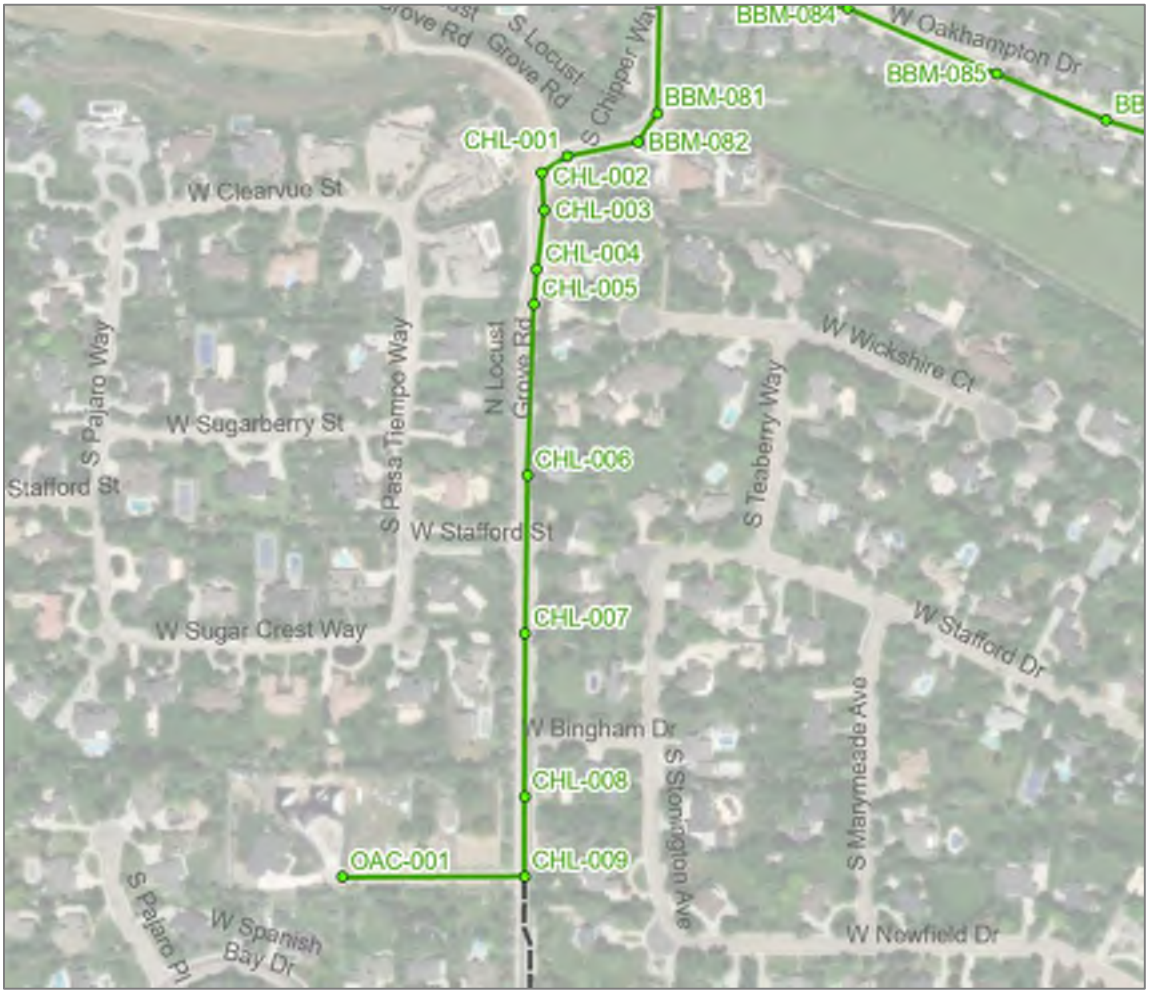
4.4. REMAINING CAPACITY

Results from the 5-year and buildout flow scenarios show there are minimal deficiencies in the existing collection system pipelines and there is expected to be capacity for additional flows on top of the projected buildout flows in most of the basins. The remaining capacity of the trunklines (>10 inch) was calculated for each pipe segment within the collection system and Figure 10 in Appendix A presents the results. It should be noted that the remaining ERUs presented in the figure do not consider the impacts from upstream or downstream flows and are strictly based on the remaining capacity of each individual pipe segment. Due to the complex hydraulics within a sewer system, an exact number of remaining ERUs cannot be calculated unless the location and flow characteristics for each growth area are provided. The reported remaining ERUs can be used as a general basis for remaining ERUs, however, the impact of developments should be evaluated on a case-by-case basis using a hydraulic model to better assess the resulting pipe capacities. Note, specific developed areas currently on septic systems that may connect to the District in the future will be evaluated in Chapter 5.

The District also requested the model to be used to estimate the remaining capacity in two specific areas within the existing system: first, the Locust Grove Line from the Ashbury & Fred Meyer force main discharge to Mace Lift Station; second, the existing 8-inch gravity line along Vizcaya Way. The Vizcaya Way line was also extended east and west along Beacon Light Road to show how far sewer services could be extended.

It is recommended that no additional flows be added to the Locust Grove line upstream of manhole CHL-007 (between Stafford Street and Bingham Drive shown in Figure 4-3). These segments of pipe flow right at 75% full once upsized pumps are installed at the Ashbury and Fred Meyer Lift Stations. Downstream of manhole CHL-007, an additional 300 ERUs could be added until the trunkline reaches 75% full. The addition of these ERUs does not trigger improvements at the Mace Lift Station.

FIGURE 4-3: LOCUST GROVE TRUNKLINE



The Vizcaya Way line can handle an additional 1,000 ERUs before pipes begin to reach 75% full. The gravity line can be extended approximately 4,700 LF east along Beacon Light Road to State Highway 55 and approximately 4,500 LF to the west to Eagle Road. Note, there is the Farmers Union Canal and Dry Creek to the east which may be an obstacle in extending the sewer line all the way to State Highway 55. Detailed elevation data showing the bottom of the canal and creek was not available, however, at the Farmers Union Canal and Dry Creek crossing, the sewer would be approximately 10 feet below ground surface. Therefore, depending on the depth of the canal and creek, there may or may not be enough vertical separation. It is also noted that for the gravity line heading west to have enough cover on the west end near Eagle Road, there would need to be several deep manholes with depths between 20 and 30 feet deep.

CHAPTER 5 - ALTERNATIVES ANALYSIS

This chapter discusses alternatives to resolve deficiencies identified in Chapters 3 and 4. Alternatives were only evaluated for deficiencies where the potential improvements were not straightforward, and several improvement alternatives would be feasible. Alternatives were evaluated for the following areas.

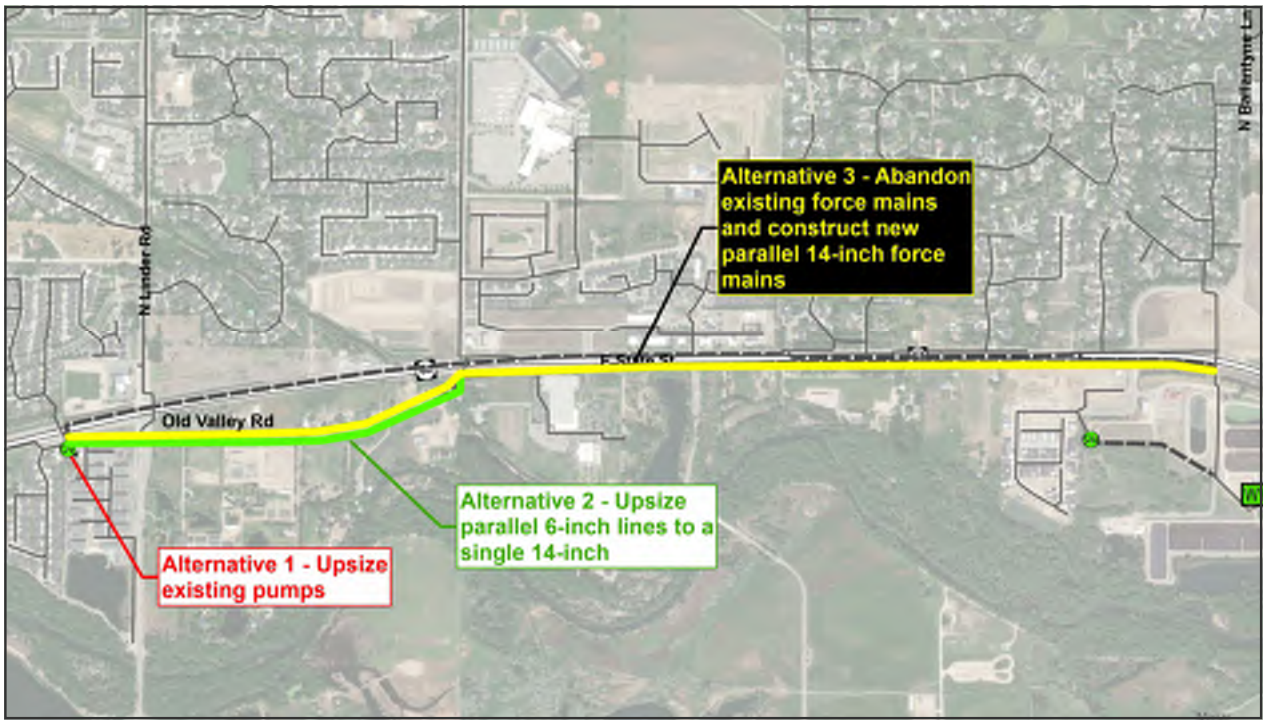
- Old Valley Force Main
- Fred Meyer / Ashbury Shared Force Main
- Future Development Connection Locations
    - North of Beacon Light Road and West of Linder Road
    - Locust Grove Road and Chinden Road Septic Areas
    - South of Floating Feather Road and West of Eagle Road.
    - South of Floating Feather Road and East of Horseshoe Bend Road.

5.1. OLD VALLEY FORCE MAIN ALTERNATIVES

The Old Valley Lift Station peak flows begin to exceed the firm capacity of the existing pumps when approaching buildout PDF flows. Provisions were made during the design of the lift station to allow for expansion of the lift station by installing additional pumps in the existing overflow wetwell. However, the existing force main sizes are also approaching capacity and excessive headloss restricts the capacity even as additional pumps area added. Several alternatives were considered for increasing the capacity of the force mains. These are described below and illustrated in Figure 5-1. Table 5-2 summarizes the pros and cons of each alternative.

- Alternative 1 – This alternative evaluated the available increase in pumping capacity if no force main improvements were made and only additional pumps were added to the lift station.
- Alternative 2 - The District has observed recent development interest in the areas north of Old Valley Road and south of Highway 44. For this reason, one alternative was to evaluate the increase in capacity if the existing parallel 6-inch force mains were replaced with a single larger diameter pipe from Old Valley Lift Station to the east end of Old Valley Road (approximately 3,400 LF of pipe) while still utilizing the parallel 6-inch mains that exist in State Highway 44.
- Alternative 3 – This alternative would consist of complete replacement of the existing parallel 6 inch and 10/14-inch force mains and install parallel 14-inch force mains from the Old Valley Lift Station to the discharge manhole. One likely possible alignment of this alternative could also be within Old Valley Road and/or within the future greenbelt path that is anticipated on the south side of Highway 44. This alternative would remove the District's infrastructure from within the State Highway 44 right-of-way and allow for more accessible maintenance.

FIGURE 5-1: OLD VALLEY ALTERNATIVES



The hydraulic model was exercised to evaluate the lift station capacity under each of these alternatives utilizing various pumping configurations. It was assumed that any new pumps are identical to the existing pumps.

TABLE 5-1: OLD VALLEY FLOW VERSUS HEADLOSSES

Summary Table[1]	2 Pumps Running (gpm)	3 Pumps Running (gpm)	4 Pumps Running (gpm)
Target Pumping Rate (gpm)		2,110	
Alternative 1 - Existing Force Mains	1,910	2,070	2,170
Alternative 2 - Upsize 3,400 LF of parallel 6's to 14-inch	2,000	2,210	2,300
Alternative 3 - Install new parallel 14-inch force main	3,600	4,600	5,100

1) Target pumping rate is equal to the projected buildout peak hour flow. Red cells are less than the Old Valley buildout peak hour flow.

TABLE 5-2: OLD VALLEY ALTERNATIVES COMPARISON

Alternative	Alternative 1 - Existing Force Mains	Alternative 2 - Upsize 3,400 LF of parallel 6's to 14-inch	Alternative 3 - Install new parallel 14-inch force main
Pros	Lowest capital costs Simple construction Uses existing infrastructure	Opportunistic approach	Largest increase in capacity Provides redundancy in force mains Easier O&M access
Cons	No redundancy in force main Higher energy costs Low excess capacity	Not a significant increase in capacity	Highest capital costs Dependent on timeline for greenbelt construction

Alternative 1 would have the lowest capital costs and the pumping capacity of the lift station nearly meets the peak hour buildout flows. It does not provide for redundancy in the force mains and if either of the lines were taken offline for repair or maintenance, the lift station would not be capable of pumping the peak hour flows. Installation of the new pumps does not have a significant increase in capacity and therefore is not recommended.

Alternative 2 consists of an opportunistic approach to increasing the capacity as land adjacent to Old Valley Road begins to develop. It would allow the District to replace the existing parallel 6-inch pipelines with a single 14-inch pipeline at a relatively low cost because the surface repair would likely be paid for by the developer or as part of a roadway project. Additionally, improvements to the intersection at Linder Road and Highway 44 are anticipated in the near future. The District should consider constructing at least one 14-inch pipeline from Old Valley Lift Station to the east side of Linder Road while the intersection is under construction.

Alternative 3 provides the largest increase in capacity and would provide redundancy in the force mains if one were to be taken off for maintenance. This alternative also would consist of an opportunistic approach to construct the parallel 14-inch force mains as development along Old Valley Road occurs or as the City of Eagle constructs a greenbelt pathway heading west toward the Old Valley Lift Station. This alternative would allow the District to abandon both existing forcemains which are currently within the Highway 44 right-of-way for a significant portion of their alignment.

Ultimately, it is recommended that the District implement Alternative 3 because it provides the largest increase in capacity at the Old Valley Lift Station and provides complete redundancy in the force mains. Installation of the parallel 14-inch force mains will likely occur in phases and the District should install the force mains when opportunities arise.

5.2. FRED MEYER & ASHBURY FORCE MAINS

Three alternatives could be considered to address the extended pump run times and competing pumps. These are described in the bullets below and illustrated in Figure 5-2. These alternatives reduce the pump run time during peak flows. However, even when the lift stations are pumping at their reported capacities, the lead pump at Fred Meyer will run for about an hour during peak hour but does not trigger the lag pump from being called on. It should be noted, the gravity lines downstream of the force main have sufficient capacity for existing and future flows with any of the alternatives listed below.

- Alternative 1 – Upsize the pumps in Fred Meyer and Ashbury LS such that when pumping simultaneously, they both can deliver the future build-out peak flows with redundancy.
- Alternative 2 – Construct a parallel 6-inch force main from Meridian Road, along Chinden Boulevard to the existing gravity manhole on Locust Grove Road.
- Alternative 3 – Construct a new 6-inch force main for the Ashbury LS from Meridian Road and Temple Drive, through local roadways and connect with the existing gravity line near Stafford Street and Locust Grove Road.

FIGURE 5-2: FRED MEYER & ASHBURY ALTERNATIVES

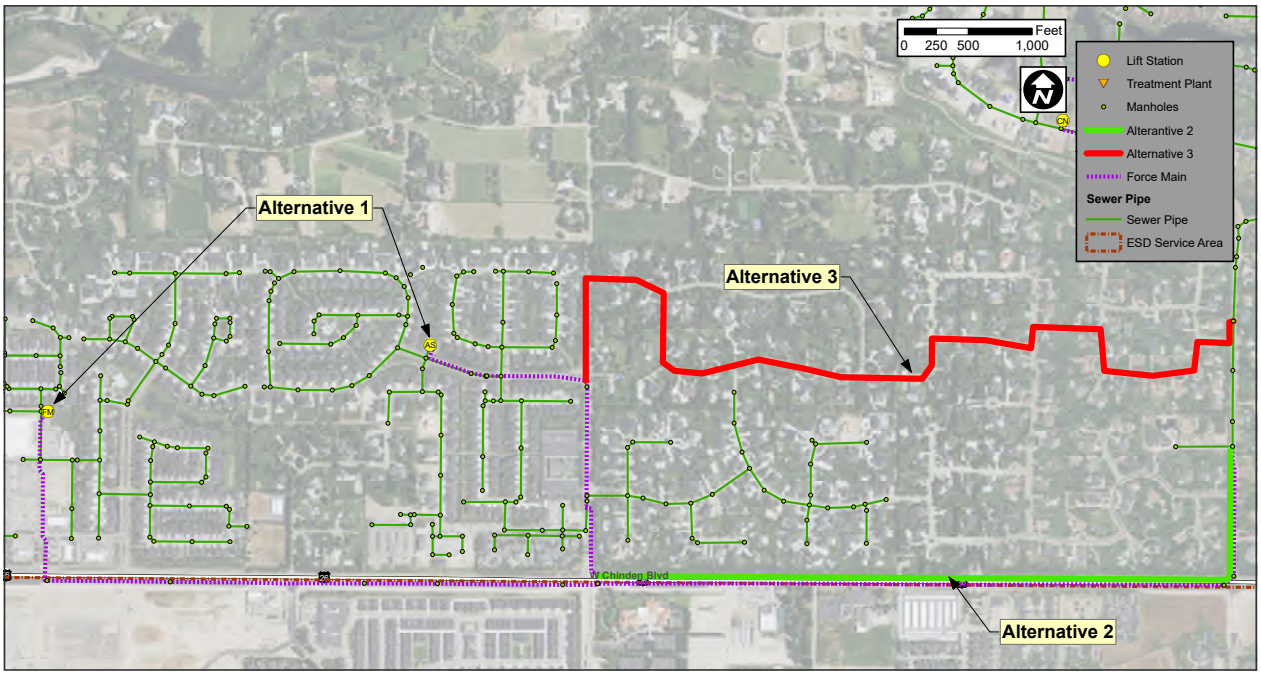


TABLE 5-3: FRED MEYER AND ASHBURY ALTERNATIVES COMPARISON

Alternative	Alternative 1 - Upsize Pumps	Alternative 2 - Parallel Force Main	Alternative 3 - New Ashbury Force Main
Pros	Lowest capital costs Quickest installation	Reliable operation Better long-term solution Shorter force main length (6,000 feet)	Reliable operation Better long-term solution Construction within local roadways
Cons	Larger variation in flows Risk remains for both pumps being on Higher energy costs	Higher capital costs Construction along highway Crosses Zinger Lateral	Higher capital costs High number of bends in the force main Longer force main length (7,600 feet)

The Fred Meyer Lift Station has the higher potential for overflow as the peak hour flow exceeds the reduced pumping capacity. However, if the Fred Meyer pumps were to be upsized to flow at their design point when the Ashbury pumps are also on, the Ashbury pumping capacity is further reduced to approximately 85 gpm which is below the existing peak hour flow. This indicates the need to upsize both the Fred Meyer and Ashbury Lift Station pumps. Alternative 1 has the lowest capital costs and will likely result in the quickest installation since it only consists of replacing the existing pumps and electrical. However, the existing issues caused with both lift stations pumping against each other remains. The upsized pumps should have a higher head so they can run at their design flow rate even with both pumps on. This will result in higher pumping rates when only one of the lift stations is running.

Alternative 2 is the alignment currently being considered by the District and will provide a long-term solution to the issue. Dedicated force mains for each lift station are generally the ideal situation because they will pump under the same head conditions each time the pump turns on. The head conditions under this alternative should be essentially the same as the current head conditions when Ashbury pumps are not pumping against the Fred Meyer pumps, so no lift station upgrades at either lift station should be needed. The drawbacks to this alternative are the higher capital costs associated with constructing the parallel force main. Specifically, this alignment is along Chinden Boulevard (U.S. Highway 26) and also crosses the Zinger Lateral canal which will require additional permitting and approval processes during the design and construction.

Alternative 3 provides similar benefits to Alternative 2, but the alignment of the force main is outside of the state highway right-of-way. This alignment winds through local roadways with a number of bends and the existing force main along Meridian Road to Chinden Boulevard cannot be used which results in an overall greater length of new pipe than Alternative 2. Even though there are more bends along this alignment, the head conditions against the Ashbury pumps should be close to current conditions. Consequently, no lift station upgrades at either lift station should be required. The overall length of force main from the Ashbury LS to their respective discharge manholes is very similar for Alternative 2 and 3 This alternative will require permitting with the Ada County Highway District (ACHD).

Note, while the peak flows into the Fred Meyer Lift Station presented in Chapter 4 show the existing pumps have capacity through buildout flows, it does not account for the possibility of the Element Skye Lift Station running at the same time as the peak hour flows. The District is not concerned with the peak inflows exceeding the lift station capacity when the Element Skye Lift Station because there is a low likelihood of this occurring and the higher flows is only a slug which will not be sustained for more than a couple of minutes.

The District has selected Alternative 1 as the preferred alternative at this time because it has the lowest capital costs and will provide the required increase in capacity to meet future flows. The existing peak hour flows are slightly higher than the reduced pumping capacity of the Fred Meyer lift station when the two lift stations are pumping concurrently. However, the existing peak day flows do not trigger the second Fred Meyer pump to turn on to maintain levels in the wetwell. The District should actively monitor pump run times and wetwell depths at the Fred Meyer Lift Station and if the backup pump is regularly turning on to meet peak flows, then the pumps should be replaced. Flows under the build-out scenario trigger the second pump to turn on and therefore the pumps should likely be upsized before the buildout flows are reached.

5.3. FUTURE DEVELOPMENT

Locations where future development will connect into the existing system were relatively straightforward in most areas, however there were a handful of areas where several connection locations would be feasible. This section evaluates the areas where multiple connection locations could be considered.

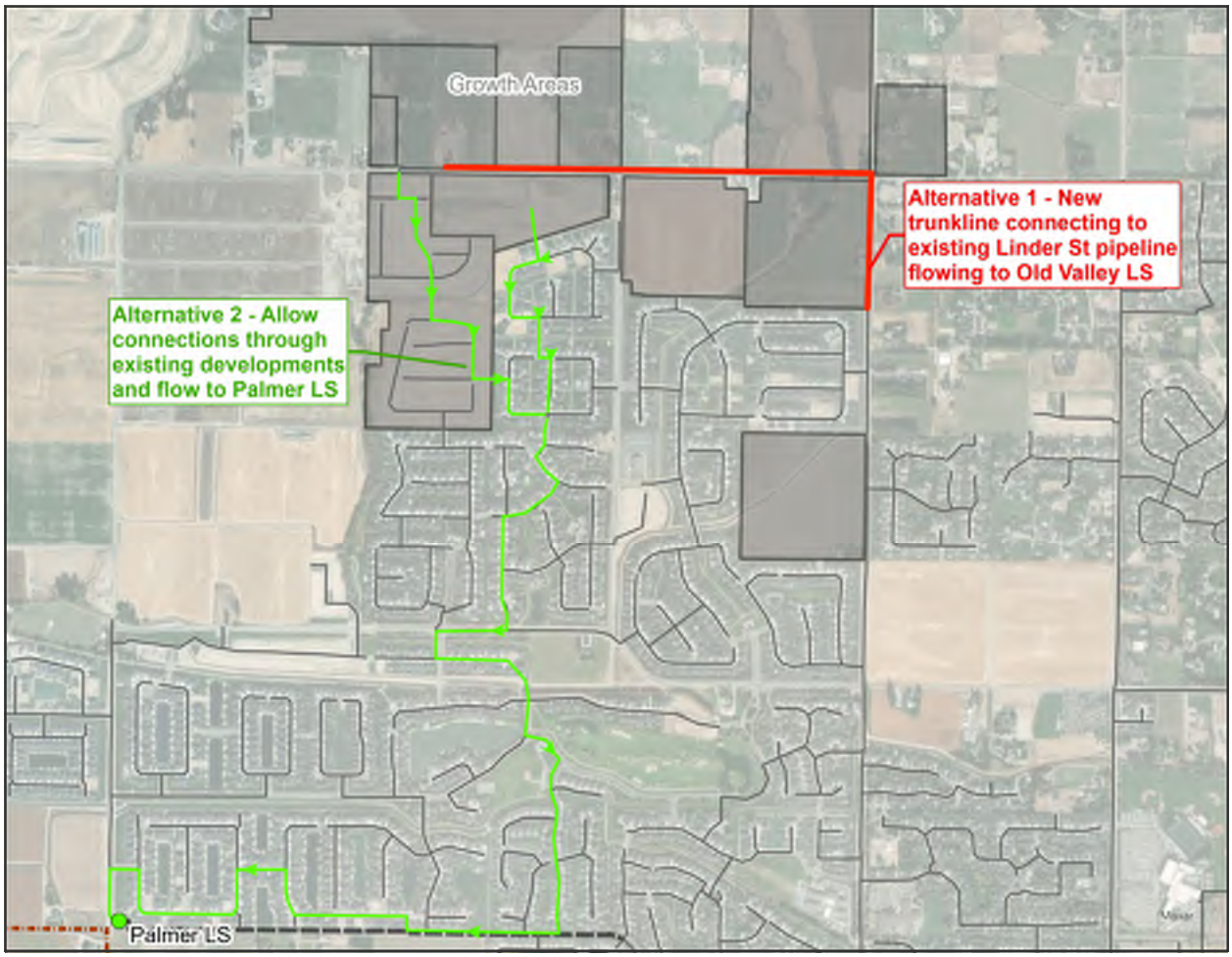
It also consists of an evaluation of how developments currently on septic systems can connect to the District's system. It evaluated if there is additional capacity in the downstream system and how the areas could convey flows to the existing system. Connection options typically included gravity flow, a new lift station, or individual grinder pump stations with a shared force main. Note, the District historically completed an evaluation of how many connections within a lift station basin were needed before the revenue income starts to offset the operational expenses. The evaluation showed the number of connections is estimated to be a minimum of 40 connections. For the purpose of this study, a minimum of 40 connections within a lift station basin was used as the threshold for considering construction of a new lift station.

5.3.1. NORTH OF BEACON LIGHT ROAD AND WEST OF LINDER ROAD

Previous planning efforts recommended construction of a new trunkline along Beacon Light Road west of Linder Road to capture flows from developments north of Beacon Light Road and convey them to the existing Linder Road trunkline which ultimately flows to the Old Valley Lift Station. However, there is the potential for this to discourage developers from developing the areas north of Beacon Light Road because they would need to construct approximately 4,500 LF of new 18-inch and 12-inch trunklines. For this reason, flows from the development north of Beacon Light Road were modeled through the existing developments to the south which ultimately flow to the Palmer Lift Station. The following future scenarios were evaluated in this study. A summary of the two alternatives is illustrated in Figure 5-3.

- Alternative 1 – Require a new trunkline along Linder Road and Beacon Light Road to flow to Old Valley Lift Station. (shown in red in Figure 5-2)
- Alternative 2 – Allow connections to the existing developments to the south and flow to the Palmer Lift Station. (shown in green in Figure 5-2)

FIGURE 5-3: N OF BEACON LIGHT ROAD W OF LINDER ROAD DEVELOPMENT AREA



Alternative 1 provides a better long-term solution for the District because it eliminates the need to pump wastewater twice (Palmer Lift Station and Old Valley Lift Station). It also will provide additional capacity in excess of the projected buildout flows in the event future flows exceed those projected in this study.

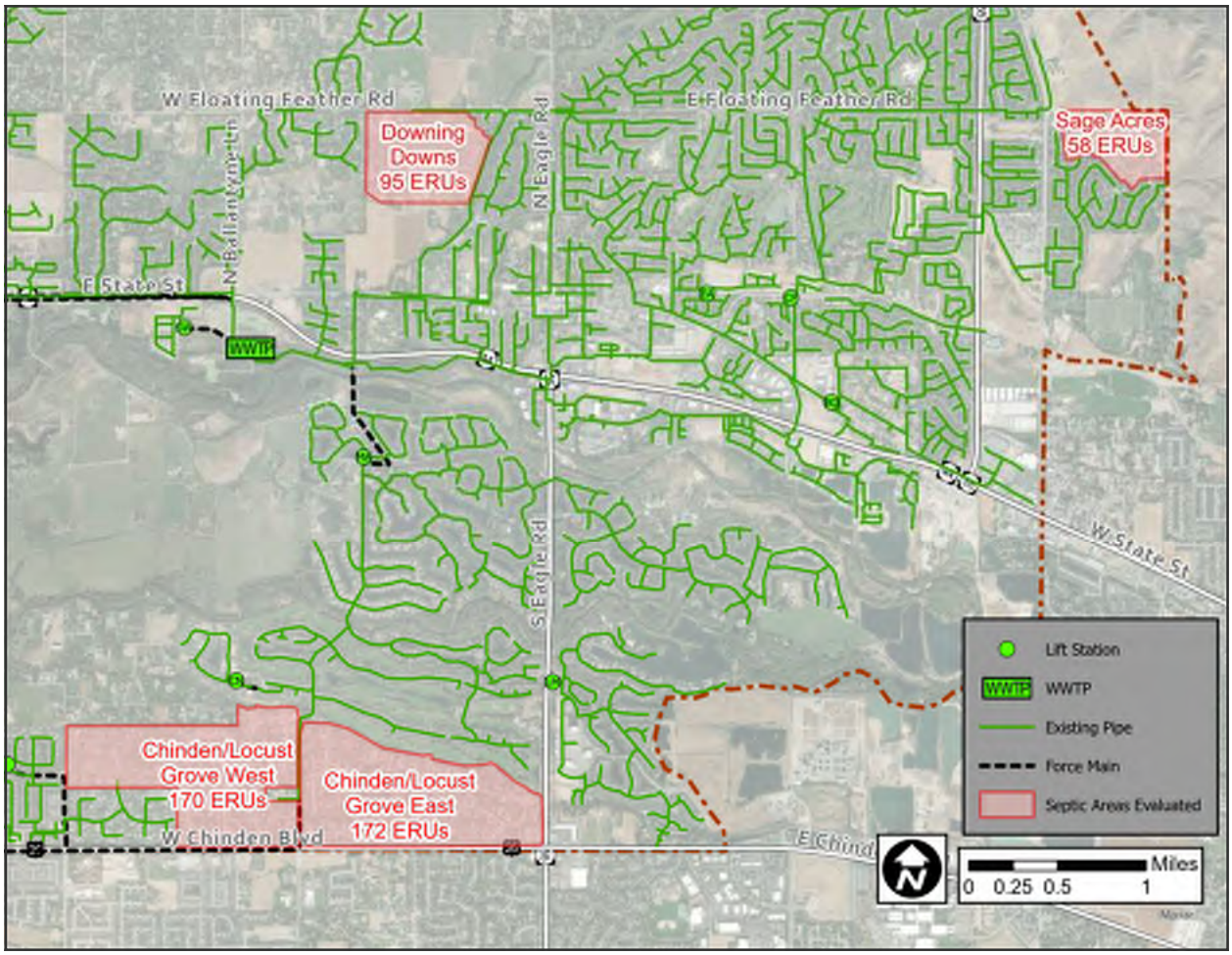
Alternative 2 provides a more appealing option for developers because they will not need to construct a significant amount of off-site sewer pipe to connect to the District's system. The model shows there is capacity through any combination of connections to the existing developments (through the Stags Development or Lanewood Line or a combination of both). While there is hydraulic capacity in these lines, it results in wastewater flows being pumped through the Palmer Lift Station and then to the Old Valley Lift Station.

Ultimately either alternative is hydraulically viable, and the preferred alternative will likely depend on the timing of developments. It is noted that the Alternative 1 has the added benefit of eliminating the need to pump wastewater from this area twice (Palmer and Old Valley lift stations) as it flows ultimately to the WWTP. This will save on long-term power and operation and maintenance costs.

5.4. INCORPORATION OF SEPTIC AREAS

There are four areas of interest within the District's service areas which are currently on private wastewater systems and do not discharge wastewater to the District's system. The District has been approached by individuals/organizations within these areas inquiring about connecting to the District's system. The following section evaluates the feasibility of these areas connecting to the District's system. The four locations are illustrated in Figure 5-4. The areas include two areas near Chinden Boulevard and Locust Grove Road as well as the Downing Downs and Sage Acres subdivisions south of Floating Feather Road.

FIGURE 5-4: SEPTIC SYSTEM AREAS EVALUATED



In general three alternatives were considered for evaluating the feasibility of connecting into the Districts system. These alternatives are described below. In addition to how wastewater from these subdivisions will get to the District's system, the remaining capacity in the District's system was also considered. Additional flows from the subdivisions were put into the hydraulic model to assess the downstream impact.

- Alternative 1 – Gravity flow to the District's nearest gravity pipeline.
    - Consists of 8-inch diameter pipe, manholes, gravity service connections, and surface repair. Assumed pipes require a minimum of three feet of cover over the top of the pipe at any point. Additionally, a tenth of a foot drop across all manholes was assumed. Minimum pipe slopes described in Chapter 2 were used.

- Alternative 2 – Gravity flow to a new lift station pumping to the District's system.
    - Consists of 8-inch diameter pipe, manholes, gravity service connections, and surface repair. Additionally requires construction of a new lift station and force main to the nearest existing manhole. Assumed pipes required a minimum of three feet of cover over the top of the pipe at any point. Additionally, a tenth of a foot drop across all manholes was assumed. Minimum pipe slopes described in Chapter 2 were used.
    - The number of parcels that would contribute to a lift station must exceed the District's "break-even" threshold of 40 ERUs.
- Alternative 3 – Individual pump stations with grinder pumps combining into a small diameter force main which discharges to the District's system.
    - Consists of private pump stations at each connection and common low-pressure force main. Assumes directional drilling of the common force main through the existing roads. Note, the individual pump stations and the common force main will be the responsibility of the home-owners association (HOA).

A summary of the outcome of the evaluation is presented in Table 5-1. In general, the most feasible alternative for any of the areas is Alternative 3 because it will result in the lowest capital costs for the existing septic system users. The capital costs associated with either Alternative 1 or Alternative 2 are significantly higher than Alternative 3. Ultimately, the HOA will need to work directly with the District to determine the most feasible alternative and the capital costs associated with the connection will be the responsibility of the HOA. The proposed gravity system layouts for each area and detailed cost estimates are provided in Appendix E.

TABLE 5-4: FEASIBILITY SUMMARY

Area	Chinden/Locust Grove West	Chinden/Locust Grove East	Downing Downs	Sage Acres
Total ERUs	170	172	95	58
Added PHF (gpm)[1]	59.6	40.8	24.5	16.3
Basin PHF Factor	1.69 or 2.5	1.69	1.84	2
Sewer Basin	Mace or Ashbury	Mace	WWTP Central	Northeast
Feasibility of Connection Alternatives				
Alternative 1 - Gravity Flow	$12,520,000	$11,740,000	$5,230,000	$3,740,000
Alternative 2 - New Lift Station	$14,400,000	Not Practical	Not Practical	Not Practical
Alternative 3 - Individual Pump Stations	$8,040,000	$7,770,000	$3,830,000	$2,520,000

1) Peak hour flows based on peak day flow of 202 gal/ERU/day and a peaking factor based on the respective basin which the area is located.

5.4.1. CHINDEN/LOCUST GROVE WEST

This area consists of several subdivisions and HOAs that are currently on either individual or shared septic systems. They have expressed interest to the District to abandon their existing septic systems and connect to the District's sewer system. Alternative 1 is feasible for majority of the connections, however, there are about 27 connections that cannot be served by connecting to the District's existing manholes. Alternative 2 would allow for the entire area to be served by gravity line and the lift station would discharge into the Ashbury Basin. Alternative 3 could discharge into either the Ashbury Basin or existing Locust Grove Road gravity line. The conceptual layout of a gravity system is provided in Appendix E.

The impact of adding these flows to the Ashbury and Mace Basins are relatively minimal and described below. In summary, the existing wastewater system has sufficient capacity to adequately convey flows from the Chinden/Locust Grove West area.

- Ashbury Lift Station peak inflow increases by 40 gpm. Still below the firm capacity of 200 gpm. However, this would exacerbate the existing problems at the lift station. Installation of new pumps at Ashbury should be completed before new connections are added.
- The gravity pipelines within the Ashbury basin see an increase in d/D but no segments exceed 50% full.
- Minimal impacts to the Locust Grove gravity line and Mace Lift Station occur with the increase in flows.

Alternative 1 and 2 have the highest capital costs, but allows the HOA to transfer all ownership and O&M responsibility of the wastewater systems to Eagle Sewer District. Alternative 3 has the lowest capital costs, but the HOA would retain responsibility of the shared force main up to the discharge point to the District's system. Additionally under Alternative 3, the homeowners would be responsible for their own individual grinder pump stations including replacement of wear parts. This plan does not provide a recommendation for which alternative to implement, but rather outlines which alternatives are technically feasible. The alternative to be implemented will be decided by the HOA or homeowners in conjunction with approval from the District.

5.4.2. CHINDEN / LOCUST GROVE EAST

This area encompasses several phases of the Banbury Subdivisions and the homes are currently using septic systems. The area has a general slope from north to south and from east to west. A gravity system is feasible if the connection to the District's system is at the northwest corner of the subdivisions. This would require construction of an 8-inch gravity line through existing private property to Locust Grove Road. Additionally, there are approximately 15 homes along Hampstead Drive which cannot be served by the gravity system and would require individual pump stations or would have to remain on their existing septic systems. Alternative 2 was assumed to be not practical since the majority of the connections can be served by connecting to the District's existing gravity system and a lift station would be unnecessary. Alternative 3 could consist of a shared force main from the individual pump stations that could discharge to the District's pipeline in Locust Grove Road anywhere downstream of manhole ID CHL-006. The gravity sections upstream of this manhole are very close to capacity once the Ashbury and Fred Meyer Lift Station pumps are upsized. Other hydraulic impacts from these added connections are relatively minor and do not create capacity deficiencies. The conceptual layout of a gravity system is provided in Appendix E.

5.4.3. DOWNING DOWNS

The Downing Downs subdivision has a general slope from north to south and east to west. Alternative 1 could consist of two potential connection locations to the District's system. Option 1 would be to connect to the west along Talega Avenue. Option 2 would be to drain to the south underneath the Dry Creek Canal and connect to future development piping. Either option must cross through private property to connect to the District's system. Alternative 2 is not practical since gravity flow to the existing system is feasible. Alternative 3 could discharge to either the existing manhole on Talega Avenue or pipeline in Floating Feather Road to the north. The conceptual layout of a gravity system is provided in Appendix E.

5.4.1. SAGE ACRES

There is a steep slope from northeast to southwest within the growth area which provides sufficient slopes for the entire area to connect to the District's existing system. Constructing pipes at minimum slopes is not practical because it would result in excessively deep bury depths. The pipes would likely be installed at steeper slopes to maintain a bury depth of between 5-10 feet. Alternative 2 is not practical since gravity flow to the existing system is feasible. Individual pump stations and shared force main may be favorable over a new 8-inch gravity collection system because bury depth and surface repair would be less. The existing collection system has sufficient capacity for these connections and no new deficiencies would be expected. The conceptual layout of a gravity system is provided in Appendix E.

CHAPTER 6 - CAPITAL IMPROVEMENT PLAN

This chapter summarizes recommended capital improvements with associated planning level cost estimates. Recommended improvements are illustrated in Figure 11 in Appendix A, and the details of each improvement are presented in Appendix F.

6.1. BASIS FOR ESTIMATE OF PROBABLE COST

Capital costs developed for the recommended improvements are Class 5 estimates as defined by the Association for the Advancement of Cost Engineering (AACE). Actual construction costs may differ from the estimates presented, depending on specific design requirements and the economic climate when a project is bid. An AACE Class 4 estimate is normally expected to be within -50 and +100 percent of the actual construction cost. As a result, the final project costs will vary from the estimated presented in this document. The range of accuracy for a Class 4 cost estimate is broad, but these are typical accuracy levels for planning work.

The costs are based on experience with similar recent collection system improvement projects. The total estimated probable project costs include contractor markups and 30% contingencies, which is typical of a planning-level estimate. Overall project costs include total construction costs, costs for engineering design, permitting, construction management services, inspection, as well as administrative costs.

6.2. PRIORITIZATION CRITERIA

The recommended improvements were prioritized into three categories as summarized in Table 6-1.

TABLE 6-1: PRIORITIZATION CRITERIA SUMMARY.

Priority	Implementation Timeline	Description
1	0-5 Years	► Infrastructure reached end of useful life ► Improve resiliency of the system ► Existing capacity deficiency
2	5-10 Years	► Deficiency resulting from projected 5-year flows
3	10-20 Year	► Deficiency resulting from projected buildout flows

6.3. CAPITAL IMPROVEMENT PLAN

The recommended capital improvements and their associated costs are provided in Table 6-2. A more detailed description of the improvements is provided in the following sections.

TABLE 6-2: CAPITAL IMPROVEMENT PLAN SUMMARY

Project ID#	Project Name	Project Trigger	Total Estimated Cost (2023 Dollars)
Priority 1 Improvements (2024-2029)			
1.1	Aikens Road Re-Route & Replacement	Infrastructure reached end of useful life	$440,000
1.2	WWTP Main East Trunkline Re-Route	Improve resiliency	$590,000
1.3	South Eagle Road Replacement	Infrastructure reached end of useful life	$590,000
		Total Priority 1 Improvements (rounded)	**$1,620,000**
Priority 2 Improvements (2030-2035)			
2.1	Fred Meyer & Ashbury Lift Station Upgrades	Capacity deficiency from 5-year flows	$520,000
2.2	Collection System Plan Update	Recommended every 5 years	$150,000
2.3	Old Park Road Replacement	Infrastructure reached end of useful life	$640,000
2.4	Old Park Road Spur Replacement	Infrastructure reached end of useful life	$250,000
2.5	North Eagle Road Replacement	Infrastructure reached end of useful life	$1,680,000
2.6	North Eagle Road to Old Park Road Replacement	Infrastructure reached end of useful life	$220,000
2.7	Cedar Ridge Street Replacement	Infrastructure reached end of useful life	$250,000
2.8	1st Street Replacement	Infrastructure reached end of useful life	$240,000
2.9	1st Street to 2nd Street Replacement	Infrastructure reached end of useful life	$420,000
		Total Priority 2 Improvements (rounded)	**$4,370,000**
Priority 3 Improvements (2036-2044)			
3.1	Old Valley Force Main Upsize Phase 1	Capacity deficiency from buildout flows	$2,690,000
3.2	Old Valley Force Main Upsize Phase 2	Capacity deficiency from buildout flows	$5,720,000
3.3	Palmer Lift Station Upgrades	Capacity deficiency from buildout flows	$340,000
		Total Priority 3 Improvements (rounded)	**$8,750,000**
		TOTAL SYSTEM IMPROVEMENTS COSTS (rounded)	**$14,740,000**

The cost estimate herein is based on our perception of current conditions at the project location. This estimate reflects our opinion of probable costs at this time and is subject to change as the project design matures. Keller Associates has no control over variances in the cost of labor, materials, equipment, services provided by others, contractor's methods of determining prices, competitive bidding or market conditions, practices or bidding strategies. Keller Associates cannot and does not warrant or guarantee that proposals, bids or actual construction costs will not vary from the costs presented herein.

6.3.1. PRIORITY 1 IMPROVEMENTS

A description of the recommended Priority 1 improvements is provided below:

- 1.1 – Aikens Road Re-Route & Replacement: This project consists of removing an existing 8-inch pipe in Aikens Road and replacing it with a new 8-inch pipe re-graded to flow from west to east. The existing pipe has reached the end of its useful life and has a flat slope. It is advised that this project be coordinated with local roadway improvements that are planned along Aikens Road from 1st Street to 2nd Street.
- 1.2 – WWTP Main East Trunkline Re-Route: This project consists of abandoning the existing 30-inch pipe located just east of the WWTP. A new 30-inch pipe should be installed from the existing manhole CTR-004 to manhole YRD-008. This project will improve the resiliency of the District's system during a flood event. This project is located within the 100-year floodplain and will likely require coordination and permitting through the local floodplain administrator and the U.S. Army Corps of Engineers (USACE).
- 1.3 – South Eagle Road Replacement: This project consists of replacing approximately 1,000 feet of existing 8-inch pipe within South Eagle Road. Ada County Highway District (ACHD) has proposed a plan to replace this section of Eagle Road and therefore the District should replace this section of pipe while the roadway is being reconstructed.

6.3.2. PRIORITY 2 IMPROVEMENTS

A description of the recommended Priority 2 improvements is provided below:

- 2.1 – Fred Meyer & Ashbury Lift Station Upgrades: Projected future flows exceed the firm capacity of the lift stations when they are pumping at the same time resulting in extended pump run times and the need for the redundant pump to turn on. This project consists of upsizing the existing pumps to meet future peak hour flows when both lift stations are pumping at the same time. Future peak inflow to Fred Meyer LS is projected to be 228 gpm and future peak inflow to Ashbury LS is projected to be 123 gpm. The design point should be selected to be equal to or exceed projected peak hour flows at each lift station when pumping at the same time. Note, the downstream gravity pipeline along Locust Grove Road is nearing capacity therefore the design point should not significantly exceed the projected peak hour flows. Upsizing the pumps will also likely require new electrical equipment.

- 2.2 – Collection System Master Plan Update: It is recommended that the District update their planning documents every five years because updates to the planning documents and models allow the City to re-assess needs, priorities, and properly allocate budgets to address system deficiencies.

- 2.3 through 2.9 – Old Towne Improvements: These projects consist of replacement of existing transite or concrete pipeline within the Old Towne area. The extent of each of these projects is further outlined in the CIP sheets in Appendix F. In general, each of the projects include installation of new 8-inch pipes within their current alignment. Pipe segments with slopes lower than minimum slopes should be regraded at minimum slopes where possible. These projects should be completed as opportunities such as new development or local roadway projects are completed within the project vicinity.

6.3.3. PRIORITY 3 IMPROVEMENTS

A description of the recommended Priority 3 improvements is provided below:

3.1 & 3.2 – Old Valley Force Main Upsize Phase 1 & 2: This project consists of upsizing the existing force main from the Old Valley Lift Station to the discharge manhole. Upsizing this pipeline will increase the pumping capacity of the lift station to handle projected buildout peak inflows without upsizing or replacing the existing pumps. The force main should be upsized to parallel 14-inch diameter pipes. Phase 1 of this project should be coordinated roadway improvements are made from Linder Road and east along Old valley Road to State Highway 44. Phase 2 consists of installing the force main along the same alignment as the future greenbelt pathway south of State Highway 44 as illustrated in Figure 5-1 in Chapter 5. While this is an opportunistic driven project, the improvements should be completed prior to peak hour flows reaching the firm capacity of 1,850 gpm. If the District were to utilize the existing parallel 6-inch pipe trench (hence taking it offline during construction) the project should be completed before peak hour flows reach 1,350 gpm. Installation of additional pumps in the overflow wetwell will provide some increase in pumping capacity and could extend the time that the force main would need to be constructed.

- 3.3 – Palmer Lift Station Upgrades: This project consists of replacing the existing pumps in the Palmer Lift Station with new pumps sized for buildout flows. This project only consists of pump replacement because the lift station was designed with provisions for future expansion.

6.4. PRELIMINARY SCHEDULE

A preliminary schedule for the Priority 1 improvements was prepared to illustrate the annual anticipated costs for the next five years. The schedule is provided in Table 6-3.

TABLE 6-3: PRELIMINARY SCHEDULE

CIP ID	Description	Cost (2023 dollars)	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029
1.1	Aikens Road Re-Route & Replacement	$ 440,000	$ 440,000		*Priority 2 projects are opportunistic and not immediately required. Therefore, no Priority 2 projects are included from FY2026 to FY2029.*			
1.2	WWTP Main East Trunkline Re-Route	$ 590,000	$ 75,000	$ 515,000				
1.3	South Eagle Road Replacement	$ 590,000	$ 45,000	$ 545,000				
Total Capital Costs		$ 1,620,000	$ 560,000	$1,060,000	$ -	$ -	$ -	$ -
Collection System Rehabilitation Annual Costs		-	$ 250,000	$ 250,000	$ 250,000	$250,000	$250,000	$250,000
Lift Station Capital Improvements Annual Costs		-	$ 200,000	$ 200,000	$ 200,000	$200,000	$200,000	$200,000
Total FY Cost		**-**	**$1,010,000**	**$1,510,000**	**$ 450,000**	**$450,000**	**$450,000**	**$450,000**

6.5. CONCLUSION

The District's existing collection system is in great condition and minimal improvements are recommended given the results of this planning study. The majority of the existing collection system has sufficient capacity to convey the projected buildout flows with the exception of the recommended improvements discussed in this study. It is recommended that this planning study be updated every five years to update the hydraulic model, re-asses needs, and re-allocate budgets.

Appendix A

Figures

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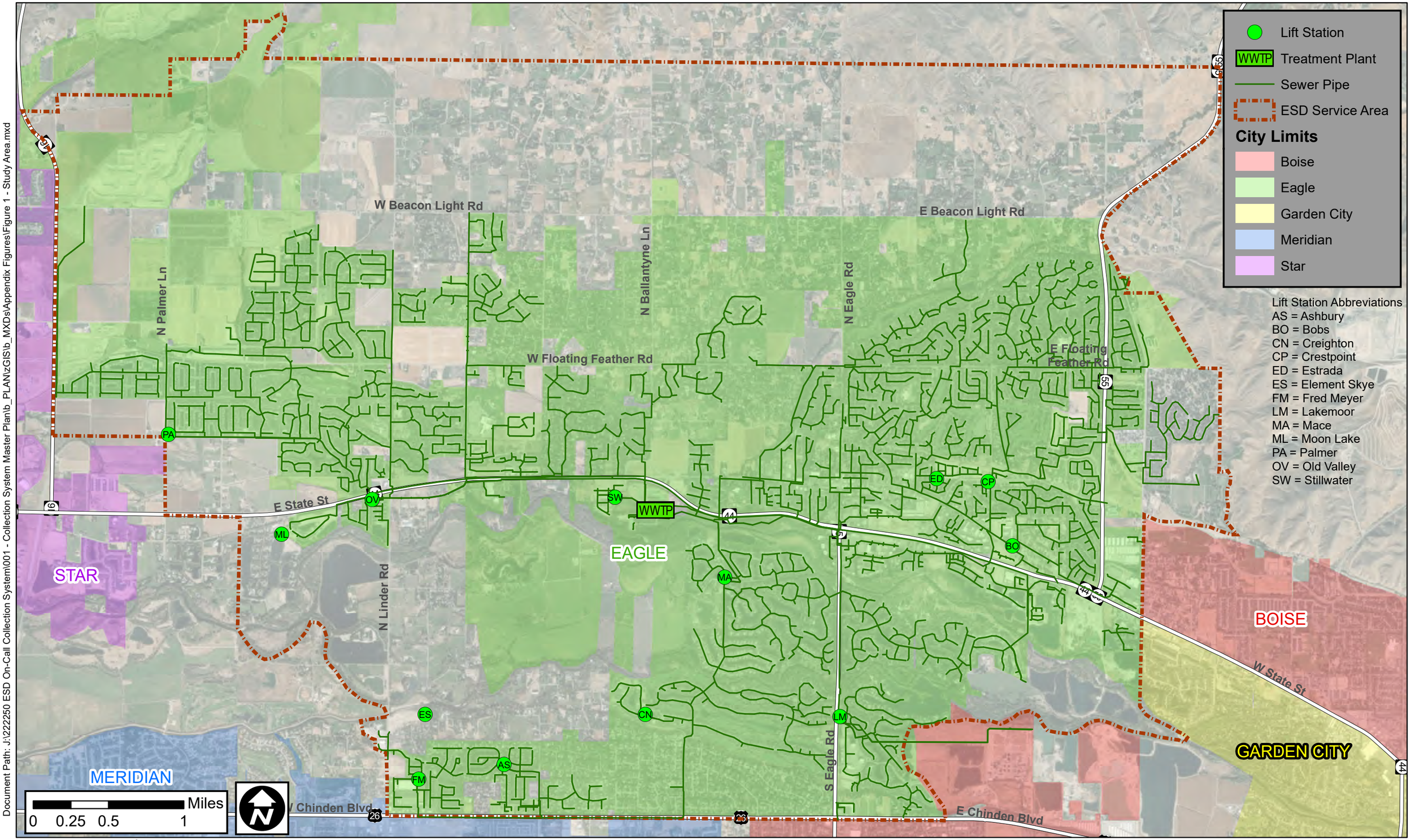

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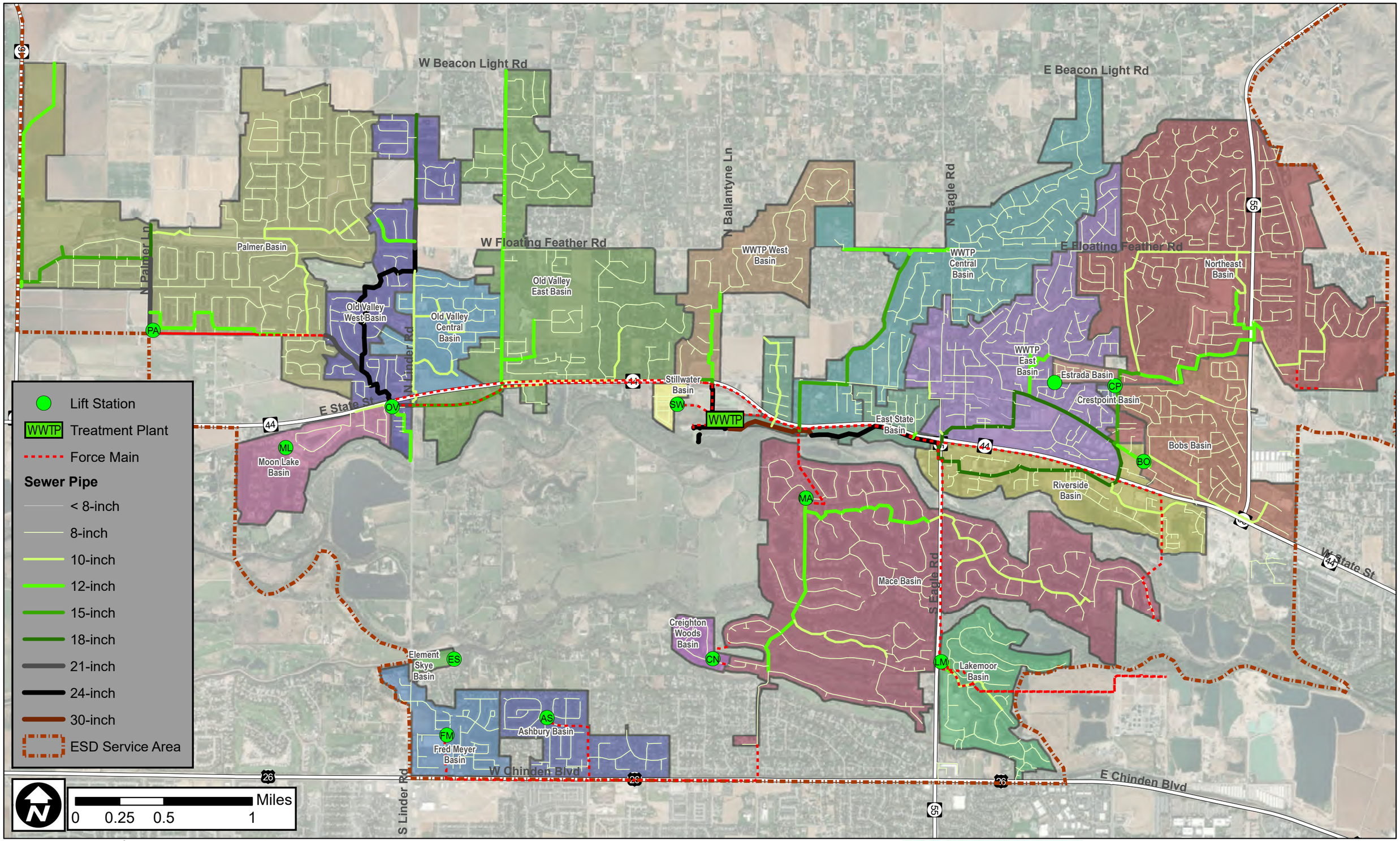
Study Area

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 1

Eagle Sewer District



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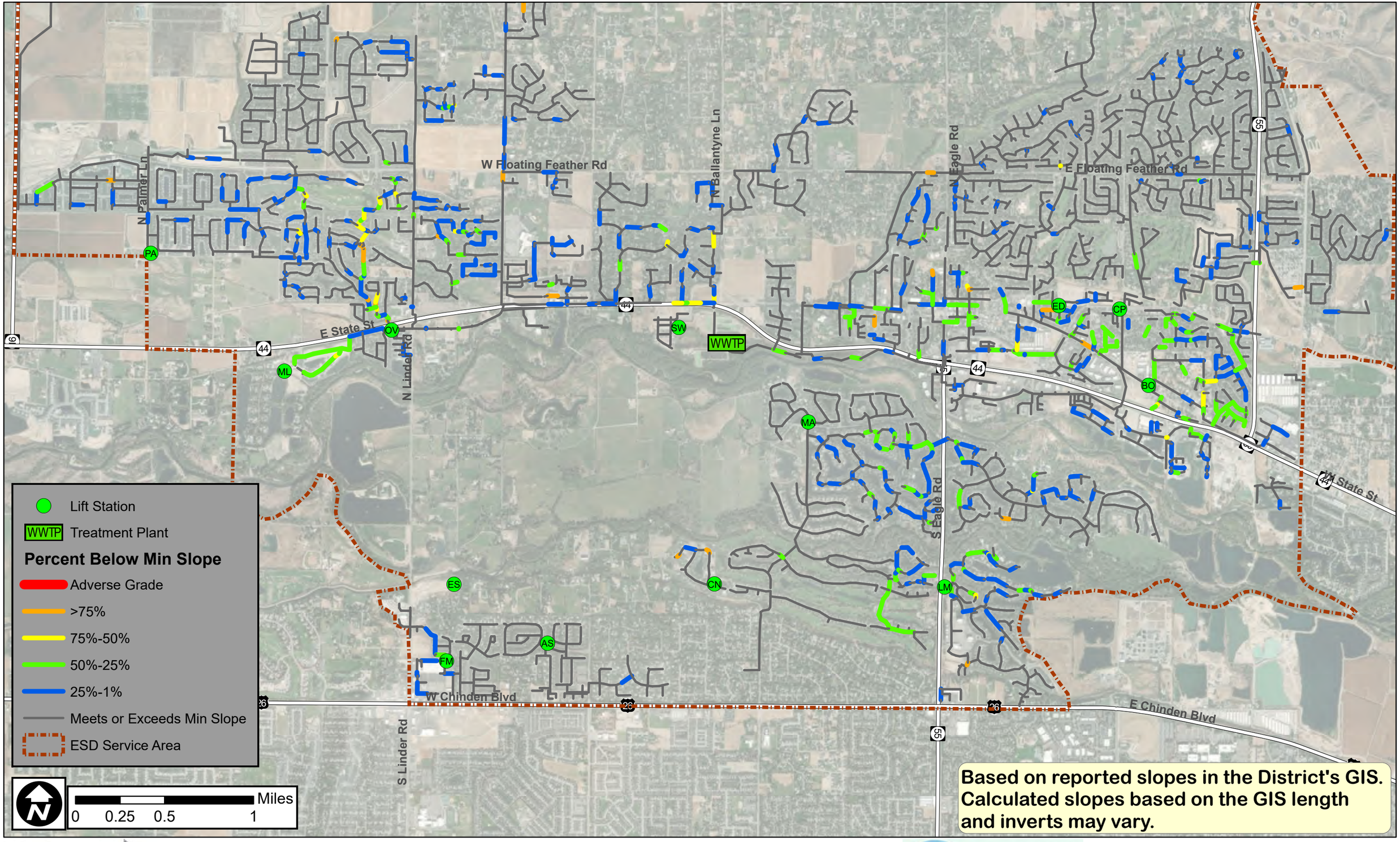
Existing WW Collection System

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 2

Eagle Sewer District



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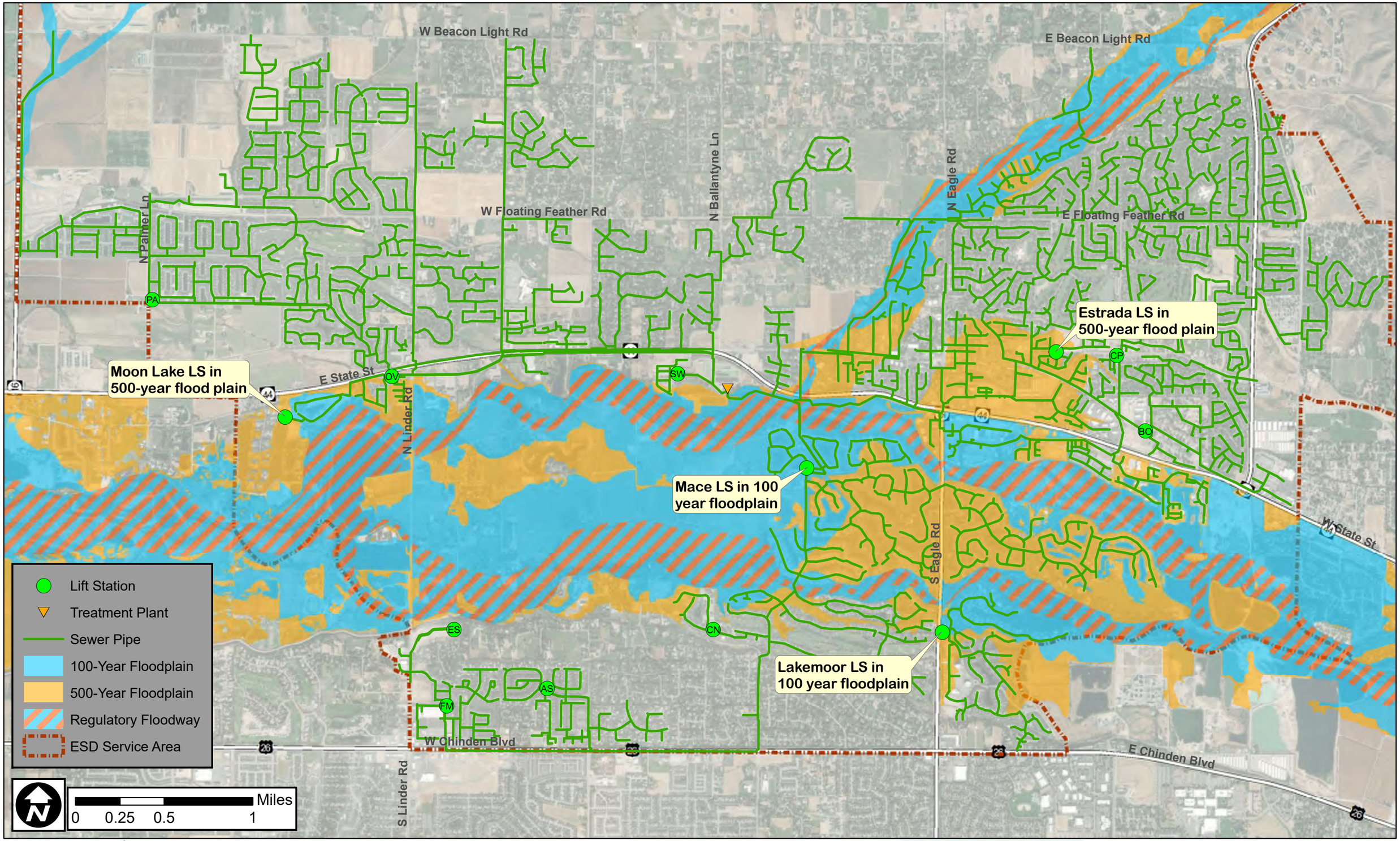
Minimum Pipe Slopes - Reported

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 3

Eagle Sewer District



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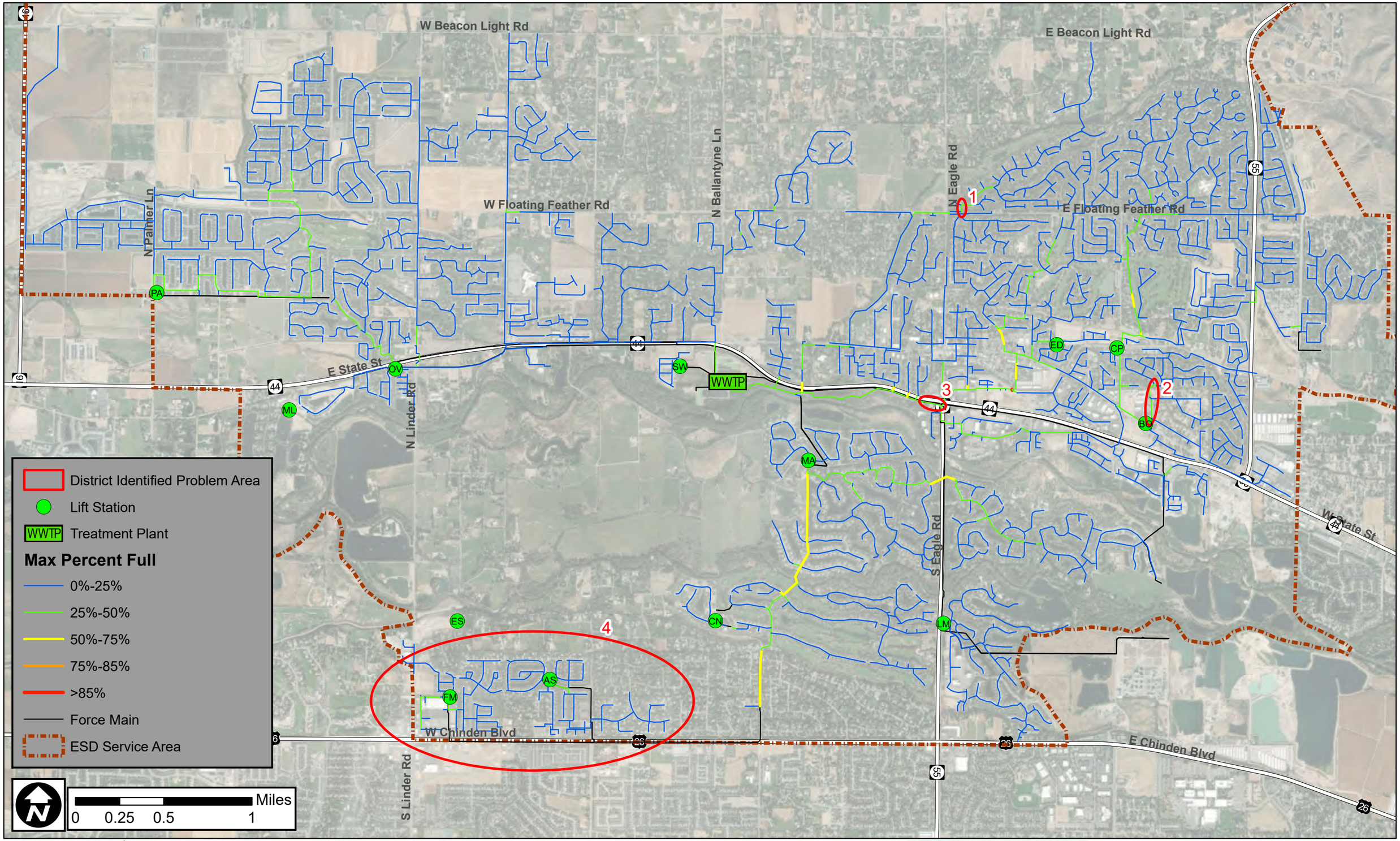
Floodplains

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 4

Eagle Sewer District



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Existing Peak Day Flow Depth over Diameter (Pipe Percent Full)

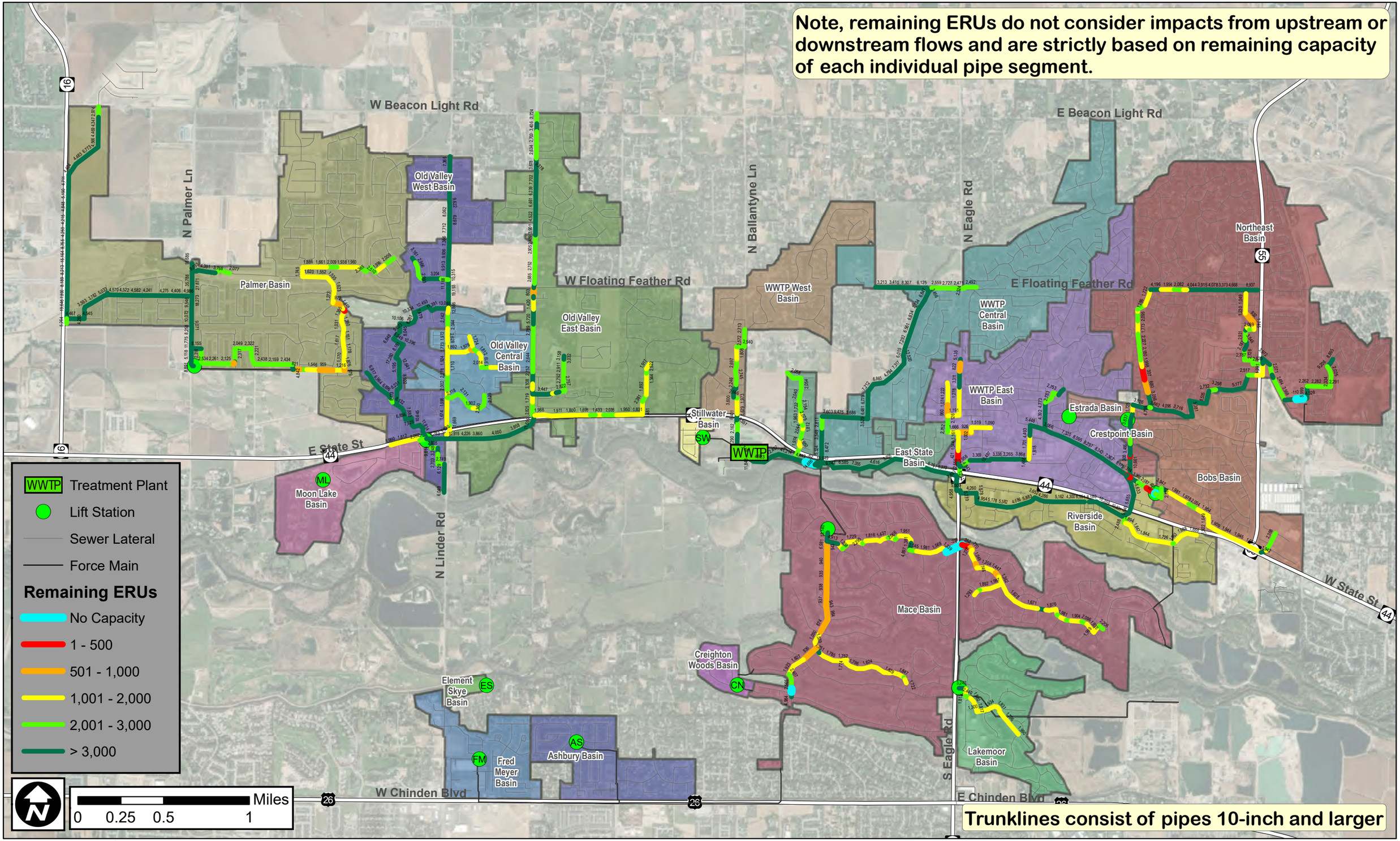
Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 5

Eagle Sewer District

Note, remaining ERUs do not consider impacts from upstream or downstream flows and are strictly based on remaining capacity of each individual pipe segment.



Trunklines consist of pipes 10-inch and larger

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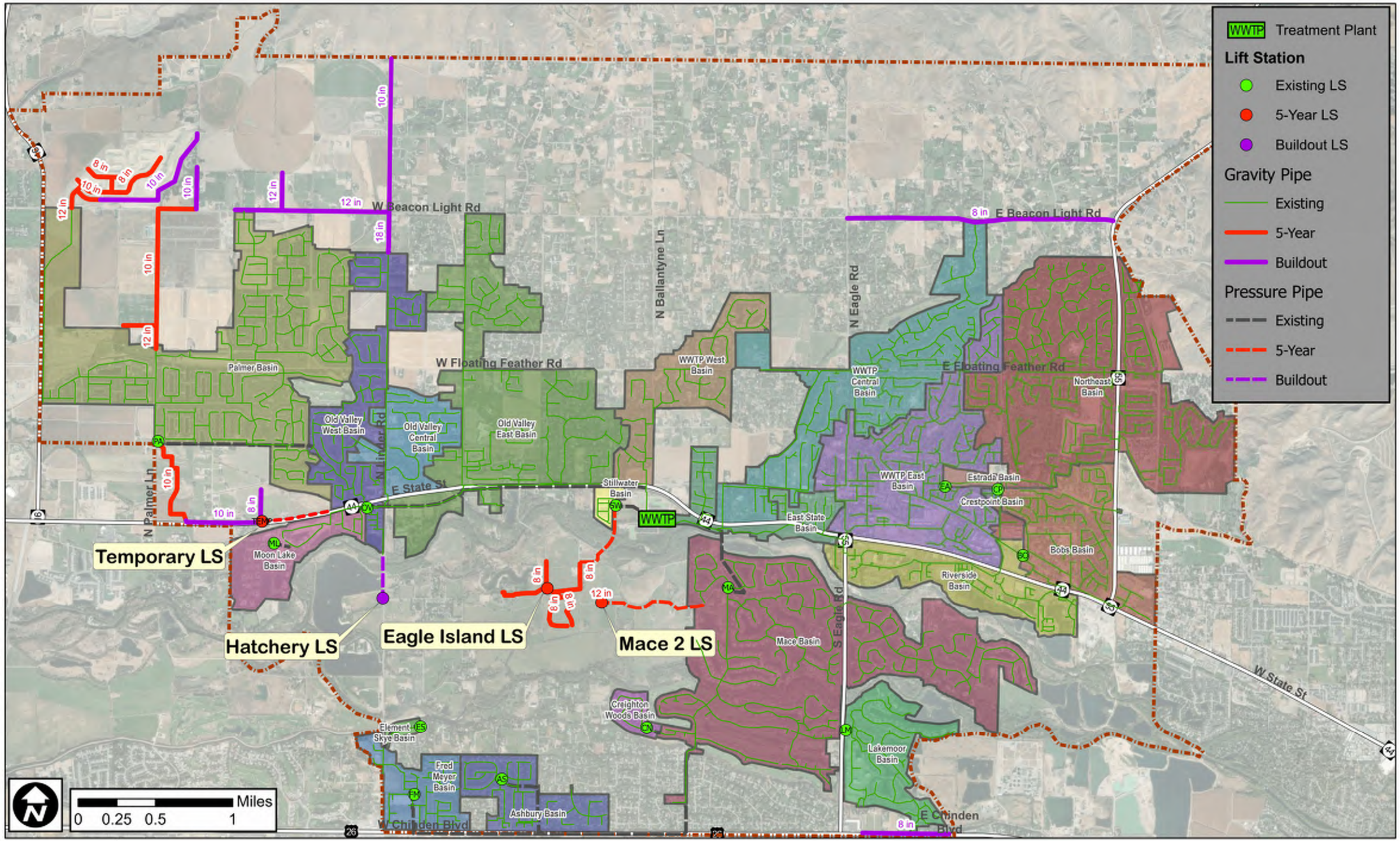
Existing PDF - Remaining ERUs

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 6

Eagle Sewer District



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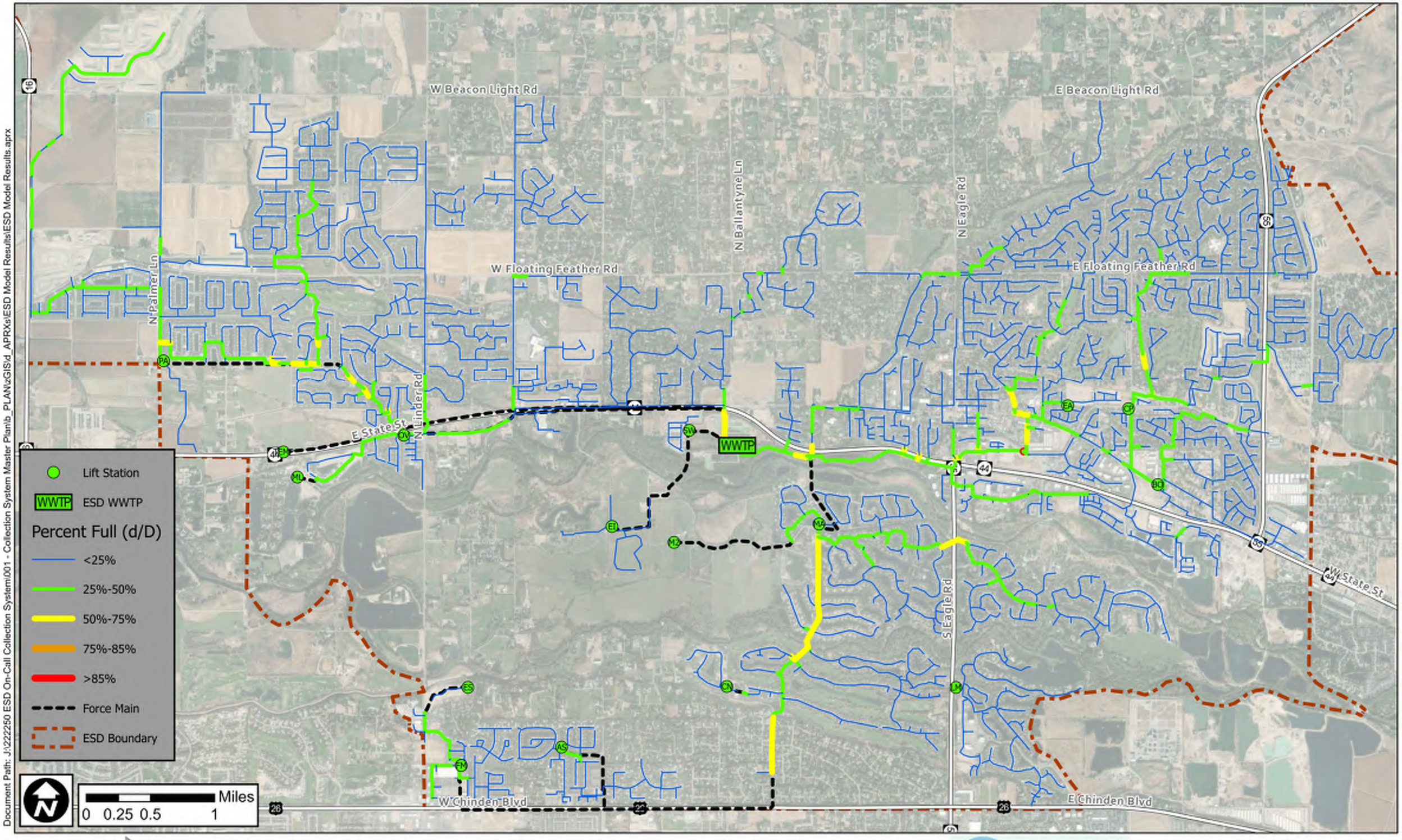
Future Collection System

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 7

Eagle Sewer District



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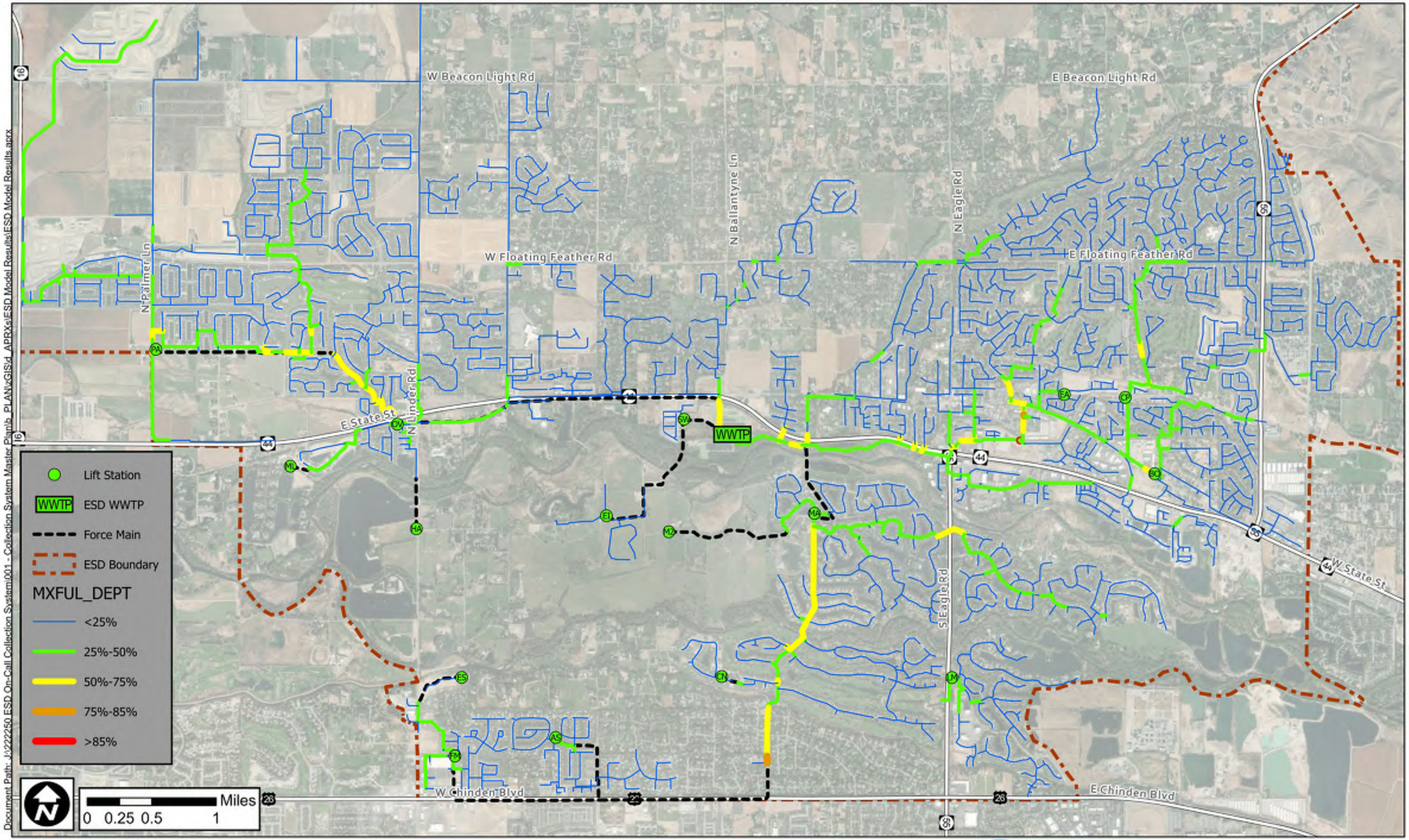
5-Year Peak Day Flow Depth over Diameter (Pipe Percent Full)

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 8

Eagle Sewer District



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Buildout Peak Day Flow Depth over Diameter (Pipe Percent Full)

Collection System Master Plan

EAGLE SEWER DISTRICT

Figure 9

Eagle Sewer District

Note, remaining ERUs do not consider impacts from upstream or downstream flows and are strictly based on remaining capacity of each individual pipe segment.

WWTP ESD WWTP

Lift Station

Remaining ERUs

No Capacity

1 - 500

501 - 1,000

1,001 - 2,000

2,001 - 3,000

> 3,000

Force Main

ESD Boundary

Parcels

Miles

0 0.25 0.5 1

Trunklines consist of pipes 10-inch and larger

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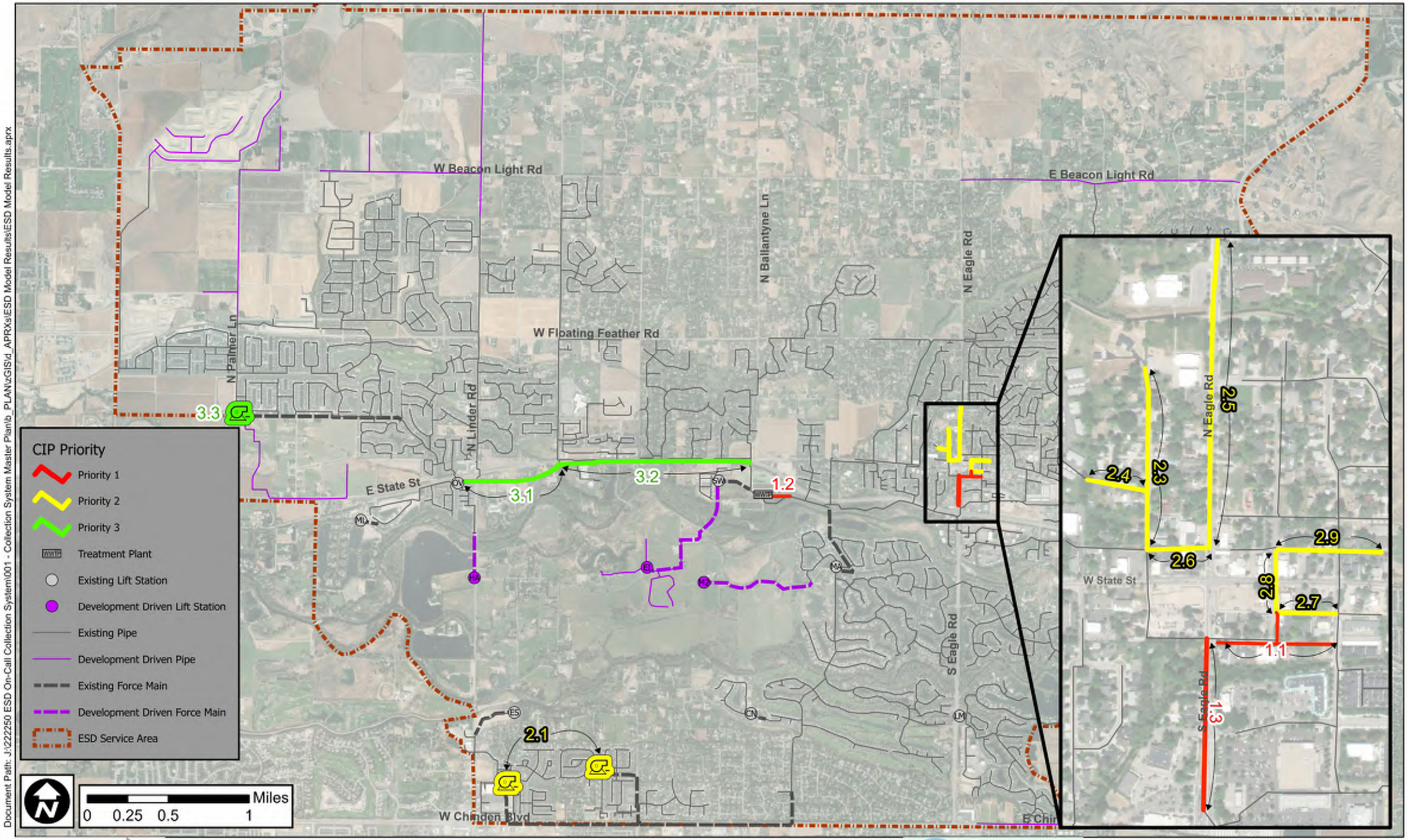
Remaining Capacity after Buildout

Collection System Master Plan

Figure 10

Eagle Sewer District



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Capital Improvement Plan

Collection System Master Plan

EAGLE SEWER DISTRICT

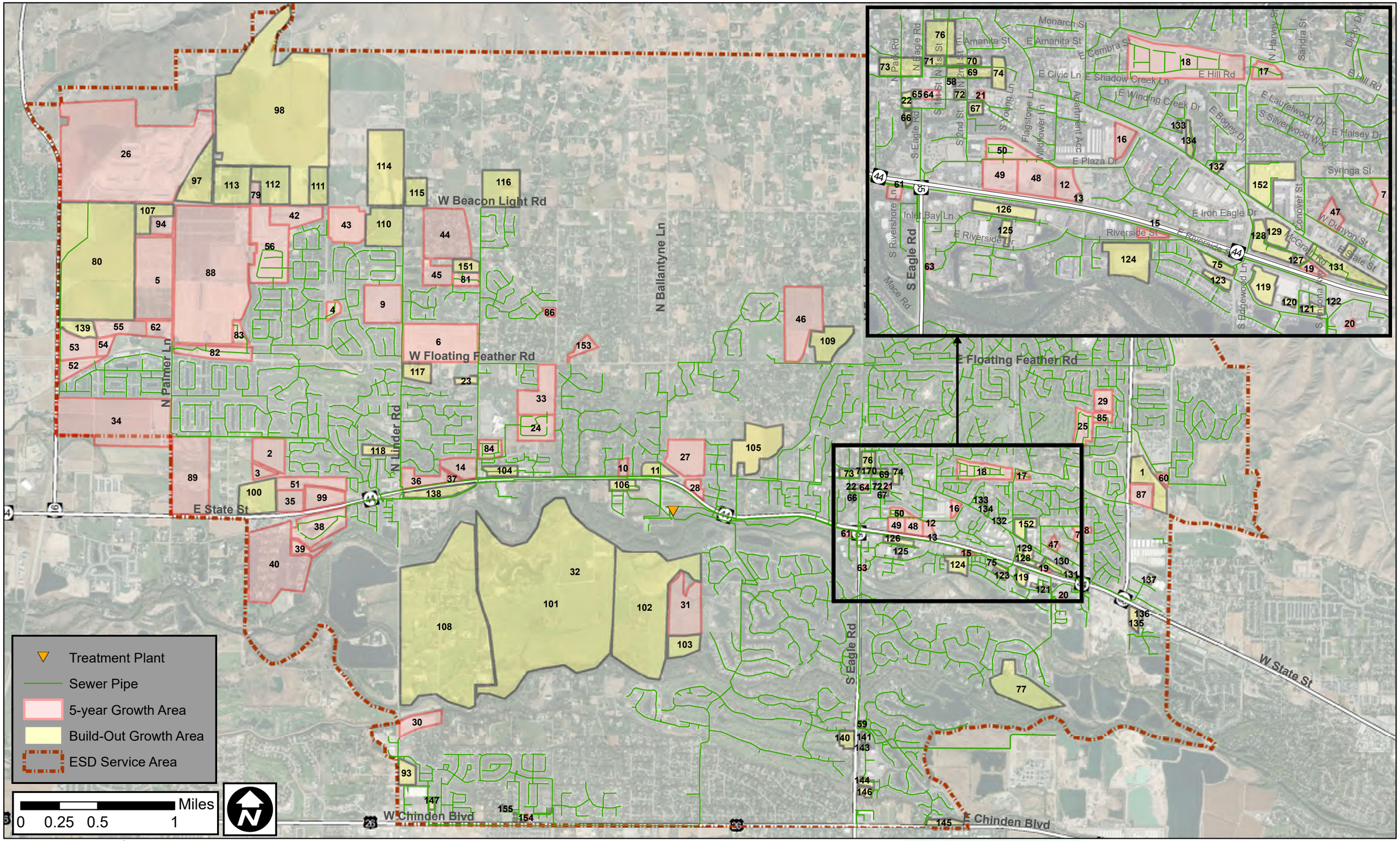
Figure 11

Eagle Sewer District

Appendix B

Growth Projections

KELLER ASSOCIATES



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5-Year & Build-Out Growth Areas

Collection System Master Plan

EAGLE SEWER DISTRICT

Appendix B

Eagle Sewer District

Client: Eagle Sewer District
Project: Wastewater Collection Master Plan
Project No.: 222250-001

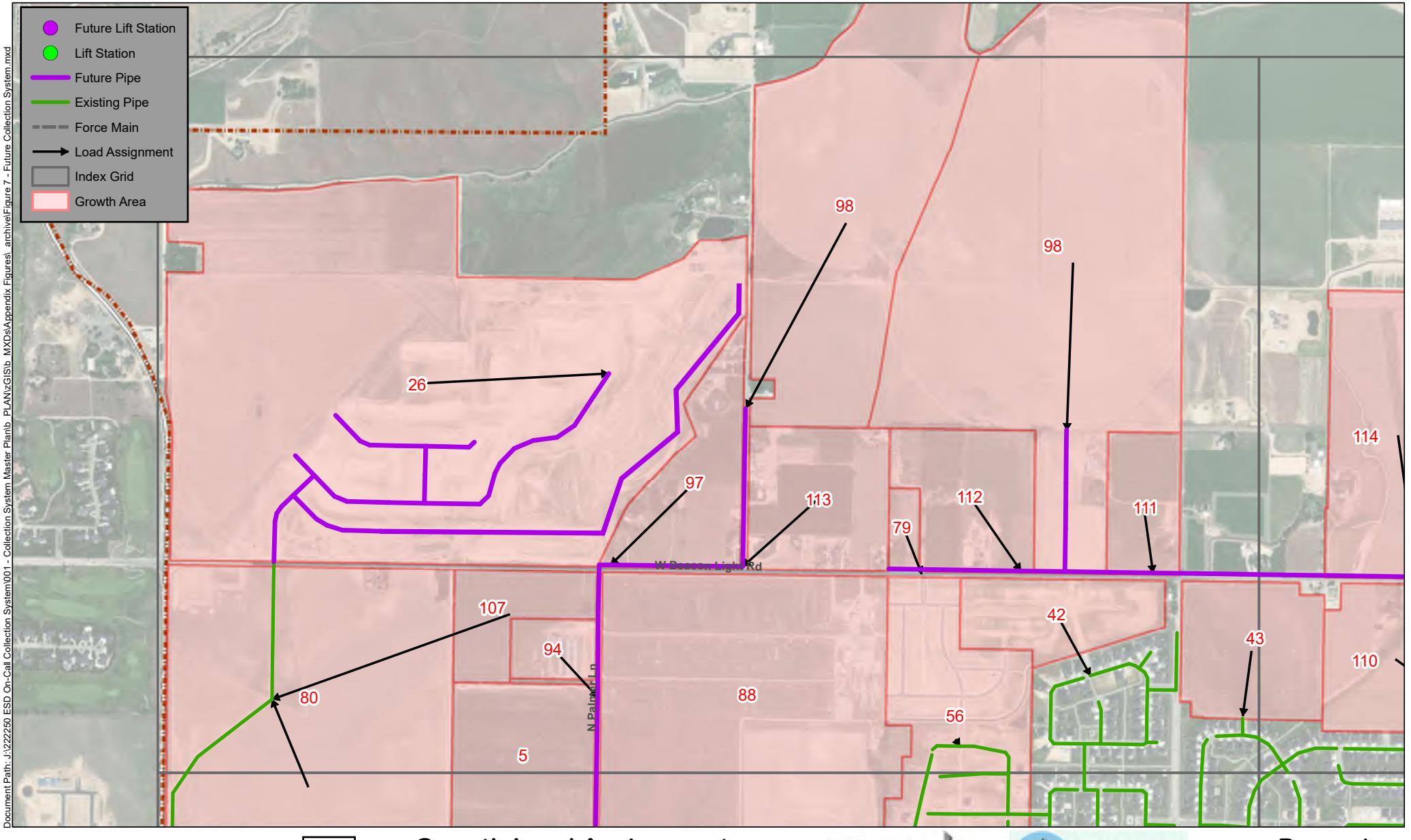
Detailed Growth Areas

Growth Area ID	Name	Area (ac)	Estimated ERUs	Source	Development Timeframe	Comments
1	Greco Remnant	47.6	50	ESD Estimate	Build-Out	This development is still in the works for a hotel, brewery, etc. Dave Yorganson is the developer's representative.
2	Serves into Legacy LS	47.9	48	Plans or Discussions w Developer	5-year	No sweat to serve north
3	Area	11.1	8	Plans or Discussions w Developer	5-year	May be able to serve north, if it can go under the canal. Need to look at closer.
4	Area	10.9	7	Plans or Discussions w Developer	5-year	2022-01 Pre-con was held and it is under construction. 3 manholes for this 5 acres. Developed by Stan Bastian's kids. Serves south and west into Lanewood.
5	Millstone	159.3	244	Plans or Discussions w Developer	5-year	First flush 2024
6	Area	145.1	140	Plans or Discussions w Developer	5-year	First flush 2024
7	Kody Corner	7.1	19	Plans or Discussions w Developer	5-year	First flush 2023
8	Area	2.0	8	Plans or Discussions w Developer	5-year	First flush 2023
9	Kingswood	73.6	74	Plans or Discussions w Developer	5-year	First flush 2024
10	Shingle Creek	7.5	9	Plans or Discussions w Developer	5-year	First flush 2023
11	Kingfisher/Predico	19.0	151	Plans or Discussions w Developer	Build-Out	63 ERUs for Kingfisher townhomes. 88 ERUs for Predico commercial/residential. First flush 2024
12	Residence Inn	7.4	65	Plans or Discussions w Developer	5-year	First flush 2025
13	Future Restaurant	0.5	20	Plans or Discussions w Developer	Build-Out	
14	Skyview	31.7	124	Plans or Discussions w Developer	5-year	Townhomes plus some commercial we haven't seen. First flush 2024
15	Eagle River 7 Commercial	2.2	8	Plans or Discussions w Developer	5-year	First flush 2025
16	Lock and Bolt	5.6	12	Plans or Discussions w Developer	5-year	First Flush 2024
17	Eastfield	5.0	30	Plans or Discussions w Developer	5-year	Townhomes, First flush 2023
18	Estrada 1 and 2	42.6	104	Plans or Discussions w Developer	5-year	First flush 2023
19	Primary Health	2.1	3	Plans or Discussions w Developer	5-year	First Flush 2023
20	Barbacoa	0.7	23	Plans or Discussions w Developer	5-year	First flush 2024
21	Gem State Brewing	0.6	5	Plans or Discussions w Developer	5-year	Commercial and Residential. First flush 2023
22	Aerie Building	1.8	36	Plans or Discussions w Developer	Build-Out	4 Story Mixed Use
23	Shetland Point	7.7	10	Plans or Discussions w Developer	Build-Out	
24	Whitehurst 1 and 2	50.1	85	Plans or Discussions w Developer	5-year	First flush 2023
25	Rene Place 1, 2 and Commons	29.6	74	Plans or Discussions w Developer	5-year	First flush 2023
26	Terra View	632.2	713	Plans or Discussions w Developer	5-year	396 residential ERU, 192 multifamily ERU 125? commercial ERU. First flush 2023
27	Benari Estates	64.5	77	Plans or Discussions w Developer	5-year	First Flush 2024
28	Premier Storage	11.9	1	Plans or Discussions w Developer	5-year	First flush 2023
29	Hovstilla	19.6	20	Plans or Discussions w Developer	5-year	First flush 2026
30	Element Skye/ Cavea	31.1	14	Plans or Discussions w Developer	5-year	First flush 2024
31	Silver Creek	86.7	54	Plans or Discussions w Developer	5-year	Temporary lift station required. First flush 2026
32	Eagle Island RV Park	31.7	50	Plans or Discussions w Developer	5-year	First Flush 2024
33	Carp Ranch	68.7	70	Plans or Discussions w Developer	5-year	First flush 2027
34	Cascade Springs	259.6	350	Plans or Discussions w Developer	5-year	First flush 2025
35	Tierpointe	30.5	66	Plans or Discussions w Developer	5-year	First flush 2024
36	Route 44 Crossing	30.6	41	Plans or Discussions w Developer	5-year	41 ERU residential. 6 commercial lots plus storage units. First flush 2027
37	Shady Acres	3.3	8	Plans or Discussions w Developer	5-year	First flush 2027
38	Bald Eagle Point2 1 and 2	68.6	61	Plans or Discussions w Developer	5-year	First flush 2022
39	Eventyr/Adventier	15.3	7	Plans or Discussions w Developer	5-year	First flush 2023
40	Moon Lake Ranch	186.5	20	Plans or Discussions w Developer	5-year	First flush 2023. New lift station 2023
42	Mosey Hill	49.0	30	Plans or Discussions w Developer	5-year	First flush 2024
43	Beaconwood	64.5	72	Plans or Discussions w Developer	5-year	First flush 2025
44	Calloway Ranch	116.9	32	Plans or Discussions w Developer	5-year	First flush ___
45	Soaring Feather	32.5	28	Plans or Discussions w Developer	5-year	First flush 2025
46	Carrera Estates	120.3	85	Plans or Discussions w Developer	5-year	First flush 2025
47	Dovetail Condos	5.3	16	Plans or Discussions w Developer	5-year	First flush 2024
48	Molinari Park 1	15.1	91	Plans or Discussions w Developer	5-year	Townhomes. First flush 2024
49	Molinari Park 2	12.8	59	Plans or Discussions w Developer	5-year	Townhomes. First flush 2024
50	Molinari Park Commercial?	9.0	26	Plans or Discussions w Developer	5-year	First flush 2025
51	Mosscreek	40.0	58	Plans or Discussions w Developer	5-year	First flush 2024
52	Arvory Crest 1	29.8	113	Plans or Discussions w Developer	5-year	First flush 2024
53	Arvory Crest 2	46.6	231	Plans or Discussions w Developer	5-year	First flush 2024
54	Arvory Crest 3	13.7	29	Plans or Discussions w Developer	5-year	First flush 2023
55	Arvory Crest 4	38.4	32	Plans or Discussions w Developer	5-year	First flush 2023
56	Stags Crossing 1 and 2	128.1	157	Plans or Discussions w Developer	5-year	First flush 2023
58	The 148	0.4	3	Plans or Discussions w Developer	Build-Out	Mixed use
59	Lakemoor Medical Dental	1.6	8	Plans or Discussions w Developer	Build-Out	
60	Stadium View	4.8	60	Plans or Discussions w Developer	5-year	First flush ___
61	North Channel Office Building	2.2	12	Plans or Discussions w Developer	5-year	First flush 2025
62	Snoqualmie Basin/Red Butte	22.1	58	Plans or Discussions w Developer	5-year	First flush 2024
63	Shell Building	0.4	2	Plans or Discussions w Developer	5-year	2 tentants. Negranti Creamery 1 ERU. First flush 2023
64	Wild West/Barber Shop/Etc	1.5	50	Plans or Discussions w Developer	5-year	Barbershop/Wild West/Hotel Eagle Gateway. 15,000 SF first floor retail. 2 restaurants. 15,000 SF office second floor. 17 condos on the third floor
65	Smith Property by Urban Renewal	0.9	12	ESD Estimate	Build-Out	Mixed use 3-4 stories
66	Potential development	1.1	3	ESD Estimate	Build-Out	
67	Potential 2-3 story something	2.0	40	Plans or Discussions w Developer	Build-Out	Double existing ERUs
69	Ripe for redevelopment 3-4 stories	5.6	23	ESD Estimate	Build-Out	Double existing ERUs
70	Ripe for redevelopment 2-3 stories	3.5	16	ESD Estimate	Build-Out	Double existing ERUs
71	Ripe for redevelopment 2-3 stories	2.3	12	ESD Estimate	Build-Out	Double existing ERUs?
72	Area	1.3	3	ESD Estimate	Build-Out	New splash pad (twice the size), two restrooms, concession stand
73	Ripe for redevelopment 2-3 stories	9.1	22	ESD Estimate	Build-Out	This whole area is expected to redevelop into a boutique retail. Small commercial on bottom and retail on the second floor. Double existing ERUs
74	Mixed use development likely 2 stories	5.1	12	ESD Estimate	Build-Out	

Client: Eagle Sewer District
Project: Wastewater Collection Master Plan
Project No.: 222250-001

Detailed Growth Areas

Growth Area ID	Name	Area (ac)	Estimated ERUs	Source	Development Timeframe	Comments
75	Commercial? Died during recession	3.7	30	ESD Estimate	Build-Out	4 commercial buildings
76	End of 20 year plan, boutique retail	12.0	33	ESD Estimate	Build-Out	Double existing ERUs
77	Potential residential R2	84.7	100	Plans or Discussions w Developer	Build-Out	
79	Gora Estates	11.4	4	Plans or Discussions w Developer	5-year	First flush 2024
80	Terra View South	456.4	425	ESD Estimate	Build-Out	205 single family ERU. 275,000 SF of office, commercial, retail. So 120 ERU of commercial. First flush 2028
81	Brush Creek	18.4	16	Plans or Discussions w Developer	5-year	First flush 2023
82	Snoqualmie 15&16	48.0	52	Plans or Discussions w Developer	5-year	First flush 2023
83	Snoqualmie 17	12.9	21	Plans or Discussions w Developer	5-year	First flush 2023
84	Bellameade	21.5	71	Plans or Discussions w Developer	5-year	First flush 2023
85	Rene Commons	9.4	17	Plans or Discussions w Developer	5-year	First flush 2023
86	Middlefork	4.7	3	Plans or Discussions w Developer	5-year	First flush 2023
87	Quarry Village	24.6	200	Plans or Discussions w Developer	5-year	First flush 2025
88	Torrente Secco	514.9	654	Plans or Discussions w Developer	5-year	First flush 2025. 613 residential lots, 6 commerical lots, and a school. Total ERU equivalent of 654.
89	Everton	150.1	200	Plans or Discussions w Developer	5-year	Serves to Palmer LS. 100 Residential ERUs north of Dry Creek Canal. 60 townhomes south of canal and 10 commercial buildings at 4 ERU each.
93	Willow Run Retirement Facility	20.1	131	Plans or Discussions w Developer	Build-Out	
94	Modern Craftsman	21.0	20	Plans or Discussions w Developer	5-year	First flush 2026
97	Area	64.3	30	Plans or Discussions w Developer	Build-Out	No notes from ESD
98	J&M Lands	719.6	180	Plans or Discussions w Developer	Build-Out	No notes from ESD
99	Brookstone	37.4	99	Plans or Discussions w Developer	5-year	First flush 2026
100	Area	61.2	80	Plans or Discussions w Developer	Build-Out	Actually 99 ERUs -TJB
101	Eagle Island State Park - flows are in the notes below	998.0	0	ESD Estimate	Build-Out	
102	Area	359.9	340	ESD Estimate	Build-Out	
103	Silvercreek Phase 2	32.4	10	ESD Estimate	Build-Out	
104	Area	16.8	36	ESD Estimate	Build-Out	
105	Area	92.3	96	Plans or Discussions w Developer	Build-Out	12 buildings, average of 3 ERU per building, so 36 ERU
106	Area	14.7	36	ESD Estimate	Build-Out	48 acres
107	Area	37.8	40	ESD Estimate	Build-Out	12 commercial buildings. Average 3 ERU per building is 36 ERUs
108	Area	654.1	350	ESD Estimate	Build-Out	
109	Area	53.6	54	ESD Estimate	Build-Out	
110	Area	73.6	50	ESD Estimate	Build-Out	
111	Area	35.8	12	ESD Estimate	Build-Out	
112	Area	63.3	32	ESD Estimate	Build-Out	12 units. (assume these are ERUs)
113	Area	71.5	36	ESD Estimate	Build-Out	
114	Area	141.8	50	ESD Estimate	Build-Out	
115	Area	31.4	88	ESD Estimate	Build-Out	
116	Area	71.1	18	ESD Estimate	Build-Out	
117	Area	25.1	18	ESD Estimate	Build-Out	
118	Area	17.7	18	ESD Estimate	Build-Out	
119	Area	8.2	56	ESD Estimate	Build-Out	9 acres
120	Area	1.0	8	ESD Estimate	Build-Out	4 acres of commercial. 12 buildings, 56 ERUs
121	Area	2.3	24	ESD Estimate	Build-Out	
122	Area	0.3	16	ESD Estimate	Build-Out	
123	Area	2.6	20	ESD Estimate	Build-Out	
124	Area	17.5	100	ESD Estimate	Build-Out	3 commercial buildings
125	Area	2.5	50	ESD Estimate	Build-Out	
126	Area	8.6	75	ESD Estimate	Build-Out	
127	Area	1.2	4	ESD Estimate	Build-Out	5 commercial buildings
128	Area	8.0	48	ESD Estimate	Build-Out	
129	Area	6.0	100	ESD Estimate	Build-Out	8 commercial buildings
130	Area	1.6	5	ESD Estimate	Build-Out	Multi-Family
131	Area	12.8	50	Plans or Discussions w Developer	Build-Out	Mixed Use Condos
132	Area	1.3	6	ESD Estimate	Build-Out	Multi-family
133	Area	0.7	3	ESD Estimate	Build-Out	
134	Area	2.2	4	ESD Estimate	Build-Out	
135	Area	10.6	60	ESD Estimate	Build-Out	
136	Area	1.8	6	Plans or Discussions w Developer	Build-Out	State Street Townhomes. Direct connect to Boise
137	Area	3.2	10	ESD Estimate	Build-Out	
138	Area	31.9	48	ESD Estimate	Build-Out	
139	Area	25.3	24	ESD Estimate	Build-Out	12 commercial buildings
140	Shekinah Commercial	12.8	40	ESD Estimate	Build-Out	
141	Area	1.7	20	Plans or Discussions w Developer	Build-Out	20 buildable lots
142	Area	0.4	3	ESD Estimate	Build-Out	
143	Area	1.3	12	ESD Estimate	Build-Out	
144	Area	5.5	48	ESD Estimate	Build-Out	
145	Area	11.9	40	ESD Estimate	Build-Out	
146	Area	6.8	48	ESD Estimate	Build-Out	
147	Area	3.7	24	ESD Estimate	Build-Out	
151	Area	16.8	14	ESD Estimate	Build-Out	
152	Heron's Edge	16.5	72	ESD Estimate	Build-Out	
153	Reining Horse	14.3	7	Plans or Discussions w Developer	5-year	First flush 2023
154	Added Ashbury Area	1.1	5	ESD Estimate	5-year	
155	Added Ashbury Area	3.2	33	ESD Estimate	Build-Out	
Total		8,378	9,037	-	-	-



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Growth Load Assignments

Collection System Master Plan

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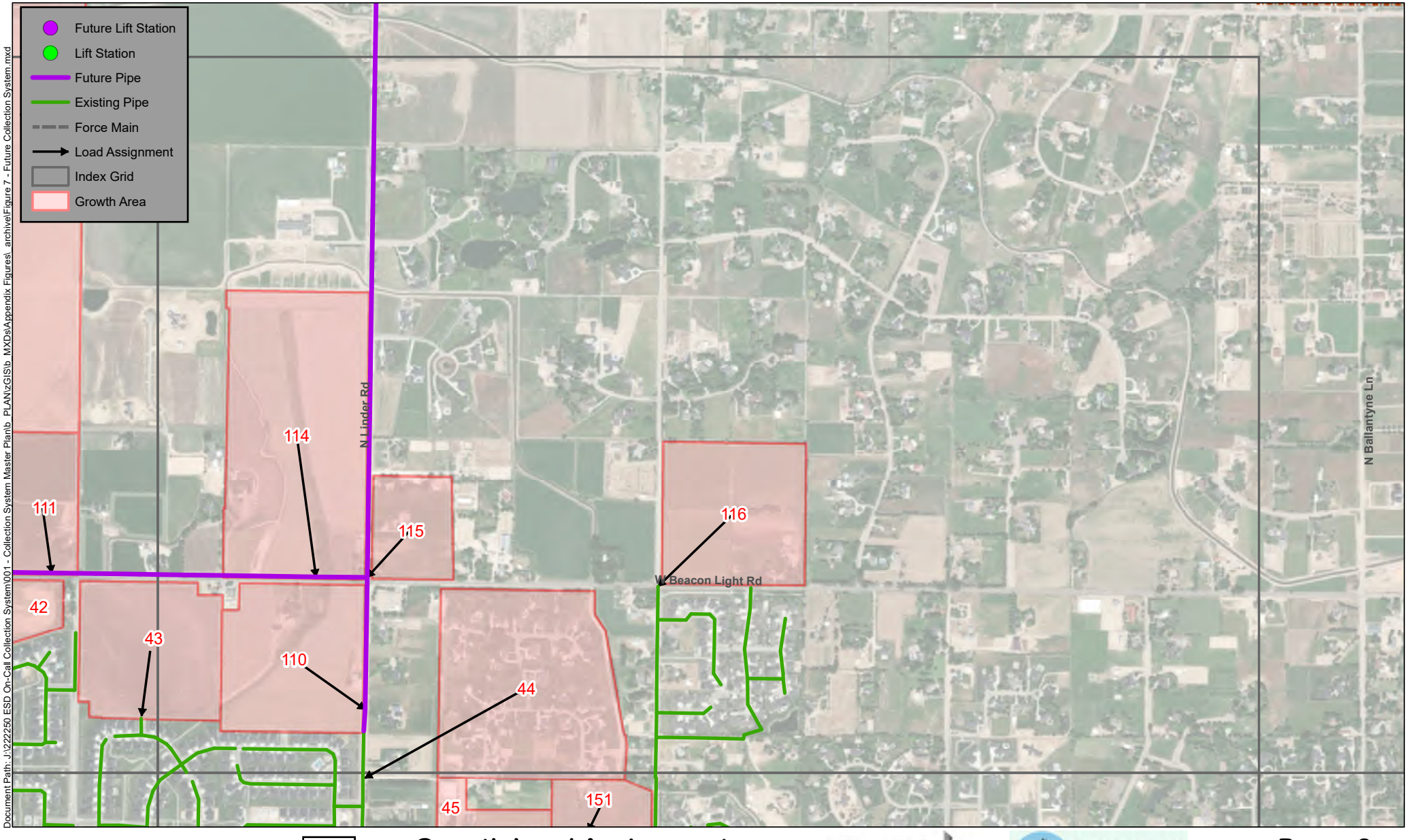
EAGLE SEWER DISTRICT



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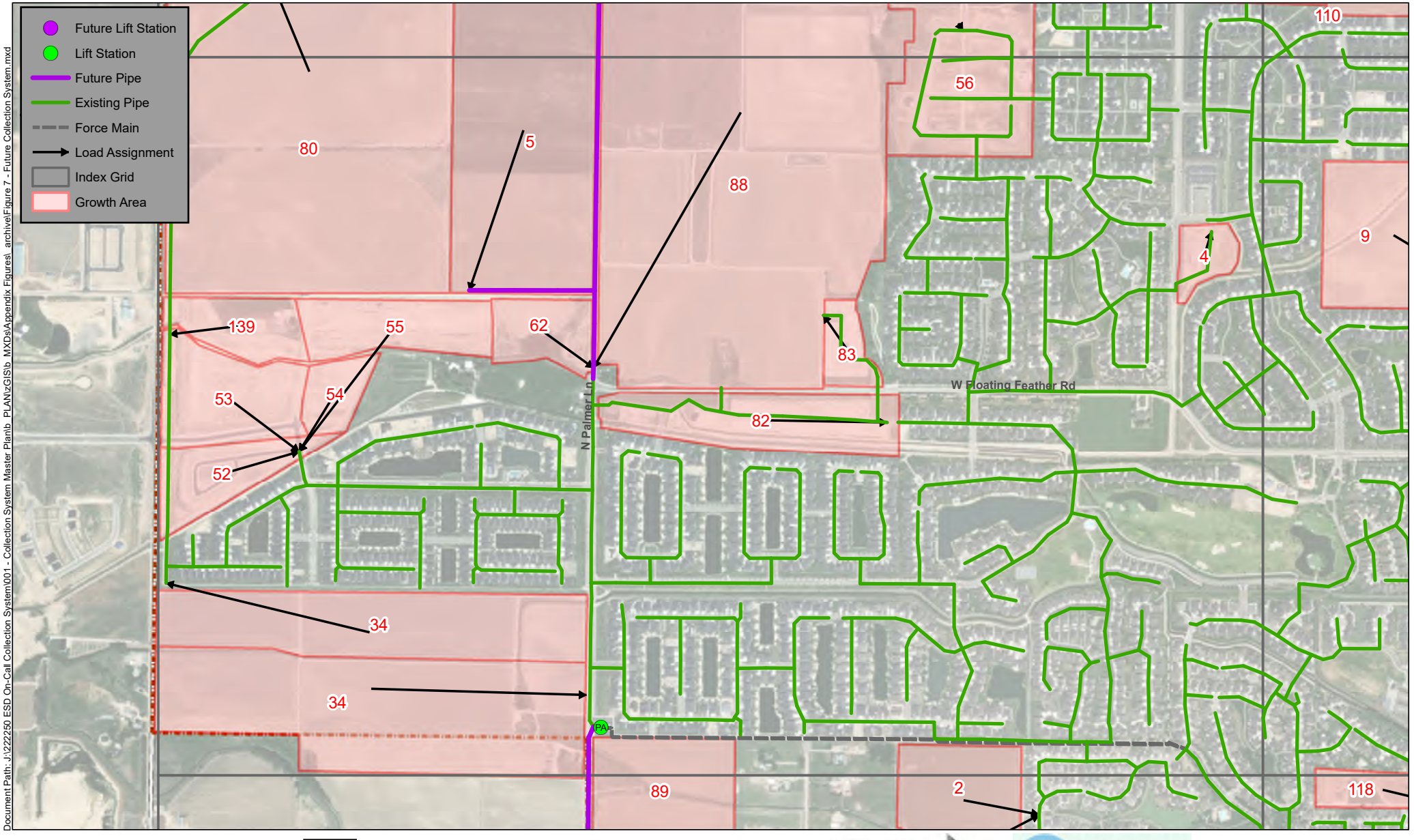

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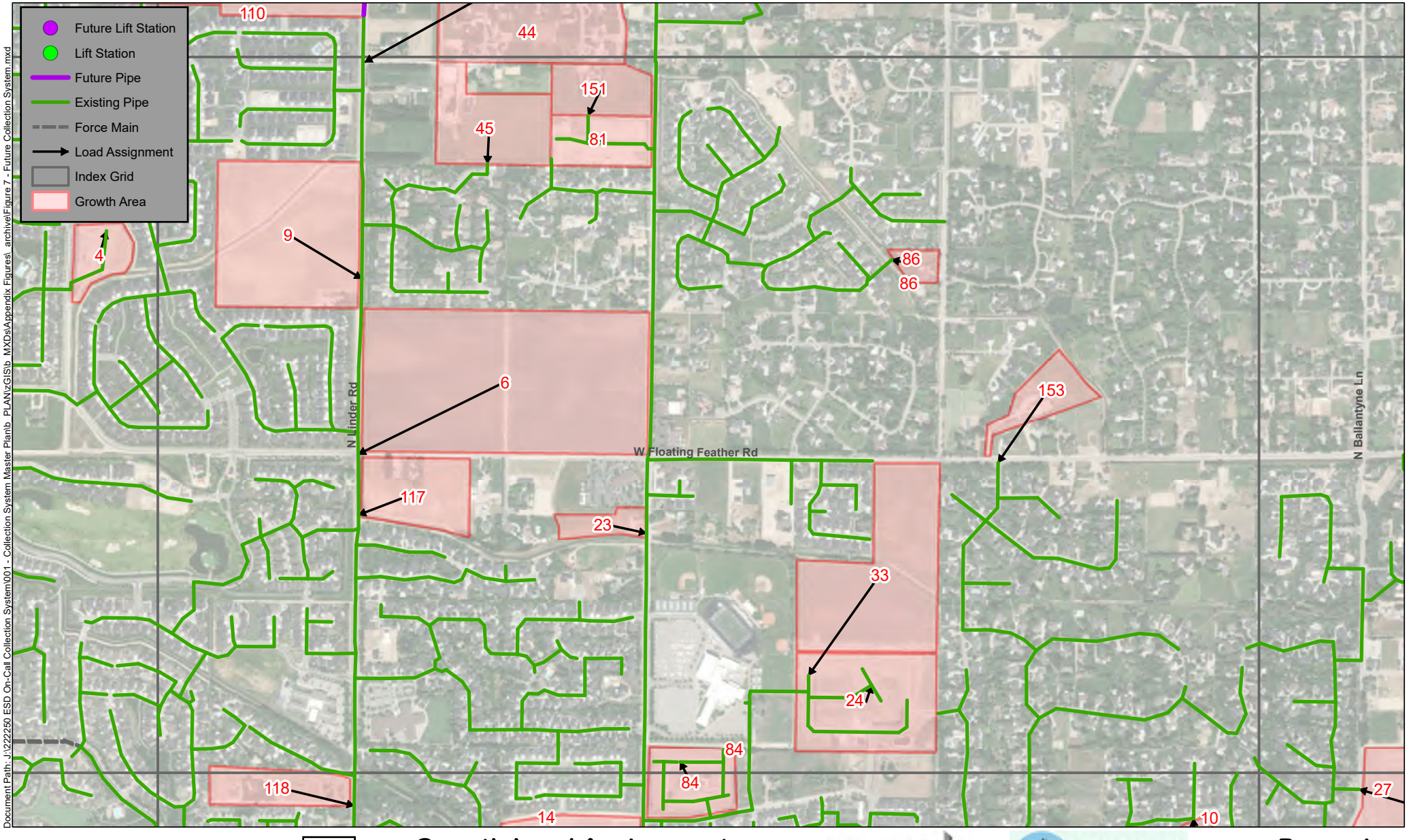

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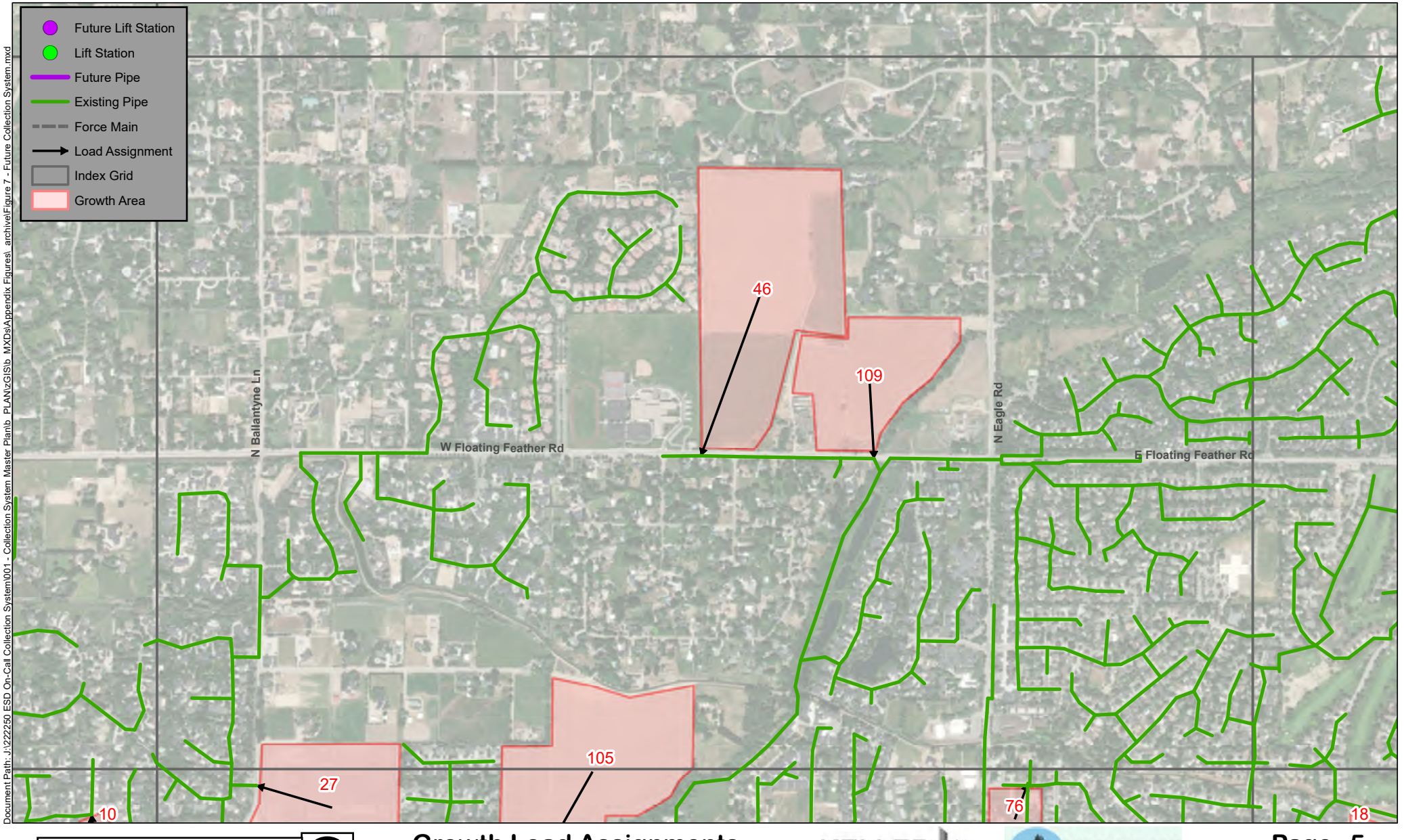

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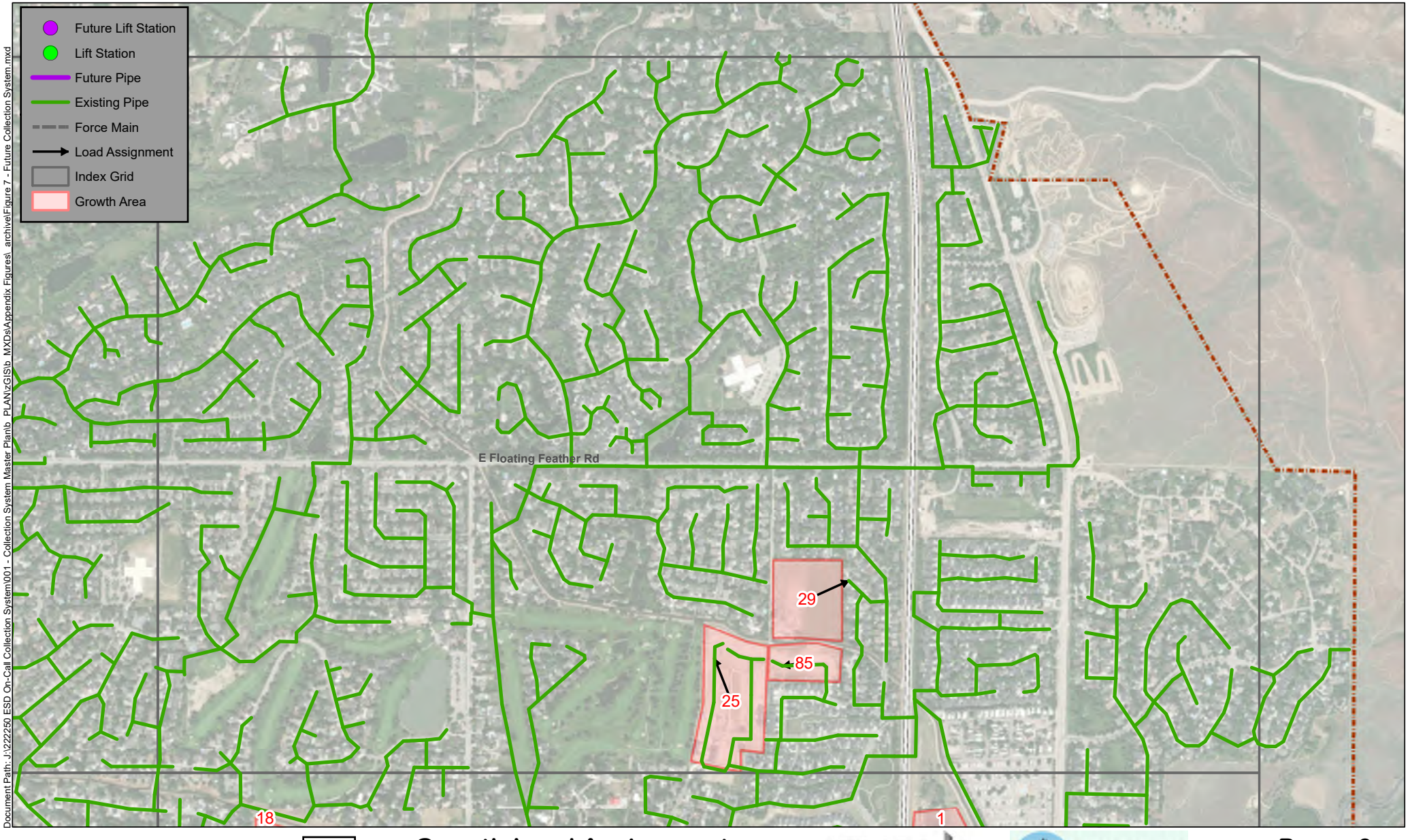

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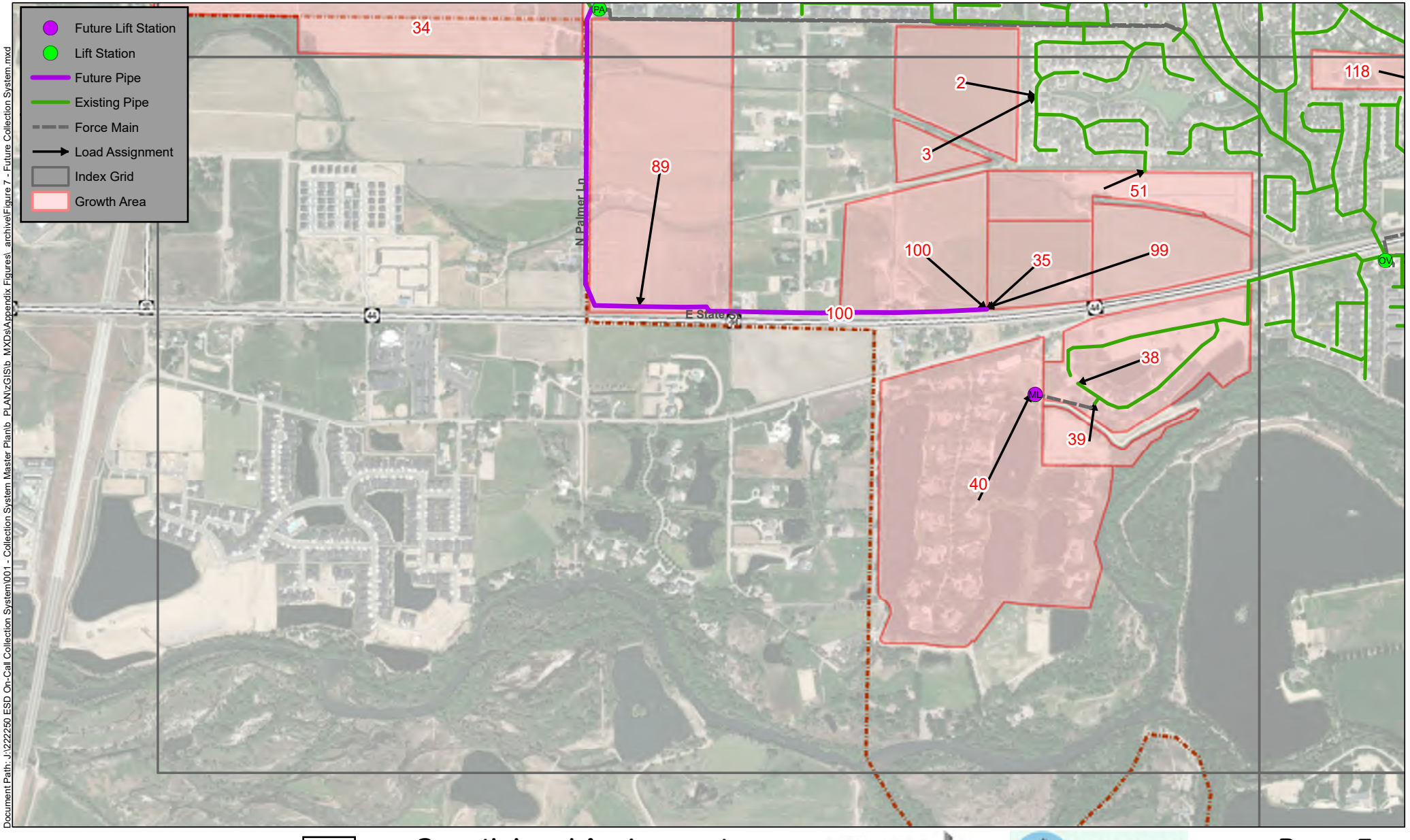

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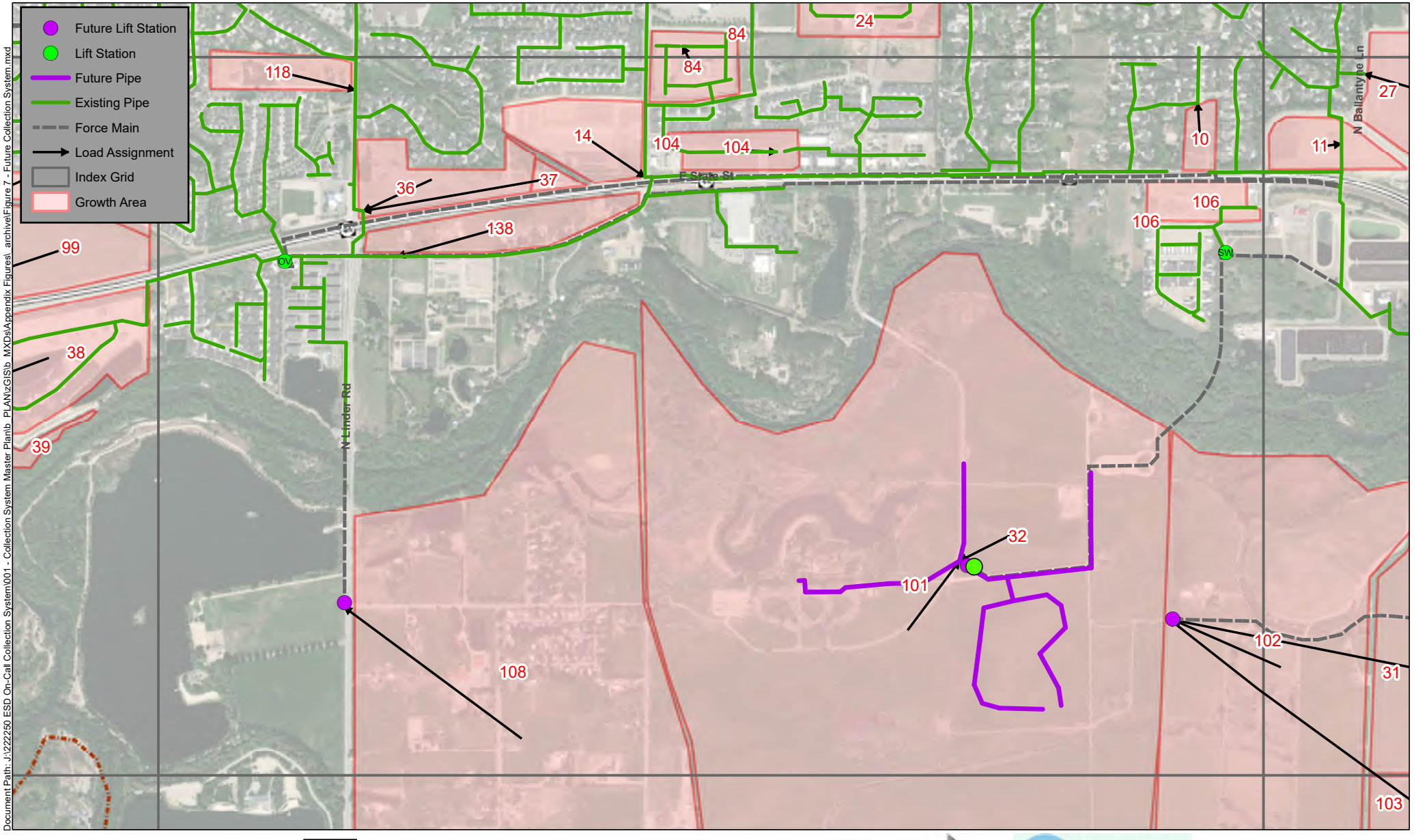

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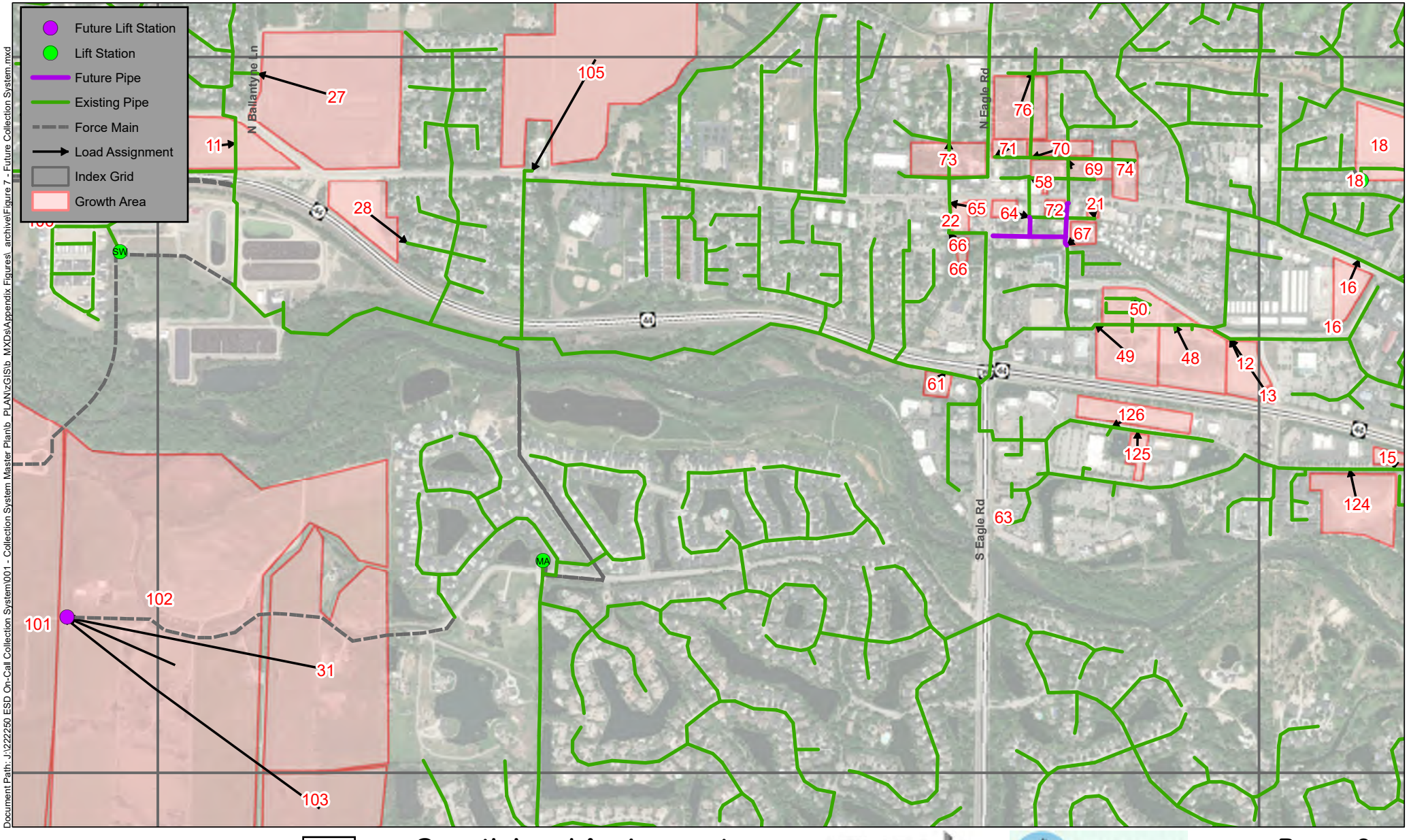

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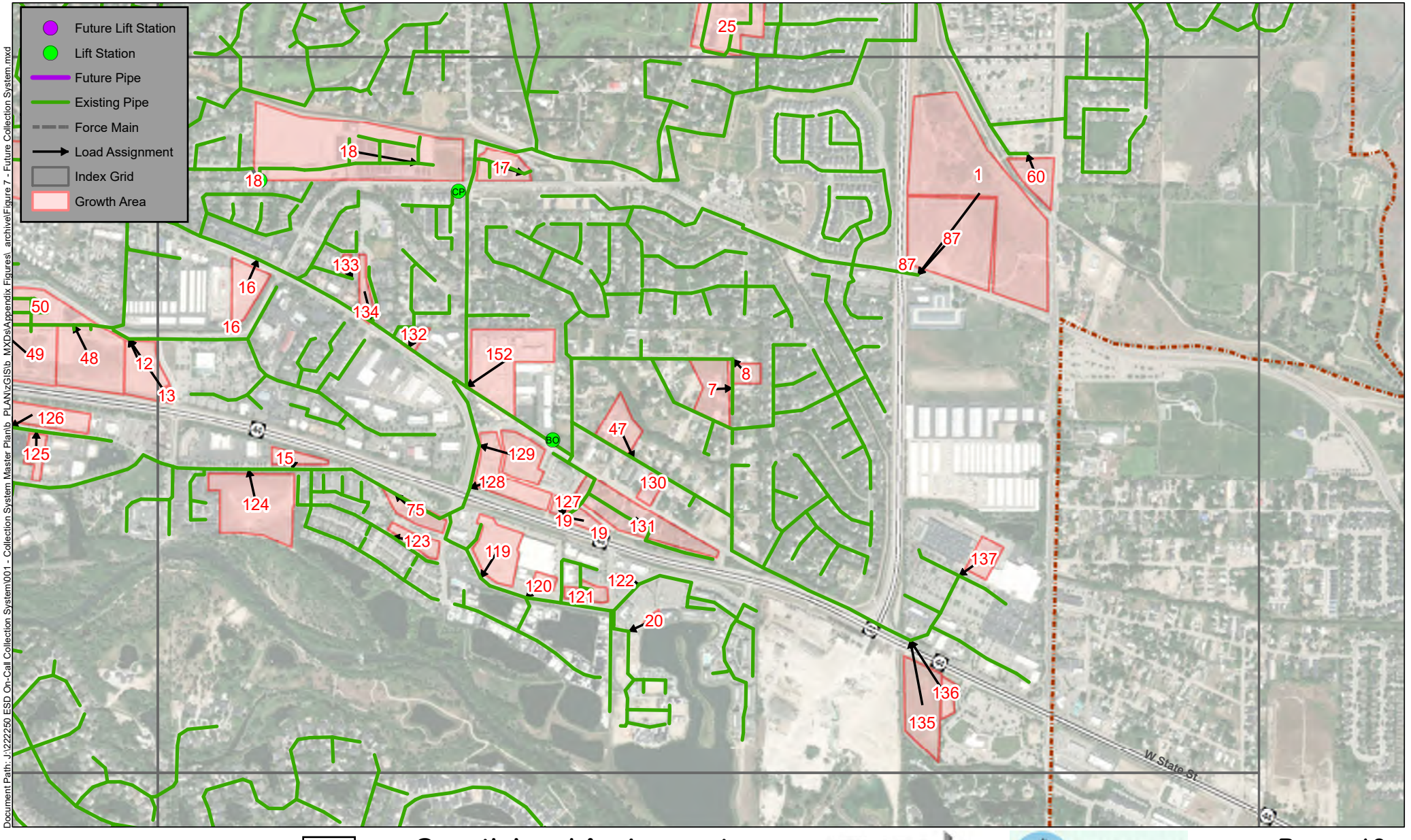

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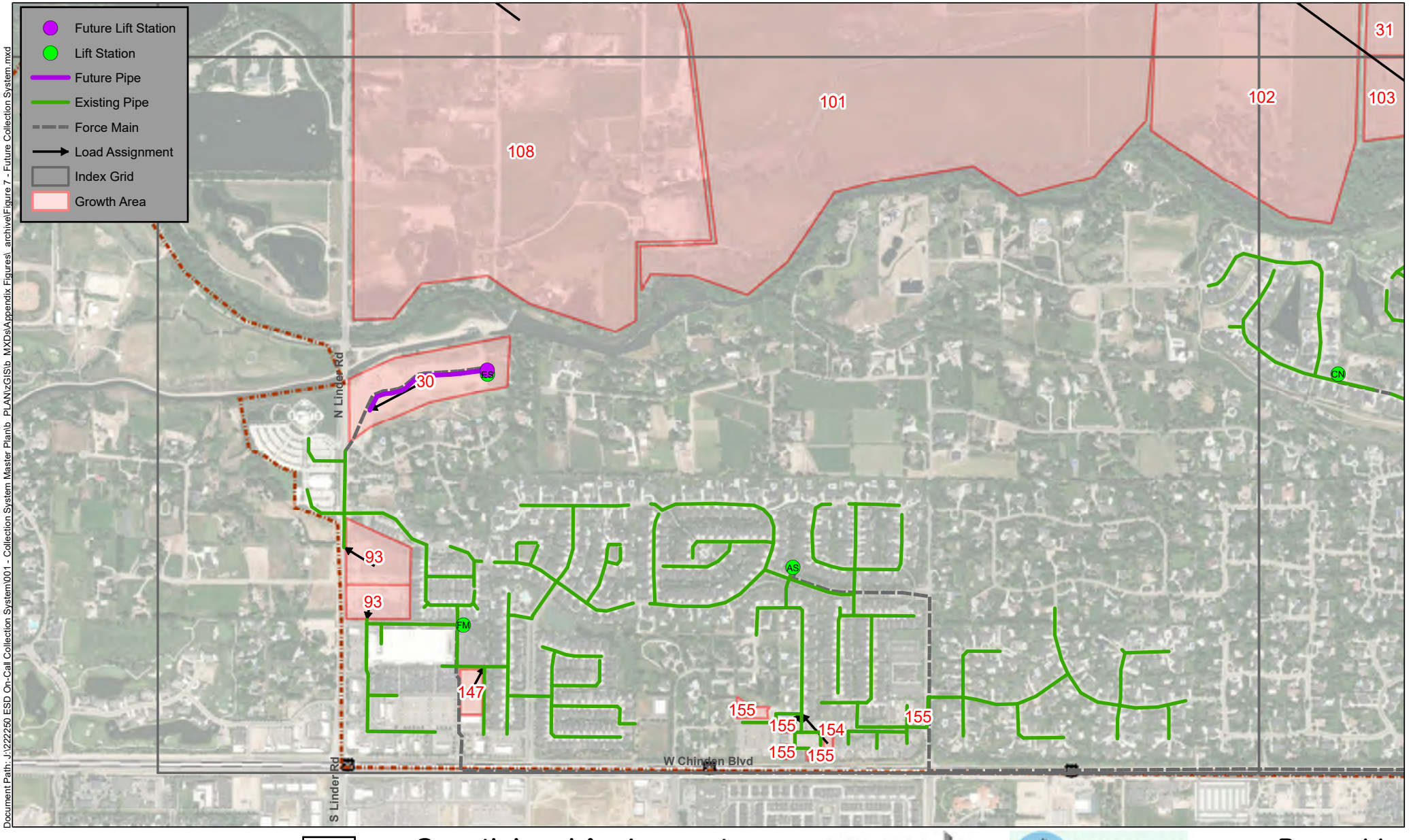

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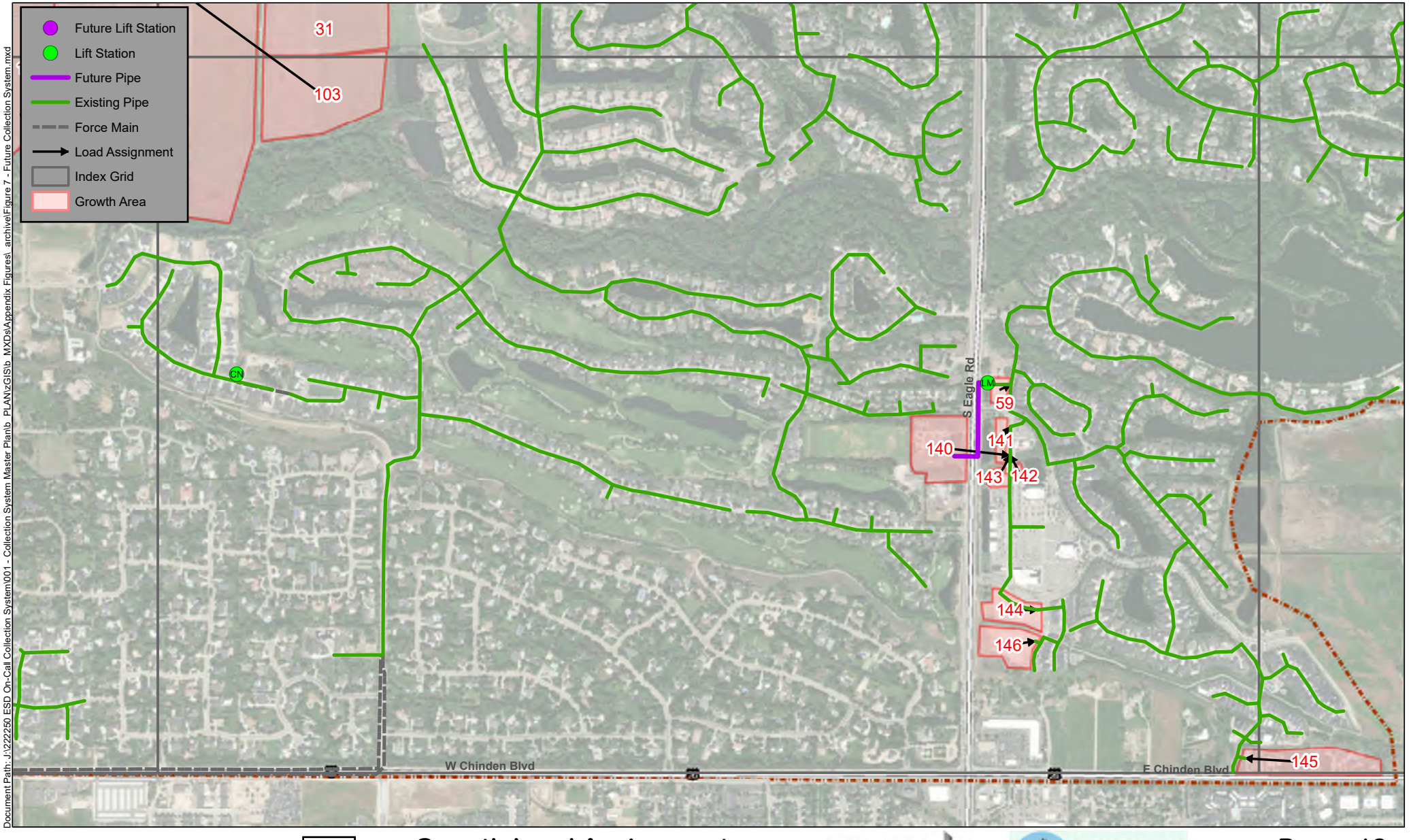

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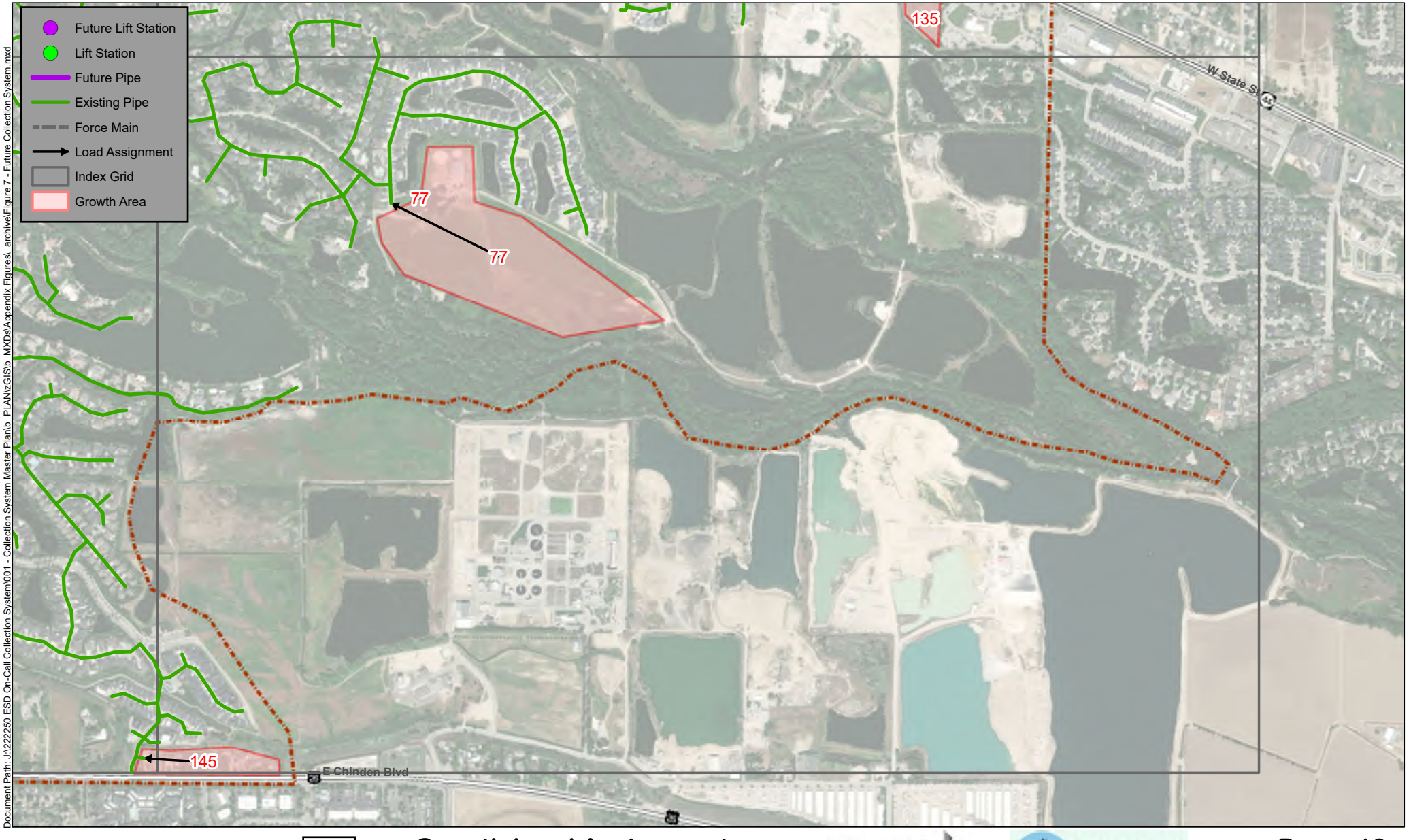

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Growth Load Assignments

Collection System Master Plan

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EAGLE SEWER DISTRICT

Appendix C

Supplemental Flow Analysis

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Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
1/1/2015	1.710	1.700
1/2/2015	1.740	1.740
1/3/2015	1.750	1.740
1/4/2015	1.810	1.810
1/5/2015	1.780	1.920
1/6/2015	1.730	1.710
1/7/2015	1.730	1.740
1/8/2015	1.720	1.750
1/9/2015	1.690	1.720
1/10/2015	1.740	1.720
1/11/2015	1.780	1.800
1/12/2015	1.750	1.830
1/13/2015	1.710	1.720
1/14/2015	1.700	1.700
1/15/2015	1.700	1.700
1/16/2015	1.750	1.750
1/17/2015	1.710	1.730
1/18/2015	1.710	1.740
1/19/2015	1.780	1.810
1/20/2015	1.720	1.760
1/21/2015	1.690	1.690
1/22/2015	1.690	1.700
1/23/2015	1.650	1.670
1/24/2015	1.690	1.670
1/25/2015	1.750	1.750
1/26/2015	1.710	1.770
1/27/2015	1.680	1.670
1/28/2015	1.690	1.700
1/29/2015	1.690	1.710
1/30/2015	1.630	1.660
1/31/2015	1.660	1.640
2/1/2015	1.750	1.750
2/2/2015	1.740	1.810
2/3/2015	1.740	1.800
2/4/2015	1.710	1.770
2/5/2015	1.680	1.690
2/6/2015	1.650	1.660
2/7/2015	1.700	1.720
2/8/2015	1.780	1.770
2/9/2015	1.780	1.930
2/10/2015	1.710	1.710
2/11/2015	1.700	1.690
2/12/2015	1.710	1.720
2/13/2015	1.680	1.710
2/14/2015	1.710	1.690
2/15/2015	1.700	1.730
2/16/2015	1.780	1.770
2/17/2015	1.690	1.750
2/18/2015	1.680	1.660
2/19/2015	1.670	1.650
2/20/2015	1.650	1.660
2/21/2015	1.740	1.710
2/22/2015	1.760	1.760
2/23/2015	1.710	1.760
2/24/2015	1.670	1.650
2/25/2015	1.690	1.670
2/26/2015	1.640	1.660
2/27/2015	1.610	1.620
2/28/2015	1.660	1.650
3/1/2015	1.720	1.710
3/2/2015	1.680	1.740
3/3/2015	1.670	1.640
3/4/2015	1.660	1.650
3/5/2015	1.640	1.650
3/6/2015	1.610	1.630
3/7/2015	1.660	1.640
3/8/2015	1.710	1.720
3/9/2015	1.680	1.740
3/10/2015	1.670	1.620
3/11/2015	1.620	1.610
3/12/2015	1.620	1.630
3/13/2015	1.590	1.610
3/14/2015	1.650	1.650
3/15/2015	1.720	1.730
3/16/2015	1.670	1.730
3/17/2015	1.640	1.640
3/18/2015	1.630	1.630
3/19/2015	1.620	1.620
3/20/2015	1.620	1.620
3/21/2015	1.590	1.570
3/22/2015	1.580	1.580
3/23/2015	1.560	1.590
3/24/2015	1.580	1.610
3/25/2015	1.530	1.540
3/26/2015	1.510	1.510
3/27/2015	1.520	1.510
3/28/2015	1.570	1.550
3/29/2015	1.690	1.670
3/30/2015	1.710	1.660
3/31/2015	1.590	1.560
4/1/2015	1.620	1.620
4/2/2015	1.630	1.620
4/3/2015	1.600	1.620
4/4/2015	1.670	1.640
4/5/2015	1.740	1.800
4/6/2015	1.720	1.780
4/7/2015	1.650	1.650
4/8/2015	1.660	1.650
4/9/2015	1.660	1.660
4/10/2015	1.610	1.610

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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
4/11/2015	1.670	1.670
4/12/2015	1.740	1.740
4/13/2015	1.680	1.720
4/14/2015	1.630	1.610
4/15/2015	1.640	1.610
4/16/2015	1.650	1.650
4/17/2015	1.650	1.630
4/18/2015	1.640	1.620
4/19/2015	1.740	1.720
4/20/2015	1.690	1.750
4/21/2015	1.670	1.650
4/22/2015	1.670	1.660
4/23/2015	1.680	1.670
4/24/2015	1.680	1.690
4/25/2015	1.730	1.710
4/26/2015	1.780	1.770
4/27/2015	1.750	1.790
4/28/2015	1.690	1.690
4/29/2015	1.690	1.670
4/30/2015	1.690	1.680
5/1/2015	1.700	1.700
5/2/2015	1.760	1.720
5/3/2015	1.800	1.800
5/4/2015	1.780	1.830
5/5/2015	1.750	1.740
5/6/2015	1.750	1.710
5/7/2015	1.800	1.840
5/8/2015	1.780	1.820
5/9/2015	1.800	1.760
5/10/2015	1.850	1.860
5/11/2015	1.830	1.880
5/12/2015	1.830	1.870
5/13/2015	1.850	1.790
5/14/2015	1.810	1.880
5/15/2015	1.800	1.870
5/16/2015	1.810	1.810
5/17/2015	1.900	1.900
5/18/2015	1.860	1.930
5/19/2015	1.840	1.870
5/20/2015	1.900	1.900
5/21/2015	1.910	1.940
5/22/2015	1.880	1.920
5/23/2015	1.860	1.830
5/24/2015	1.840	1.830
5/25/2015	1.970	1.940
5/26/2015	2.020	2.060
5/27/2015	1.950	2.100
5/28/2015	1.950	1.940
5/29/2015	1.910	1.890
5/30/2015	1.900	1.880

Date	Influent (MGD)	Effluent (MGD)
5/31/2015	1.950	1.940
6/1/2015	1.870	1.950
6/2/2015	1.830	1.810
6/3/2015	1.810	1.790
6/4/2015	1.830	1.820
6/5/2015	1.780	1.820
6/6/2015	1.800	1.770
6/7/2015	1.830	1.820
6/8/2015	1.820	1.850
6/9/2015	1.800	1.810
6/10/2015	1.810	1.810
6/11/2015	1.820	1.830
6/12/2015	1.820	1.790
6/13/2015	1.780	1.760
6/14/2015	1.810	1.790
6/15/2015	1.820	1.850
6/16/2015	1.800	1.820
6/17/2015	1.800	1.820
6/18/2015	1.800	1.810
6/19/2015	1.790	1.790
6/20/2015	1.800	1.780
6/21/2015	1.840	1.840
6/22/2015	1.860	1.880
6/23/2015	1.840	1.840
6/24/2015	1.840	1.830
6/25/2015	1.840	1.830
6/26/2015	1.800	1.820
6/27/2015	1.820	1.800
6/28/2015	1.880	1.880
6/29/2015	1.920	1.970
6/30/2015	1.870	1.920
7/1/2015	1.900	1.900
7/2/2015	1.880	1.890
7/3/2015	1.840	1.840
7/4/2015	1.800	1.800
7/5/2015	1.880	1.870
7/6/2015	1.940	1.990
7/7/2015	1.900	1.930
7/8/2015	2.070	2.070
7/9/2015	1.960	2.100
7/10/2015	1.970	1.980
7/11/2015	1.950	1.930
7/12/2015	1.980	1.980
7/13/2015	1.980	2.020
7/14/2015	1.940	1.970
7/15/2015	1.940	1.930
7/16/2015	1.940	1.920
7/17/2015	1.900	1.910
7/18/2015	1.920	1.900
7/19/2015	1.950	1.930

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Date	Influent (MGD)	Effluent (MGD)
7/20/2015	1.950	1.990
7/21/2015	1.890	1.910
7/22/2015	1.920	1.920
7/23/2015	1.940	1.950
7/24/2015	1.880	1.890
7/25/2015	1.840	1.870
7/26/2015	1.940	1.920
7/27/2015	1.950	1.980
7/28/2015	1.880	1.880
7/29/2015	1.890	1.870
7/30/2015	1.880	1.880
7/31/2015	1.870	1.880
8/1/2015	1.860	1.850
8/2/2015	1.900	1.910
8/3/2015	1.960	2.010
8/4/2015	1.930	1.980
8/5/2015	1.900	1.900
8/6/2015	1.910	1.900
8/7/2015	1.880	1.880
8/8/2015	1.890	1.860
8/9/2015	1.950	1.930
8/10/2015	1.990	2.050
8/11/2015	1.950	1.990
8/12/2015	1.930	1.910
8/13/2015	1.920	1.900
8/14/2015	1.900	1.910
8/15/2015	1.880	1.860
8/16/2015	1.920	1.890
8/17/2015	1.940	1.970
8/18/2015	1.940	1.940
8/19/2015	1.950	1.950
8/20/2015	1.920	1.930
8/21/2015	1.900	1.910
8/22/2015	1.970	2.070
8/23/2015	2.070	2.230
8/24/2015	2.020	2.140
8/25/2015	1.930	2.010
8/26/2015	1.920	1.950
8/27/2015	1.920	1.420
8/28/2015	1.890	1.840
8/29/2015	1.890	1.910
8/30/2015	1.980	1.970
8/31/2015	1.980	2.020
9/1/2015	1.930	1.950
9/2/2015	1.920	1.930
9/3/2015	1.920	1.940
9/4/2015	1.880	1.900
9/5/2015	1.850	1.840
9/6/2015	1.840	1.830
9/7/2015	2.000	1.950

Date	Influent (MGD)	Effluent (MGD)
9/8/2015	1.940	1.990
9/9/2015	1.930	1.900
9/10/2015	1.910	1.910
9/11/2015	1.850	1.870
9/12/2015	1.870	1.850
9/13/2015	1.940	1.920
9/14/2015	1.920	1.950
9/15/2015	1.890	1.890
9/16/2015	1.900	1.960
9/17/2015	1.930	1.940
9/18/2015	1.900	1.890
9/19/2015	1.910	1.940
9/20/2015	1.970	1.950
9/21/2015	1.940	1.970
9/22/2015	1.900	1.910
9/23/2015	1.890	1.890
9/24/2015	1.880	1.900
9/25/2015	1.850	1.870
9/26/2015	1.860	1.850
9/27/2015	1.930	1.930
9/28/2015	1.920	1.960
9/29/2015	1.870	1.870
9/30/2015	1.850	1.860
10/1/2015	1.850	1.850
10/2/2015	1.820	1.820
10/3/2015	1.820	1.810
10/4/2015	1.930	1.890
10/5/2015	1.920	1.990
10/6/2015	1.880	1.860
10/7/2015	1.870	1.870
10/8/2015	1.880	1.890
10/9/2015	1.850	1.870
10/10/2015	1.870	1.850
10/11/2015	1.920	1.920
10/12/2015	1.920	1.920
10/13/2015	1.890	1.880
10/14/2015	1.880	1.880
10/15/2015	1.870	1.870
10/16/2015	1.840	1.860
10/17/2015	1.880	1.860
10/18/2015	1.940	1.960
10/19/2015	1.930	2.010
10/20/2015	1.880	1.890
10/21/2015	1.850	1.850
10/22/2015	1.840	1.840
10/23/2015	1.810	1.800
10/24/2015	1.830	1.800
10/25/2015	1.890	1.860
10/26/2015	1.880	1.920
10/27/2015	1.830	1.780

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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
10/28/2015	1.820	1.870
10/29/2015	1.810	1.820
10/30/2015	1.790	1.800
10/31/2015	1.800	1.790
11/1/2015	1.880	1.850
11/2/2015	1.830	1.870
11/3/2015	1.790	1.780
11/4/2015	1.790	1.770
11/5/2015	1.770	1.770
11/6/2015	1.740	1.750
11/7/2015	1.810	1.770
11/8/2015	1.860	1.830
11/9/2015	1.840	1.930
11/10/2015	1.750	1.780
11/11/2015	1.780	1.750
11/12/2015	1.770	1.760
11/13/2015	1.730	1.750
11/14/2015	1.770	1.730
11/15/2015	1.820	1.800
11/16/2015	1.810	1.830
11/17/2015	1.760	1.780
11/18/2015	1.760	1.750
11/19/2015	1.740	1.760
11/20/2015	1.730	1.740
11/21/2015	1.770	1.730
11/22/2015	1.790	1.780
11/23/2015	1.780	1.790
11/24/2015	1.770	1.770
11/25/2015	1.890	1.970
11/26/2015	1.870	1.920
11/27/2015	1.740	1.730
11/28/2015	1.810	1.790
11/29/2015	1.890	1.870
11/30/2015	1.820	1.860
12/1/2015	1.790	1.780
12/2/2015	1.780	1.780
12/3/2015	1.790	1.790
12/4/2015	1.750	1.800
12/5/2015	1.770	1.760
12/6/2015	1.840	1.840
12/7/2015	1.920	2.060
12/8/2015	1.770	1.840
12/9/2015	1.780	1.790
12/10/2015	1.840	1.890
12/11/2015	1.760	1.810
12/12/2015	1.830	1.820
12/13/2015	1.960	1.980
12/14/2015	1.880	1.970
12/15/2015	1.820	1.810
12/16/2015	1.820	1.840

Date	Influent (MGD)	Effluent (MGD)
12/17/2015	1.820	1.820
12/18/2015	1.890	1.920
12/19/2015	1.930	1.970
12/20/2015	1.870	1.900
12/21/2015	1.990	2.020
12/22/2015	1.880	1.940
12/23/2015	1.900	1.890
12/24/2015	1.940	1.980
12/25/2015	1.810	1.840
12/26/2015	1.860	1.840
12/27/2015	1.860	1.860
12/28/2015	1.870	1.880
12/29/2015	1.850	1.840
12/30/2015	1.850	1.820
12/31/2015	1.860	1.830
1/1/2016	1.810	1.800
1/2/2016	1.880	1.850
1/3/2016	1.930	1.930
1/4/2016	1.890	1.950
1/5/2016	1.840	1.870
1/6/2016	1.850	1.890
1/7/2016	1.820	1.840
1/8/2016	1.790	1.810
1/9/2016	1.840	1.820
1/10/2016	1.880	1.880
1/11/2016	1.850	1.890
1/12/2016	1.790	1.790
1/13/2016	1.790	1.780
1/14/2016	1.800	1.820
1/15/2016	1.750	1.790
1/16/2016	1.790	1.780
1/17/2016	1.770	1.800
1/18/2016	1.870	1.900
1/19/2016	1.790	1.850
1/20/2016	1.790	1.800
1/21/2016	1.760	1.770
1/22/2016	1.730	1.740
1/23/2016	1.790	1.780
1/24/2016	1.860	1.870
1/25/2016	1.800	1.810
1/26/2016	1.760	1.750
1/27/2016	1.750	1.760
1/28/2016	1.730	1.750
1/29/2016	1.700	1.750
1/30/2016	1.760	1.750
1/31/2016	1.810	1.780
2/1/2016	1.800	1.830
2/2/2016	1.770	1.760
2/3/2016	1.750	1.750
2/4/2016	1.740	1.760

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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
2/5/2016	1.720	1.750
2/6/2016	1.780	1.760
2/7/2016	1.840	1.850
2/8/2016	1.810	1.840
2/9/2016	1.740	1.750
2/10/2016	1.750	1.730
2/11/2016	1.740	1.750
2/12/2016	1.720	1.740
2/13/2016	1.770	1.770
2/14/2016	1.750	1.800
2/15/2016	1.820	1.820
2/16/2016	1.730	1.790
2/17/2016	1.740	1.730
2/18/2016	1.730	1.770
2/19/2016	1.690	1.710
2/20/2016	1.780	1.750
2/21/2016	1.830	1.830
2/22/2016	1.780	1.820
2/23/2016	1.740	1.740
2/24/2016	1.730	1.720
2/25/2016	1.740	1.740
2/26/2016	1.700	1.740
2/27/2016	1.770	1.770
2/28/2016	1.830	1.830
2/29/2016	1.770	1.830
3/1/2016	1.720	1.730
3/2/2016	1.730	1.740
3/3/2016	1.710	1.720
3/4/2016	1.710	1.720
3/5/2016	1.750	1.760
3/6/2016	1.810	1.840
3/7/2016	1.770	1.820
3/8/2016	1.730	1.730
3/9/2016	1.730	1.720
3/10/2016	1.710	1.710
3/11/2016	1.680	1.720
3/12/2016	1.740	1.740
3/13/2016	1.790	1.820
3/14/2016	1.800	1.850
3/15/2016	1.730	1.760
3/16/2016	1.740	1.700
3/17/2016	1.750	1.780
3/18/2016	1.710	1.720
3/19/2016	1.720	1.700
3/20/2016	1.710	1.730
3/21/2016	1.810	1.870
3/22/2016	1.660	1.740
3/23/2016	1.660	1.600
3/24/2016	1.650	1.660
3/25/2016	1.670	1.640
3/26/2016	1.780	1.740
3/27/2016	1.810	1.830
3/28/2016	1.800	1.810
3/29/2016	1.730	1.730
3/30/2016	1.740	1.740
3/31/2016	1.740	1.760
4/1/2016	1.720	1.740
4/2/2016	1.760	1.760
4/3/2016	1.800	1.810
4/4/2016	1.770	1.810
4/5/2016	1.740	1.720
4/6/2016	1.730	1.730
4/7/2016	1.740	1.730
4/8/2016	1.740	1.780
4/9/2016	1.800	1.790
4/10/2016	1.850	1.860
4/11/2016	1.799	1.839
4/12/2016	1.779	1.768
4/13/2016	1.799	1.807
4/14/2016	1.796	1.806
4/15/2016	1.750	1.510
4/16/2016	1.825	1.876
4/17/2016	1.888	1.900
4/18/2016	1.886	1.879
4/19/2016	1.824	1.826
4/20/2016	1.815	1.827
4/21/2016	1.800	1.815
4/22/2016	1.772	1.766
4/23/2016	1.862	1.937
4/24/2016	1.895	1.880
4/25/2016	1.867	1.847
4/26/2016	1.824	1.820
4/27/2016	1.820	1.833
4/28/2016	1.822	1.829
4/29/2016	1.776	1.783
4/30/2016	1.908	1.874
5/1/2016	2.063	2.092
5/2/2016	1.941	2.000
5/3/2016	1.845	1.804
5/4/2016	1.843	1.852
5/5/2016	1.846	1.860
5/6/2016	1.833	1.866
5/7/2016	1.890	1.921
5/8/2016	1.945	1.982
5/9/2016	1.992	1.945
5/10/2016	1.914	1.913
5/11/2016	1.873	1.855
5/12/2016	1.941	1.963
5/13/2016	1.867	1.874
5/14/2016	1.865	1.875

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Date	Influent (MGD)	Effluent (MGD)
5/15/2016	1.957	1.974
5/16/2016	1.979	2.000
5/17/2016	1.915	1.915
5/18/2016	1.883	1.898
5/19/2016	1.920	1.857
5/20/2016	1.878	1.992
5/21/2016	1.929	1.896
5/22/2016	2.022	2.014
5/23/2016	1.986	2.057
5/24/2016	1.942	1.831
5/25/2016	1.927	1.921
5/26/2016	1.946	2.579
5/27/2016	1.921	2.040
5/28/2016	1.917	1.786
5/29/2016	1.876	1.862
5/30/2016	2.039	2.019
5/31/2016	2.003	2.116
6/1/2016	1.988	1.592
6/2/2016	1.962	2.229
6/3/2016	1.945	1.947
6/4/2016	1.953	1.959
6/5/2016	2.013	2.058
6/6/2016	1.995	2.065
6/7/2016	1.958	1.943
6/8/2016	1.971	1.993
6/9/2016	1.955	1.950
6/10/2016	1.922	1.913
6/11/2016	1.938	1.894
6/12/2016	1.953	1.956
6/13/2016	1.985	2.006
6/14/2016	1.972	1.967
6/15/2016	1.972	1.974
6/16/2016	1.977	2.000
6/17/2016	1.947	1.961
6/18/2016	1.946	1.945
6/19/2016	1.983	1.994
6/20/2016	2.009	2.058
6/21/2016	1.967	1.958
6/22/2016	1.965	1.754
6/23/2016	1.971	1.899
6/24/2016	1.927	1.939
6/25/2016	1.951	1.921
6/26/2016	1.993	1.998
6/27/2016	2.000	2.057
6/28/2016	1.964	1.965
6/29/2016	1.985	2.004
6/30/2016	1.985	2.017
7/1/2016	1.925	1.937
7/2/2016	1.883	1.854
7/3/2016	1.813	1.820

Date	Influent (MGD)	Effluent (MGD)
7/4/2016	1.851	1.831
7/5/2016	1.936	1.907
7/6/2016	1.955	1.945
7/7/2016	1.934	1.927
7/8/2016	1.954	1.954
7/9/2016	1.972	1.966
7/10/2016	2.140	2.239
7/11/2016	2.048	2.077
7/12/2016	1.983	1.953
7/13/2016	1.981	1.982
7/14/2016	1.982	2.001
7/15/2016	1.970	1.970
7/16/2016	1.992	1.967
7/17/2016	2.012	2.024
7/18/2016	2.008	2.036
7/19/2016	1.967	1.960
7/20/2016	1.976	1.991
7/21/2016	1.958	2.018
7/22/2016	1.923	1.963
7/23/2016	1.933	1.949
7/24/2016	2.023	2.005
7/25/2016	2.014	2.131
7/26/2016	1.947	2.009
7/27/2016	1.971	2.030
7/28/2016	1.967	2.033
7/29/2016	1.954	1.635
7/30/2016	1.964	1.924
7/31/2016	1.988	2.910
8/1/2016	2.014	2.176
8/2/2016	1.986	1.962
8/3/2016	1.988	2.165
8/4/2016	1.989	2.163
8/5/2016	1.941	2.033
8/6/2016	1.966	2.006
8/7/2016	2.029	1.984
8/8/2016	2.092	2.172
8/9/2016	2.017	2.126
8/10/2016	2.010	2.046
8/11/2016	2.011	2.080
8/12/2016	1.996	2.086
8/13/2016	2.010	2.035
8/14/2016	2.063	2.043
8/15/2016	2.078	2.200
8/16/2016	2.005	2.113
8/17/2016	2.013	2.020
8/18/2016	2.025	2.138
8/19/2016	2.007	2.108
8/20/2016	2.014	1.969
8/21/2016	2.111	2.070
8/22/2016	2.059	2.186

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
8/23/2016	2.038	2.085
8/24/2016	2.030	2.102
8/25/2016	2.051	2.145
8/26/2016	2.000	2.018
8/27/2016	2.035	1.986
8/28/2016	2.097	2.088
8/29/2016	2.081	2.115
8/30/2016	2.023	2.021
8/31/2016	2.030	2.042
9/1/2016	2.043	2.013
9/2/2016	1.967	2.017
9/3/2016	1.948	1.949
9/4/2016	1.912	1.917
9/5/2016	2.140	2.006
9/6/2016	2.051	2.086
9/7/2016	2.014	2.303
9/8/2016	2.023	2.083
9/9/2016	1.994	2.019
9/10/2016	2.017	1.997
9/11/2016	2.055	2.021
9/12/2016	2.041	2.067
9/13/2016	1.983	2.032
9/14/2016	1.992	1.993
9/15/2016	2.019	2.003
9/16/2016	1.972	2.011
9/17/2016	2.007	1.980
9/18/2016	2.045	2.038
9/19/2016	2.030	2.087
9/20/2016	1.986	2.028
9/21/2016	2.005	2.001
9/22/2016	2.046	2.004
9/23/2016	2.005	2.026
9/24/2016	2.035	1.999
9/25/2016	2.087	2.046
9/26/2016	2.067	2.116
9/27/2016	2.031	2.072
9/28/2016	2.038	2.042
9/29/2016	2.028	2.038
9/30/2016	1.999	2.024
10/1/2016	2.027	1.987
10/2/2016	2.088	2.021
10/3/2016	2.050	2.069
10/4/2016	2.010	2.010
10/5/2016	1.976	1.993
10/6/2016	1.950	1.955
10/7/2016	1.946	1.937
10/8/2016	1.979	1.945
10/9/2016	2.033	2.005
10/10/2016	2.008	1.963
10/11/2016	2.008	1.835

Date	Influent (MGD)	Effluent (MGD)
10/12/2016	1.988	1.942
10/13/2016	1.960	1.971
10/14/2016	1.975	1.988
10/15/2016	2.031	2.004
10/16/2016	2.093	2.060
10/17/2016	2.041	1.854
10/18/2016	2.021	2.006
10/19/2016	1.983	2.023
10/20/2016	1.951	1.942
10/21/2016	1.913	1.930
10/22/2016	1.932	1.918
10/23/2016	1.985	1.997
10/24/2016	1.932	1.990
10/25/2016	1.993	1.980
10/26/2016	1.903	2.059
10/27/2016	1.889	2.125
10/28/2016	1.859	1.934
10/29/2016	1.919	1.884
10/30/2016	1.994	1.972
10/31/2016	1.887	1.997
11/1/2016	1.916	1.913
11/2/2016	1.892	1.895
11/3/2016	1.904	1.896
11/4/2016	1.888	1.903
11/5/2016	1.938	1.903
11/6/2016	1.961	1.939
11/7/2016	1.952	1.983
11/8/2016	1.867	1.913
11/9/2016	1.825	1.859
11/10/2016	1.850	1.844
11/11/2016	1.862	1.880
11/12/2016	1.863	1.859
11/13/2016	1.943	1.913
11/14/2016	1.887	1.951
11/15/2016	1.846	1.892
11/16/2016	1.906	1.879
11/17/2016	1.886	1.875
11/18/2016	1.864	1.854
11/19/2016	1.901	1.858
11/20/2016	1.922	1.909
11/21/2016	1.925	1.946
11/22/2016	1.899	1.840
11/23/2016	1.916	1.955
11/24/2016	1.938	1.949
11/25/2016	1.824	1.859
11/26/2016	1.895	1.866
11/27/2016	1.984	1.930
11/28/2016	1.939	1.996
11/29/2016	1.865	1.904
11/30/2016	1.859	1.849

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
12/1/2016	1.879	1.866
12/2/2016	1.836	1.860
12/3/2016	1.904	1.861
12/4/2016	1.903	1.894
12/5/2016	1.916	1.932
12/6/2016	1.829	1.852
12/7/2016	1.876	1.847
12/8/2016	1.854	1.853
12/9/2016	1.884	1.902
12/10/2016	2.256	2.234
12/11/2016	2.060	2.127
12/12/2016	1.984	2.053
12/13/2016	1.920	1.951
12/14/2016	1.877	1.911
12/15/2016	1.945	1.949
12/16/2016	1.914	1.955
12/17/2016	1.992	1.931
12/18/2016	1.995	1.961
12/19/2016	1.978	1.987
12/20/2016	1.948	1.963
12/21/2016	1.999	1.982
12/22/2016	1.997	1.673
12/23/2016	1.978	1.979
12/24/2016	2.057	2.121
12/25/2016	1.894	1.931
12/26/2016	2.027	1.967
12/27/2016	1.938	1.984
12/28/2016	1.958	1.946
12/29/2016	1.962	1.959
12/30/2016	1.943	1.938
12/31/2016	2.007	1.969
1/1/2017	1.903	1.939
1/2/2017	2.064	2.019
1/3/2017	1.963	2.041
1/4/2017	1.867	1.928
1/5/2017	1.944	1.910
1/6/2017	1.971	1.953
1/7/2017	2.013	2.007
1/8/2017	2.095	2.142
1/9/2017	2.238	2.281
1/10/2017	3.782	2.562
1/11/2017	3.055	2.974
1/12/2017	2.065	2.844
1/13/2017	1.989	2.821
1/14/2017	2.038	2.822
1/15/2017	2.027	2.822
1/16/2017	2.110	1.971
1/17/2017	1.993	2.250
1/18/2017	1.976	2.296
1/19/2017	2.619	2.276

Date	Influent (MGD)	Effluent (MGD)
1/20/2017	2.404	2.722
1/21/2017	2.526	2.564
1/22/2017	2.343	1.839
1/23/2017	1.994	2.244
1/24/2017	1.997	1.994
1/25/2017	1.980	1.897
1/26/2017	1.951	2.039
1/27/2017	1.932	1.936
1/28/2017	1.968	1.953
1/29/2017	2.023	2.001
1/30/2017	1.978	1.985
1/31/2017	1.940	1.927
2/1/2017	1.917	1.933
2/2/2017	1.915	2.453
2/3/2017	1.952	1.897
2/4/2017	2.378	2.366
2/5/2017	2.770	2.572
2/6/2017	2.479	2.873
2/7/2017	2.258	2.325
2/8/2017	2.473	2.438
2/9/2017	2.342	2.661
2/10/2017	2.062	2.345
2/11/2017	2.095	2.163
2/12/2017	2.114	2.078
2/13/2017	2.046	2.012
2/14/2017	1.986	1.935
2/15/2017	1.988	2.334
2/16/2017	1.941	1.246
2/17/2017	1.966	1.595
2/18/2017	2.009	2.006
2/19/2017	2.007	1.761
2/20/2017	2.052	1.953
2/21/2017	1.995	1.963
2/22/2017	1.999	1.988
2/23/2017	1.994	1.972
2/24/2017	1.997	2.001
2/25/2017	2.098	2.063
2/26/2017	2.103	2.100
2/27/2017	2.049	2.100
2/28/2017	2.018	2.042
3/1/2017	2.060	2.065
3/2/2017	2.042	2.070
3/3/2017	2.022	2.066
3/4/2017	2.089	2.122
3/5/2017	2.149	2.131
3/6/2017	2.110	2.168
3/7/2017	2.048	2.077
3/8/2017	2.086	2.113
3/9/2017	2.084	2.126
3/10/2017	2.090	2.137

Client: Eagle Sewer District
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
3/11/2017	2.161	2.162
3/12/2017	2.198	2.213
3/13/2017	2.151	2.194
3/14/2017	2.112	2.127
3/15/2017	2.123	2.162
3/16/2017	2.128	2.181
3/17/2017	2.071	2.112
3/18/2017	2.100	2.102
3/19/2017	2.197	2.244
3/20/2017	2.149	2.195
3/21/2017	2.106	2.139
3/22/2017	2.142	2.156
3/23/2017	2.127	1.992
3/24/2017	2.125	1.846
3/25/2017	2.143	2.119
3/26/2017	2.134	1.982
3/27/2017	2.071	2.138
3/28/2017	2.018	2.336
3/29/2017	2.046	2.401
3/30/2017	2.602	2.751
3/31/2017	2.221	2.447
4/1/2017	2.212	2.232
4/2/2017	2.321	2.325
4/3/2017	2.243	2.276
4/4/2017	2.194	2.205
4/5/2017	2.164	2.194
4/6/2017	2.150	2.160
4/7/2017	2.110	2.130
4/8/2017	2.170	2.140
4/9/2017	2.250	2.240
4/10/2017	2.188	2.217
4/11/2017	2.160	2.172
4/12/2017	2.160	2.180
4/13/2017	2.170	2.190
4/14/2017	2.215	2.248
4/15/2017	2.268	2.258
4/16/2017	2.272	2.308
4/17/2017	2.227	2.270
4/18/2017	2.209	2.284
4/19/2017	2.215	2.251
4/20/2017	2.154	2.244
4/21/2017	2.153	2.214
4/22/2017	2.174	2.166
4/23/2017	2.234	2.237
4/24/2017	2.259	2.314
4/25/2017	2.182	2.202
4/26/2017	2.227	2.245
4/27/2017	2.260	2.478
4/28/2017	2.196	2.338
4/29/2017	2.237	2.083

Date	Influent (MGD)	Effluent (MGD)
4/30/2017	2.283	2.231
5/1/2017	2.252	2.288
5/2/2017	2.190	2.228
5/3/2017	2.226	2.221
5/4/2017	2.182	2.211
5/5/2017	2.141	2.171
5/6/2017	2.190	2.150
5/7/2017	2.320	2.230
5/8/2017	2.275	2.299
5/9/2017	2.236	2.278
5/10/2017	2.240	2.263
5/11/2017	2.216	2.236
5/12/2017	2.171	2.192
5/13/2017	2.280	2.206
5/14/2017	2.310	2.269
5/15/2017	2.297	2.301
5/16/2017	2.400	2.194
5/17/2017	2.383	2.556
5/18/2017	2.375	2.391
5/19/2017	2.350	2.387
5/20/2017	2.364	2.379
5/21/2017	2.412	2.416
5/22/2017	2.391	2.463
5/23/2017	2.349	2.417
5/24/2017	2.307	2.303
5/25/2017	2.286	2.279
5/26/2017	2.270	2.296
5/27/2017	2.245	2.246
5/28/2017	2.215	2.236
5/29/2017	2.373	2.364
5/30/2017	2.355	2.435
5/31/2017	2.303	2.446
6/1/2017	2.320	2.499
6/2/2017	2.352	2.082
6/3/2017	2.436	2.219
6/4/2017	2.529	2.353
6/5/2017	2.505	2.390
6/6/2017	2.485	2.485
6/7/2017	2.448	2.547
6/8/2017	2.413	2.442
6/9/2017	2.440	2.472
6/10/2017	2.450	2.470
6/11/2017	2.565	2.550
6/12/2017	2.673	2.679
6/13/2017	2.564	2.704
6/14/2017	2.436	2.470
6/15/2017	2.350	2.380
6/16/2017	2.295	2.330
6/17/2017	2.287	2.285
6/18/2017	2.295	2.312

Client: Eagle Sewer District
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
6/19/2017	2.311	2.502
6/20/2017	2.247	2.515
6/21/2017	2.217	2.416
6/22/2017	2.203	2.344
6/23/2017	2.179	2.355
6/24/2017	2.186	2.188
6/25/2017	2.224	2.220
6/26/2017	2.235	2.268
6/27/2017	2.221	2.216
6/28/2017	2.212	2.245
6/29/2017	2.208	2.209
6/30/2017	2.173	2.197
7/1/2017	2.156	2.164
7/2/2017	2.113	2.145
7/3/2017	2.130	2.146
7/4/2017	2.121	2.139
7/5/2017	2.180	2.181
7/6/2017	2.178	2.205
7/7/2017	2.195	2.207
7/8/2017	2.192	2.194
7/9/2017	2.220	2.233
7/10/2017	2.172	2.240
7/11/2017	2.164	2.103
7/12/2017	2.154	2.156
7/13/2017	2.137	2.049
7/14/2017	2.108	2.228
7/15/2017	2.147	2.117
7/16/2017	2.164	2.147
7/17/2017	2.165	2.149
7/18/2017	2.123	2.150
7/19/2017	2.102	2.105
7/20/2017	2.112	2.099
7/21/2017	2.034	2.057
7/22/2017	2.030	2.018
7/23/2017	2.078	2.083
7/24/2017	2.095	2.126
7/25/2017	2.073	2.088
7/26/2017	2.049	2.066
7/27/2017	2.051	1.823
7/28/2017	2.035	2.255
7/29/2017	2.042	2.090
7/30/2017	2.082	2.080
7/31/2017	2.100	2.112
8/1/2017	2.062	2.081
8/2/2017	2.050	2.060
8/3/2017	2.077	2.070
8/4/2017	2.025	2.053
8/5/2017	2.030	2.011
8/6/2017	2.089	2.063
8/7/2017	2.088	1.908

Date	Influent (MGD)	Effluent (MGD)
8/8/2017	2.059	1.844
8/9/2017	2.065	1.731
8/10/2017	2.067	1.739
8/11/2017	2.054	1.758
8/12/2017	2.046	1.819
8/13/2017	2.085	2.029
8/14/2017	2.180	2.158
8/15/2017	2.073	2.096
8/16/2017	2.080	2.072
8/17/2017	2.083	2.093
8/18/2017	2.050	2.072
8/19/2017	2.050	2.031
8/20/2017	2.053	2.051
8/21/2017	2.030	2.031
8/22/2017	2.161	2.129
8/23/2017	2.084	2.134
8/24/2017	2.090	1.899
8/25/2017	2.034	2.034
8/26/2017	2.057	2.057
8/27/2017	2.163	2.163
8/28/2017	2.108	2.108
8/29/2017	2.097	2.097
8/30/2017	2.090	2.090
8/31/2017	2.127	2.127
9/1/2017	1.993	1.993
9/2/2017	1.980	1.980
9/3/2017	1.951	1.951
9/4/2017	2.123	2.123
9/5/2017	2.065	2.101
9/6/2017	2.053	3.255
9/7/2017	2.045	3.231
9/8/2017	2.005	3.235
9/9/2017	2.034	3.223
9/10/2017	2.087	3.116
9/11/2017	2.082	2.999
9/12/2017	2.024	2.530
9/13/2017	2.058	2.058
9/14/2017	2.007	2.007
9/15/2017	1.949	1.949
9/16/2017	2.022	2.022
9/17/2017	2.071	2.071
9/18/2017	2.076	2.076
9/19/2017	2.021	2.021
9/20/2017	2.030	2.030
9/21/2017	2.029	2.029
9/22/2017	2.005	2.005
9/23/2017	2.043	2.043
9/24/2017	2.145	2.145
9/25/2017	2.063	2.063
9/26/2017	2.009	2.009

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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
9/27/2017	1.977	1.977
9/28/2017	1.999	1.999
9/29/2017	1.984	1.984
9/30/2017	1.985	1.985
10/1/2017	2.104	2.104
10/2/2017	2.035	2.035
10/3/2017	1.979	1.979
10/4/2017	1.955	1.955
10/5/2017	1.950	1.950
10/6/2017	1.917	1.917
10/7/2017	1.921	1.921
10/8/2017	2.009	2.009
10/9/2017	2.027	2.027
10/10/2017	1.943	1.943
10/11/2017	1.951	1.951
10/12/2017	1.954	1.954
10/13/2017	1.924	1.924
10/14/2017	1.984	1.984
10/15/2017	2.016	2.016
10/16/2017	2.013	2.013
10/17/2017	1.959	1.959
10/18/2017	1.939	1.939
10/19/2017	1.940	1.940
10/20/2017	1.885	1.885
10/21/2017	1.921	1.921
10/22/2017	1.963	1.963
10/23/2017	1.924	1.924
10/24/2017	1.884	1.884
10/25/2017	1.879	2.087
10/26/2017	1.809	3.257
10/27/2017	1.846	3.244
10/28/2017	1.898	3.075
10/29/2017	1.939	3.061
10/30/2017	1.919	2.631
10/31/2017	1.883	2.381
11/1/2017	1.886	1.890
11/2/2017	1.846	1.846
11/3/2017	1.846	1.846
11/4/2017	1.892	1.892
11/5/2017	1.960	1.960
11/6/2017	1.904	0.000
11/7/2017	1.864	0.000
11/8/2017	1.859	0.000
11/9/2017	1.852	0.000
11/10/2017	1.834	1.477
11/11/2017	1.881	1.791
11/12/2017	1.926	1.791
11/13/2017	1.898	1.803
11/14/2017	1.846	1.809
11/15/2017	1.858	1.806

Date	Influent (MGD)	Effluent (MGD)
11/16/2017	1.874	1.807
11/17/2017	1.856	1.937
11/18/2017	1.881	1.950
11/19/2017	1.898	1.961
11/20/2017	1.984	1.971
11/21/2017	1.856	1.973
11/22/2017	1.930	1.978
11/23/2017	1.915	1.978
11/24/2017	1.831	1.980
11/25/2017	1.873	1.977
11/26/2017	1.906	1.881
11/27/2017	1.838	1.962
11/28/2017	1.839	1.905
11/29/2017	1.848	1.745
11/30/2017	1.848	1.677
12/1/2017	1.793	1.978
12/2/2017	1.835	1.728
12/3/2017	1.906	1.729
12/4/2017	1.876	1.654
12/5/2017	1.849	1.585
12/6/2017	1.833	1.994
12/7/2017	1.866	1.830
12/8/2017	1.804	1.804
12/9/2017	1.859	1.795
12/10/2017	1.910	1.794
12/11/2017	1.865	1.860
12/12/2017	1.823	1.934
12/13/2017	1.836	1.948
12/14/2017	1.839	1.943
12/15/2017	1.839	1.879
12/16/2017	1.920	1.827
12/17/2017	1.975	1.828
12/18/2017	1.918	1.829
12/19/2017	1.892	1.826
12/20/2017	1.919	1.910
12/21/2017	1.926	1.980
12/22/2017	1.935	1.993
12/23/2017	2.049	1.982
12/24/2017	2.067	1.979
12/25/2017	1.927	1.981
12/26/2017	1.979	2.383
12/27/2017	1.916	2.205
12/28/2017	1.913	1.918
12/29/2017	1.901	1.947
12/30/2017	1.922	1.921
12/31/2017	1.905	1.917
1/1/2018	1.899	1.901
1/2/2018	1.930	1.950
1/3/2018	1.896	1.917
1/4/2018	1.902	1.931

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Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
1/5/2018	1.868	1.906
1/6/2018	1.887	1.908
1/7/2018	1.946	1.943
1/8/2018	1.886	1.933
1/9/2018	1.871	1.931
1/10/2018	1.886	1.930
1/11/2018	1.850	1.891
1/12/2018	1.830	1.859
1/13/2018	1.879	1.866
1/14/2018	1.864	1.880
1/15/2018	1.934	1.937
1/16/2018	1.840	1.933
1/17/2018	1.822	1.844
1/18/2018	1.864	1.876
1/19/2018	1.866	1.942
1/20/2018	1.913	1.899
1/21/2018	1.975	1.957
1/22/2018	1.931	1.974
1/23/2018	1.869	1.913
1/24/2018	1.833	1.860
1/25/2018	1.868	1.860
1/26/2018	1.809	1.833
1/27/2018	1.843	1.828
1/28/2018	1.932	1.919
1/29/2018	1.898	1.939
1/30/2018	1.834	1.888
1/31/2018	1.832	1.792
2/1/2018	1.843	1.835
2/2/2018	1.774	1.836
2/3/2018	1.842	1.835
2/4/2018	1.870	1.880
2/5/2018	1.860	1.880
2/6/2018	1.829	1.837
2/7/2018	1.799	1.812
2/8/2018	1.794	1.798
2/9/2018	1.772	1.798
2/10/2018	1.880	1.825
2/11/2018	1.913	1.885
2/12/2018	1.848	1.875
2/13/2018	1.816	1.811
2/14/2018	1.813	1.840
2/15/2018	1.825	1.831
2/16/2018	1.789	1.799
2/17/2018	1.778	1.771
2/18/2018	1.818	1.797
2/19/2018	1.914	1.876
2/20/2018	1.843	1.865
2/21/2018	1.821	1.831
2/22/2018	1.827	1.848
2/23/2018	1.817	1.833

Date	Influent (MGD)	Effluent (MGD)
2/24/2018	1.824	1.834
2/25/2018	1.892	1.870
2/26/2018	1.876	1.916
2/27/2018	1.854	1.871
2/28/2018	1.832	1.859
3/1/2018	1.810	1.764
3/2/2018	1.799	1.800
3/3/2018	1.834	1.816
3/4/2018	1.918	1.880
3/5/2018	1.864	1.939
3/6/2018	1.835	1.846
3/7/2018	1.813	1.825
3/8/2018	1.791	1.881
3/9/2018	1.755	1.824
3/10/2018	1.854	1.868
3/11/2018	1.871	1.892
3/12/2018	1.740	1.875
3/13/2018	1.768	1.809
3/14/2018	1.868	1.903
3/15/2018	1.820	1.899
3/16/2018	1.795	1.529
3/17/2018	1.890	1.405
3/18/2018	1.932	1.832
3/19/2018	1.863	2.607
3/20/2018	1.819	1.971
3/21/2018	1.816	1.839
3/22/2018	1.816	1.902
3/23/2018	1.814	1.965
3/24/2018	1.827	1.854
3/25/2018	1.879	1.916
3/26/2018	1.801	1.844
3/27/2018	1.760	1.785
3/28/2018	1.760	1.780
3/29/2018	1.777	1.794
3/30/2018	1.804	1.817
3/31/2018	1.869	1.876
4/1/2018	1.932	1.940
4/2/2018	1.920	1.970
4/3/2018	1.873	1.875
4/4/2018	1.865	1.882
4/5/2018	1.882	1.902
4/6/2018	1.843	1.497
4/7/2018	1.964	1.909
4/8/2018	1.988	1.959
4/9/2018	2.030	2.030
4/10/2018	1.880	1.950
4/11/2018	1.870	1.890
4/12/2018	1.940	1.930
4/13/2018	1.930	1.930
4/14/2018	1.970	1.960

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
4/15/2018	2.040	2.030
4/16/2018	1.987	2.032
4/17/2018	1.956	1.961
4/18/2018	1.939	1.953
4/19/2018	1.903	1.923
4/20/2018	1.881	1.902
4/21/2018	1.923	1.916
4/22/2018	1.983	1.968
4/23/2018	1.950	1.978
4/24/2018	1.950	1.979
4/25/2018	1.909	1.951
4/26/2018	1.932	1.938
4/27/2018	1.906	1.939
4/28/2018	1.927	1.917
4/29/2018	1.927	1.953
4/30/2018	1.966	1.993
5/1/2018	1.934	1.938
5/2/2018	1.949	1.955
5/3/2018	1.930	1.950
5/4/2018	1.898	1.941
5/5/2018	1.943	1.933
5/6/2018	2.067	2.041
5/7/2018	2.013	1.874
5/8/2018	2.008	2.243
5/9/2018	1.974	2.040
5/10/2018	1.996	1.993
5/11/2018	1.906	1.915
5/12/2018	2.011	1.968
5/13/2018	2.038	2.057
5/14/2018	2.087	2.109
5/15/2018	2.032	2.080
5/16/2018	2.071	2.101
5/17/2018	2.058	2.084
5/18/2018	2.070	2.100
5/19/2018	2.080	2.100
5/20/2018	2.140	2.140
5/21/2018	2.138	2.177
5/22/2018	2.133	2.158
5/23/2018	2.130	2.150
5/24/2018	2.154	2.167
5/25/2018	2.150	2.190
5/26/2018	2.164	2.172
5/27/2018	2.202	2.206
5/28/2018	2.350	2.360
5/29/2018	2.332	2.369
5/30/2018	2.251	2.320
5/31/2018	2.230	2.255
6/1/2018	2.167	2.195
6/2/2018	2.169	2.178
6/3/2018	2.169	2.205

Date	Influent (MGD)	Effluent (MGD)
6/4/2018	2.171	2.013
6/5/2018	2.130	2.140
6/6/2018	2.122	2.146
6/7/2018	2.108	2.147
6/8/2018	2.085	2.135
6/9/2018	2.045	2.076
6/10/2018	2.091	2.067
6/11/2018	2.124	2.121
6/12/2018	2.077	2.100
6/13/2018	2.092	2.107
6/14/2018	2.048	2.080
6/15/2018	2.039	2.060
6/16/2018	2.048	2.060
6/17/2018	2.085	2.111
6/18/2018	2.130	2.150
6/19/2018	2.120	2.320
6/20/2018	2.070	2.130
6/21/2018	2.030	2.030
6/22/2018	2.030	2.030
6/23/2018	2.000	2.000
6/24/2018	2.070	2.070
6/25/2018	2.080	2.080
6/26/2018	2.040	2.040
6/27/2018	2.050	2.050
6/28/2018	2.022	2.022
6/29/2018	2.020	1.498
6/30/2018	2.011	2.006
7/1/2018	2.026	2.027
7/2/2018	2.100	2.090
7/3/2018	2.080	2.070
7/4/2018	2.048	2.065
7/5/2018	2.040	2.045
7/6/2018	2.075	2.088
7/7/2018	2.122	2.122
7/8/2018	2.120	2.110
7/9/2018	2.160	2.200
7/10/2018	2.090	2.113
7/11/2018	2.079	2.149
7/12/2018	2.100	2.110
7/13/2018	2.124	2.149
7/14/2018	2.108	2.118
7/15/2018	2.110	2.130
7/16/2018	2.130	2.163
7/17/2018	2.130	2.150
7/18/2018	2.130	2.150
7/19/2018	2.123	2.143
7/20/2018	2.096	2.122
7/21/2018	2.064	2.068
7/22/2018	2.114	2.096
7/23/2018	2.190	2.200

Client: Eagle Sewer District
Project: Collection System Master Plan
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
7/24/2018	2.110	2.160
7/25/2018	2.130	2.150
7/26/2018	2.130	2.150
7/27/2018	2.080	2.100
7/28/2018	2.080	2.080
7/29/2018	2.110	2.110
7/30/2018	2.150	2.160
7/31/2018	2.130	2.150
8/1/2018	2.150	1.900
8/2/2018	2.120	2.110
8/3/2018	2.110	2.120
8/4/2018	2.110	2.120
8/5/2018	2.100	2.100
8/6/2018	2.100	2.160
8/7/2018	2.150	2.180
8/8/2018	2.150	2.380
8/9/2018	2.132	2.210
8/10/2018	2.140	2.140
8/11/2018	2.110	2.110
8/12/2018	2.120	2.170
8/13/2018	2.190	2.180
8/14/2018	2.180	2.190
8/15/2018	2.140	2.170
8/16/2018	2.121	2.154
8/17/2018	2.073	2.115
8/18/2018	2.102	2.098
8/19/2018	2.145	2.145
8/20/2018	2.160	2.170
8/21/2018	2.290	2.180
8/22/2018	2.150	2.190
8/23/2018	2.180	2.180
8/24/2018	2.193	2.231
8/25/2018	2.208	2.204
8/26/2018	2.300	2.260
8/27/2018	2.210	2.260
8/28/2018	2.210	2.260
8/29/2018	2.180	2.210
8/30/2018	2.200	2.220
8/31/2018	2.130	2.170
9/1/2018	2.090	2.090
9/2/2018	2.000	2.030
9/3/2018	2.240	2.170
9/4/2018	2.169	2.222
9/5/2018	2.170	2.187
9/6/2018	2.170	2.200
9/7/2018	2.049	2.139
9/8/2018	2.126	2.121
9/9/2018	2.200	2.180
9/10/2018	2.140	2.170
9/11/2018	2.140	2.134

Date	Influent (MGD)	Effluent (MGD)
9/12/2018	2.120	2.130
9/13/2018	2.148	2.132
9/14/2018	2.066	2.098
9/15/2018	2.090	2.079
9/16/2018	2.090	2.173
9/17/2018	2.150	2.193
9/18/2018	2.130	2.140
9/19/2018	2.110	2.130
9/20/2018	2.096	2.098
9/21/2018	2.054	2.081
9/22/2018	2.094	2.088
9/23/2018	2.160	2.140
9/24/2018	2.140	2.160
9/25/2018	2.100	2.110
9/26/2018	2.090	2.100
9/27/2018	2.090	2.100
9/28/2018	2.091	2.121
9/29/2018	2.087	2.091
9/30/2018	2.170	2.150
10/1/2018	2.110	1.920
10/2/2018	2.080	2.070
10/3/2018	2.050	2.080
10/4/2018	2.060	2.100
10/5/2018	2.070	2.090
10/6/2018	2.030	2.050
10/7/2018	2.160	2.120
10/8/2018	2.140	2.180
10/9/2018	2.390	2.640
10/10/2018	2.150	2.300
10/11/2018	2.155	2.169
10/12/2018	2.098	2.129
10/13/2018	2.129	2.111
10/14/2018	2.180	2.170
10/15/2018	2.180	2.140
10/16/2018	2.100	2.070
10/17/2018	2.040	2.060
10/18/2018	2.040	2.060
10/19/2018	1.973	2.016
10/20/2018	2.036	2.030
10/21/2018	2.090	2.090
10/22/2018	2.030	2.080
10/23/2018	1.990	2.030
10/24/2018	1.962	1.994
10/25/2018	1.940	1.970
10/26/2018	1.926	1.953
10/27/2018	1.961	1.957
10/28/2018	2.026	2.012
10/29/2018	2.004	2.027
10/30/2018	2.000	1.997
10/31/2018	1.940	1.970

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
11/1/2018	1.981	2.027
11/2/2018	1.955	1.978
11/3/2018	2.019	2.005
11/4/2018	2.047	2.043
11/5/2018	2.031	2.057
11/6/2018	1.961	1.992
11/7/2018	1.958	1.961
11/8/2018	1.966	1.954
11/9/2018	1.943	1.962
11/10/2018	1.988	1.958
11/11/2018	2.033	2.019
11/12/2018	2.009	2.037
11/13/2018	1.937	1.976
11/14/2018	1.935	1.947
11/15/2018	1.942	1.951
11/16/2018	1.918	1.952
11/17/2018	1.946	1.952
11/18/2018	1.977	1.985
11/19/2018	1.980	2.000
11/20/2018	1.980	1.980
11/21/2018	2.011	2.007
11/22/2018	2.022	2.052
11/23/2018	1.890	1.955
11/24/2018	2.010	2.008
11/25/2018	2.050	2.040
11/26/2018	1.995	2.035
11/27/2018	1.937	1.971
11/28/2018	1.930	1.970
11/29/2018	1.965	1.980
11/30/2018	1.947	2.019
12/1/2018	2.055	2.103
12/2/2018	2.060	2.120
12/3/2018	2.027	2.075
12/4/2018	2.000	2.002
12/5/2018	1.995	2.000
12/6/2018	1.970	1.970
12/7/2018	1.961	1.957
12/8/2018	1.984	1.978
12/9/2018	2.041	2.031
12/10/2018	1.990	2.050
12/11/2018	1.960	1.980
12/12/2018	1.990	2.020
12/13/2018	2.000	2.010
12/14/2018	1.940	1.970
12/15/2018	1.940	1.970
12/16/2018	2.040	2.040
12/17/2018	2.048	2.110
12/18/2018	2.022	2.008
12/19/2018	2.003	1.988
12/20/2018	2.070	2.110
12/21/2018	2.022	2.076
12/22/2018	2.068	2.061
12/23/2018	2.007	2.029
12/24/2018	2.080	2.111
12/25/2018	1.918	1.976
12/26/2018	2.040	2.030
12/27/2018	2.010	2.040
12/28/2018	2.004	2.017
12/29/2018	1.917	1.995
12/30/2018	1.930	1.959
12/31/2018	2.021	2.013
1/1/2019	1.950	1.976
1/2/2019	2.023	2.028
1/3/2019	1.978	1.993
1/4/2019	1.974	2.005
1/5/2019	1.991	1.997
1/6/2019	2.006	2.003
1/7/2019	2.012	2.058
1/8/2019	1.977	1.932
1/9/2019	1.952	2.041
1/10/2019	1.960	1.978
1/11/2019	1.906	1.967
1/12/2019	1.933	1.936
1/13/2019	1.992	1.983
1/14/2019	1.963	2.002
1/15/2019	1.890	1.915
1/16/2019	1.908	1.906
1/17/2019	1.904	1.945
1/18/2019	1.891	1.926
1/19/2019	1.974	2.034
1/20/2019	1.881	1.943
1/21/2019	2.010	1.980
1/22/2019	1.920	1.950
1/23/2019	1.910	1.920
1/24/2019	1.540	1.880
1/25/2019	1.910	1.900
1/26/2019	1.930	1.890
1/27/2019	2.000	1.940
1/28/2019	1.980	1.930
1/29/2019	1.937	1.937
1/30/2019	1.923	1.923
1/31/2019	1.940	1.913
2/1/2019	1.882	1.882
2/2/2019	1.933	1.933
2/3/2019	2.167	2.167
2/4/2019	2.040	2.040
2/5/2019	1.993	1.993
2/6/2019	1.980	1.980
2/7/2019	1.976	1.976
2/8/2019	1.939	1.939

Client: Eagle Sewer District
Project: Collection System Master Plan
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
2/9/2019	1.952	1.952
2/10/2019	2.016	2.016
2/11/2019	1.980	1.980
2/12/2019	1.946	1.946
2/13/2019	2.061	2.061
2/14/2019	2.139	2.139
2/15/2019	2.020	2.020
2/16/2019	1.990	1.990
2/17/2019	1.973	1.973
2/18/2019	2.079	2.079
2/19/2019	1.990	1.990
2/20/2019	1.960	1.960
2/21/2019	2.000	2.000
2/22/2019	1.960	1.960
2/23/2019	2.000	2.000
2/24/2019	2.080	2.080
2/25/2019	2.016	2.016
2/26/2019	1.993	1.993
2/27/2019	2.270	2.270
2/28/2019	2.099	2.099
3/1/2019	2.077	2.077
3/2/2019	2.093	2.093
3/3/2019	2.121	2.121
3/4/2019	2.090	2.090
3/5/2019	2.016	2.016
3/6/2019	2.015	2.015
3/7/2019	2.004	2.004
3/8/2019	1.997	1.997
3/9/2019	2.038	2.038
3/10/2019	2.130	2.130
3/11/2019	2.051	2.051
3/12/2019	2.015	2.015
3/13/2019	2.006	2.006
3/14/2019	2.004	2.004
3/15/2019	1.979	1.979
3/16/2019	2.025	2.025
3/17/2019	2.062	2.062
3/18/2019	2.001	2.001
3/19/2019	1.955	1.955
3/20/2019	1.970	1.970
3/21/2019	1.912	1.912
3/22/2019	1.879	1.879
3/23/2019	1.896	1.896
3/24/2019	1.985	1.985
3/25/2019	1.910	1.910
3/26/2019	1.851	1.851
3/27/2019	1.861	1.861
3/28/2019	1.949	2.000
3/29/2019	1.905	2.141
3/30/2019	1.973	2.108

Date	Influent (MGD)	Effluent (MGD)
3/31/2019	2.095	2.091
4/1/2019	2.024	2.086
4/2/2019	1.990	2.084
4/3/2019	1.982	2.078
4/4/2019	1.965	1.691
4/5/2019	1.927	1.868
4/6/2019	1.963	2.138
4/7/2019	2.033	2.092
4/8/2019	1.998	2.126
4/9/2019	2.007	2.202
4/10/2019	1.965	2.263
4/11/2019	1.962	2.263
4/12/2019	1.965	2.098
4/13/2019	1.990	2.015
4/14/2019	2.139	1.886
4/15/2019	2.050	2.020
4/16/2019	2.040	2.040
4/17/2019	2.040	2.040
4/18/2019	2.070	2.070
4/19/2019	2.050	2.050
4/20/2019	2.110	1.990
4/21/2019	2.160	2.110
4/22/2019	2.111	2.041
4/23/2019	2.097	2.460
4/24/2019	2.090	2.490
4/25/2019	2.090	2.541
4/26/2019	2.064	2.268
4/27/2019	2.111	1.975
4/28/2019	2.204	1.895
4/29/2019	2.170	1.620
4/30/2019	2.130	2.240
5/1/2019	2.130	2.170
5/2/2019	2.150	2.270
5/3/2019	2.150	2.420
5/4/2019	2.170	2.430
5/5/2019	2.250	2.300
5/6/2019	2.206	2.353
5/7/2019	2.179	2.392
5/8/2019	2.189	2.387
5/9/2019	2.200	2.400
5/10/2019	2.178	2.285
5/11/2019	2.170	2.172
5/12/2019	2.221	2.220
5/13/2019	2.241	2.182
5/14/2019	2.162	2.184
5/15/2019	2.150	2.090
5/16/2019	2.175	2.141
5/17/2019	2.199	2.115
5/18/2019	2.181	2.124
5/19/2019	2.296	2.242

Client: Eagle Sewer District
Project: Collection System Master Plan
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
5/20/2019	2.314	2.306
5/21/2019	2.403	2.397
5/22/2019	2.261	2.328
5/23/2019	2.242	2.289
5/24/2019	2.207	2.276
5/25/2019	2.214	2.283
5/26/2019	2.158	2.220
5/27/2019	2.337	2.265
5/28/2019	2.287	2.109
5/29/2019	2.224	1.905
5/30/2019	2.233	2.363
5/31/2019	2.222	2.462
6/1/2019	2.209	2.540
6/2/2019	2.243	2.244
6/3/2019	2.256	2.255
6/4/2019	2.203	2.055
6/5/2019	2.193	2.366
6/6/2019	2.191	2.292
6/7/2019	2.120	2.161
6/8/2019	2.181	2.184
6/9/2019	2.236	2.207
6/10/2019	2.235	2.255
6/11/2019	2.170	2.220
6/12/2019	2.176	2.206
6/13/2019	2.226	2.256
6/14/2019	2.152	2.228
6/15/2019	2.148	2.171
6/16/2019	2.188	2.171
6/17/2019	2.258	2.267
6/18/2019	2.212	2.289
6/19/2019	2.189	1.858
6/20/2019	2.157	2.394
6/21/2019	2.140	2.256
6/22/2019	2.158	2.188
6/23/2019	2.233	2.228
6/24/2019	2.248	2.251
6/25/2019	2.219	2.230
6/26/2019	2.210	2.158
6/27/2019	2.172	2.192
6/28/2019	2.148	2.204
6/29/2019	2.138	2.445
6/30/2019	2.222	2.334
7/1/2019	2.228	2.059
7/2/2019	2.190	2.128
7/3/2019	2.180	2.161
7/4/2019	2.228	2.059
7/5/2019	2.075	2.154
7/6/2019	2.158	2.354
7/7/2019	2.252	2.288
7/8/2019	2.261	2.049

Date	Influent (MGD)	Effluent (MGD)
7/9/2019	2.253	2.077
7/10/2019	2.190	2.200
7/11/2019	2.193	2.132
7/12/2019	2.156	2.125
7/13/2019	2.180	2.131
7/14/2019	2.234	2.169
7/15/2019	2.233	2.207
7/16/2019	2.210	2.210
7/17/2019	2.213	2.214
7/18/2019	2.249	2.215
7/19/2019	2.212	2.208
7/20/2019	2.213	2.210
7/21/2019	2.223	2.224
7/22/2019	2.215	2.253
7/23/2019	2.199	2.258
7/24/2019	2.197	2.243
7/25/2019	2.214	2.182
7/26/2019	2.161	2.204
7/27/2019	2.162	2.197
7/28/2019	2.212	2.201
7/29/2019	2.240	2.219
7/30/2019	2.224	2.231
7/31/2019	2.220	2.236
8/1/2019	2.217	2.248
8/2/2019	2.177	2.245
8/3/2019	2.176	2.225
8/4/2019	2.263	2.238
8/5/2019	2.337	2.277
8/6/2019	2.246	2.270
8/7/2019	2.281	2.284
8/8/2019	2.232	2.271
8/9/2019	2.230	2.269
8/10/2019	2.209	2.263
8/11/2019	2.279	2.255
8/12/2019	2.316	2.272
8/13/2019	2.280	2.272
8/14/2019	2.257	2.279
8/15/2019	2.210	2.259
8/16/2019	2.216	2.257
8/17/2019	2.226	2.242
8/18/2019	2.311	2.264
8/19/2019	2.320	2.290
8/20/2019	2.320	2.290
8/21/2019	2.280	1.840
8/22/2019	2.268	2.256
8/23/2019	2.231	2.265
8/24/2019	2.245	2.330
8/25/2019	2.340	2.360
8/26/2019	2.276	2.339
8/27/2019	2.236	2.372

Client: Eagle Sewer District
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
8/28/2019	2.219	2.341
8/29/2019	2.227	2.313
8/30/2019	2.193	2.292
8/31/2019	2.139	2.257
9/1/2019	2.085	2.187
9/2/2019	2.280	2.130
9/3/2019	2.223	2.231
9/4/2019	2.101	2.169
9/5/2019	2.170	2.168
9/6/2019	2.191	2.244
9/7/2019	2.213	2.247
9/8/2019	2.313	2.252
9/9/2019	2.280	2.264
9/10/2019	2.219	2.270
9/11/2019	2.196	2.243
9/12/2019	2.174	2.222
9/13/2019	2.131	2.204
9/14/2019	2.157	2.185
9/15/2019	2.256	2.181
9/16/2019	2.220	2.076
9/17/2019	2.259	1.918
9/18/2019	2.217	1.964
9/19/2019	2.207	2.270
9/20/2019	2.144	2.272
9/21/2019	2.171	2.273
9/22/2019	2.250	2.300
9/23/2019	2.214	2.333
9/24/2019	2.155	2.278
9/25/2019	2.168	2.317
9/26/2019	2.163	2.271
9/27/2019	2.133	2.228
9/28/2019	2.187	2.176
9/29/2019	2.314	2.186
9/30/2019	2.250	2.250
10/1/2019	2.190	2.240
10/2/2019	2.190	2.220
10/3/2019	2.180	2.210
10/4/2019	2.120	2.200
10/5/2019	2.150	2.150
10/6/2019	2.100	2.150
10/7/2019	2.220	2.190
10/8/2019	2.210	2.220
10/9/2019	2.222	2.212
10/10/2019	2.223	2.215
10/11/2019	2.165	2.216
10/12/2019	2.221	2.189
10/13/2019	2.288	2.189
10/14/2019	2.248	2.201
10/15/2019	2.139	2.239
10/16/2019	2.123	2.197

Date	Influent (MGD)	Effluent (MGD)
10/17/2019	2.110	2.158
10/18/2019	2.064	2.141
10/19/2019	2.096	2.116
10/20/2019	2.253	2.134
10/21/2019	2.149	2.190
10/22/2019	2.086	2.161
10/23/2019	2.092	2.129
10/24/2019	2.050	2.110
10/25/2019	2.025	2.072
10/26/2019	2.051	2.041
10/27/2019	2.120	2.040
10/28/2019	2.076	1.814
10/29/2019	2.073	1.812
10/30/2019	2.078	1.812
10/31/2019	2.020	1.812
11/1/2019	2.038	1.944
11/2/2019	2.084	1.955
11/3/2019	2.130	1.969
11/4/2019	2.086	1.999
11/5/2019	2.055	2.072
11/6/2019	2.087	2.134
11/7/2019	2.077	2.119
11/8/2019	2.042	2.131
11/9/2019	2.069	2.100
11/10/2019	2.135	2.095
11/11/2019	2.120	2.110
11/12/2019	2.050	2.110
11/13/2019	2.050	2.080
11/14/2019	2.040	2.080
11/15/2019	2.000	2.060
11/16/2019	2.040	2.040
11/17/2019	2.130	2.030
11/18/2019	2.080	2.050
11/19/2019	2.032	2.035
11/20/2019	2.026	2.027
11/21/2019	2.029	1.841
11/22/2019	2.038	2.074
11/23/2019	2.040	2.074
11/24/2019	2.039	2.091
11/25/2019	2.054	2.084
11/26/2019	2.026	2.079
11/27/2019	2.067	2.067
11/28/2019	2.115	2.071
11/29/2019	1.932	2.058
11/30/2019	2.042	2.040
12/1/2019	2.062	2.047
12/2/2019	2.000	2.070
12/3/2019	1.986	2.043
12/4/2019	2.005	2.043
12/5/2019	1.966	2.033

Client: Eagle Sewer District
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
12/6/2019	1.945	2.014
12/7/2019	1.941	1.985
12/8/2019	2.055	1.994
12/9/2019	2.002	2.018
12/10/2019	1.973	2.017
12/11/2019	1.973	2.001
12/12/2019	2.012	2.016
12/13/2019	1.930	2.012
12/14/2019	2.017	1.996
12/15/2019	2.059	2.015
12/16/2019	2.031	2.038
12/17/2019	1.996	2.035
12/18/2019	1.982	2.119
12/19/2019	1.979	2.148
12/20/2019	1.984	2.129
12/21/2019	2.038	2.158
12/22/2019	2.043	2.232
12/23/2019	2.040	2.140
12/24/2019	2.110	2.050
12/25/2019	1.950	2.110
12/26/2019	2.030	2.080
12/27/2019	2.020	2.030
12/28/2019	2.030	2.000
12/29/2019	1.970	2.010
12/30/2019	1.980	2.012
12/31/2019	1.980	2.001
1/1/2020	1.930	1.980
1/2/2020	1.982	1.993
1/3/2020	1.963	2.005
1/4/2020	1.975	1.976
1/5/2020	2.040	1.990
1/6/2020	2.017	2.028
1/7/2020	1.979	1.980
1/8/2020	1.980	2.054
1/9/2020	1.987	2.042
1/10/2020	1.953	2.023
1/11/2020	1.952	1.962
1/12/2020	2.032	1.996
1/13/2020	1.982	2.040
1/14/2020	1.946	2.030
1/15/2020	2.005	2.002
1/16/2020	1.969	1.995
1/17/2020	1.953	1.998
1/18/2020	1.962	1.955
1/19/2020	1.970	1.956
1/20/2020	2.038	1.988
1/21/2020	1.955	2.017
1/22/2020	1.946	1.977
1/23/2020	1.939	1.983
1/24/2020	1.948	2.008
1/25/2020	1.930	1.948
1/26/2020	2.164	1.999
1/27/2020	2.031	2.093
1/28/2020	2.002	2.074
1/29/2020	1.973	2.027
1/30/2020	2.030	2.084
1/31/2020	1.978	2.069
2/1/2020	1.993	2.007
2/2/2020	2.048	2.016
2/3/2020	2.050	2.050
2/4/2020	1.980	1.980
2/5/2020	1.920	2.020
2/6/2020	1.980	2.020
2/7/2020	1.950	2.010
2/8/2020	2.000	1.970
2/9/2020	2.080	1.990
2/10/2020	2.030	2.050
2/11/2020	1.990	2.035
2/12/2020	1.976	2.008
2/13/2020	1.989	1.991
2/14/2020	1.974	1.978
2/15/2020	1.974	1.956
2/16/2020	2.015	1.996
2/17/2020	2.066	2.004
2/18/2020	2.008	2.020
2/19/2020	1.982	2.001
2/20/2020	1.991	1.985
2/21/2020	1.937	1.974
2/22/2020	2.011	1.965
2/23/2020	2.054	1.975
2/24/2020	2.052	2.006
2/25/2020	1.996	2.004
2/26/2020	1.990	1.965
2/27/2020	1.970	1.960
2/28/2020	1.964	1.980
2/29/2020	2.049	1.951
3/1/2020	2.133	1.922
3/2/2020	2.050	1.860
3/3/2020	1.973	1.868
3/4/2020	1.977	1.893
3/5/2020	1.976	1.897
3/6/2020	1.945	2.039
3/7/2020	1.980	2.082
3/8/2020	2.115	2.086
3/9/2020	2.023	2.107
3/10/2020	1.999	2.088
3/11/2020	1.997	2.074
3/12/2020	1.985	2.063
3/13/2020	1.962	2.049
3/14/2020	2.051	2.235

Client: Eagle Sewer District
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
3/15/2020	2.051	2.229
3/16/2020	2.050	2.290
3/17/2020	2.130	2.270
3/18/2020	2.020	2.250
3/19/2020	2.040	2.200
3/20/2020	2.010	2.130
3/21/2020	2.040	2.060
3/22/2020	2.060	2.050
3/23/2020	2.037	1.915
3/24/2020	1.999	1.951
3/25/2020	2.000	1.980
3/26/2020	2.004	1.892
3/27/2020	1.987	1.912
3/28/2020	2.022	1.945
3/29/2020	2.031	1.976
3/30/2020	2.007	1.976
3/31/2020	2.045	2.040
4/1/2020	2.005	2.028
4/2/2020	2.020	2.017
4/3/2020	2.010	2.020
4/4/2020	2.019	2.011
4/5/2020	2.047	2.031
4/6/2020	2.030	2.040
4/7/2020	2.010	1.830
4/8/2020	1.980	1.850
4/9/2020	1.990	1.910
4/10/2020	1.981	1.989
4/11/2020	2.044	2.058
4/12/2020	2.050	2.200
4/13/2020	2.027	2.153
4/14/2020	2.001	2.077
4/15/2020	1.973	2.030
4/16/2020	2.010	2.010
4/17/2020	2.012	2.018
4/18/2020	2.064	2.026
4/19/2020	2.107	2.067
4/20/2020	2.075	2.067
4/21/2020	2.057	2.093
4/22/2020	2.055	2.078
4/23/2020	2.122	2.084
4/24/2020	2.087	2.115
4/25/2020	2.114	2.124
4/26/2020	2.164	2.152
4/27/2020	2.130	2.170
4/28/2020	2.120	2.160
4/29/2020	2.110	2.130
4/30/2020	2.150	2.160
5/1/2020	2.170	2.170
5/2/2020	2.180	2.270
5/3/2020	2.240	2.350

Date	Influent (MGD)	Effluent (MGD)
5/4/2020	2.220	2.350
5/5/2020	2.185	2.126
5/6/2020	2.186	2.286
5/7/2020	2.244	2.266
5/8/2020	2.188	2.247
5/9/2020	2.245	2.270
5/10/2020	2.234	2.276
5/11/2020	2.262	2.285
5/12/2020	2.215	2.277
5/13/2020	2.219	2.265
5/14/2020	2.290	2.282
5/15/2020	2.268	2.264
5/16/2020	2.236	2.255
5/17/2020	2.244	2.267
5/18/2020	2.264	2.215
5/19/2020	2.233	2.434
5/20/2020	2.430	2.480
5/21/2020	2.294	2.415
5/22/2020	2.270	2.413
5/23/2020	2.221	2.402
5/24/2020	2.178	2.402
5/25/2020	2.323	2.440
5/26/2020	2.300	1.538
5/27/2020	2.275	1.885
5/28/2020	2.256	2.177
5/29/2020	2.226	2.233
5/30/2020	2.212	2.235
5/31/2020	2.277	2.235
6/1/2020	2.304	2.510
6/2/2020	2.319	2.259
6/3/2020	2.314	2.292
6/4/2020	2.329	2.340
6/5/2020	2.234	2.343
6/6/2020	2.225	2.342
6/7/2020	2.384	2.344
6/8/2020	2.350	2.346
6/9/2020	2.306	2.347
6/10/2020	2.318	2.348
6/11/2020	2.293	2.349
6/12/2020	2.260	2.347
6/13/2020	3.202	2.355
6/14/2020	3.115	2.637
6/15/2020	2.440	2.763
6/16/2020	2.383	2.683
6/17/2020	2.370	2.297
6/18/2020	2.430	2.260
6/19/2020	2.354	2.255
6/20/2020	2.363	2.257
6/21/2020	2.388	2.261
6/22/2020	2.452	2.261

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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
6/23/2020	2.387	2.400
6/24/2020	2.383	2.656
6/25/2020	2.330	2.691
6/26/2020	2.357	2.555
6/27/2020	2.330	2.543
6/28/2020	2.403	2.428
6/29/2020	2.403	2.409
6/30/2020	2.419	2.402
7/1/2020	2.371	2.411
7/2/2020	2.301	2.500
7/3/2020	2.262	2.256
7/4/2020	2.204	2.254
7/5/2020	2.350	2.247
7/6/2020	2.310	2.305
7/7/2020	2.320	2.315
7/8/2020	2.310	2.314
7/9/2020	2.330	2.327
7/10/2020	2.320	2.315
7/11/2020	2.300	2.295
7/12/2020	2.290	2.291
7/13/2020	2.310	2.309
7/14/2020	2.300	2.304
7/15/2020	2.300	2.299
7/16/2020	2.320	2.323
7/17/2020	2.330	2.331
7/18/2020	2.300	2.303
7/19/2020	2.300	2.304
7/20/2020	2.340	2.338
7/21/2020	2.340	2.342
7/22/2020	2.080	2.080
7/23/2020	1.930	1.932
7/24/2020	2.360	2.358
7/25/2020	2.450	2.398
7/26/2020	2.590	2.335
7/27/2020	2.640	2.631
7/28/2020	2.420	2.468
7/29/2020	2.310	2.396
7/30/2020	2.300	2.370
7/31/2020	2.250	2.340
8/1/2020	2.276	2.308
8/2/2020	2.324	2.313
8/3/2020	2.327	2.343
8/4/2020	2.293	2.332
8/5/2020	2.270	2.313
8/6/2020	2.306	2.302
8/7/2020	2.268	2.280
8/8/2020	2.277	2.257
8/9/2020	2.355	2.290
8/10/2020	2.359	2.327
8/11/2020	2.338	2.340

Date	Influent (MGD)	Effluent (MGD)
8/12/2020	2.229	2.329
8/13/2020	2.327	2.335
8/14/2020	2.272	2.308
8/15/2020	2.283	2.277
8/16/2020	2.358	2.301
8/17/2020	2.372	2.356
8/18/2020	2.327	2.356
8/19/2020	2.366	2.361
8/20/2020	2.349	2.361
8/21/2020	2.316	2.348
8/22/2020	2.330	2.322
8/23/2020	2.432	2.350
8/24/2020	2.407	2.393
8/25/2020	2.408	2.407
8/26/2020	2.421	2.411
8/27/2020	2.398	2.406
8/28/2020	2.357	2.387
8/29/2020	2.357	2.358
8/30/2020	2.382	2.332
8/31/2020	2.338	2.322
9/1/2020	2.343	2.336
9/2/2020	2.343	2.336
9/3/2020	2.336	2.347
9/4/2020	2.306	2.343
9/5/2020	2.277	2.316
9/6/2020	2.251	2.286
9/7/2020	2.419	2.311
9/8/2020	2.354	2.328
9/9/2020	2.328	2.343
9/10/2020	2.359	2.378
9/11/2020	2.337	2.360
9/12/2020	2.388	2.381
9/13/2020	2.399	2.391
9/14/2020	2.444	2.453
9/15/2020	2.421	2.431
9/16/2020	2.463	2.442
9/17/2020	2.466	2.479
9/18/2020	2.411	2.447
9/19/2020	2.411	2.447
9/20/2020	2.357	2.425
9/21/2020	2.578	2.512
9/22/2020	2.432	2.516
9/23/2020	2.537	2.509
9/24/2020	2.456	2.512
9/25/2020	2.482	2.497
9/26/2020	2.355	2.425
9/27/2020	2.402	2.354
9/28/2020	2.576	2.426
9/29/2020	2.526	2.407
9/30/2020	2.550	2.451

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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
10/1/2020	2.450	2.400
10/2/2020	2.453	2.404
10/3/2020	2.324	2.334
10/4/2020	2.324	2.326
10/5/2020	2.432	1.922
10/6/2020	2.269	1.516
10/7/2020	2.282	1.549
10/8/2020	2.229	1.253
10/9/2020	2.210	2.305
10/10/2020	2.213	2.270
10/11/2020	2.264	2.226
10/12/2020	2.240	2.250
10/13/2020	2.288	2.260
10/14/2020	2.243	2.258
10/15/2020	2.218	2.236
10/16/2020	2.247	2.212
10/17/2020	2.082	2.175
10/18/2020	2.097	2.140
10/19/2020	2.197	2.170
10/20/2020	2.159	2.430
10/21/2020	2.171	2.202
10/22/2020	2.157	2.150
10/23/2020	2.188	2.141
10/24/2020	2.144	2.170
10/25/2020	2.145	2.128
10/26/2020	2.220	2.129
10/27/2020	2.184	2.134
10/28/2020	2.149	2.131
10/29/2020	2.122	2.113
10/30/2020	2.129	2.117
10/31/2020	2.146	2.102
11/1/2020	2.192	2.099
11/2/2020	2.174	2.126
11/3/2020	2.130	2.107
11/4/2020	2.137	2.114
11/5/2020	2.091	2.083
11/6/2020	2.063	2.059
11/7/2020	2.096	2.032
11/8/2020	2.149	2.054
11/9/2020	2.150	2.095
11/10/2020	2.095	2.091
11/11/2020	2.100	2.070
11/12/2020	2.083	2.046
11/13/2020	2.086	2.096
11/14/2020	2.129	2.089
11/15/2020	2.224	2.186
11/16/2020	2.118	2.175
11/17/2020	2.091	2.112
11/18/2020	2.133	2.137
11/19/2020	2.126	2.124
11/20/2020	2.116	2.282
11/21/2020	2.166	2.237
11/22/2020	2.174	2.193
11/23/2020	2.150	1.791
11/24/2020	2.114	1.983
11/25/2020	2.179	2.191
11/26/2020	2.199	2.214
11/27/2020	2.075	2.325
11/28/2020	2.120	2.196
11/29/2020	2.084	2.152
11/30/2020	2.231	2.085
12/1/2020	2.194	2.179
12/2/2020	2.151	2.373
12/3/2020	2.131	2.185
12/4/2020	2.103	1.953
12/5/2020	2.118	2.006
12/6/2020	2.167	2.069
12/7/2020	2.187	2.111
12/8/2020	2.095	2.074
12/9/2020	2.091	2.061
12/10/2020	2.086	2.067
12/11/2020	2.084	2.043
12/12/2020	2.084	2.043
12/13/2020	2.098	2.045
12/14/2020	2.127	2.102
12/15/2020	2.085	2.074
12/16/2020	2.104	2.097
12/17/2020	2.094	2.078
12/18/2020	2.101	2.080
12/19/2020	2.115	2.068
12/20/2020	2.100	2.068
12/21/2020	2.145	2.108
12/22/2020	2.166	2.150
12/23/2020	2.208	2.111
12/24/2020	2.278	2.154
12/25/2020	2.015	2.120
12/26/2020	2.136	2.103
12/27/2020	2.100	2.118
12/28/2020	2.128	2.095
12/29/2020	2.087	2.073
12/30/2020	2.090	2.044
12/31/2020	2.088	2.067
1/1/2021	2.022	2.033
1/2/2021	2.079	2.046
1/3/2021	2.171	2.113
1/4/2021	2.218	2.201
1/5/2021	2.160	2.220
1/6/2021	2.100	2.178
1/7/2021	2.163	2.194
1/8/2021	2.068	2.155

Client: Eagle Sewer District
Project: Collection System Master Plan
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
1/9/2021	2.098	2.118
1/10/2021	2.173	2.126
1/11/2021	2.133	2.116
1/12/2021	2.068	2.083
1/13/2021	2.057	2.071
1/14/2021	2.067	2.071
1/15/2021	2.019	2.055
1/16/2021	2.056	2.025
1/17/2021	2.133	2.043
1/18/2021	2.203	2.083
1/19/2021	2.098	2.115
1/20/2021	2.060	2.067
1/21/2021	2.036	2.037
1/22/2021	2.015	2.045
1/23/2021	2.046	2.090
1/24/2021	2.120	2.055
1/25/2021	2.106	2.057
1/26/2021	2.066	2.067
1/27/2021	2.040	2.026
1/28/2021	2.260	2.019
1/29/2021	2.003	2.034
1/30/2021	2.063	2.063
1/31/2021	2.088	2.043
2/1/2021	2.086	2.053
2/2/2021	2.023	2.046
2/3/2021	2.001	2.050
2/4/2021	2.017	1.997
2/5/2021	1.983	2.020
2/6/2021	2.016	1.970
2/7/2021	2.068	2.003
2/8/2021	2.063	2.086
2/9/2021	2.017	2.043
2/10/2021	2.027	1.948
2/11/2021	1.993	2.079
2/12/2021	1.959	2.031
2/13/2021	1.975	2.033
2/14/2021	2.039	2.002
2/15/2021	2.337	2.120
2/16/2021	2.112	2.206
2/17/2021	2.095	2.161
2/18/2021	2.070	2.121
2/19/2021	2.035	2.107
2/20/2021	2.090	2.093
2/21/2021	2.110	2.099
2/22/2021	2.066	2.070
2/23/2021	2.043	2.045
2/24/2021	2.036	2.030
2/25/2021	2.027	2.021
2/26/2021	1.197	2.026
2/27/2021	2.033	1.992
2/28/2021	2.081	2.019
3/1/2021	2.071	2.047
3/2/2021	2.016	2.044
3/3/2021	2.025	2.034
3/4/2021	2.025	2.032
3/5/2021	1.996	2.031
3/6/2021	1.999	1.994
3/7/2021	2.072	2.003
3/8/2021	2.057	2.340
3/9/2021	2.043	2.042
3/10/2021	2.032	2.034
3/11/2021	2.026	2.018
3/12/2021	2.026	2.018
3/13/2021	1.984	2.022
3/14/2021	2.036	2.012
3/15/2021	2.068	2.040
3/16/2021	2.014	2.027
3/17/2021	2.020	2.016
3/18/2021	2.001	2.021
3/19/2021	1.975	2.003
3/20/2021	1.996	1.979
3/21/2021	1.963	1.965
3/22/2021	1.979	2.028
3/23/2021	1.930	2.000
3/24/2021	1.924	1.966
3/25/2021	1.910	1.958
3/26/2021	1.917	1.944
3/27/2021	1.977	1.957
3/28/2021	2.087	2.011
3/29/2021	2.098	2.019
3/30/2021	2.069	2.046
3/31/2021	2.069	2.036
4/1/2021	2.084	2.068
4/2/2021	2.041	2.079
4/3/2021	2.163	2.064
4/4/2021	2.145	2.118
4/5/2021	2.115	2.105
4/6/2021	2.097	2.079
4/7/2021	2.071	2.076
4/8/2021	2.060	2.061
4/9/2021	2.033	2.042
4/10/2021	2.130	2.048
4/11/2021	2.200	2.083
4/12/2021	2.144	2.116
4/13/2021	2.114	2.108
4/14/2021	2.091	2.095
4/15/2021	2.098	2.086
4/16/2021	2.081	2.083
4/17/2021	2.151	2.078
4/18/2021	2.225	2.128

Client: Eagle Sewer District
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
4/19/2021	2.192	2.159
4/20/2021	2.139	2.144
4/21/2021	2.154	2.130
4/22/2021	2.169	2.131
4/23/2021	2.171	2.144
4/24/2021	2.170	2.143
4/25/2021	2.256	2.188
4/26/2021	2.252	2.221
4/27/2021	2.238	2.222
4/28/2021	2.259	2.284
4/29/2021	2.222	2.254
4/30/2021	2.194	2.241
5/1/2021	2.227	2.231
5/2/2021	2.315	2.249
5/3/2021	2.328	2.316
5/4/2021	2.273	2.291
5/5/2021	2.241	2.264
5/6/2021	2.208	2.244
5/7/2021	2.203	2.221
5/8/2021	2.281	2.221
5/9/2021	2.301	2.246
5/10/2021	2.323	2.276
5/11/2021	2.310	2.289
5/12/2021	2.268	2.282
5/13/2021	2.239	2.279
5/14/2021	2.183	2.243
5/15/2021	2.195	2.208
5/16/2021	2.298	2.227
5/17/2021	2.331	2.308
5/18/2021	2.266	2.306
5/19/2021	2.236	2.384
5/20/2021	2.240	2.419
5/21/2021	2.243	2.423
5/22/2021	2.323	2.377
5/23/2021	2.337	2.342
5/24/2021	2.337	2.359
5/25/2021	2.338	2.375
5/26/2021	2.394	1.728
5/27/2021	2.327	2.319
5/28/2021	2.261	2.296
5/29/2021	2.234	2.266
5/30/2021	2.234	2.248
5/31/2021	2.387	2.279
6/1/2021	2.407	2.347
6/2/2021	2.401	2.421
6/3/2021	2.328	2.395
6/4/2021	2.329	2.365
6/5/2021	2.291	2.316
6/6/2021	2.348	2.295
6/7/2021	2.366	2.322

Date	Influent (MGD)	Effluent (MGD)
6/8/2021	2.299	2.314
6/9/2021	2.381	2.305
6/10/2021	2.420	2.416
6/11/2021	2.314	2.145
6/12/2021	2.350	2.370
6/13/2021	2.440	2.380
6/14/2021	2.472	2.499
6/15/2021	2.331	2.563
6/16/2021	2.307	2.434
6/17/2021	2.303	2.361
6/18/2021	2.303	2.326
6/19/2021	2.271	2.307
6/20/2021	2.315	2.297
6/21/2021	2.384	2.228
6/22/2021	2.316	2.348
6/23/2021	2.337	2.335
6/24/2021	2.307	2.351
6/25/2021	2.289	2.385
6/26/2021	2.291	2.353
6/27/2021	2.378	2.333
6/28/2021	2.348	1.985
6/29/2021	2.348	2.295
6/30/2021	2.391	2.440
7/1/2021	2.340	2.418
7/2/2021	2.318	2.507
7/3/2021	2.266	2.402
7/4/2021	2.222	2.324
7/5/2021	2.350	2.317
7/6/2021	2.310	2.410
7/7/2021	2.320	2.370
7/8/2021	2.310	2.353
7/9/2021	2.330	2.339
7/10/2021	2.320	2.316
7/11/2021	2.300	2.317
7/12/2021	2.290	2.358
7/13/2021	2.310	2.350
7/14/2021	2.300	2.344
7/15/2021	2.300	2.331
7/16/2021	2.320	2.242
7/17/2021	2.330	2.245
7/18/2021	2.300	2.288
7/19/2021	2.300	2.333
7/20/2021	2.340	2.331
7/21/2021	2.340	2.346
7/22/2021	2.080	2.333
7/23/2021	1.930	2.283
7/24/2021	2.360	2.250
7/25/2021	2.450	2.263
7/26/2021	2.590	2.296
7/27/2021	2.640	2.290

Client: Eagle Sewer District
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
7/28/2021	2.420	2.306
7/29/2021	2.310	2.324
7/30/2021	2.300	2.302
7/31/2021	2.250	2.296
8/1/2021	2.393	2.372
8/2/2021	2.433	2.405
8/3/2021	2.336	2.393
8/4/2021	2.321	2.342
8/5/2021	2.303	2.347
8/6/2021	2.270	2.362
8/7/2021	2.286	2.309
8/8/2021	2.322	2.302
8/9/2021	2.323	2.315
8/10/2021	2.312	2.312
8/11/2021	2.313	2.303
8/12/2021	2.198	2.316
8/13/2021	2.420	2.331
8/14/2021	2.405	2.352
8/15/2021	2.319	2.445
8/16/2021	2.333	2.478
8/17/2021	2.293	2.443
8/18/2021	2.282	2.421
8/19/2021	2.235	2.370
8/20/2021	2.254	2.348
8/21/2021	2.264	2.331
8/22/2021	2.368	2.416
8/23/2021	2.337	2.447
8/24/2021	2.314	2.417
8/25/2021	2.332	2.421
8/26/2021	2.297	2.399
8/27/2021	2.254	2.369
8/28/2021	2.326	2.339
8/29/2021	2.409	2.390
8/30/2021	2.352	2.423
8/31/2021	2.331	2.406
9/1/2021	2.332	2.403
9/2/2021	2.285	2.383
9/3/2021	2.247	2.361
9/4/2021	2.208	2.293
9/5/2021	2.181	2.288
9/6/2021	2.452	2.383
9/7/2021	2.466	2.442
9/8/2021	2.379	1.817
9/9/2021	2.283	1.342
9/10/2021	2.251	2.047
9/11/2021	2.323	2.213
9/12/2021	2.413	2.331
9/13/2021	2.360	2.394
9/14/2021	2.299	2.337
9/15/2021	2.285	2.307

Date	Influent (MGD)	Effluent (MGD)
9/16/2021	2.266	2.277
9/17/2021	2.257	2.262
9/18/2021	2.214	2.228
9/19/2021	2.331	2.265
9/20/2021	2.332	2.341
9/21/2021	2.255	2.292
9/22/2021	2.236	2.253
9/23/2021	2.424	2.243
9/24/2021	2.205	2.197
9/25/2021	2.206	2.264
9/26/2021	2.355	2.425
9/27/2021	2.255	2.245
9/28/2021	2.207	2.364
9/29/2021	2.223	2.266
9/30/2021	2.234	2.298
10/1/2021	2.450	2.400
10/2/2021	2.038	1.946
10/3/2021	2.126	2.139
10/4/2021	2.177	2.125
10/5/2021	2.210	2.125
10/6/2021	2.173	2.128
10/7/2021	2.146	2.128
10/8/2021	2.156	2.064
10/9/2021	2.125	2.054
10/10/2021	2.121	2.052
10/11/2021	2.189	2.046
10/12/2021	2.230	2.047
10/13/2021	2.179	2.046
10/14/2021	2.152	2.186
10/15/2021	2.139	1.964
10/16/2021	2.110	2.194
10/17/2021	2.104	2.160
10/18/2021	2.191	2.163
10/19/2021	2.164	0.328
10/20/2021	2.122	1.321
10/21/2021	2.108	2.233
10/22/2021	2.082	2.226
10/23/2021	2.133	2.215
10/24/2021	2.101	2.205
10/25/2021	2.275	2.163
10/26/2021	2.290	1.818
10/27/2021	2.140	1.900
10/28/2021	2.145	1.600
10/29/2021	2.144	1.500
10/30/2021	2.128	1.200
10/31/2021	2.161	1.700
11/1/2021	2.240	2.083
11/2/2021	2.150	2.140
11/3/2021	2.137	2.510
11/4/2021	2.108	2.236

Client: Eagle Sewer District
Project: Collection System Master Plan
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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
11/5/2021	2.077	2.348
11/6/2021	2.090	2.097
11/7/2021	2.197	2.013
11/8/2021	2.182	2.013
11/9/2021	2.165	2.349
11/10/2021	2.143	2.348
11/11/2021	2.115	1.696
11/12/2021	2.117	1.856
11/13/2021	2.149	2.013
11/14/2021	2.205	2.012
11/15/2021	2.173	2.013
11/16/2021	2.142	2.013
11/17/2021	2.147	2.013
11/18/2021	2.163	2.013
11/19/2021	2.112	2.013
11/20/2021	2.166	2.012
11/21/2021	2.175	2.013
11/22/2021	2.159	2.013
11/23/2021	2.119	2.013
11/24/2021	2.226	2.027
11/25/2021	2.175	2.027
11/26/2021	2.062	2.027
11/27/2021	2.133	2.027
11/28/2021	2.236	2.027
11/29/2021	2.236	2.027
11/30/2021	2.142	2.028
12/1/2021	2.124	2.027
12/2/2021	2.117	2.027
12/3/2021	2.074	2.218
12/4/2021	2.111	2.185
12/5/2021	2.181	2.216
12/6/2021	2.159	2.186
12/7/2021	2.135	2.186
12/8/2021	2.134	2.182
12/9/2021	2.126	2.182
12/10/2021	2.097	2.182
12/11/2021	2.113	2.176
12/12/2021	2.178	2.174
12/13/2021	2.154	2.177
12/14/2021	2.121	2.181
12/15/2021	2.158	2.180
12/16/2021	2.085	2.180
12/17/2021	2.085	2.181
12/18/2021	2.199	2.182
12/19/2021	2.214	2.183
12/20/2021	2.263	2.184
12/21/2021	2.263	2.187
12/22/2021	2.272	2.216
12/23/2021	2.325	2.101
12/24/2021	2.373	2.309

Date	Influent (MGD)	Effluent (MGD)
12/25/2021	2.137	2.348
12/26/2021	2.261	2.343
12/27/2021	2.240	2.334
12/28/2021	2.219	2.328
12/29/2021	2.210	2.319
12/30/2021	2.182	2.312
12/31/2021	2.271	2.303
1/1/2022	2.208	2.279
1/2/2022	2.310	2.270
1/3/2022	2.362	2.265
1/4/2022	2.328	2.265
1/5/2022	2.368	2.297
1/6/2022	2.318	2.368
1/7/2022	2.338	2.360
1/8/2022	2.284	2.386
1/9/2022	2.326	2.384
1/10/2022	2.294	2.383
1/11/2022	2.223	2.376
1/12/2022	2.235	2.364
1/13/2022	2.203	2.205
1/14/2022	2.183	2.384
1/15/2022	2.170	2.385
1/16/2022	2.187	2.313
1/17/2022	2.270	2.239
1/18/2022	2.157	2.231
1/19/2022	2.151	2.233
1/20/2022	2.114	2.230
1/21/2022	2.145	2.160
1/22/2022	2.184	2.149
1/23/2022	2.201	2.160
1/24/2022	2.180	2.168
1/25/2022	2.161	2.225
1/26/2022	2.137	1.982
1/27/2022	2.169	1.243
1/28/2022	2.155	2.192
1/29/2022	2.167	1.987
1/30/2022	2.169	1.993
1/31/2022	2.184	1.997
2/1/2022	2.151	1.999
2/2/2022	2.161	2.931
2/3/2022	2.141	3.045
2/4/2022	2.099	3.059
2/5/2022	2.142	2.470
2/6/2022	2.208	2.365
2/7/2022	2.218	1.971
2/8/2022	2.169	2.017
2/9/2022	2.152	2.134
2/10/2022	2.161	2.181
2/11/2022	2.144	2.180
2/12/2022	2.202	2.187

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Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
2/13/2022	2.229	2.195
2/14/2022	2.195	2.227
2/15/2022	2.284	2.250
2/16/2022	2.146	2.249
2/17/2022	2.135	2.250
2/18/2022	2.098	2.249
2/19/2022	2.104	2.248
2/20/2022	2.106	2.244
2/21/2022	2.218	2.160
2/22/2022	2.126	2.125
2/23/2022	2.170	2.106
2/24/2022	2.083	2.091
2/25/2022	2.103	2.083
2/26/2022	2.137	2.065
2/27/2022	2.171	2.059
2/28/2022	2.161	2.108
3/1/2022	2.105	2.155
3/2/2022	2.092	2.153
3/3/2022	2.131	2.154
3/4/2022	2.095	2.138
3/5/2022	2.147	2.159
3/6/2022	2.217	2.198
3/7/2022	2.167	2.202
3/8/2022	2.115	2.204
3/9/2022	2.135	2.201
3/10/2022	2.161	2.201
3/11/2022	2.131	2.202
3/12/2022	2.073	2.109
3/13/2022	2.182	2.153
3/14/2022	2.181	2.134
3/15/2022	2.124	2.138
3/16/2022	2.117	2.139
3/17/2022	2.110	2.139
3/18/2022	2.086	2.139
3/19/2022	2.048	2.139
3/20/2022	2.090	2.154
3/21/2022	2.042	2.139
3/22/2022	1.998	2.139
3/23/2022	1.992	2.025
3/24/2022	2.017	1.981
3/25/2022	2.106	1.982
3/26/2022	2.088	1.981
3/27/2022	2.191	1.996
3/28/2022	2.176	2.026
3/29/2022	2.085	2.136
3/30/2022	2.090	2.136
3/31/2022	2.113	2.292
4/1/2022	2.103	2.042
4/2/2022	2.133	1.998
4/3/2022	2.232	2.084

Date	Influent (MGD)	Effluent (MGD)
4/4/2022	2.132	2.217
4/5/2022	2.178	2.207
4/6/2022	2.165	2.204
4/7/2022	2.112	2.069
4/8/2022	2.111	2.139
4/9/2022	2.173	2.184
4/10/2022	2.212	2.139
4/11/2022	2.185	2.230
4/12/2022	2.174	2.040
4/13/2022	2.163	2.137
4/14/2022	2.173	2.164
4/15/2022	2.122	2.190
4/16/2022	2.173	2.196
4/17/2022	2.180	2.201
4/18/2022	2.138	2.202
4/19/2022	2.132	2.199
4/20/2022	2.129	2.202
4/21/2022	2.177	2.165
4/22/2022	2.150	2.089
4/23/2022	2.180	2.090
4/24/2022	2.232	2.103
4/25/2022	2.224	2.330
4/26/2022	2.175	2.163
4/27/2022	2.182	2.328
4/28/2022	2.189	2.140
4/29/2022	2.186	2.294
4/30/2022	2.237	2.264
5/1/2022	2.308	2.264
5/2/2022	2.328	2.274
5/3/2022	2.288	0.066
5/4/2022	2.332	1.133
5/5/2022	2.259	2.913
5/6/2022	2.249	2.796
5/7/2022	2.256	2.690
5/8/2022	2.356	2.555
5/9/2022	2.442	2.561
5/10/2022	2.362	2.412
5/11/2022	2.317	2.411
5/12/2022	2.306	2.357
5/13/2022	2.248	2.362
5/14/2022	2.288	2.344
5/15/2022	2.346	2.360
5/16/2022	2.368	2.199
5/17/2022	2.328	2.415
5/18/2022	2.309	2.387
5/19/2022	2.331	2.235
5/20/2022	2.303	2.177
5/21/2022	2.289	2.448
5/22/2022	2.376	2.365
5/23/2022	2.365	2.167

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
5/24/2022	2.310	2.234
5/25/2022	2.406	2.297
5/26/2022	2.382	2.254
5/27/2022	2.383	2.356
5/28/2022	2.385	2.614
5/29/2022	2.277	2.553
5/30/2022	2.434	2.445
5/31/2022	2.435	2.380
6/1/2022	2.411	2.326
6/2/2022	2.346	2.364
6/3/2022	2.351	2.371
6/4/2022	2.288	2.636
6/5/2022	2.869	2.503
6/6/2022	2.469	2.395
6/7/2022	2.381	2.425
6/8/2022	2.336	2.408
6/9/2022	2.403	2.415
6/10/2022	2.336	2.416
6/11/2022	2.359	2.709
6/12/2022	2.568	2.616
6/13/2022	2.493	2.370
6/14/2022	2.428	2.419
6/15/2022	2.450	2.417
6/16/2022	2.405	2.397
6/17/2022	2.379	2.215
6/18/2022	2.359	2.504
6/19/2022	2.364	2.390
6/20/2022	2.487	2.192
6/21/2022	2.441	2.276
6/22/2022	2.466	2.290
6/23/2022	2.380	2.321
6/24/2022	2.368	2.334
6/25/2022	2.344	2.654
6/26/2022	2.398	2.513
6/27/2022	2.446	2.221
6/28/2022	2.406	2.263
6/29/2022	2.410	2.289
6/30/2022	2.372	2.327
7/1/2022	2.401	2.344
7/2/2022	2.322	2.665
7/3/2022	2.309	2.539
7/4/2022	2.324	2.206
7/5/2022	2.409	2.236
7/6/2022	2.427	2.267
7/7/2022	2.420	2.287
7/8/2022	2.397	2.229
7/9/2022	2.365	2.651
7/10/2022	2.374	2.518
7/11/2022	2.426	2.210
7/12/2022	2.402	2.156

Date	Influent (MGD)	Effluent (MGD)
7/13/2022	2.416	2.293
7/14/2022	2.395	2.290
7/15/2022	2.366	2.350
7/16/2022	2.347	2.342
7/17/2022	2.385	2.334
7/18/2022	2.462	2.343
7/19/2022	2.408	2.349
7/20/2022	2.364	2.353
7/21/2022	2.305	2.332
7/22/2022	2.264	2.313
7/23/2022	2.248	2.292
7/24/2022	2.325	2.258
7/25/2022	2.363	2.276
7/26/2022	2.323	2.283
7/27/2022	2.322	2.275
7/28/2022	2.328	2.279
7/29/2022	2.285	2.314
7/30/2022	2.274	2.271
7/31/2022	2.319	2.245
8/1/2022	2.393	2.372
8/2/2022	2.433	2.405
8/3/2022	2.336	2.393
8/4/2022	2.321	2.342
8/5/2022	2.303	2.347
8/6/2022	2.270	2.362
8/7/2022	2.286	2.309
8/8/2022	2.322	2.302
8/9/2022	2.323	2.315
8/10/2022	2.312	2.312
8/11/2022	2.313	2.303
8/12/2022	2.198	2.316
8/13/2022	2.420	2.331
8/14/2022	2.405	2.352
8/15/2022	2.319	2.445
8/16/2022	2.333	2.478
8/17/2022	2.293	2.443
8/18/2022	2.282	2.421
8/19/2022	2.235	2.370
8/20/2022	2.254	2.348
8/21/2022	2.264	2.331
8/22/2022	2.368	2.416
8/23/2022	2.337	2.447
8/24/2022	2.314	2.417
8/25/2022	2.332	2.421
8/26/2022	2.297	2.399
8/27/2022	2.254	2.369
8/28/2022	2.326	2.339
8/29/2022	2.409	2.390
8/30/2022	2.352	2.423
8/31/2022	2.331	2.406

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
9/1/2022	2.332	2.403
9/2/2022	2.285	2.383
9/3/2022	2.247	2.361
9/4/2022	2.208	2.293
9/5/2022	2.181	2.288
9/6/2022	2.452	2.383
9/7/2022	2.466	2.442
9/8/2022	2.379	1.817
9/9/2022	2.283	1.342
9/10/2022	2.251	2.047
9/11/2022	2.323	2.213
9/12/2022	2.413	2.331
9/13/2022	2.360	2.394
9/14/2022	2.299	2.337
9/15/2022	2.285	2.307
9/16/2022	2.266	2.277
9/17/2022	2.257	2.262
9/18/2022	2.214	2.228
9/19/2022	2.331	2.265
9/20/2022	2.332	2.341
9/21/2022	2.255	2.292
9/22/2022	2.236	2.253
9/23/2022	2.424	2.243
9/24/2022	2.205	2.197
9/25/2022	2.206	2.264
9/26/2022	2.355	2.425
9/27/2022	2.255	2.245
9/28/2022	2.207	2.364
9/29/2022	2.223	2.266
9/30/2022	2.234	2.298
10/1/2022	2.270	2.405
10/2/2022	2.356	2.404
10/3/2022	2.333	2.407
10/4/2022	2.274	2.399
10/5/2022	2.269	2.107
10/6/2022	2.241	2.495
10/7/2022	2.231	2.337
10/8/2022	2.235	2.287
10/9/2022	2.335	2.281
10/10/2022	2.312	2.296
10/11/2022	2.254	2.298
10/12/2022	2.239	2.281
10/13/2022	2.258	2.267
10/14/2022	2.207	2.264
10/15/2022	2.195	2.265
10/16/2022	2.278	2.155
10/17/2022	2.257	2.013
10/18/2022	2.244	2.322
10/19/2022	2.199	2.265
10/20/2022	2.184	2.279

Date	Influent (MGD)	Effluent (MGD)
10/21/2022	2.189	2.279
10/22/2022	2.249	2.295
10/23/2022	2.296	2.280
10/24/2022	2.240	2.279
10/25/2022	2.204	2.279
10/26/2022	2.225	2.278
10/27/2022	2.186	2.278
10/28/2022	2.157	2.278
10/29/2022	2.192	2.278
10/30/2022	2.262	2.278
10/31/2022	2.184	2.278
11/1/2022	2.221	2.278
11/2/2022	2.173	2.276
11/3/2022	2.167	2.279
11/4/2022	2.155	2.279
11/5/2022	2.173	2.311
11/6/2022	2.243	2.278
11/7/2022	2.191	2.278
11/8/2022	2.151	2.278
11/9/2022	2.201	2.278
11/10/2022	2.143	2.278
11/11/2022	2.126	2.280
11/12/2022	2.315	2.196
11/13/2022	2.250	2.153
11/14/2022	2.216	2.153
11/15/2022	2.171	2.154
11/16/2022	2.161	2.155
11/17/2022	2.136	2.157
11/18/2022	2.104	2.155
11/19/2022	2.140	2.153
11/20/2022	2.177	2.153
11/21/2022	1.815	1.437
11/22/2022	2.490	2.026
11/23/2022	2.159	2.026
11/24/2022	2.214	2.085
11/25/2022	2.036	2.152
11/26/2022	2.155	2.153
11/27/2022	2.186	2.164
11/28/2022	2.197	2.217
11/29/2022	2.127	2.241
11/30/2022	2.126	2.178
12/1/2022	2.166	2.217
12/2/2022	2.106	2.214
12/3/2022	2.118	2.278
12/4/2022	2.155	2.278
12/5/2022	2.186	2.278
12/6/2022	2.094	2.278
12/7/2022	2.149	2.085
12/8/2022	2.129	2.042
12/9/2022	2.111	2.106

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250**-001**

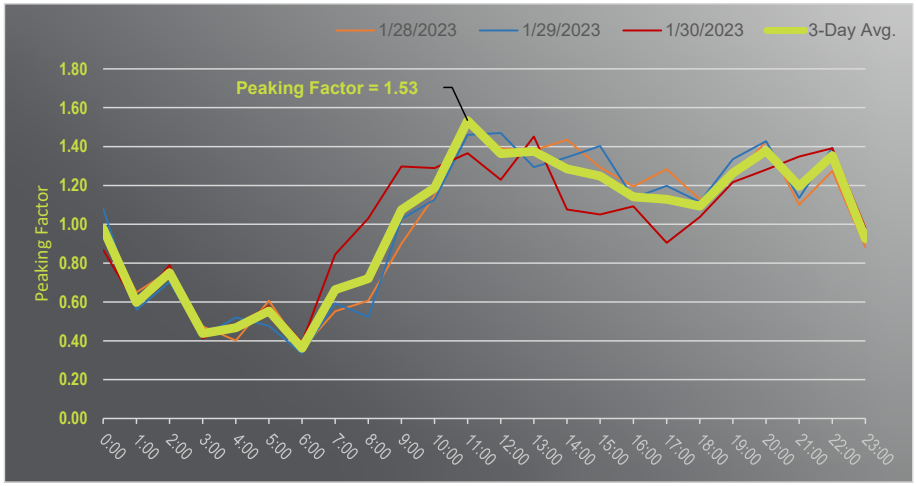
Daily Influent & Effluent Flows

Date	Influent (MGD)	Effluent (MGD)
12/10/2022	2.125	2.330
12/11/2022	2.226	2.278
12/12/2022	2.199	2.103
12/13/2022	2.155	2.160
12/14/2022	2.161	2.156
12/15/2022	2.175	2.166
12/16/2022	2.147	2.169
12/17/2022	2.172	2.384
12/18/2022	2.238	2.387
12/19/2022	2.223	2.297
12/20/2022	2.187	2.278
12/21/2022	2.249	2.326
12/22/2022	2.263	2.278
12/23/2022	2.238	2.241
12/24/2022	2.294	2.184
12/25/2022	2.062	2.182
12/26/2022	2.296	2.212
12/27/2022	2.496	2.360
12/28/2022	2.164	2.364
12/29/2022	2.137	2.367
12/30/2022	2.320	2.397
12/31/2022	2.303	2.404

Client: Eagle Sewer District
Project: WW Collection System Plan
Project No.: 222250

WWTP Influent Peaking Factors

	1/28/2023		1/29/2023		1/30/2023		
Time	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	3-Day Avg.
0:00	1,422	0.98	1,668	1.08	1,310	0.87	0.98
1:00	938	0.65	863	0.56	880	0.58	0.60
2:00	1,098	0.76	1,085	0.70	1,192	0.79	0.75
3:00	686	0.47	654	0.42	623	0.41	0.44
4:00	580	0.40	803	0.52	727	0.48	0.47
5:00	876	0.61	736	0.48	873	0.58	0.55
6:00	518	0.36	516	0.33	591	0.39	0.36
7:00	798	0.55	915	0.59	1,274	0.84	0.66
8:00	876	0.61	807	0.52	1,555	1.03	0.72
9:00	1,300	0.90	1,585	1.03	1,958	1.30	1.07
10:00	1,656	1.15	1,739	1.13	1,945	1.29	1.19
11:00	2,216	1.53	2,255	1.46	2,061	1.37	1.53
12:00	2,010	1.39	2,268	1.47	1,855	1.23	1.36
13:00	1,997	1.38	1,997	1.29	2,190	1.45	1.38
14:00	2,074	1.44	2,074	1.34	1,623	1.08	1.29
15:00	1,868	1.29	2,164	1.40	1,585	1.05	1.25
16:00	1,726	1.19	1,752	1.14	1,649	1.09	1.14
17:00	1,855	1.28	1,849	1.20	1,366	0.91	1.13
18:00	1,630	1.13	1,720	1.11	1,565	1.04	1.09
19:00	1,791	1.24	2,061	1.34	1,836	1.22	1.26
20:00	2,061	1.43	2,203	1.43	1,933	1.28	1.38
21:00	1,591	1.10	1,752	1.14	2,036	1.35	1.20
22:00	1,842	1.27	2,152	1.39	2,100	1.39	1.35
23:00	1,276	0.88	1,411	0.91	1,482	0.98	0.93
Average	1,445	1.00	1,543	1.00	1,509	1.00	1.00
Max	2,216	1.53	2,268	1.47	2,190	1.45	1.53

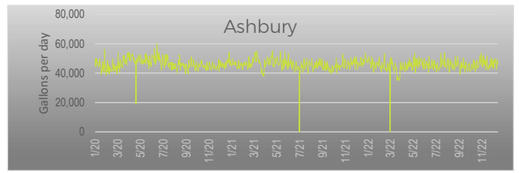


Client: Eagle Sewer District 1/1/2023
Project: Collection System Master Plan
Project No.: 222250-001

Lift Station Summary Tables

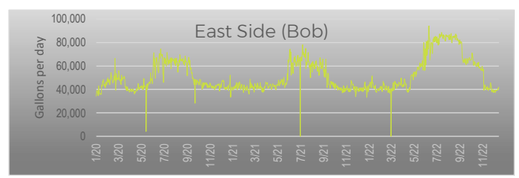
Ashbury														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	46,344	49,975	45,089	43,529	48,088	48,957	48,203	49,975	46,497	44,745	44,942	44,858	44,661	46,510
2021	46,153	48,334	45,727	46,285	46,818	48,334	47,501	45,509	44,794	46,009	43,315	45,337	46,746	47,433
2022	45,400	46,798	46,498	44,485	42,752	44,774	46,798	45,241	45,785	46,020	44,221	45,758	46,341	46,759
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**45,966**	**48,369**	**45,771**	**44,766**	**45,886**	**47,355**	**47,501**	**46,908**	**45,692**	**45,591**	**44,159**	**45,318**	**45,916**	**46,901**
Max	**46,344**	**49,975**	**46,498**	**46,285**	**48,088**	**48,957**	**48,203**	**49,975**	**46,497**	**46,020**	**44,942**	**45,758**	**46,746**	**47,433**

Asbury Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	**6/14/2020**	**60,360**	**1.32**	**Selected peak day**
2	6/7/2020	56,768	0.63	
3	1/26/2020	56,184	0.19	
4	4/19/2021	55,352	0	
5	5/22/2021	54,917	0.37	
Max	-	60,360	-	-



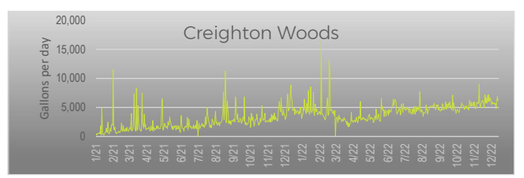
East Side (Bob)														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	49,190	64,322	41,495	48,878	45,062	39,855	43,360	62,441	64,322	63,248	52,201	44,162	42,552	42,697
2021	47,941	65,181	42,250	41,253	41,927	42,780	48,186	64,080	65,181	59,688	47,869	40,757	40,898	40,420
2022	58,475	84,443	42,208	40,699	43,684	44,984	60,274	78,732	84,443	83,566	67,114	61,344	41,811	39,477
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**51,869**	**71,315**	**41,984**	**43,610**	**43,558**	**42,540**	**50,607**	**68,417**	**71,315**	**68,834**	**55,728**	**48,755**	**41,754**	**40,865**
Max	**58,475**	**84,443**	**42,250**	**48,878**	**45,062**	**44,984**	**60,274**	**78,732**	**84,443**	**83,566**	**67,114**	**61,344**	**42,552**	**42,697**

Bobs Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	**6/9/2022**	**94,035**	**0.04**	**Selected peak day**
2	7/13/2022	88,545	0	
3	8/8/2022	87,540	0	
4	7/8/2022	87,287	0	
5	8/20/2022	87,255	0.04	
Max	-	94,035	-	-



Creighton Woods															
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*exclude*
2021	2,525	4,778	1,355	1,023	2,331	1,761	1,760	1,737	2,323	3,417	3,140	2,857	3,649	4,778	
2022	4,575	6,010	4,802	5,155	2,730	3,055	3,672	4,827	4,666	4,793	5,065	5,124	6,010	5,824	
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Avg.	**3,550**	**5,394**	**3,078**	**3,089**	**2,531**	**2,408**	**2,716**	**3,282**	**3,495**	**4,105**	**4,102**	**3,991**	**4,829**	**5,301**	
Max	**4,575**	**6,010**	**4,802**	**5,155**	**2,730**	**3,055**	**3,672**	**4,827**	**4,666**	**4,793**	**5,065**	**5,124**	**6,010**	**5,824**	

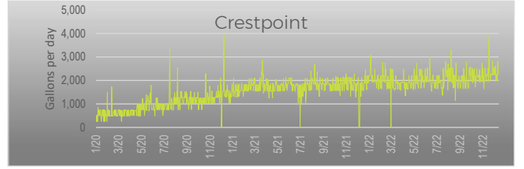
Creighton Woods Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	2/3/2022	16,503	0	
2	2/17/2022	13,141	0	*All top 5 days were considered outliers. Selected 11/9/2022 as peak day flow with 9,067 GPD*
3	1/31/2021	11,516	0	
4	2/18/2022	11,411	0	
5	8/17/2021	11,245	0	
Max	-	16,503	-	-



Crestpoint														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2021	1,762	1,898	1,586	1,765	1,825	1,695	1,762	1,774	1,712	1,898	1,802	1,826	1,784	1,709
2022	2,068	2,332	2,076	2,052	1,872	1,859	2,069	2,017	2,015	2,151	2,002	2,189	2,332	2,328
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**1,915**	**2,115**	**1,831**	**1,909**	**1,848**	**1,777**	**1,916**	**1,896**	**1,864**	**2,025**	**1,902**	**2,007**	**2,058**	**2,019**
Max	**2,068**	**2,332**	**2,076**	**2,052**	**1,872**	**1,859**	**2,069**	**2,017**	**2,015**	**2,151**	**2,002**	**2,189**	**2,332**	**2,328**

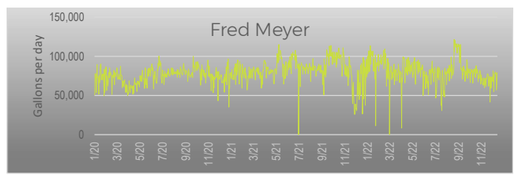
exclude

Crestpoint Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	12/8/2020	3,960	0.00	Outlier based on daily flow graph
2	**11/18/2022**	**3,945**	**N/A**	**Selected peak day**
3	7/16/2020	3,360	0.00	
4	11/17/2022	3,330	N/A	
5	8/8/2022	3,315	0.00	
Max	-	3,960	-	-



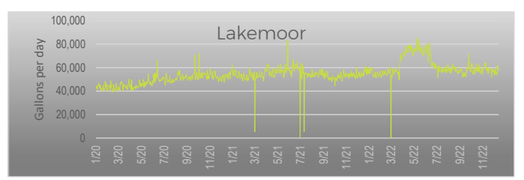
Fred Meyer														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	74,608	81,047	73,135	74,370	67,402	62,204	74,351	79,245	77,560	79,983	81,047	80,866	72,764	72,252
2021	82,887	97,465	79,420	75,415	79,665	80,484	90,732	93,759	84,836	84,071	93,466	97,465	67,622	67,461
2022	80,963	94,207	89,493	90,453	78,736	83,203	82,306	75,585	68,514	94,207	86,514	77,703	68,381	72,365
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**79,486**	**90,907**	**80,682**	**80,080**	**75,268**	**75,297**	**82,463**	**82,863**	**76,970**	**86,087**	**87,009**	**85,345**	**69,589**	**70,693**
Max	**82,887**	**97,465**	**89,493**	**90,453**	**79,665**	**83,203**	**90,732**	**93,759**	**84,836**	**94,207**	**93,466**	**97,465**	**72,764**	**72,365**

Fred Meyer Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	**8/20/2022**	**121,440**	**0.04**	**Selected peak day**
2	8/22/2022	120,185	0.00	
3	8/23/2022	116,516	0.00	
4	8/26/2022	116,272	0.00	
5	8/31/2022	115,579	0.00	
Max	-	121,440	-	-



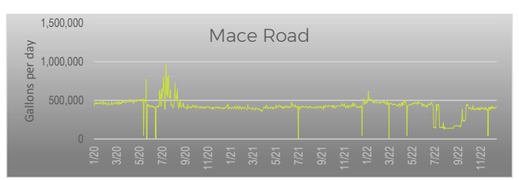
Lakemoor														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	48,872	54,454	43,084	43,000	44,305	44,031	46,607	50,944	49,136	52,094	52,441	54,454	52,610	53,524
2021	54,542	59,124	53,600	52,526	51,904	56,460	59,069	59,124	53,529	54,872	51,848	52,171	53,822	55,633
2022	61,532	75,994	55,021	55,689	58,928	74,108	75,994	67,706	58,162	57,942	57,573	58,625	58,738	56,766
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**54,982**	**63,190**	**50,568**	**50,405**	**51,712**	**58,199**	**60,557**	**59,258**	**53,609**	**54,969**	**53,954**	**55,083**	**55,057**	**55,308**
Max	**61,532**	**75,994**	**55,021**	**55,689**	**58,928**	**74,108**	**75,994**	**67,706**	**58,162**	**57,942**	**57,573**	**58,625**	**58,738**	**56,766**

Lakemoor Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	**5/8/2022**	**85,385**	**0.09**	**Selected peak day**
2	5/28/2021	83,786	0.00	
3	5/14/2022	83,669	0.00	
4	5/9/2022	82,482	0.43	
5	6/12/2022	80,921	0.01	
Max	-	85,385	-	-



Mace Road														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	459,053	490,510	462,140	456,651	473,397	490,510	471,160	447,887	-	478,276	412,775	410,661	404,648	406,245
2021	413,743	432,896	405,584	398,520	386,106	405,277	416,171	422,206	412,386	409,405	420,044	426,804	429,018	432,896
2022	376,904	494,310	494,310	470,095	445,311	439,152	459,177	407,236	225,535	151,963	278,220	392,597	382,140	406,001
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**416,567**	**472,572**	**454,011**	**441,755**	**434,938**	**444,980**	**448,836**	**425,776**	**318,960**	**346,548**	**370,346**	**410,021**	**405,269**	**415,047**
Max	**459,053**	**494,310**	**494,310**	**470,095**	**473,397**	**490,510**	**471,160**	**447,887**	**412,386**	**478,276**	**420,044**	**426,804**	**429,018**	**432,896**

Mace Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	7/11/2020	967,616	0.00	
2	7/12/2020	882,176	0.00	*Based on plot, daily flows from July-September 2020 appear to be outliers. Selected 1/4/2022 as peak day flows with 616,240 GPD.*
3	7/17/2020	821,632	0.00	
4	7/18/2020	820,096	0.00	
5	7/4/2020	799,936	0.00	
Max	-	967,616	-	-



Client: Eagle Sewer District 1/1/2023
Project: Collection System Master Plan
Project No.: 222250-001

Lift Station Summary Tables

Old Valley														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	414,258	493,357	352,357	361,567	368,717	391,190	493,357	467,531	-	471,491	463,099	431,083	410,944	403,805
2021	441,133	479,766	400,334	403,075	395,583	424,352	455,207	461,503	465,773	473,048	479,766	435,976	447,401	450,123
2022	500,777	554,127	460,033	443,761	444,077	471,904	509,981	523,176	510,772	544,879	554,127	519,135	512,069	522,615
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**452,056**	**509,083**	**404,241**	**402,801**	**402,792**	**429,149**	**486,182**	**484,070**	**488,272**	**496,472**	**498,998**	**462,065**	**456,805**	**458,848**
Max	**500,777**	**554,127**	**460,033**	**443,761**	**444,077**	**471,904**	**509,981**	**523,176**	**510,772**	**544,879**	**554,127**	**519,135**	**512,069**	**522,615**

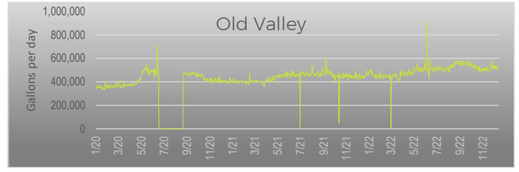
Palmer Road														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	147,886	167,251	122,300	129,929	136,321	134,726	145,742	155,212	153,168	152,384	158,068	153,433	167,251	165,703
2021	185,205	209,134	165,035	166,550	164,328	171,028	188,110	176,848	189,108	189,528	202,091	197,919	201,028	209,134
2022	217,104	243,124	215,257	206,111	210,468	204,988	212,113	218,515	228,613	243,124	240,502	242,936	183,333	169,627
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**183,398**	**206,503**	**167,531**	**167,530**	**170,372**	**170,247**	**181,988**	**183,525**	**190,297**	**195,012**	**200,220**	**198,096**	**183,871**	**181,488**
Max	**217,104**	**243,124**	**215,257**	**206,111**	**210,468**	**204,988**	**212,113**	**218,515**	**228,613**	**243,124**	**240,502**	**242,936**	**201,028**	**209,134**

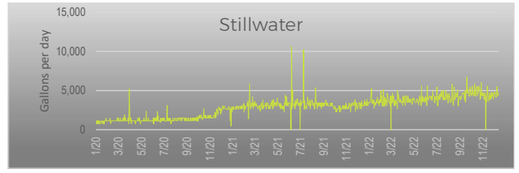
Stillwater														
Year	AADF	MMF	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	1,432	2,568	1,009	1,133	1,368	1,132	1,178	1,255	1,285	1,348	1,302	1,611	1,973	2,568
2021	3,155	3,573	2,807	3,127	3,032	3,206	3,150	3,488	3,573	3,311	3,149	2,732	3,058	3,239
2022	4,058	4,789	3,603	3,712	3,654	3,786	3,784	4,074	4,171	4,097	4,581	4,789	4,138	4,567
2023	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Avg.	**2,881**	**3,643**	**2,473**	**2,657**	**2,685**	**2,708**	**2,704**	**2,939**	**3,010**	**2,919**	**3,011**	**3,044**	**3,056**	**3,458**
Max	**4,058**	**4,789**	**3,603**	**3,712**	**3,654**	**3,786**	**3,784**	**4,074**	**4,171**	**4,097**	**4,581**	**4,789**	**4,138**	**4,567**

Old Valley Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	6/5/2022	906,360	0.12	Outlier based on daily flow graph
2	6/13/2020	713,152	0.00	Outlier based on daily flow graph
3	**9/7/2021**	**606,216**	**0**	**Selected peak day**
4	9/18/2022	590,536	0.00	
5	6/12/2022	586,137	0.01	
Max	-	**906,360**	-	-

Palmer Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	6/5/2022	528,488	0.12	Outlier based on daily flow graph
2	9/7/2021	327,872	0.00	Outlier based on daily flow graph
3	6/13/2020	301,864	0.00	Outlier based on daily flow graph
4	**5/13/2021**	**277,072**	**0**	**Selected peak day**
5	8/24/2022	273,360	0.00	
Max	-	**528,488**	-	-

Stillwater Top 5 Days				
Rank	Date	Flow (GPD)	Precipitation (in)	Comments
1	6/7/2021	10,599	0.00	Outlier based on daily flow graph
2	7/9/2021	10,223	0.00	Outlier based on daily flow graph
3	**9/19/2022**	**6,732**	**0**	**Selected peak day**
4	10/28/2022	6,018	0.00	
5	2/15/2021	5,856	0.15	
Max	-	**10,599**	-	-

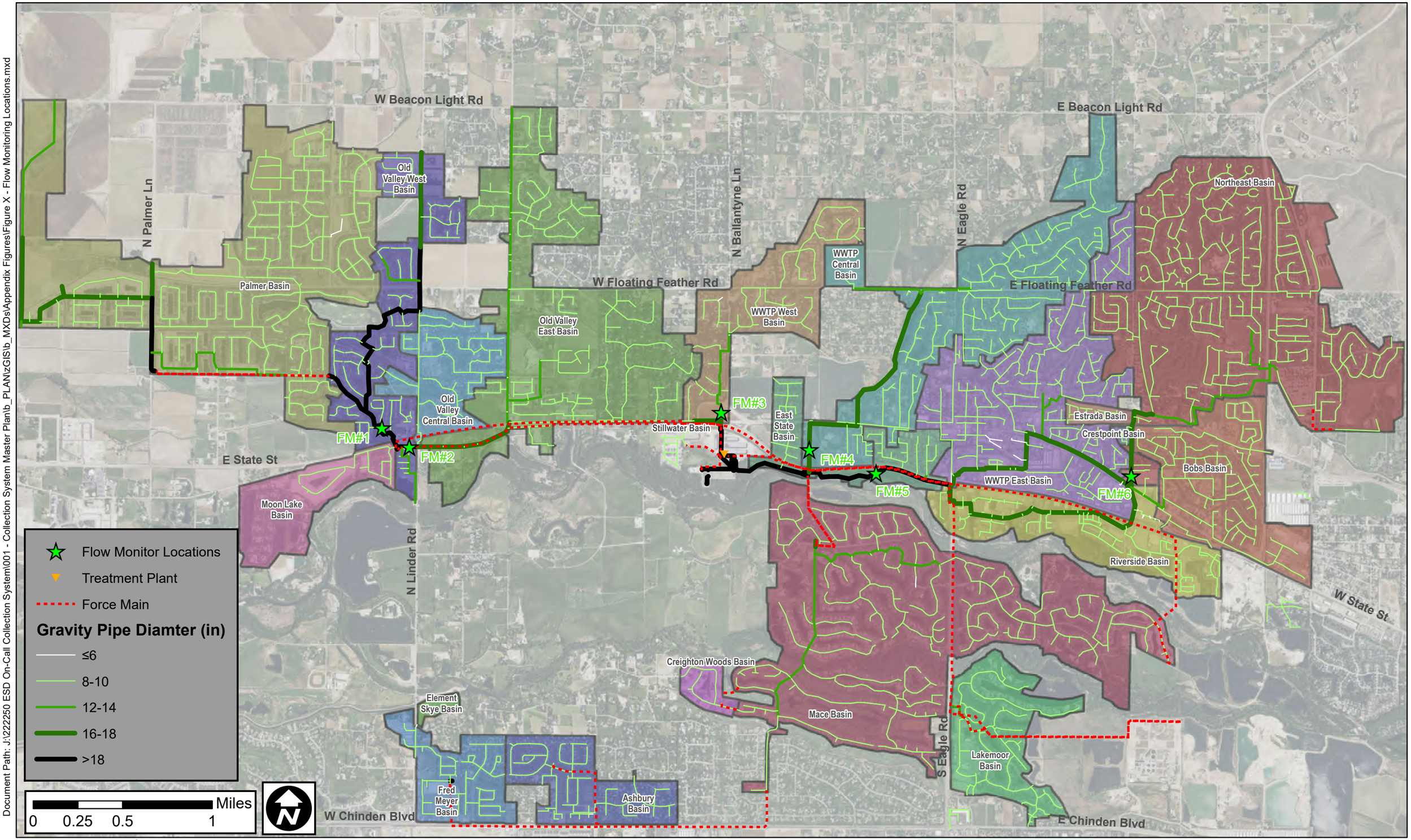




Appendix D

Flow Monitoring & Calibration

KELLER ASSOCIATES



Document Path: J:\222250 ESD On-Call Collection System\001 - Collection System Master Plan\b_PLAN\zGIS\b_MXDs\Appendix Figures\Figure X - Flow Monitoring Locations.mxd

KELLER ASSOCIATES

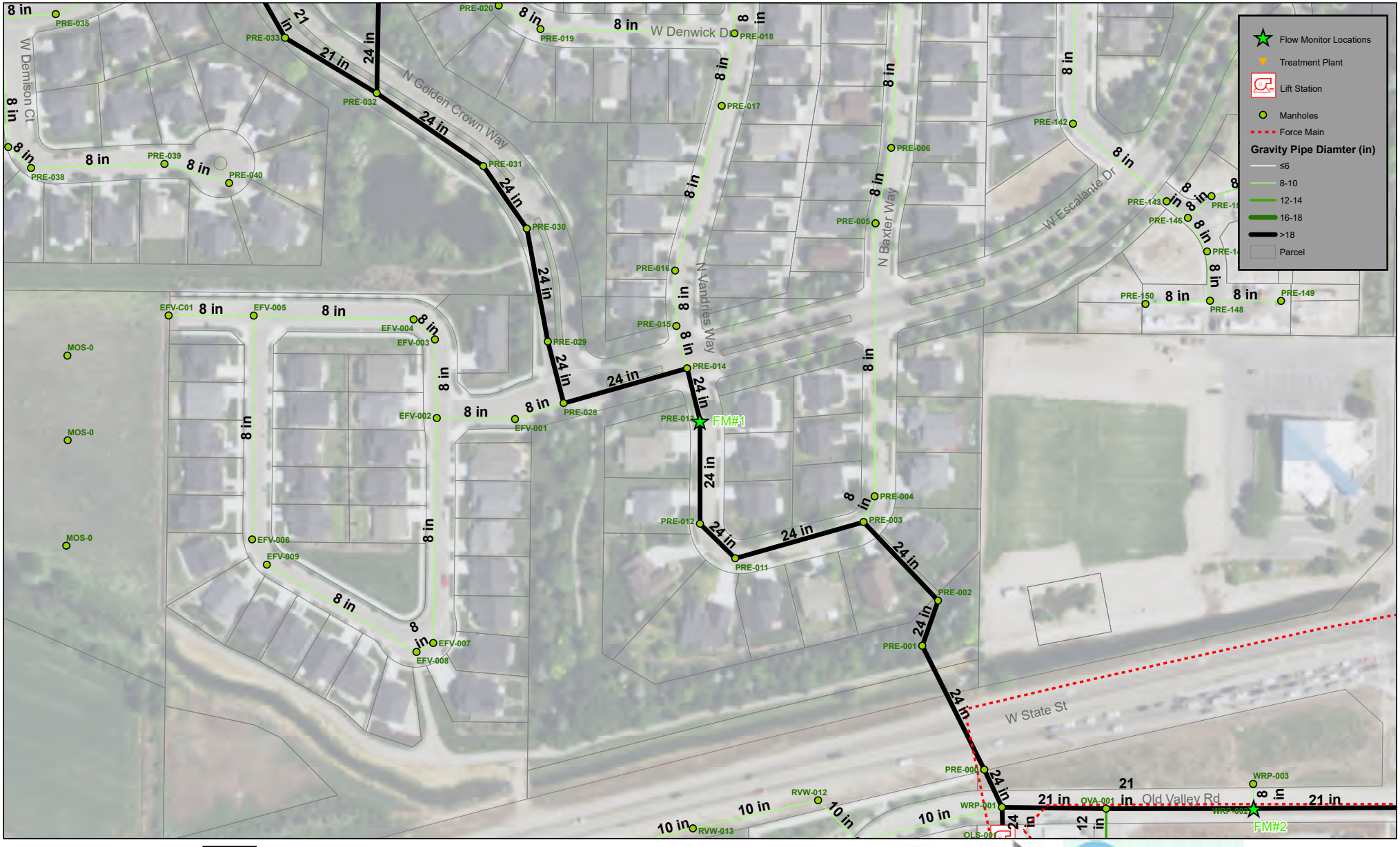
Flow Monitoring Locations

Collection System Master Plan

EAGLE SEWER DISTRICT

Appendix D

Eagle Sewer District



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Feet
0 50 100 200

Flow Monitoring Locations

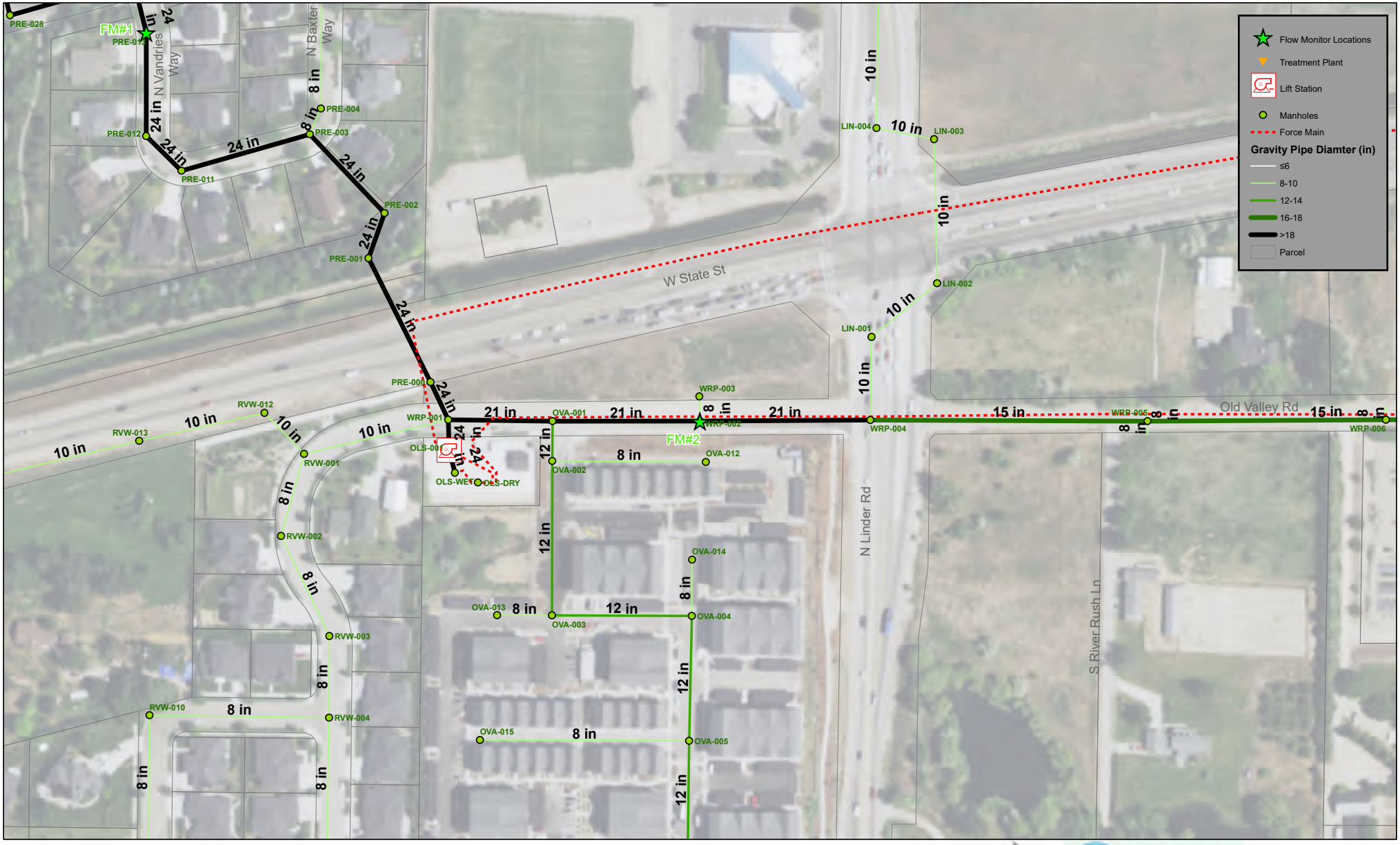
Collection System Master Plan

KELLER ASSOCIATES

EAGLE SEWER DISTRICT

Site: 1

Eagle Sewer District



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Feet
0 50 100 200

Flow Monitoring Locations

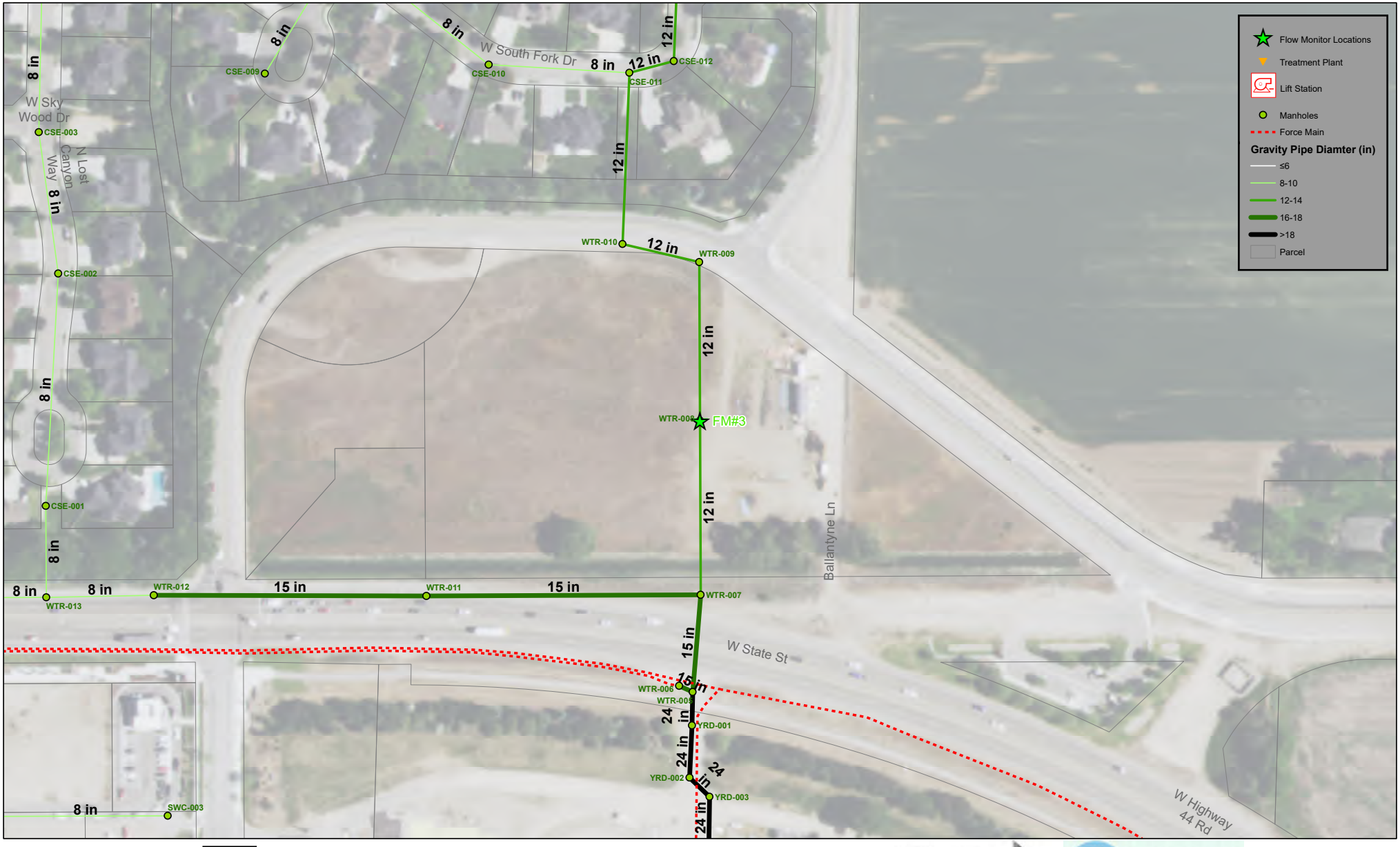
Collection System Master Plan

KELLER ASSOCIATES

EAGLE SEWER DISTRICT

Site: 2

Eagle Sewer District



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Feet
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Flow Monitoring Locations

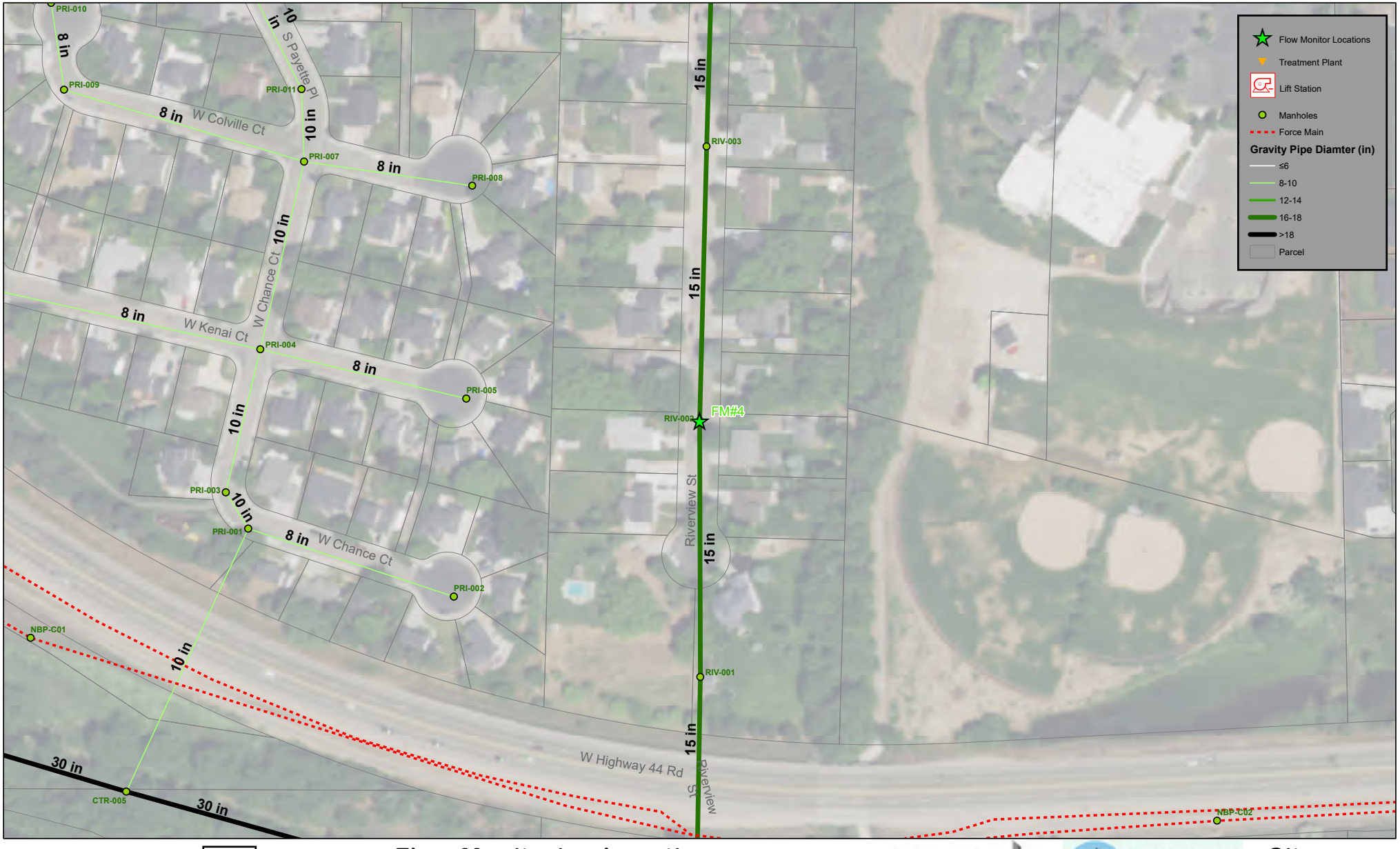
Collection System Master Plan

KELLER ASSOCIATES

EAGLE SEWER DISTRICT

Site: 3

Eagle Sewer District



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Feet
0 50 100 200

Flow Monitoring Locations

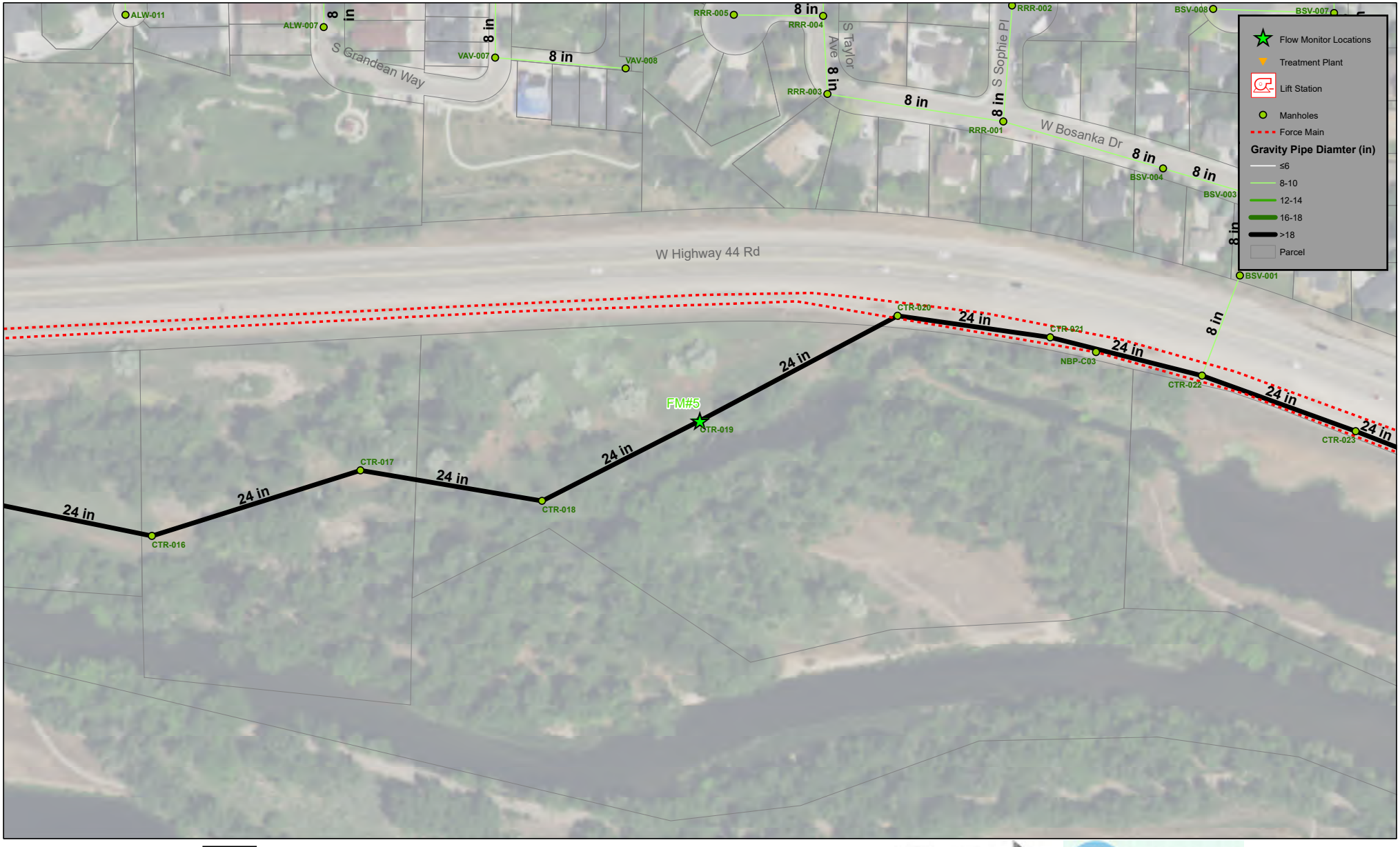
Collection System Master Plan

KELLER ASSOCIATES

EAGLE SEWER DISTRICT

Site: 4

Eagle Sewer District



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Feet
0 50 100 200

Flow Monitoring Locations

Collection System Master Plan

KELLER ASSOCIATES

EAGLE SEWER DISTRICT

Site: 5

Eagle Sewer District

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Feet
0 50 100 200

Flow Monitoring Locations

Collection System Master Plan

KELLER ASSOCIATES

EAGLE SEWER DISTRICT

Site: 6

Eagle Sewer District

Client: Eagle Sewer District
Project: WW Collection Plan
Project No.: 222250-001

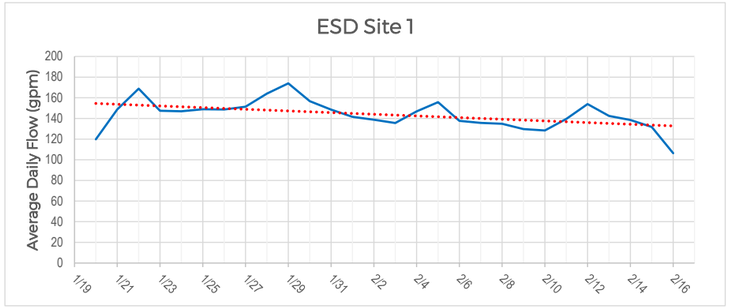
Daily Flow Monitoring Flows

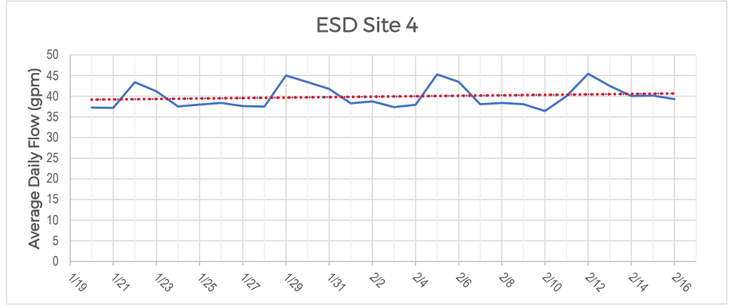
	Average Daily Flow (gpm)					
Date	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6[1]
1/19/2023	-	-	-	-	-	-
1/20/2023	120	32	18	37	647	93
1/21/2023	149	46	20	37	637	88
1/22/2023	169	77	17	43	623	80
1/23/2023	147	87	20	41	631	68
1/24/2023	147	76	18	38	627	57
1/25/2023	149	100	18	38	619	45
1/26/2023	149	92	17	38	654	23
1/27/2023	151	80	18	38	643	17
1/28/2023	164	76	19	38	640	64
1/29/2023	174	86	23	45	649	165
1/30/2023	157	94	20	43	645	102
1/31/2023	149	98	19	42	638	37
2/1/2023	142	105	21	38	634	62
2/2/2023	139	108	19	39	634	36
2/3/2023	136	106	18	37	640	0
2/4/2023	147	98	18	38	643	0
2/5/2023	156	100	23	45	637	0
2/6/2023	138	103	22	43	634	0
2/7/2023	136	102	19	38	646	0
2/8/2023	135	106	19	38	642	22
2/9/2023	130	114	19	38	622	33
2/10/2023	128	109	19	36	617	14
2/11/2023	139	105	21	40	622	53
2/12/2023	154	120	24	45	631	55
2/13/2023	142	110	22	43	632	22
2/14/2023	138	106	19	40	625	65
2/15/2023	132	107	20	40	641	47
2/16/2023	106	106	19	39	643	26
2/17/2023	-	-	-	-	-	-
Avg.(gpm)	**144**	**95**	**19**	**40**	**636**	**46**
Max. (gpm)	**174**	**120**	**24**	**45**	**654**	**165**

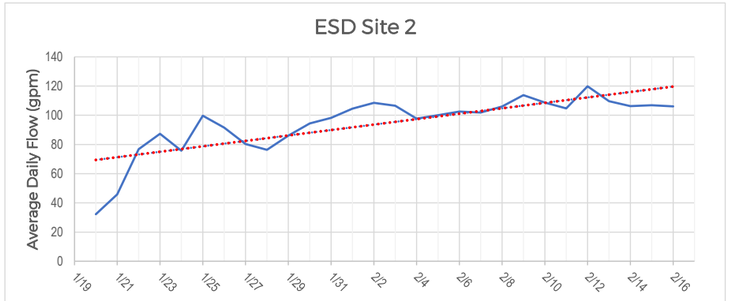
1) Site 6 had poor data quality. Average flows are not representative.

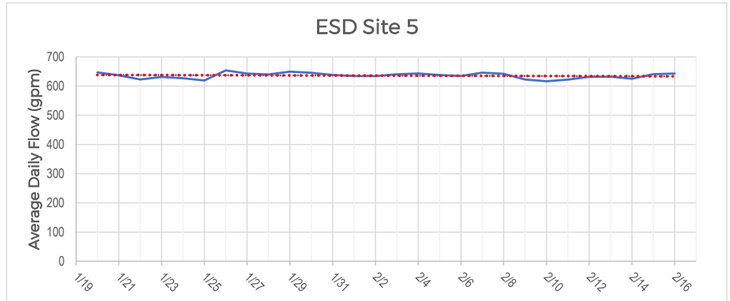
Additional Summary Metrics	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6[1]
Approximate ERUs	2,105	899	298	980	5,105	2,030
Avg. Flow per ERU (gpepd)	98	151	94	59	179	117
Systemwide AWWF (gpepd)	154					

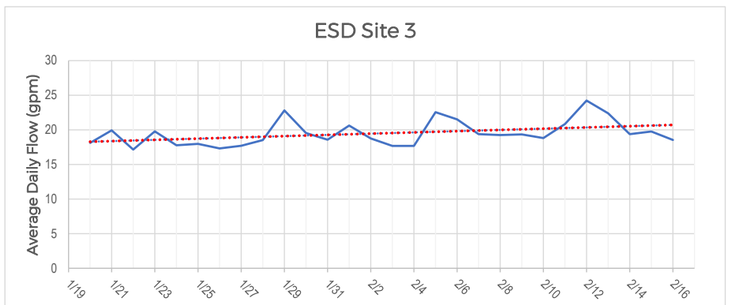
1) Average flow per ERU for Site 6 is based on the daily flow from 1/29.

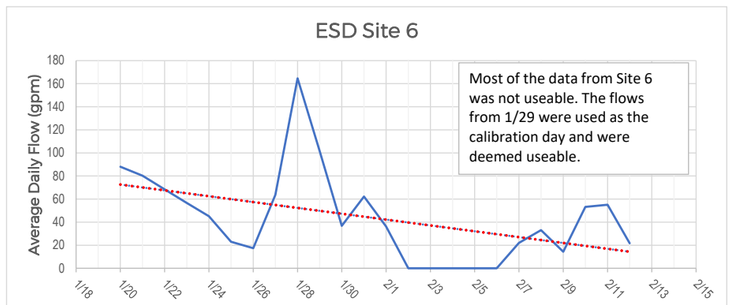










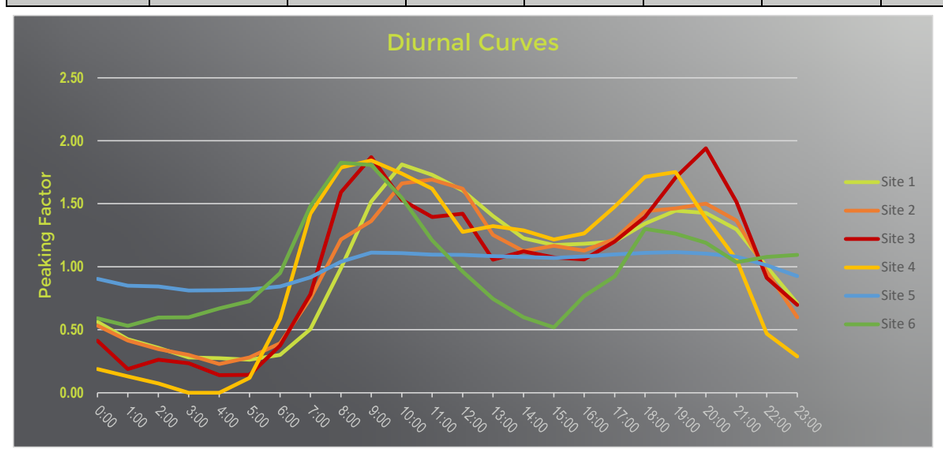


Client: Eagle Sewer District
Project: Wastewater Master Plan
Project No.: 222250

Site 1 Processed Flow Data for Model

Peak Day Observed: January 29th

		Site 1		Site 2		Site 3		Site 4		Site 5		Site 6	
Date	*Time*	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor
1/29/2023	*0:00*	98	0.56	46	0.53	9	0.41	8	0.19	586	0.90	97	0.59
1/29/2023	*1:00*	74	0.42	36	0.41	4	0.19	6	0.13	551	0.85	87	0.53
1/29/2023	*2:00*	62	0.36	30	0.34	6	0.26	3	0.07	547	0.84	98	0.60
1/29/2023	*3:00*	48	0.28	26	0.30	5	0.23	0	0.00	527	0.81	98	0.60
1/29/2023	*4:00*	48	0.27	20	0.23	3	0.14	0	0.00	528	0.81	110	0.67
1/29/2023	*5:00*	46	0.26	24	0.28	3	0.14	5	0.12	531	0.82	119	0.73
1/29/2023	*6:00*	52	0.30	34	0.39	9	0.37	26	0.59	547	0.84	156	0.95
1/29/2023	*7:00*	88	0.50	64	0.75	18	0.78	64	1.42	594	0.92	243	1.48
1/29/2023	*8:00*	172	0.99	105	1.22	36	1.59	80	1.79	674	1.04	300	1.83
1/29/2023	*9:00*	264	1.52	117	1.36	43	1.87	83	1.84	722	1.11	297	1.81
1/29/2023	*10:00*	316	1.81	143	1.66	35	1.53	78	1.74	719	1.11	254	1.55
1/29/2023	*11:00*	301	1.73	145	1.69	32	1.39	73	1.62	711	1.10	199	1.21
1/29/2023	*12:00*	279	1.61	139	1.62	32	1.42	57	1.28	709	1.09	158	0.96
1/29/2023	*13:00*	244	1.40	108	1.25	24	1.05	59	1.32	703	1.08	122	0.74
1/29/2023	*14:00*	213	1.23	97	1.12	26	1.12	58	1.29	699	1.08	98	0.60
1/29/2023	*15:00*	204	1.17	100	1.17	24	1.07	55	1.21	695	1.07	85	0.52
1/29/2023	*16:00*	206	1.18	97	1.13	24	1.06	57	1.26	703	1.08	126	0.77
1/29/2023	*17:00*	209	1.20	105	1.22	27	1.20	66	1.48	713	1.10	151	0.92
1/29/2023	*18:00*	234	1.34	124	1.44	32	1.39	77	1.71	720	1.11	214	1.30
1/29/2023	*19:00*	251	1.44	126	1.46	39	1.71	79	1.75	725	1.12	207	1.26
1/29/2023	*20:00*	248	1.43	129	1.50	44	1.94	62	1.38	716	1.10	195	1.19
1/29/2023	*21:00*	225	1.30	118	1.37	35	1.51	48	1.06	701	1.08	170	1.03
1/29/2023	*22:00*	174	1.00	83	0.96	21	0.91	21	0.47	656	1.01	177	1.08
1/29/2023	*23:00*	123	0.71	51	0.60	16	0.70	13	0.29	600	0.92	180	1.09
Average	-	**174**	**1.00**	**86**	**1.00**	**23**	**1.00**	**45**	**1.00**	**649**	**1.00**	**164**	**1.00**
Max	-	**316**	**1.81**	**145**	**1.69**	**44**	**1.94**	**83**	**1.84**	**725**	**1.12**	**300**	**1.83**



Client: Eagle Sewer District
Project: WW Collection System Plan
Project No.: 222250

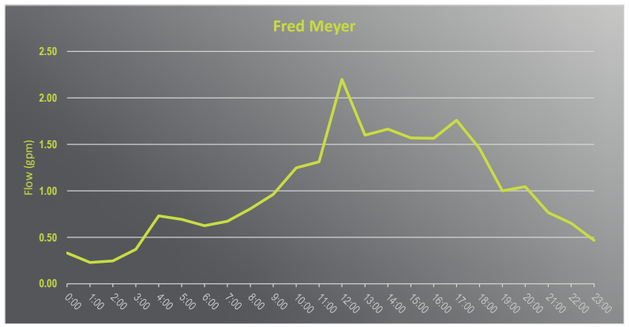
Lift Station Diurnal Curves

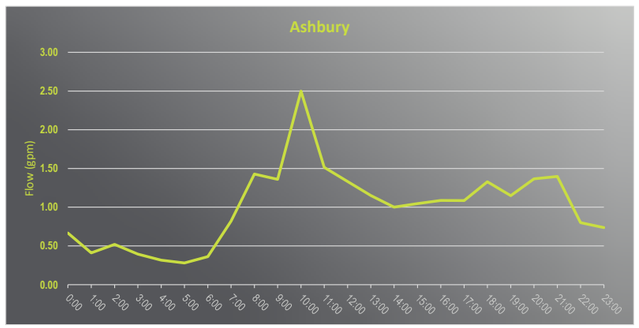
Red peaking factors adjusted manually during calibration

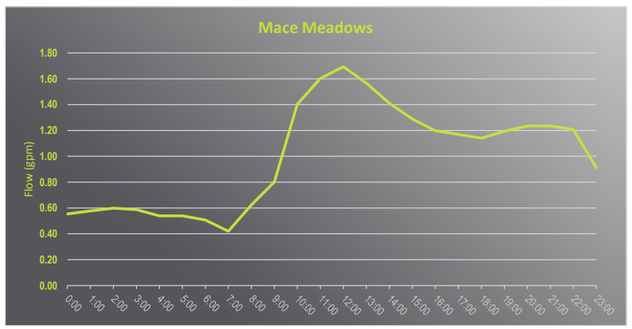
Time	Peak Day	Fred Meyer		Ashbury		Mace Meadows		Creighton Woods		Bobs		Stillwater		Crestpoint		Lakemoor		Old Valley		Palmer	
		1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor	1-Hour Avg. Flow (gpm)	Peaking Factor
0:00	1/29/23 0:00	19	0.33	23	0.67	182	0.55	3	0.63	18	0.58	1	0.40	1	0.51	28	0.60	320	0.78	132	0.52
1:00	1/29/23 1:00	13	0.23	14	0.41	190	0.58	3	0.63	12	0.39	1	0.40	1	0.51	22	0.47	229	0.56	104	0.44
2:00	1/29/23 2:00	14	0.25	18	0.52	197	0.60	3	0.52	11	0.35	1	0.40	1	0.37	23	0.50	197	0.48	88	0.40
3:00	1/29/23 3:00	22	0.37	14	0.39	193	0.59	2	0.44	9	0.31	1	0.43	1	0.35	27	0.58	164	0.40	74	0.38
4:00	1/29/23 4:00	43	0.73	11	0.32	177	0.54	2	0.44	9	0.30	2	0.55	1	0.35	21	0.45	143	0.35	67	0.34
5:00	1/29/23 5:00	40	0.69	10	0.28	177	0.54	2	0.44	10	0.31	2	0.55	1	0.35	20	0.43	129	0.31	64	0.37
6:00	1/29/23 6:00	37	0.62	13	0.36	167	0.51	2	0.44	9	0.30	2	0.55	1	0.35	21	0.45	129	0.32	57	0.66
7:00	1/29/23 7:00	39	0.67	29	0.82	138	0.42	2	0.44	12	0.38	4	1.09	1	0.35	28	0.60	144	0.35	63	1.18
8:00	1/29/23 8:00	47	0.81	50	1.43	205	0.62	3	0.53	23	0.73	4	1.20	1	0.35	41	1.30	231	0.56	112	1.46
9:00	1/29/23 9:00	56	0.96	48	1.36	264	0.80	7	1.29	31	0.99	3	1.02	3	1.39	62	2.00	390	0.95	199	1.74
10:00	1/29/23 10:00	73	1.25	88	2.50	461	1.40	7	1.29	38	1.24	4	1.05	3	1.84	76	1.90	550	1.34	246	1.74
11:00	1/29/23 11:00	77	1.31	53	1.51	527	1.60	9	1.63	52	1.67	4	1.13	3	1.56	76	1.80	678	1.65	276	1.74
12:00	1/29/23 12:00	129	2.20	47	1.33	557	1.69	9	1.68	51	1.65	4	1.07	3	1.66	66	1.30	749	1.83	294	1.39
13:00	1/29/23 13:00	93	1.60	40	1.15	515	1.57	7	1.27	48	1.55	3	1.02	3	1.53	66	1.30	586	1.43	235	1.26
14:00	1/29/23 14:00	97	1.67	35	1.00	464	1.41	7	1.27	51	1.66	4	1.12	2	0.91	59	0.90	602	1.47	234	1.15
15:00	1/29/23 15:00	92	1.57	37	1.05	424	1.29	6	1.12	45	1.44	4	1.18	2	0.91	60	1.10	520	1.27	212	1.12
16:00	1/29/23 16:00	91	1.57	38	1.09	394	1.20	6	1.06	44	1.41	5	1.45	2	1.26	60	1.00	497	1.21	194	1.09
17:00	1/29/23 17:00	103	1.76	38	1.09	385	1.17	6	1.06	46	1.49	7	2.00	3	1.68	55	1.17	465	1.13	190	1.40
18:00	1/29/23 18:00	85	1.46	47	1.33	375	1.14	9	1.72	41	1.31	7	2.03	4	2.08	57	1.21	533	1.30	184	1.40
19:00	1/29/23 19:00	58	1.00	40	1.15	393	1.19	9	1.73	45	1.43	6	1.63	3	1.51	53	1.14	554	1.35	216	1.40
20:00	1/29/23 20:00	61	1.04	48	1.37	406	1.23	9	1.67	46	1.47	5	1.36	2	1.28	53	1.14	552	1.34	216	0.75
21:00	1/29/23 21:00	45	0.77	49	1.40	406	1.23	7	1.23	41	1.31	4	1.14	2	1.03	61	1.00	565	1.38	222	0.66
22:00	1/29/23 22:00	38	0.65	28	0.80	397	1.21	4	0.73	31	1.00	2	0.73	2	0.94	49	0.80	522	1.27	202	0.78
23:00	1/29/23 23:00	27	0.47	26	0.74	300	0.91	4	0.73	23	0.74	2	0.51	2	0.94	36	0.77	396	0.97	167	0.61
Average	**-**	**58**	**1.00**	**35**	**1.00**	**329**	**1.00**	**5**	**1.00**	**31**	**1.00**	**3**	**1.00**	**2**	**1.00**	**47**	**1.00**	**410**	**1.00**	**169**	**1.00**
Max	**-**	**129**	**2.20**	**88**	**2.50**	**557**	**1.69**	**9**	**1.73**	**52**	**1.67**	**7**	**2.03**	**4**	**2.08**	**76**	**2.00**	**749**	**1.83**	**294**	**1.74**

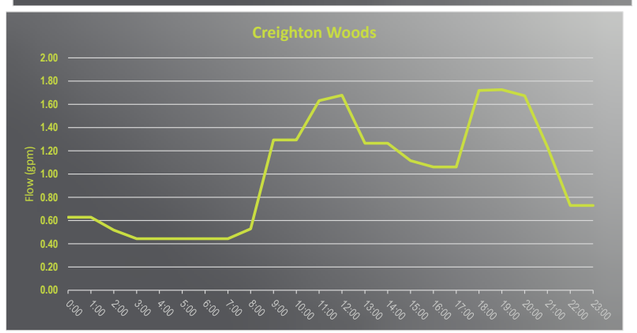
Client: Eagle Sewer District
Project: WW Collection System Plan
Project No.: 222250

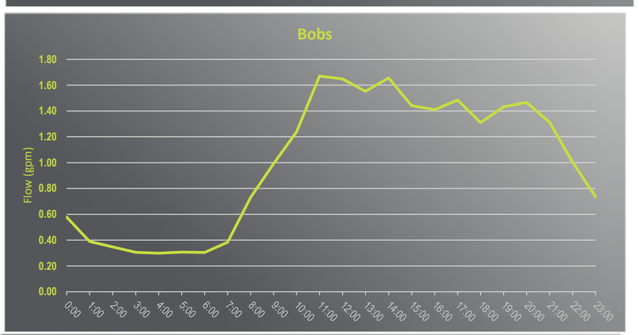
Lift Station Diurnal Curves

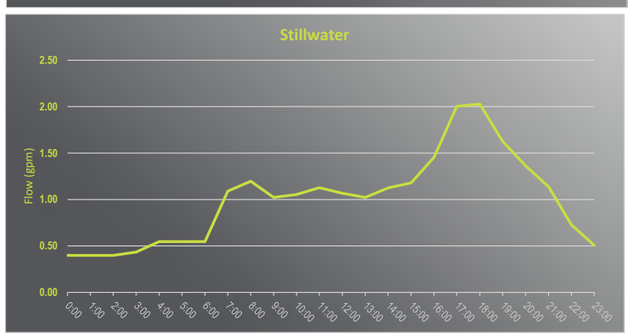


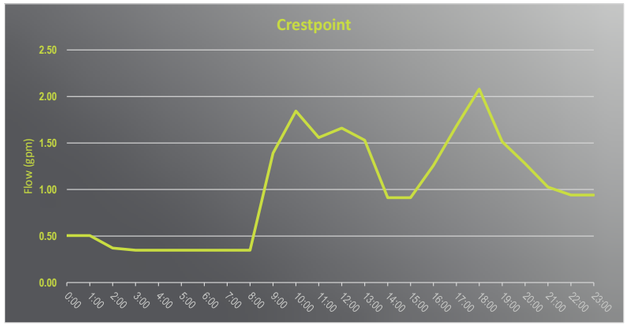


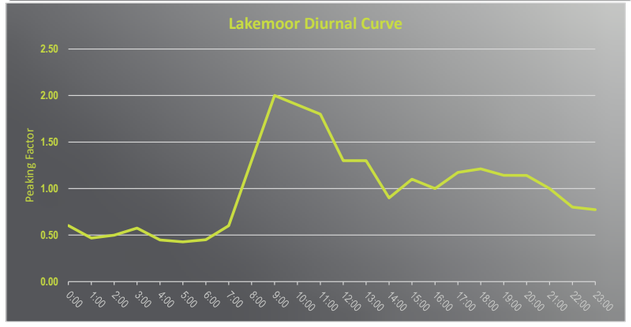


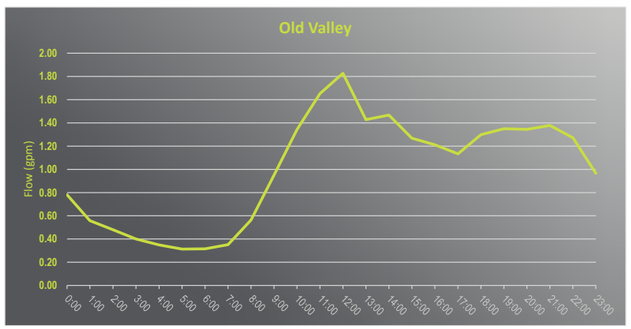


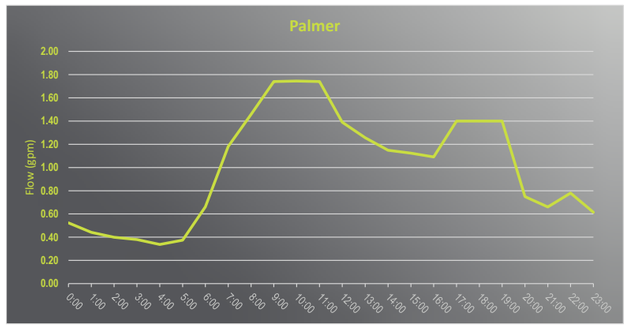








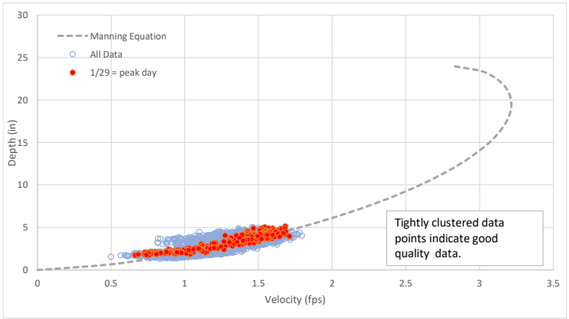


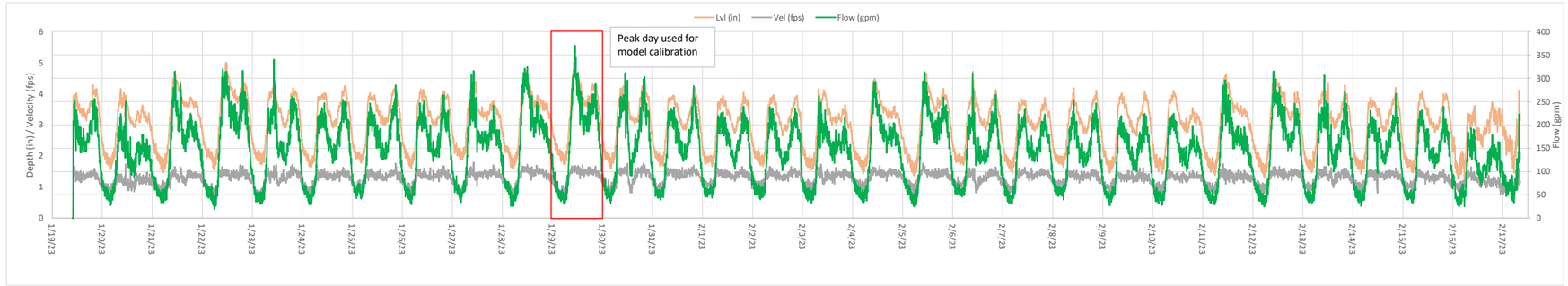


Client: Eagle Sewer District
Project: WW Collection Plan
Project No.: 222250-001

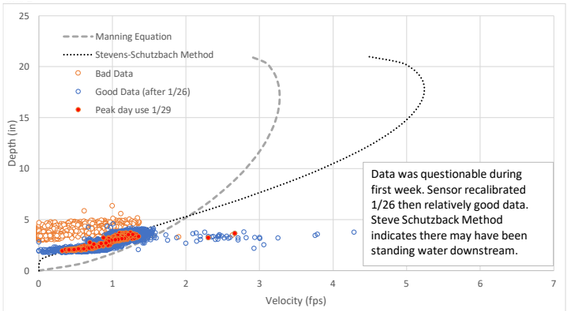
Flow Monitoring Results

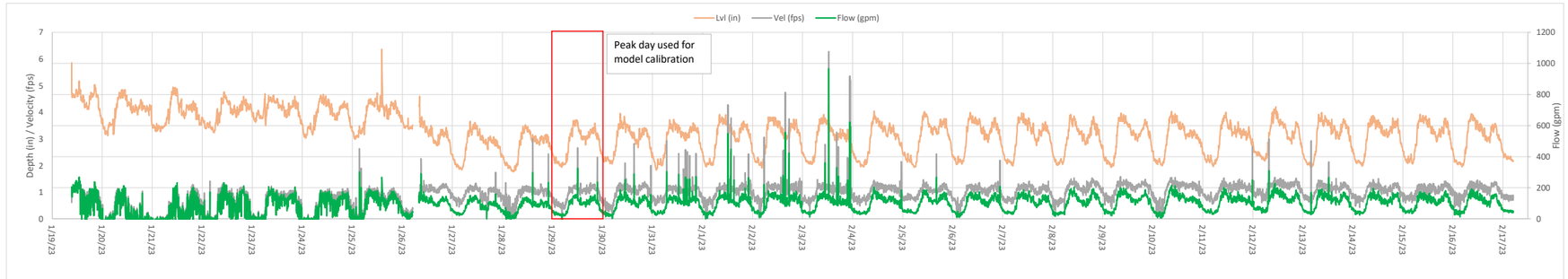
Site 1



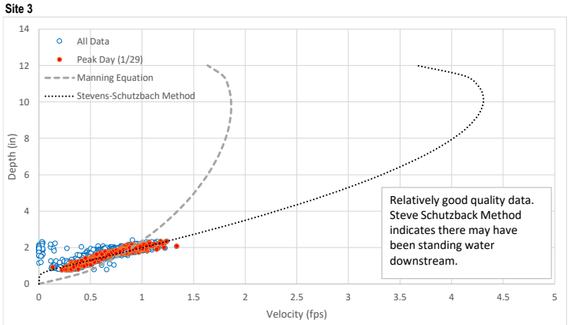


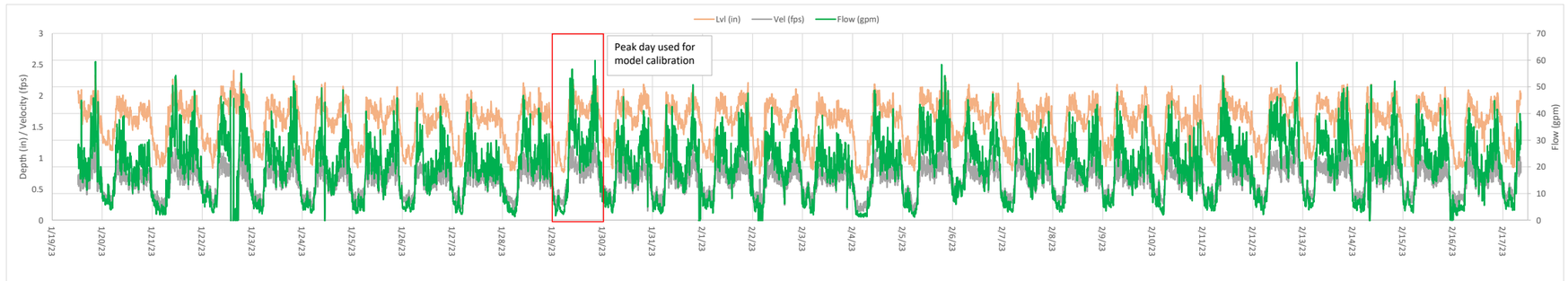
Site 2





Site 3

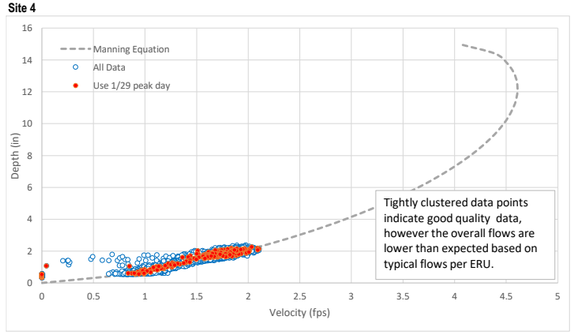


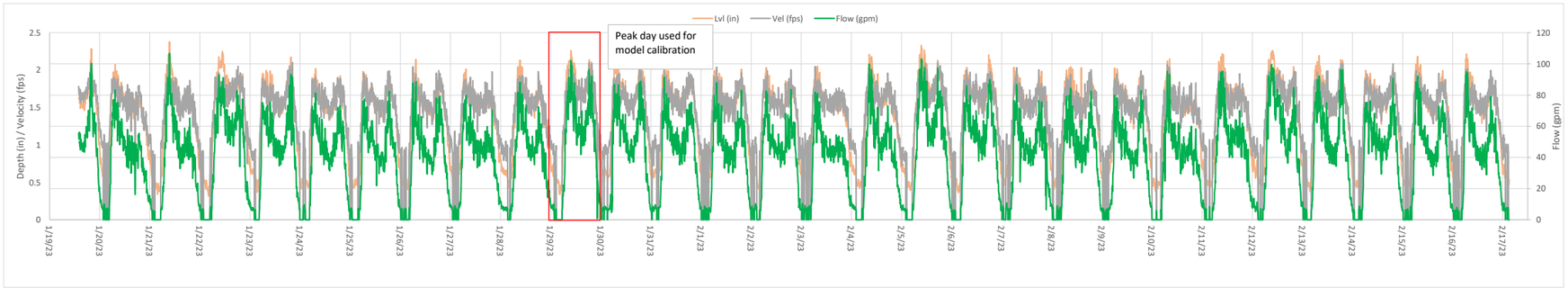


Client: Eagle Sewer District
Project: WW Collection Plan
Project No.: 222250-001

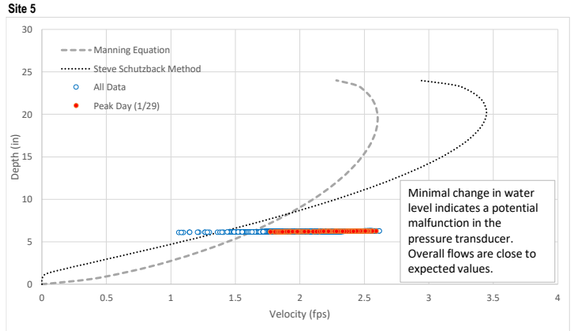
Flow Monitoring Results

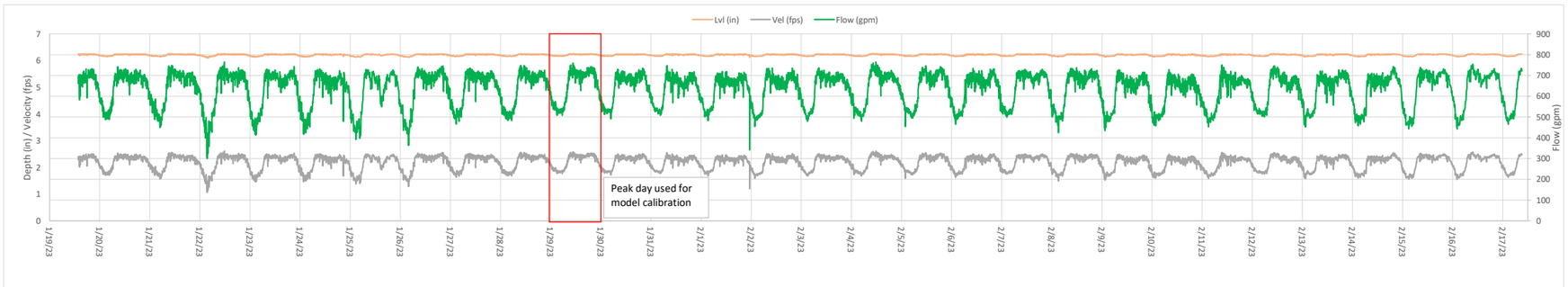
Site 4



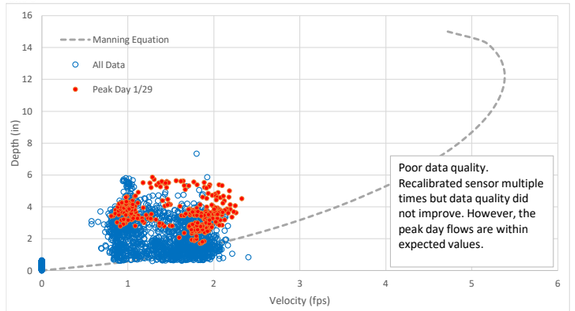


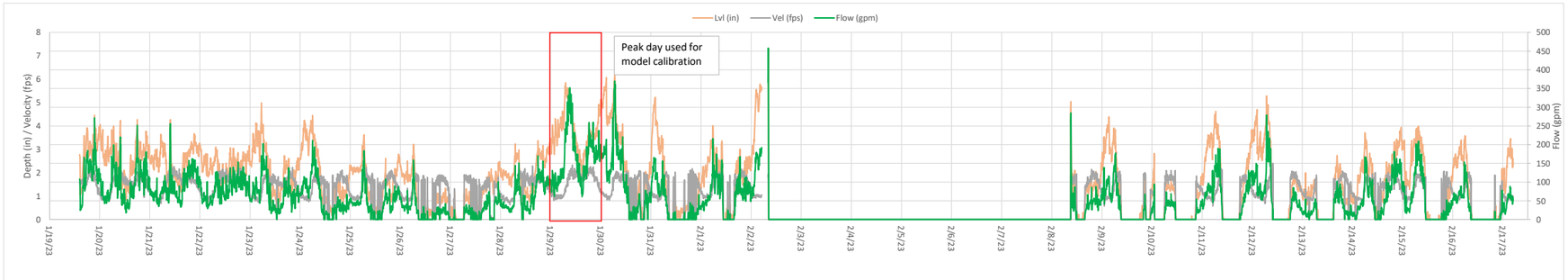
Site 5





Site 6



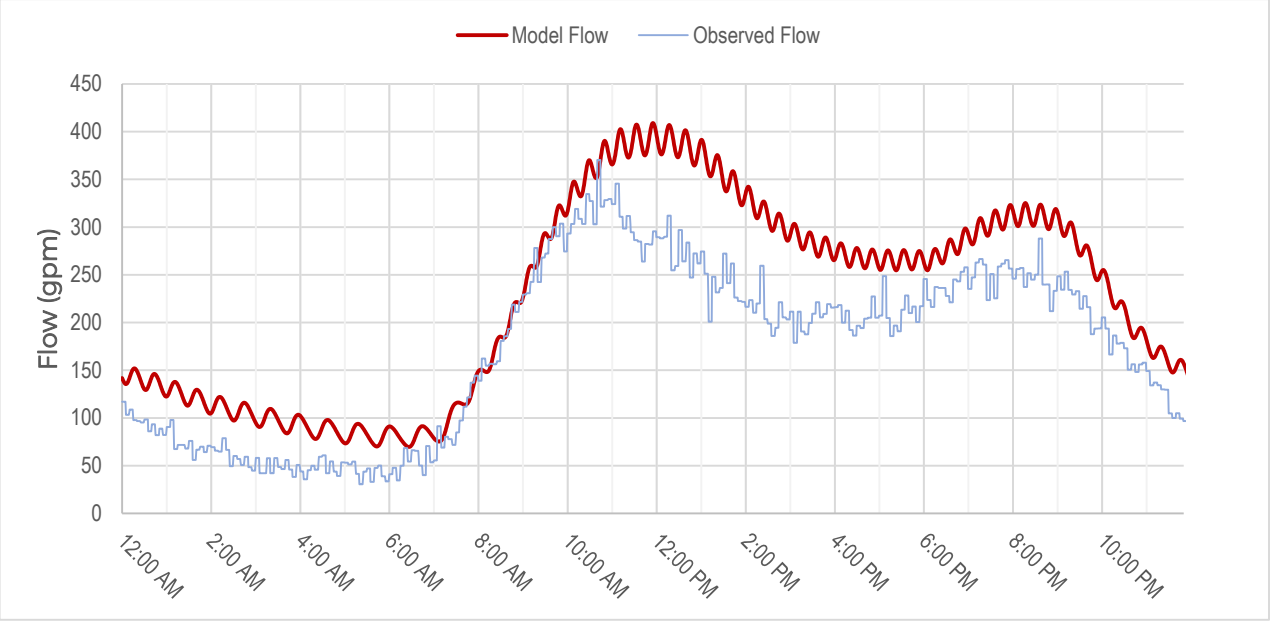


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number: 1
Flow Monitoring Period: 1/19/2023 - 2/13/2023
Calibration Day: 1/29/2023

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	174	370
Model Data	227	409
Difference	31%	10%



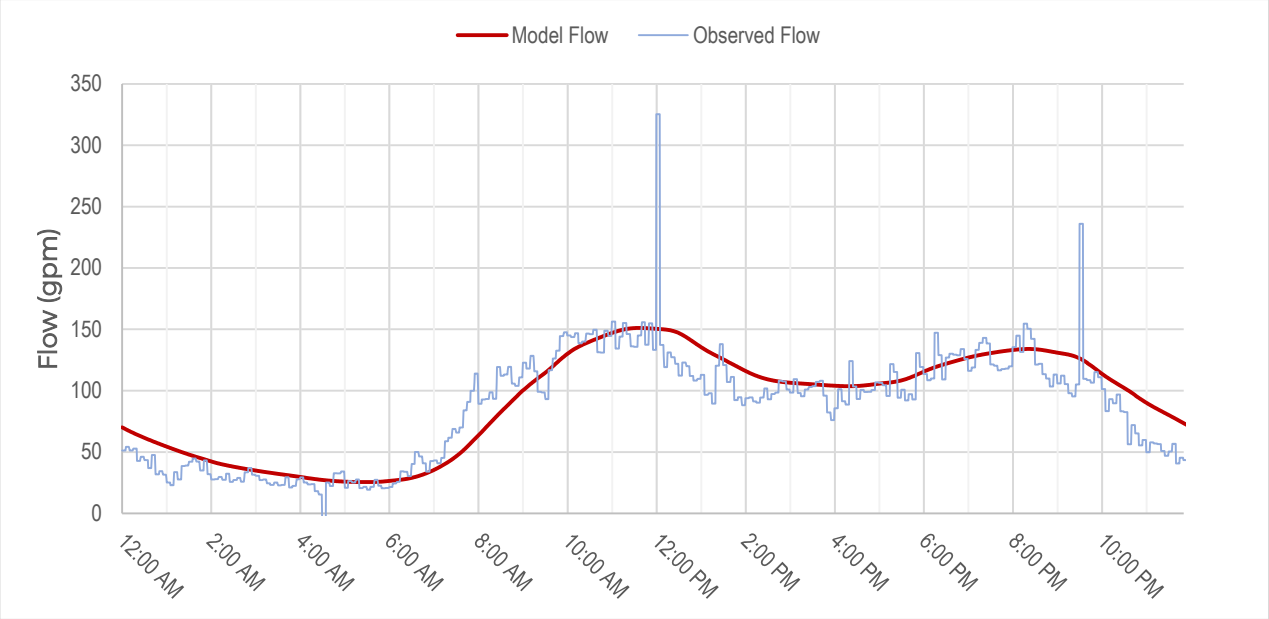
Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number: 2
Flow Monitoring Period: 1/19/2023 - 2/13/2023
Calibration Day: 1/29/2023

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	86	156
Model Data	91	151
Difference	6%	-3%

Excludes spikes at 12PM and 9:30 PM

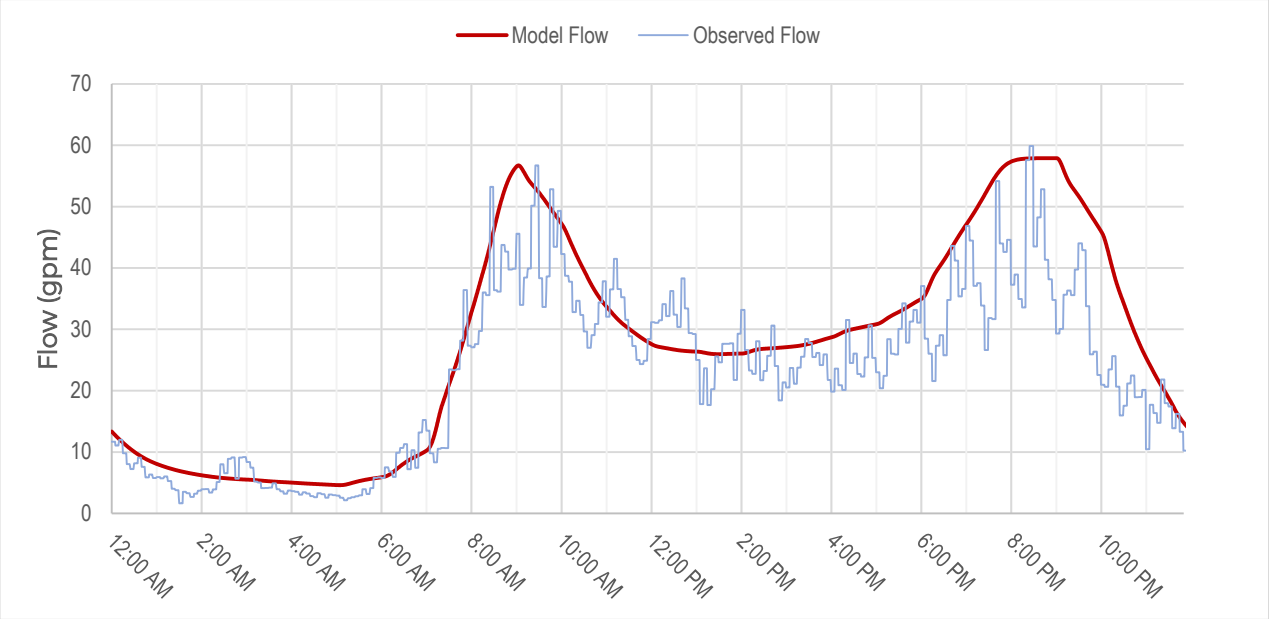


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number: 3
Flow Monitoring Period: 1/19/2023 - 2/13/2023
Calibration Day: 1/29/2023

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	23	60
Model Data	28	58
Difference	21%	-3%

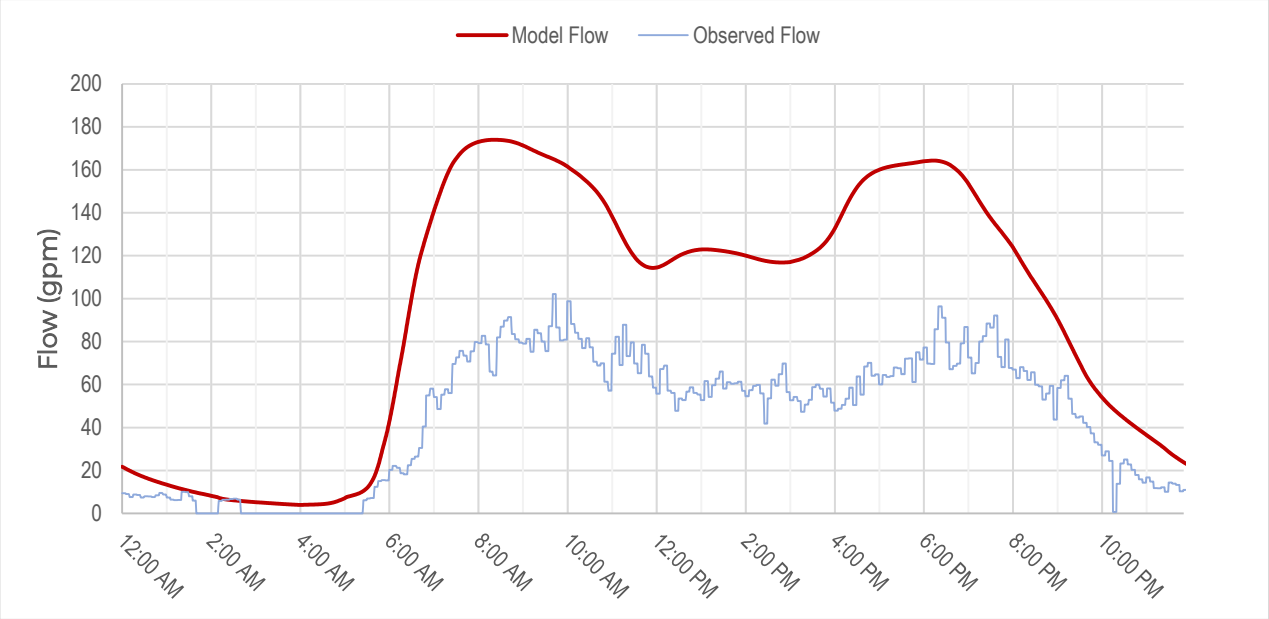


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number: 4
Flow Monitoring Period: 1/19/2023 - 2/13/2023
Calibration Day: 1/29/2023

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	45	102
Model Data	95	174
Difference	111%	70%

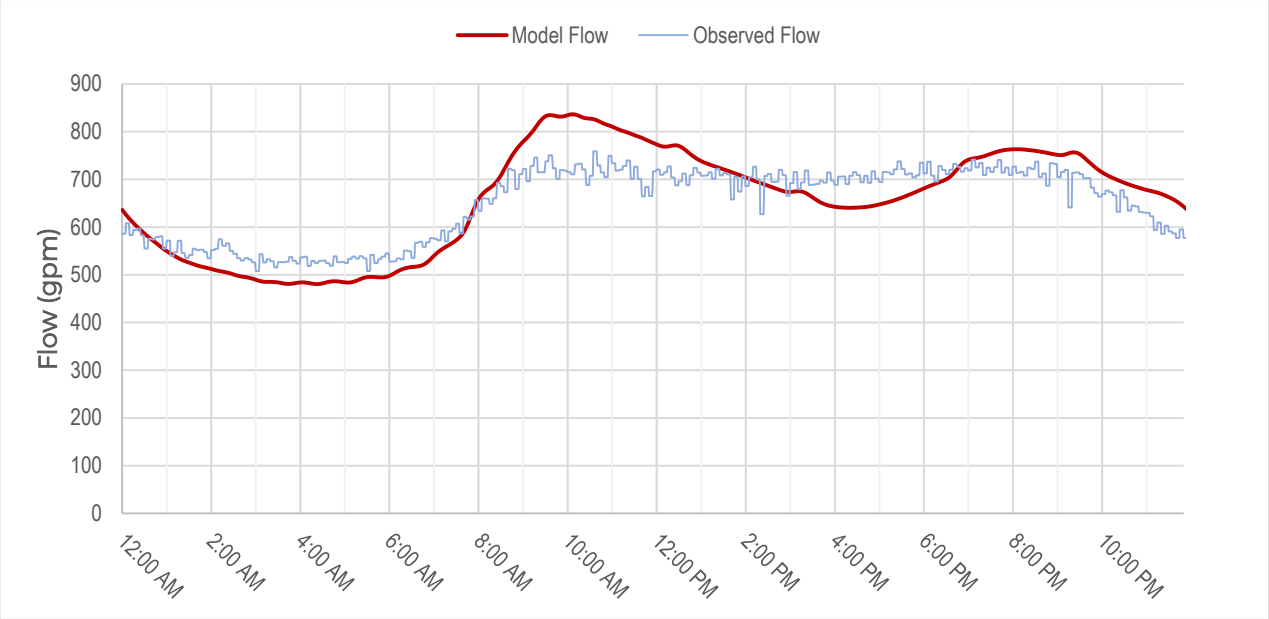


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number: 5
Flow Monitoring Period: 1/19/2023 - 2/13/2023
Calibration Day: 1/29/2023

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	649	759
Model Data	657	836
Difference	1%	10%

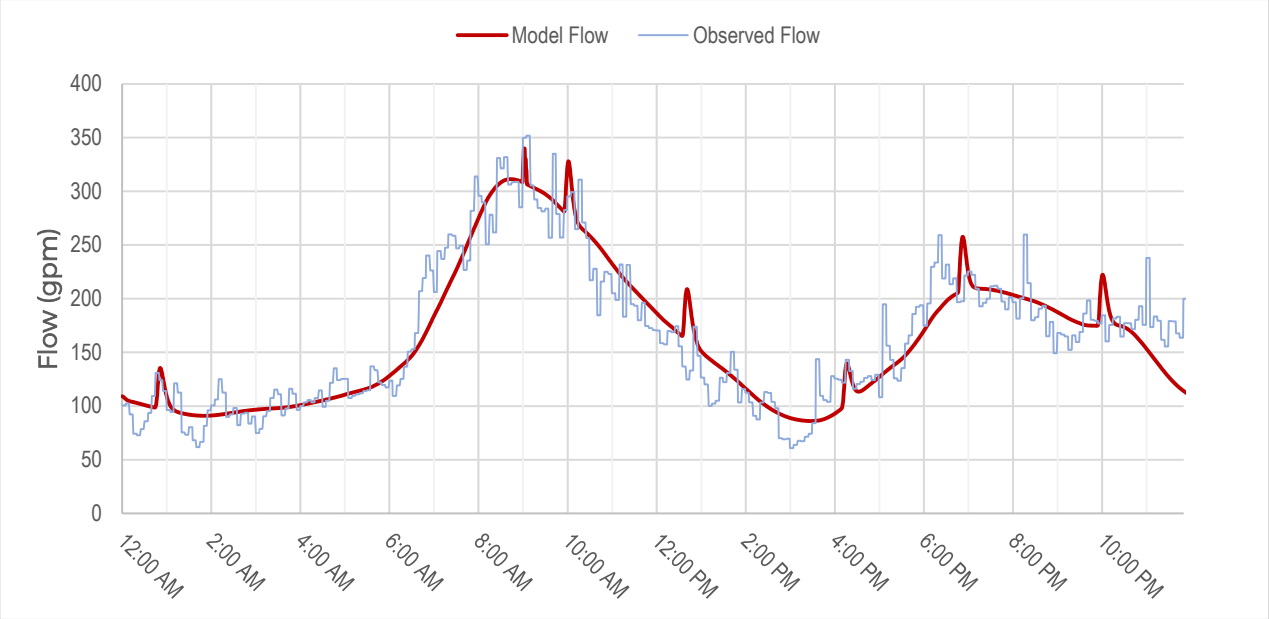


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number: 6
Flow Monitoring Period: 1/19/2023 - 2/13/2023
Calibration Day: 1/29/2023

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	165	352
Model Data	163	340
Difference	-1%	-3%

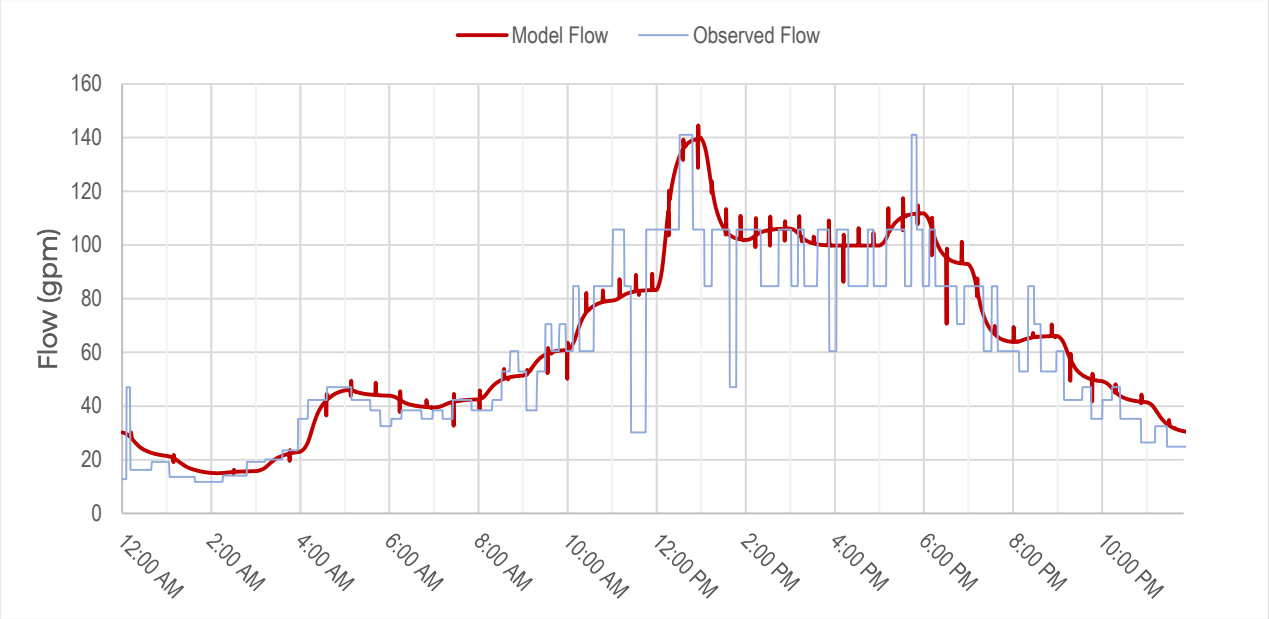


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number:	**Fred Meyer Lift Station**
Flow Monitoring Period:	**1/19/2023 - 2/13/2023**
Calibration Day:	**1/29/2023**

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	58	141
Model Data	64	145
Difference	9%	3%

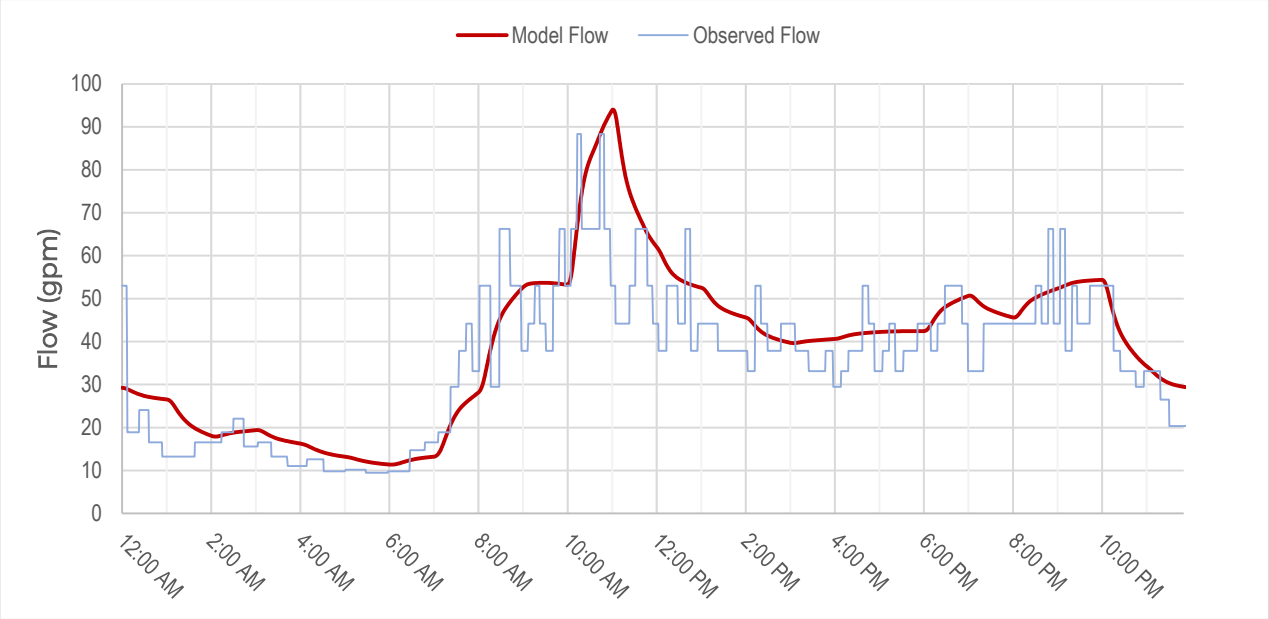


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number:	**Ashbury Lift Station**
Flow Monitoring Period:	**1/19/2023 - 2/13/2023**
Calibration Day:	**1/29/2023**

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	35	88
Model Data	39	94
Difference	11%	6%

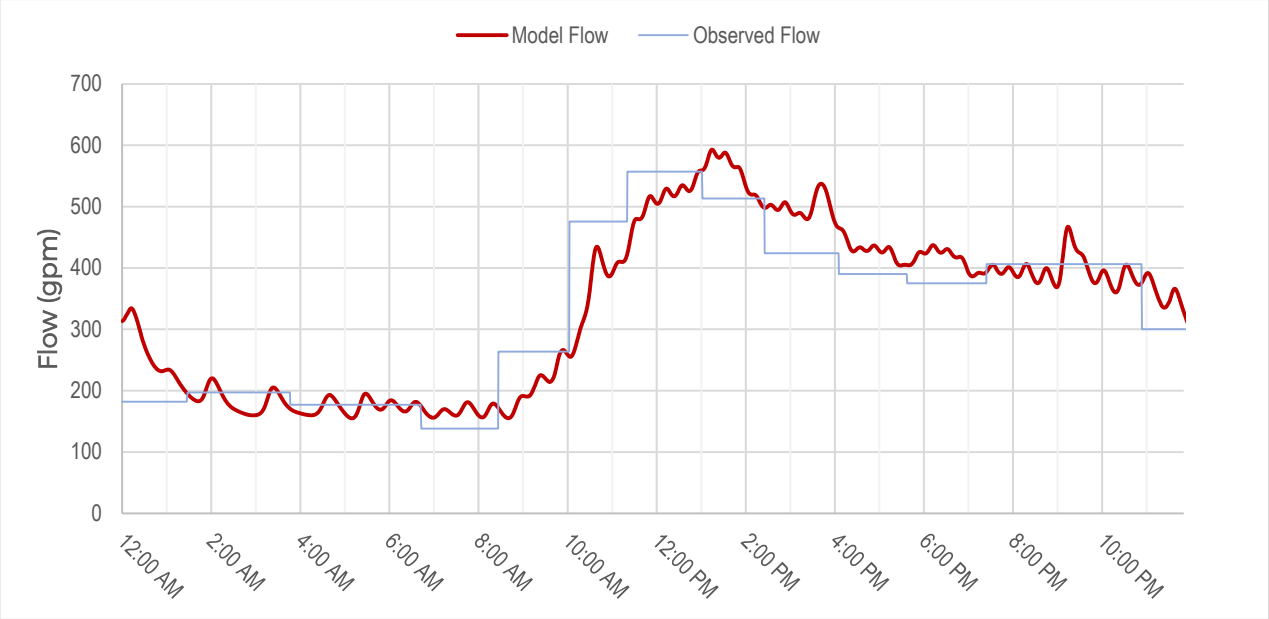


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number:	**Mace Lift Station**
Flow Monitoring Period:	**1/19/2023 - 2/13/2023**
Calibration Day:	**1/29/2023**

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	329	557
Model Data	335	593
Difference	2%	6%

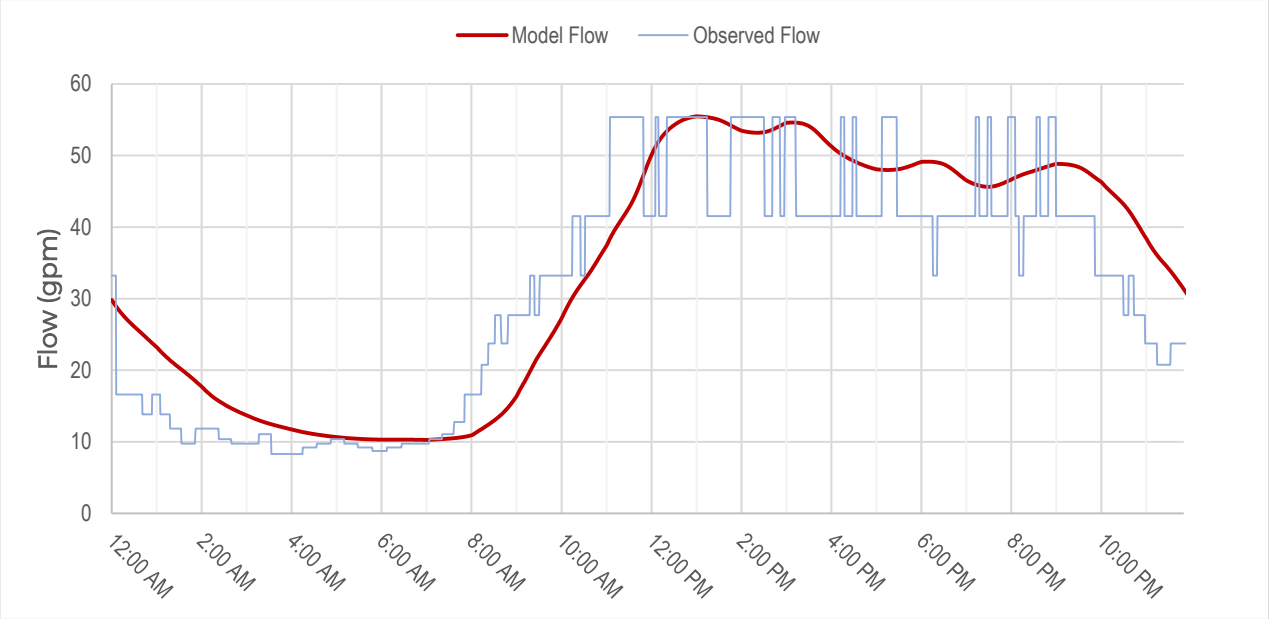


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number:	**Bob Lift Station**
Flow Monitoring Period:	**1/19/2023 - 2/13/2023**
Calibration Day:	**1/29/2023**

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	31	55
Model Data	34	55
Difference	8%	0%

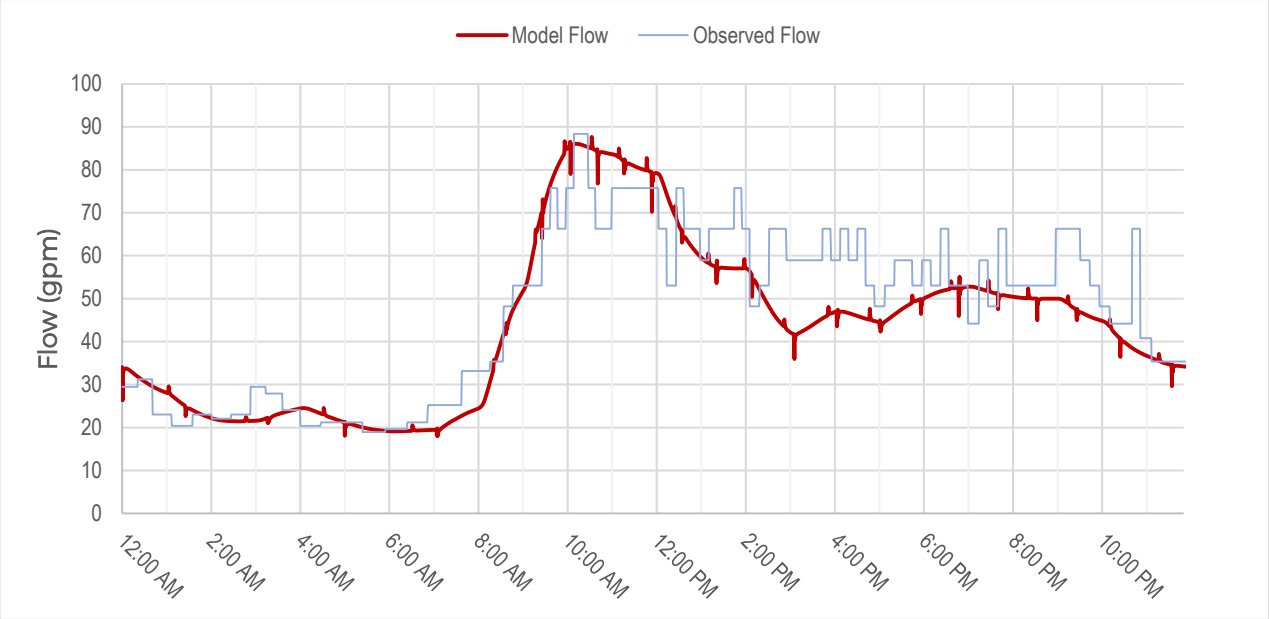


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number:	**Lakemoor Lift Station**
Flow Monitoring Period:	**1/19/2023 - 2/13/2023**
Calibration Day:	**1/29/2023**

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	47	88
Model Data	44	88
Difference	-6%	-1%

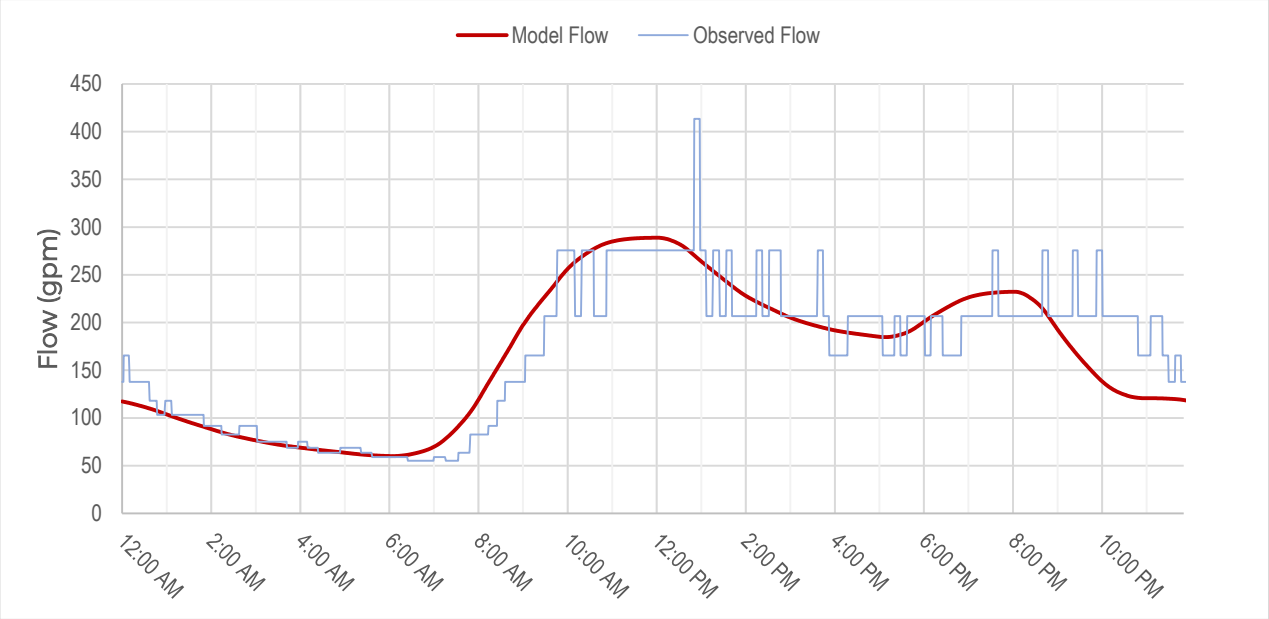


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number: Palmer Lift Station
Flow Monitoring Period: 1/19/2023 - 2/13/2023
Calibration Day: 1/29/2023

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)	
Observed Data	169	276	*Excludes spike at 1PM*
Model Data	166	289	
Difference	-2%	5%	

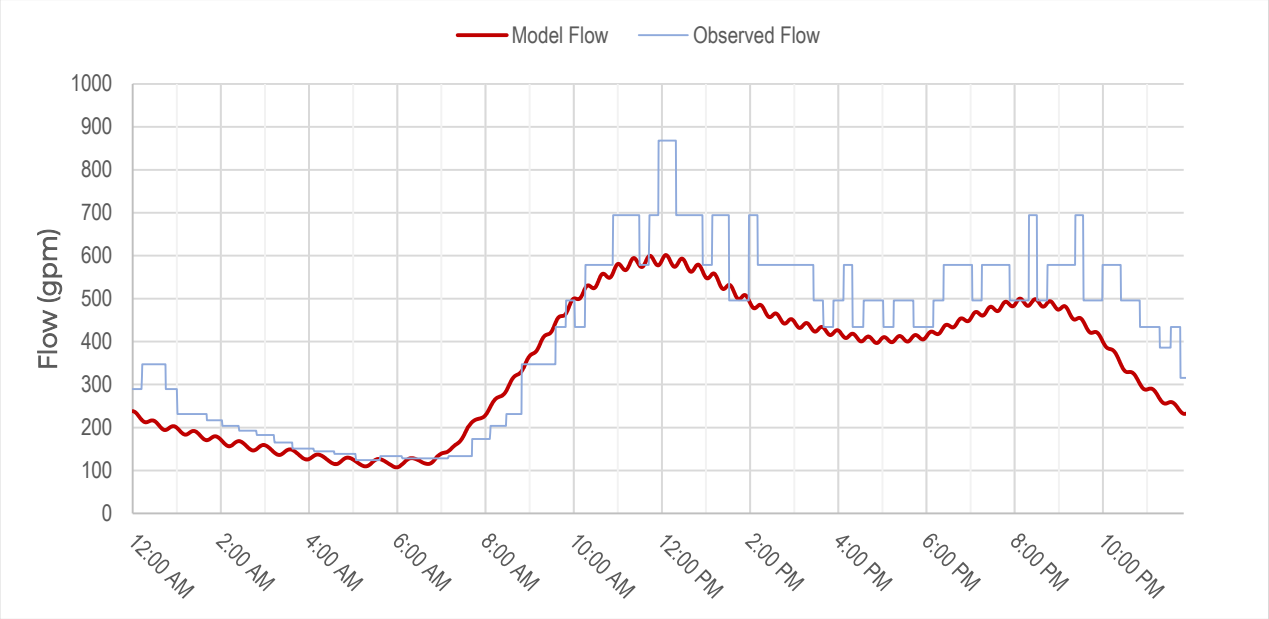


Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Model Calibration Results

Site Number:	**Old Valley Lift Station**
Flow Monitoring Period:	**1/19/2023 - 2/13/2023**
Calibration Day:	**1/29/2023**

Parameter	Average Daily Flow (gpm)	Peak Flow (gpm)
Observed Data	410	868
Model Data	348	602
Difference	**-15%**	**-31%**



APPENDIX E

Alternatives Analysis

KELLER ASSOCIATES

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Locust Grove West Septic Area

Alternative 1 - 8-inch Gravity Throughout

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	16,300	LF	$ 135	$ 2,200,500	
48-Inch, Concrete Manhole	63	EA	$ 6,125	$ 385,900	
New Sanitary Service Line (Excavation, Backfill, Pipe, Surface Repair)	143	EA	$ 10,000	$ 1,430,000	
Connect to Existing Manhole	3	EA	$ 2,100	$ 6,300	
Roadway Restoration (Full Lane)	16,300	LF	$ 75	$ 1,222,500	
Private Sewer Connection w/ Grinder Pump	27	EA	$ 15,000	$ 405,000	
Small Diameter Force Main - Directional Drilling	3,500	LF	$ 100	$ 350,000	
Traffic Control w/o Flaggers	1	LS	$ 75,000	$ 75,000	
				Construction Subtotal	***$ 6,075,200***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 608,000	
Bonding			2.5%	$ 152,000	
Contractor Overhead and Profit			15%	$ 911,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 1,823,000	
				Total Construction Subtotal	***$ 9,570,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,436,000	
Engineering - Construction Contract Administration			5%	$ 479,000	
Engineering -- Inspection			8%	$ 766,000	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 191,000	
				Total Project Costs (rounded)	**$ 12,520,000**

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Locust Grove West Septic Area

Alternative 2 - 8-inch Gravity and Lift Station

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	19,800	LF	$ 135	$ 2,673,000	
48-Inch, Concrete Manhole	72	EA	$ 6,125	$ 441,000	
New Sanitary Service Line (Excavation, Backfill, Pipe, Surface Repair)	170	EA	$ 10,000	$ 1,700,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
4-inch Pressure Pipe - Excavation, Backfill	100	LF	$ 80	$ 8,000	
Roadway Restoration (Full Lane)	19,800	LF	$ 75	$ 1,485,000	
Small Lift Station (<10 hp pumps)	1	EA	$ 600,000	$ 600,000	
Traffic Control w/o Flaggers	1	LS	$ 75,000	$ 75,000	
				Construction Subtotal	***$ 6,984,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 698,000	
Bonding			2.5%	$ 175,000	
Contractor Overhead and Profit			15%	$ 1,048,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 2,095,000	
				Total Construction Subtotal	***$ 11,001,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,650,000	
Engineering - Construction Contract Administration			5%	$ 550,000	
Engineering -- Inspection			8%	$ 880,000	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ 25,000	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 220,000	
				Total Project Costs (rounded)	**$ 14,400,000**

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Locust Grove West Septic Area

Alternative 3 - Private Pump Station w/ Grinder Pumps

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
Small Diameter Force Main - Directional Drilling	19,800	LF	$ 100	$ 1,980,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
Private Sewer Connection w/ Grinder Pump	170	EA	$ 15,000	$ 2,550,000	
Traffic Control w/o Flaggers	1	LS	$ 25,000	$ 25,000	
				Construction Subtotal	***$ 4,557,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 456,000	
Bonding			2.5%	$ 114,000	
Contractor Overhead and Profit			15%	$ 684,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 1,367,000	
				Total Construction Subtotal	***$ 7,179,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			5%	$ 359,000	
Engineering - Construction Contract Administration			2%	$ 144,000	
Engineering -- Inspection			2%	$ 144,000	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 144,000	
				Total Project Costs (rounded)	**$ 8,040,000**

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Locust Grove East Septic Area

Alternative 1 - 8-inch Gravity Throughout

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	16,500	LF	$ 135	$ 2,227,500	
48-Inch, Concrete Manhole	40	EA	$ 6,125	$ 245,000	
New Sanitary Service Line (Excavation, Backfill, Pipe, Surface Repair)	158	EA	$ 10,000	$ 1,580,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
Roadway Restoration (Full Lane)	16,500	LF	$ 75	$ 1,237,500	
Private Sewer Connection w/ Grinder Pump	14	EA	$ 15,000	$ 210,000	
Small Diameter Force Main - Directional Drilling	1,200	LF	$ 100	$ 120,000	
Traffic Control w/o Flaggers	1	LS	$ 75,000	$ 75,000	
				Construction Subtotal	***$ 5,697,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 570,000	
Bonding			2.5%	$ 142,000	
Contractor Overhead and Profit			15%	$ 855,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 1,709,000	
				Total Construction Subtotal	***$ 8,974,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 1,346,000	
Engineering - Construction Contract Administration			5%	$ 449,000	
Engineering -- Inspection			8%	$ 718,000	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 179,000	
				Total Project Costs (rounded)	**$ 11,740,000**

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Locust Grove East Septic Area

Alternative 2 - 8-inch Gravity and Lift Station - Not Practival

Alternative 3 - Private Pump Station w/ Grinder Pumps

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
Small Diameter Force Main - Directional Drilling	17,700	LF	$ 100	$ 1,770,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
Private Sewer Connection w/ Grinder Pump	172	EA	$ 15,000	$ 2,580,000	
Traffic Control w/o Flaggers	1	LS	$ 50,000	$ 50,000	
				Construction Subtotal	***$ 4,402,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 440,000	
Bonding			2.5%	$ 110,000	
Contractor Overhead and Profit			15%	$ 660,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 1,321,000	
				Total Construction Subtotal	***$ 6,934,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			5%	$ 347,000	
Engineering - Construction Contract Administration			2%	$ 139,000	
Engineering -- Inspection			2%	$ 139,000	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 139,000	
				Total Project Costs (rounded)	**$ 7,770,000**

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Downing Downs Alternatives

Alternative 1 - 8-inch Gravity Throughout

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	6,900	LF	$ 135	$ 931,500	
48-Inch, Concrete Manhole	17	EA	$ 6,125	$ 104,200	
New Sanitary Service Line (Excavation, Backfill, Pipe, Surface Repair)	95	EA	$ 10,000	$ 950,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
Roadway Restoration (Full Lane)	6,900	LF	$ 75	$ 517,500	
Traffic Control w/o Flaggers	1	LS	$ 30,000	$ 30,000	
				Construction Subtotal	***$ 2,535,300***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 254,000	
Bonding			2.5%	$ 63,000	
Contractor Overhead and Profit			15%	$ 380,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 761,000	
				Total Construction Subtotal	***$ 3,994,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 599,000	
Engineering - Construction Contract Administration			5%	$ 200,000	
Engineering -- Inspection			8%	$ 320,000	
Geotechnical Investigation			LS	$ 5,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 25,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			2%	$ 80,000	
				Total Project Costs (rounded)	**$ 5,230,000**

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Downing Downs Alternatives

Alternative 2 - 8-inch Gravity and Lift Station - Not Practival

Alternative 3 - Private Pump Station w/ Grinder Pumps

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
Small Diameter Force Main - Directional Drilling	6,900	LF	$ 100	$ 690,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
Private Sewer Connection w/ Grinder Pump	95	EA	$ 15,000	$ 1,425,000	
Traffic Control w/o Flaggers	1	LS	$ 30,000	$ 30,000	
				Construction Subtotal	***$ 2,147,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 215,000	
Bonding			2.5%	$ 54,000	
Contractor Overhead and Profit			15%	$ 322,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 644,000	
				Total Construction Subtotal	***$ 3,383,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			5%	$ 169,000	
Engineering - Construction Contract Administration			2%	$ 68,000	
Engineering -- Inspection			2%	$ 68,000	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 68,000	
				Total Project Costs (rounded)	**$ 3,830,000**

Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

Sage Acres Alternatives

Alternative 1 - 8-inch Gravity Throughout

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	5,260	LF	$ 135	$ 710,100	
48-Inch, Concrete Manhole	15	EA	$ 6,125	$ 91,900	
New Sanitary Service Line (Excavation, Backfill, Pipe, Surface Repair)	58	EA	$ 10,000	$ 580,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
Roadway Restoration (Full Lane)	5,260	LF	$ 75	$ 394,500	
Traffic Control w/o Flaggers	1	LS	$ 30,000	$ 30,000	
				Construction Subtotal	***$ 1,808,600***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 181,000	
Bonding			2.5%	$ 45,000	
Contractor Overhead and Profit			15%	$ 271,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 543,000	
				Total Construction Subtotal	***$ 2,849,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 427,000	
Engineering - Construction Contract Administration			5%	$ 142,000	
Engineering -- Inspection			8%	$ 228,000	
Geotechnical Investigation			LS	$ 5,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 25,000	
Environmental & Permitting			LS	$ 5,000	
Legal, Administrative, and Funding			2%	$ 57,000	
				Total Project Costs (rounded)	**$ 3,740,000**

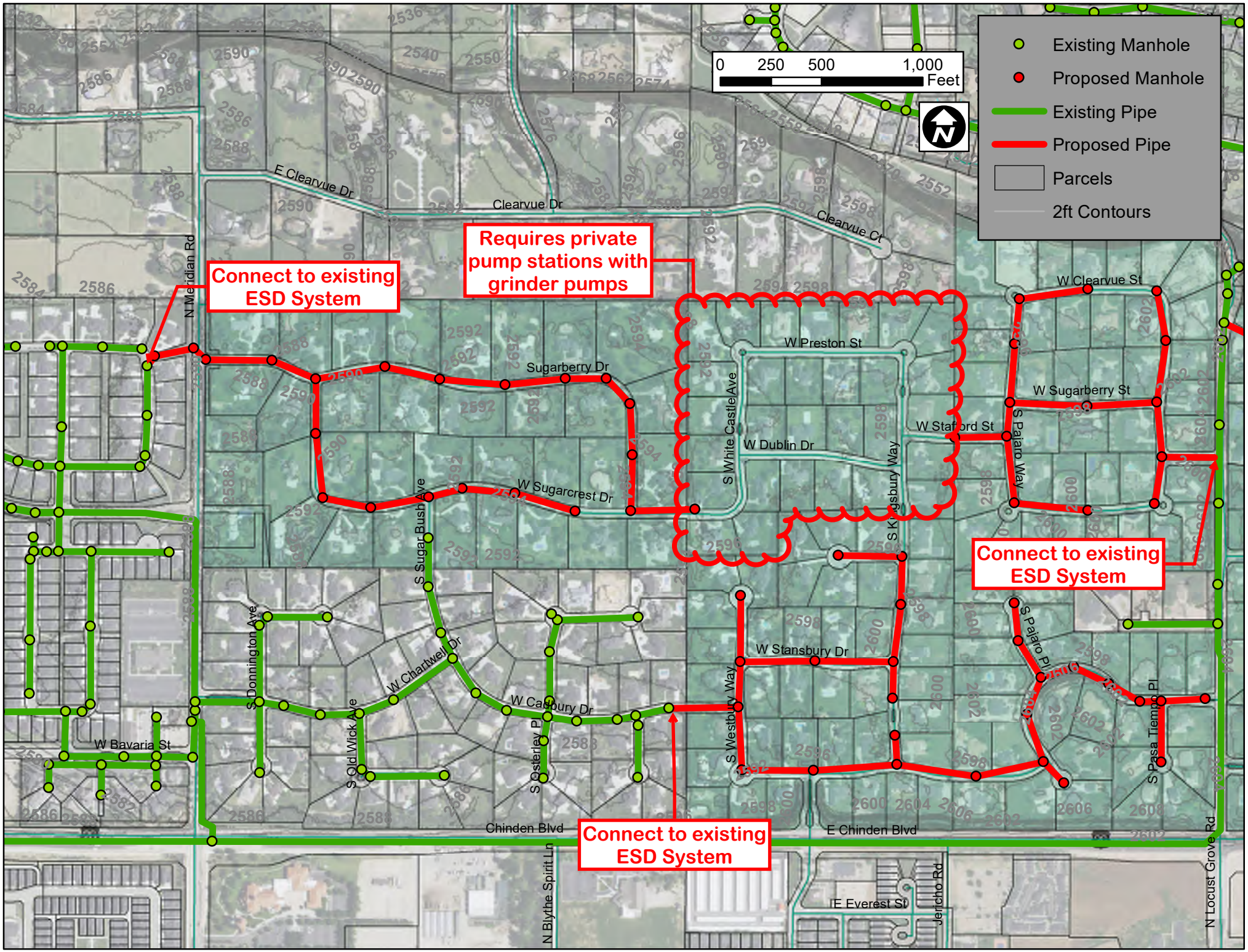
Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250-001

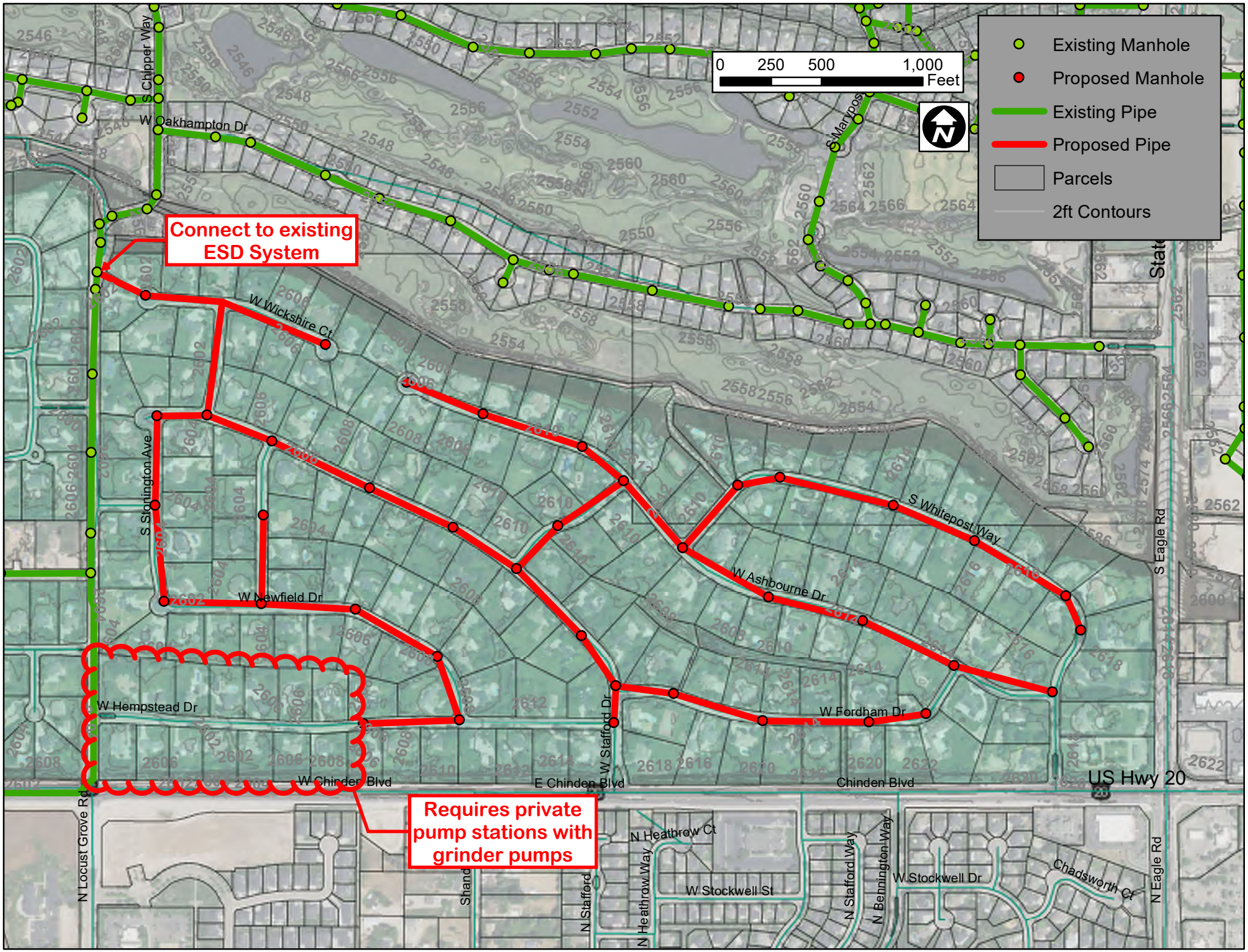
Sage Acres Alternatives

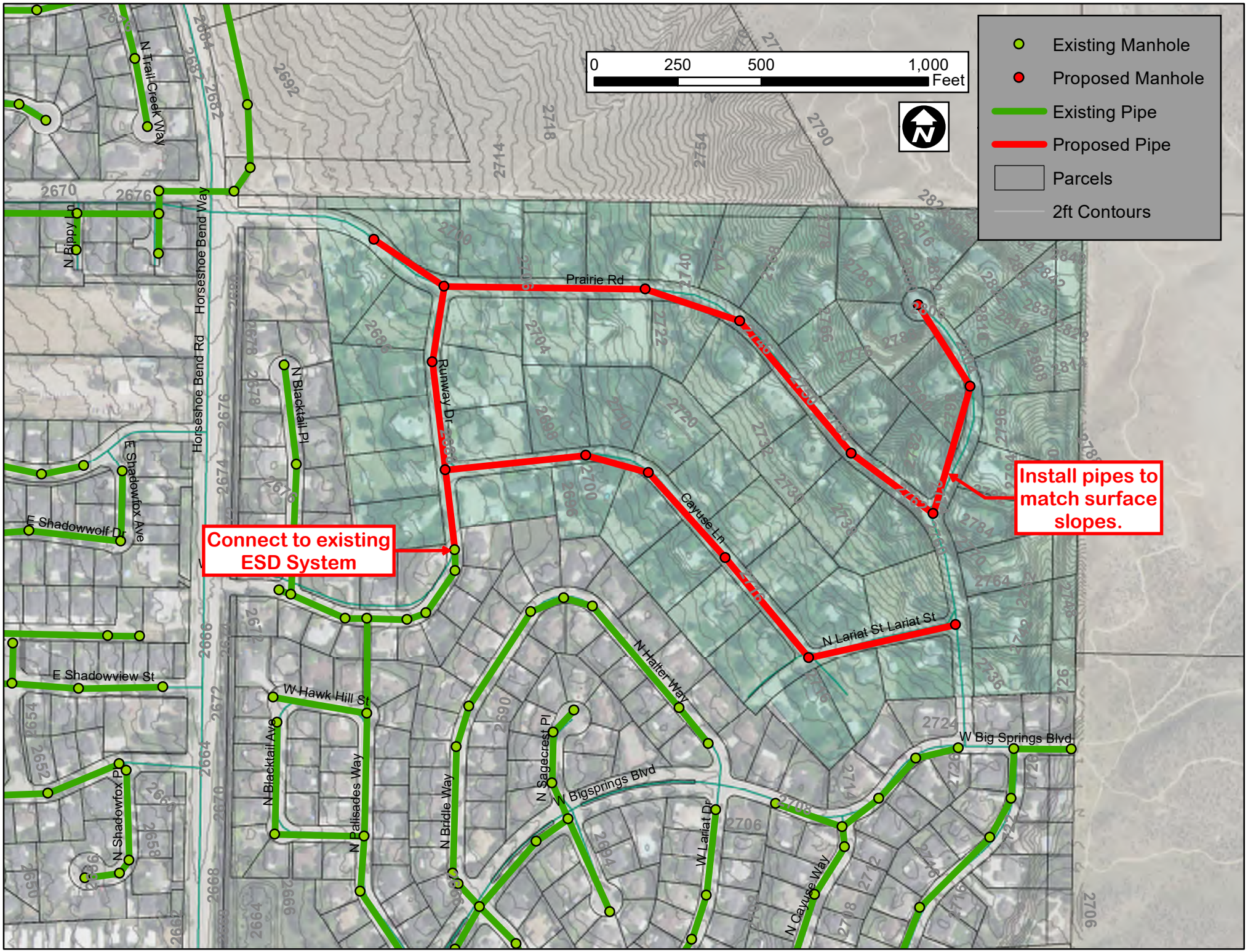
Alternative 2 - 8-inch Gravity and Lift Station - Not Practival

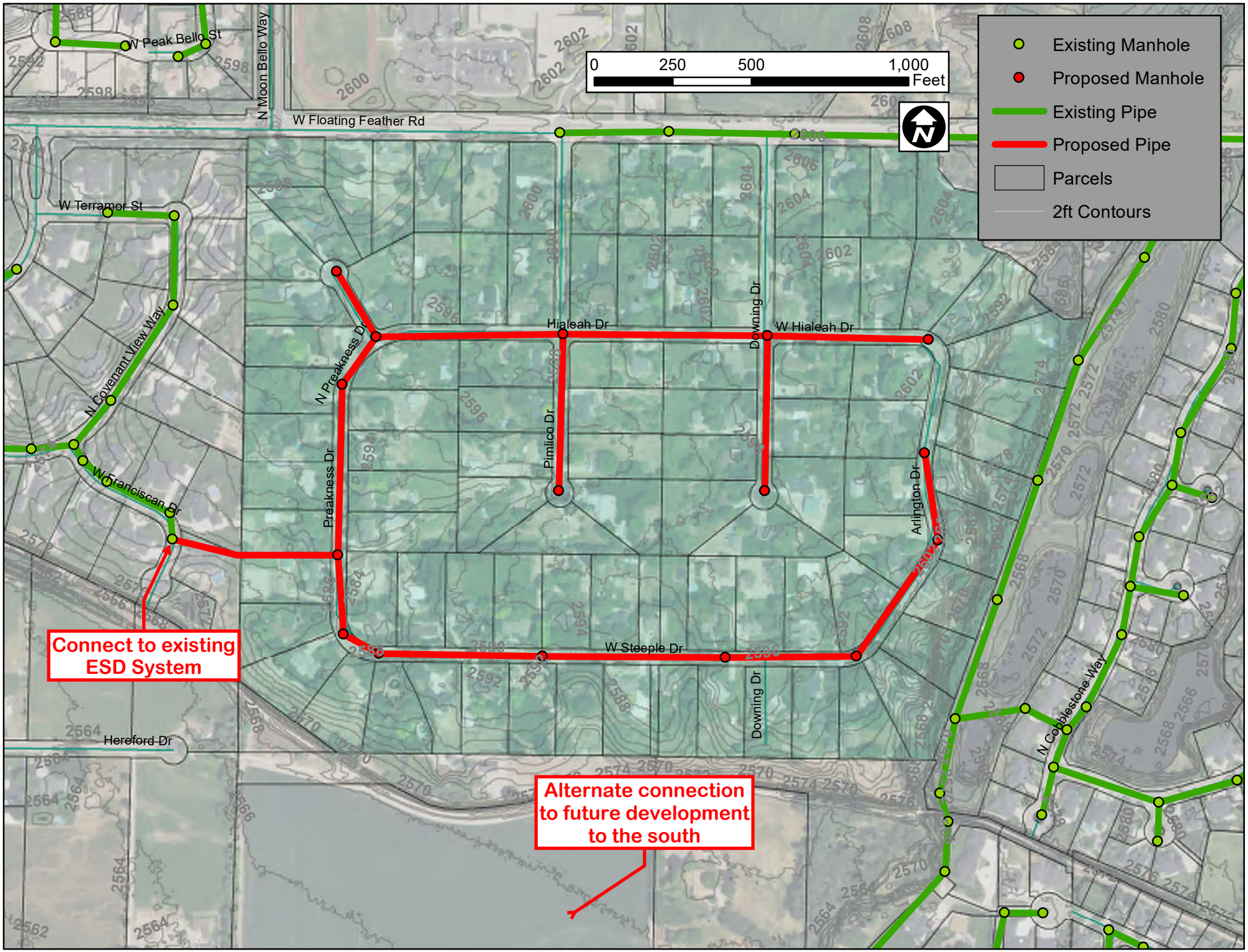
Alternative 3 - Private Pump Station w/ Grinder Pumps

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2022 Dollars)
Goods and Services					
Small Diameter Force Main - Directional Drilling	5,260	LF	$ 100	$ 526,000	
Connect to Existing Manhole	1	EA	$ 2,100	$ 2,100	
Private Sewer Connection w/ Grinder Pump	58	EA	$ 15,000	$ 870,000	
Traffic Control w/o Flaggers	1	LS	$ 3,000	$ 3,000	
				Construction Subtotal	***$ 1,401,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 140,000	
Bonding			2.5%	$ 35,000	
Contractor Overhead and Profit			15%	$ 210,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 420,000	
				Total Construction Subtotal	***$ 2,207,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			5%	$ 110,000	
Engineering - Construction Contract Administration			2%	$ 44,000	
Engineering -- Inspection			2%	$ 44,000	
Geotechnical Investigation			LS	$ 10,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 50,000	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 44,000	
				Total Project Costs (rounded)	**$ 2,520,000**


Existing Manhole
Proposed Manhole
Existing Pipe
Proposed Pipe
Parcels
2ft Contours
0 250 500 1,000 Feet
Connect to existing ESD System
Requires private pump stations with grinder pumps
Connect to existing ESD System
Connect to existing ESD System
E Clearvue Dr
Clearvue Dr
Clearvue Ct
N Meridian Rd
Sugarberry Dr
W Sugarcrest Dr
W Preston St
S White Castle Ave
W Dublin Dr
S Kingsbury Way
W Clearvue St
W Sugarberry St
W Stafford St
S Pajaro Way
S Sugar Bush Ave
S Donnington Ave
W Chartwell Dr
W Canterbury Dr
S Old Wick Ave
S Osterley Pl
W Bavaria St
W Stansbury Dr
S Westbury Way
S Pajaro Pl
S Pasa Tiempo Pl
Chinden Blvd
E Chinden Blvd
N Blythe Spirit Ln
E Everest St
Jericho Rd
N Locust Grove Rd


Connect to existing ESD System
Requires private pump stations with grinder pumps
Existing Manhole
Proposed Manhole
Existing Pipe
Proposed Pipe
Parcels
2ft Contours
0 250 500 1,000 Feet
W Oakhampton Dr
S Chipper Way
W Wickshire Ct
S Stonington Ave
W Newfield Dr
W Hempstead Dr
W Chinden Blvd
E Chinden Blvd
Chinden Blvd
US Hwy 20
W Stafford Dr
S Whitepost Way
W Ashbourne Dr
W Fordham Dr
S Eagle Rd
N Locust Grove Rd
N Heathrow Ct
N Heathrow Way
N Stafford
N Stafford Way
N Bennington Way
W Stockwell St
W Stockwell Dr
Chadsworth Ct
N Eagle Rd


Existing Manhole
Proposed Manhole
Existing Pipe
Proposed Pipe
Parcels
2ft Contours
0
250
500
1,000
Feet
Prairie Rd
Runway Dr
Cayuse Ln
N Lariat St Lariat St
N Halter Way
W Big Springs Blvd
N Bigsprings Blvd
W Lariat Dr
N Cayuse Way
N Sagecrest Pl
N Bridle Way
N Palisades Way
N Blacktail Ave
N Blacktail Pl
W Hawk Hill St
E Shadowview St
E Shadowwolf Dr
E Shadowfox Ave
N Shadowfox Pl
Horseshoe Bend Rd
Horseshoe Bend Way
N Trail Creek Way
N Bippy Ln
Connect to existing ESD System
Install pipes to match surface slopes.


Existing Manhole
Proposed Manhole
Existing Pipe
Proposed Pipe
Parcels
2ft Contours
0
250
500
1,000
Feet
W Peak Bello St
N Moon Bello Way
W Floating Feather Rd
W Terramor St
N Covenant View Way
W Franciscan Dr
N Preakness Dr
Preakness Dr
Hialeah Dr
W Hialeah Dr
Pimlico Dr
Downing Dr
Arlington Dr
W Steeple Dr
Hereford Dr
N Cobblestone Way
Connect to existing ESD System
Alternate connection to future development to the south

Appendix F

Capital Improvement Plan

KELLER ASSOCIATES

Client:	Eagle Sewer District
Project:	Collection System Master Plan
Project No.:	222250
Location:	Meridian Office
Date:	Nov-23
Reviewed By:	

Capital Improvement Plan Summary

Project ID#	Project Name	Project Trigger	Total Estimated Cost (2023 Dollars)
Priority 1 Improvements (2024-2029)			
1.1	Aikens Road Re-Route & Replacement	Infrastructure reached end of useful life	$440,000
1.2	WWTP Main East Trunkline Re-Route	Improve resiliency	$590,000
1.3	South Eagle Road Replacement	Infrastructure reached end of useful life	$590,000
		Total Priority 1 Improvements (rounded)	**$1,620,000**
Priority 2 Improvements (2030-2035)			
2.1	Fred Meyer & Ashbury Lift Station Upgrades	Capacity deficiency from 5-year flows	$520,000
2.2	Collection System Plan Update	Recommended every 5 years	$150,000
2.3	Old Park Road Replacement	Infrastructure reached end of useful life	$640,000
2.4	Old Park Road Spur Replacement	Infrastructure reached end of useful life	$250,000
2.5	North Eagle Road Replacement	Infrastructure reached end of useful life	$1,680,000
2.6	North Eagle Road to Old Park Road Replacement	Infrastructure reached end of useful life	$220,000
2.7	Cedar Ridge Street Replacement	Infrastructure reached end of useful life	$250,000
2.8	1st Street Replacement	Infrastructure reached end of useful life	$240,000
2.9	1st Street to 2nd Street Replacement	Infrastructure reached end of useful life	$420,000
		Total Priority 2 Improvements (rounded)	**$4,370,000**
Priority 3 Improvements (2036-2044)			
3.1	Old Valley Force Main Upsize Phase 1	Capacity deficiency from buildout flows	$2,690,000
3.2	Old Valley Force Main Upsize Phase 2	Capacity deficiency from buildout flows	$5,720,000
3.3	Palmer Lift Station Upgrades	Capacity deficiency from buildout flows	$340,000
		Total Priority 3 Improvements (rounded)	**$8,750,000**
		TOTAL SYSTEM IMPROVEMENTS COSTS (rounded)	**$14,740,000**

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Client: Eagle Sewer District
Project: Collection System Master Plan
Project No.: 222250

5-Year CIP

CIP ID	Description	Cost (2023 dollars)	FY2024	FY2025	FY2026	FY2027	FY2028	FY2029
1.1	Aikens Road Re-Route & Replacement	$ 440,000	$ 440,000		*Priority 2 projects are opportunistic and not immediately required. Therefore, no Priority 2 projects are included from FY2026 to FY2029.*			
1.2	WWTP Main East Trunkline Re-Route	$ 590,000	$ 75,000	$ 515,000				
1.3	South Eagle Road Replacement	$ 590,000	$ 45,000	$ 545,000				
	Total Capital Costs	$ 1,620,000	$ 560,000	$ 1,060,000	$ -	$ -	$ -	$ -
	Collection System Rehabilitation Annual Costs	-	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000	$ 250,000
	Lift Station Capital Improvements Annual Costs	-	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000
	Total FY Cost	**-**	**$ 1,010,000**	**$ 1,510,000**	**$ 450,000**	**$ 450,000**	**$ 450,000**	**$ 450,000**

Project Title: Aikens Road Re-Route & Replacement

Project Identifier: 1.1

Location: Aikens Road and 1st Street

Need for Project:
- Existing pipe from 1st Street to Eagle Road is in need of replacement and has a flat slope.

Objective:
- Install a new pipe in Aikens Road flowing from west to east and connect to the existing pipeline in 2nd Street

Design Considerations:
- Coordinate with roadway improvements anticipated in this area.
- Assumes extent of service reconnections are only the length impacted by the pipe replacement. Does not include complete service line replacement to each property line.
-Will require permitting with ACHD

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	840	LF	$135	$ 113,400	
48-Inch, Concrete Manhole	3	EA	$6,125	$ 18,400	
Reconnect Services (existing)	9	EA	$1,000	$ 9,000	
Abandon Existing Pipeline	400	LF	$30	$ 12,000	
Roadway Restoration (Full Lane)	470	LF	$75	$ 35,300	
Sod Surface Repair	370	LF	$35	$ 13,000	
Traffic Control w/o Flaggers	840	LF	$10	$ 8,400	
				Construction Subtotal	***$ 209,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 21,000	
Bonding			3%	$ 5,000	
Contractor Overhead and Profit			15%	$ 31,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 63,000	
				Total Construction Subtotal	***$ 330,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 50,000	
Engineering - Construction Contract Administration			5%	$ 17,000	
Engineering -- Inspection			8%	$ 26,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 8,400	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 7,000	
				Total Project Costs (rounded)	**$ 440,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: WWTP Main East Trunkline Re-Route

Project Identifier: 1.2

Location: East of WWTP

Need for Project:
- The existing pipeline alignment is near the Boise River channel.

Objective:
- Re-route the pipeline to be further from the Boise River to improve resiliency in the event of a flood or high water event.
-Will increase pipe slope.

Design Considerations:
- Construction within the 100-year floodplain. Likely need for permit from Floodplain Administrator and US Army Corps of Engineers
- Assumes replacement of the existing manhole to the east but connect to existing manhole at the WWTP
- Assumes line will be abandoned in place and will be capped at both ends.
- Consider upsizing from 30-inch to 36-inch to provide additional capacity beyond buildout flows.
- Include design considerations to reduce impact of competing flows from the trunkline from the west. Consider adding a new manhole upstream of the connection shown.

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
30-inch Pipe - Excavation, Backfill	850	LF	$250	$ 212,500	
72-Inch, Concrete Manhole	3	EA	$14,000	$ 42,000	
Native Surface Repair - Top Soil Replacement	850	LF	$10	$ 8,500	
				Construction Subtotal	***$ 263,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 26,000	
Bonding			3%	$ 7,000	
Contractor Overhead and Profit			15%	$ 39,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 79,000	
				Total Construction Subtotal	***$ 414,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 62,000	
Engineering - Construction Contract Administration			5%	$ 21,000	
Engineering -- Inspection			8%	$ 33,000	
Geotechnical Investigation			LS	$ 15,000	
SCADA Integration			LS	$ -	
Surveying			LS	$ 8,500	
Environmental & Permitting			LS	$ 20,000	
Legal, Administrative, and Funding			2%	$ 8,000	
				Total Project Costs (rounded)	**$ 590,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: South Eagle Road Replacement

Project Identifier: 1.3

Location: South Eagle Road; Manhole ERD-004 to ERD-001

Need for Project:
- Pipe has reached end of useful life and requires replacement.

Objective:
- Install a new pipe in same alignment.

Design Considerations:
- Construction within high traffic road. Traffic control with flaggers will likely be needed.
- CIP Project 1.1 (Aikens Road re-route) is adjacent to project extent. Consider combining projects.
- Assumes replacement of existing manholes.
- Bypass pumping will likely be needed.
-Will require permitting with ACHD
- Coordinate with ACHD road improvements

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	960	LF	$135	$ 129,600	
48-Inch, Concrete Manhole	4	EA	$6,125	$ 24,500	
Reconnect Services (existing)	5	EA	$1,000	$ 5,000	
Roadway Restoration (Full Lane)	960	LF	$75	$ 72,000	
Traffic Control w/ Flaggers	960	LF	$20	$ 19,200	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 275,300***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 28,000	
Bonding			3%	$ 7,000	
Contractor Overhead and Profit			15%	$ 41,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 83,000	
				Total Construction Subtotal	***$ 435,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 65,000	
Engineering - Construction Contract Administration			5%	$ 22,000	
Engineering -- Inspection			8%	$ 35,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 19,200	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 9,000	
				Total Project Costs (rounded)	**$ 590,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: Fred Meyer & Ashbury Lift Station Upgrades
Project Identifier: 2.1

Location: Ashbury & Fred Meyer Lift Stations

Need for Project:
- Projected future flows exceed the firm capacity of the lift stations when they are pumping at the same time resulting in extended pump run times and the need for the redundant pump to turn on.

Objective:
- Upsize the existing pumps to meet future peak hour flows when both lift stations are pumping at the same time.

Design Considerations:
- Future peak inflow to Fred Meyer LS is projected to be 228 gpm
- Future peak inflow to Ashbury LS is projected to be 123 gpm
- Design point should be selected to be equal to or exceed projected peak hour flows at each lift station when pumping at the same time.
- Downstream gravity pipeline along Locust Grove Road is nearing capacity therefore the design point should not significantly exceed the projected peak hour flows.
- Upsizing the pumps will also likely require new electrical equipment.

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Fred Meyer Pump Upsize	2	EA	$35,000	$ 70,000	
Fred Meyer Electrical Upgrades	1	LS	$40,000	$ 40,000	
Ashbury Pump Upsize	2	LS	$35,000	$ 70,000	
Ashbury Electrical Upgrades	1	EA	$40,000	$ 40,000	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 245,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 25,000	
Bonding			3%	$ 6,000	
Contractor Overhead and Profit			15%	$ 37,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 74,000	
				Total Construction Subtotal	***$ 387,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 58,000	
Engineering - Construction Contract Administration			5%	$ 19,000	
Engineering -- Inspection			8%	$ 31,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 10,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 8,000	
				Total Project Costs (rounded)	**$ 520,000**

EA = each, LF = linear foot, LS = lump sum
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Project Title: Old Park Road Replacement

Project Identifier: 2.3

Location: Park Road; Manhole JPA-015 to JPA-005

Need for Project:
- Pipe has reached end of useful life and requires replacement.

Objective:
- Install a new pipe in same alignment.

Design Considerations:
- CIP Project 1.5 and 1.7 are adjacent to project extent. Consider combining projects.
- Assumes replacement of existing manholes.
- Bypass pumping will likely be needed.
-Will require permitting with ACHD

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	1,020	LF	$135	$ 137,700	
48-Inch, Concrete Manhole	5	EA	$6,125	$ 30,700	
Reconnect Services (existing)	25	EA	$1,000	$ 25,000	
Roadway Restoration (Full Lane)	1,020	LF	$75	$ 76,500	
Traffic Control w/o Flaggers	1,020	LF	$10	$ 10,200	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 305,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 31,000	
Bonding			3%	$ 8,000	
Contractor Overhead and Profit			15%	$ 46,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 92,000	
				Total Construction Subtotal	***$ 483,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 72,000	
Engineering - Construction Contract Administration			5%	$ 24,000	
Engineering -- Inspection			8%	$ 39,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 10,200	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 10,000	
				Total Project Costs (rounded)	**$ 640,000**

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Project Title: Old Park Road Spur Replacement

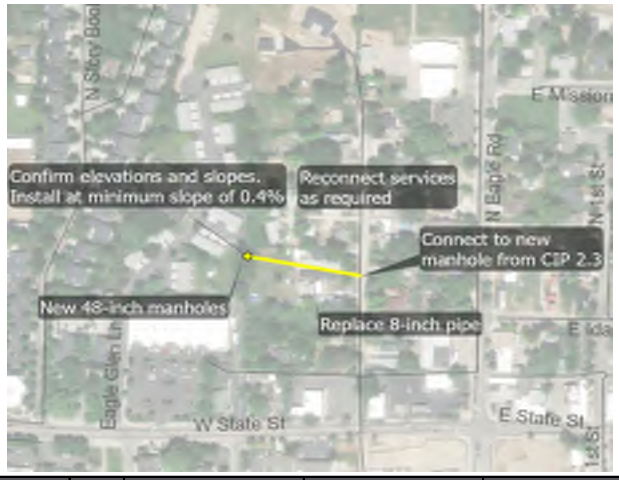
Project Identifier: 2.4

Location: Park Road; Manhole JPA-010 to JPA-009

Need for Project:
- Pipe has reached end of useful life and requires replacement.

Objective:
- Install a new pipe in same alignment.

Design Considerations:
- CIP Project 1.4 is adjacent to project extent. Consider combining projects.
- Assumes replacement of existing manholes.
- Assumes bypass pumping is not needed.
- Coordination with property owner through existing alignment.
-Will require permitting with ACHD



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	350	LF	$135	$ 47,300	
48-Inch, Concrete Manhole	1	EA	$6,125	$ 6,200	
Concrete Surface Repair	190	LF	$300	$ 57,000	
Sod Surface Repair	160	LF	$35	$ 5,600	
Traffic Control w/o Flaggers	350	LF	$10	$ 3,500	
				Construction Subtotal	***$ 119,600***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 12,000	
Bonding			3%	$ 3,000	
Contractor Overhead and Profit			15%	$ 18,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 36,000	
				Total Construction Subtotal	***$ 189,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 28,000	
Engineering - Construction Contract Administration			5%	$ 9,000	
Engineering -- Inspection			8%	$ 15,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 3,500	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 4,000	
				Total Project Costs (rounded)	**$ 250,000**

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Eagle Sewer District

Collection System Master Plan

Project Title: North Eagle Road Replacement

Project Identifier: 2.5

Location: Eagle Road; Manhole ERD-001 to ERD-005

Need for Project:
- Pipe has reached end of useful life and requires replacement.

Objective:
- Install a new pipe in same alignment.

Design Considerations:
- CIP Project 1.7 is adjacent to project extent. Consider combining projects.
- Assumes replacement of existing manholes.
- Bypass pumping will likely be needed.
- Consider cast in place pipe (CIPP) or slip lining the pipe segment under the canal.
- Assumes traffic control with flaggers is needed.
-Will require permitting with ACHD

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	3,110	LF	$135	$ 419,900	
48-Inch, Concrete Manhole	7	EA	$6,125	$ 42,900	
Reconnect Services (existing)	15	EA	$1,000	$ 15,000	
Roadway Restoration (Full Lane)	3,110	LF	$75	$ 233,300	
Traffic Control w/ Flaggers	3,110	LF	$20	$ 62,200	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 798,300***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 80,000	
Bonding			3%	$ 20,000	
Contractor Overhead and Profit			15%	$ 120,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 239,000	
				Total Construction Subtotal	***$ 1,258,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 189,000	
Engineering - Construction Contract Administration			5%	$ 63,000	
Engineering -- Inspection			8%	$ 101,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 31,100	
Environmental & Permitting			LS	$ 10,000	
Legal, Administrative, and Funding			2%	$ 25,000	
				Total Project Costs (rounded)	**$ 1,680,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: North Eagle Road to Old Park Road Replacement

Project Identifier: 2.6

Location: Manhole JPA-004 to ERD-005

Need for Project:
- Pipe has reached end of useful life and requires replacement.

Objective:
- Install a new pipe in same alignment.

Design Considerations:
- CIP Project 1.5 and 1.6 areadjacent to project extent. Consider combining projects.
- Assumes connecting to new manholes from CIP 1.5 and 1.6
- Bypass pumping will likely be needed.
- May require slip lining or CIPP if there are existing structures over the top of the pipe.
-Will require permitting with ACHD

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	350	LF	$135	$ 47,300	
Reconnect Services (existing)	1	EA	$1,000	$ 1,000	
Roadway Restoration (Full Lane)	350	LF	$75	$ 26,300	
Traffic Control w/o Flaggers	350	LF	$10	$ 3,500	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 103,100***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 10,000	
Bonding			3%	$ 3,000	
Contractor Overhead and Profit			15%	$ 15,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 31,000	
				Total Construction Subtotal	***$ 163,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 24,000	
Engineering - Construction Contract Administration			5%	$ 8,000	
Engineering -- Inspection			8%	$ 13,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 3,500	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 3,000	
				Total Project Costs (rounded)	**$ 220,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: Cedar Ridge Street Replacement Project Identifier: 2.7	**Location: Manhole OLD-002 to OLD-004**
Need for Project: - Pipe has reached end of useful life and requires replacement. Objective: - Install a new pipe in same alignment. Design Considerations: - CIP Project 1.1 and 1.9 are adjacent to project extent. Consider combining projects. - Assumes replacement of existing manholes. - Bypass pumping will likely be needed. - Consider slip lining or CIPP -Will require permitting with ACHD	

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	350	LF	$135	$ 47,300	
48-Inch, Concrete Manhole	1	EA	$6,125	$ 6,200	
Reconnect Services (existing)	7	EA	$1,000	$ 7,000	
Roadway Restoration (Full Lane)	350	LF	$75	$ 26,300	
Traffic Control w/ Flaggers	350	LF	$20	$ 7,000	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 118,800***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 12,000	
Bonding			3%	$ 3,000	
Contractor Overhead and Profit			15%	$ 18,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 36,000	
				Total Construction Subtotal	***$ 188,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 28,000	
Engineering - Construction Contract Administration			5%	$ 9,000	
Engineering -- Inspection			8%	$ 15,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 3,500	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 4,000	
				Total Project Costs (rounded)	**$ 250,000**

EA = each, LF = linear foot, LS = lump sum
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Project Title: 1st Street Replacement

Project Identifier: 2.8

Location: Manhole OLD-007 to OLD-002

Need for Project:
- Pipe has reached end of useful life and requires replacement.

Objective:
- Install a new pipe in same alignment.

Design Considerations:
- CIP Project 1.8 and 1.10 are adjacent to project extent. Consider combining projects.
- Assumes connect to manhole from CIP 1.8 and new manhole at upstream end in 1st Street.
- Bypass pumping will likely be needed.
- Consider slip lining or CIPP
-Will require permitting with ACHD

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	350	LF	$135	$ 47,300	
48-Inch, Concrete Manhole	1	EA	$6,125	$ 6,200	
Reconnect Services (existing)	3	EA	$1,000	$ 3,000	
Roadway Restoration (Full Lane)	350	LF	$75	$ 26,300	
Traffic Control w/ Flaggers	350	LF	$20	$ 7,000	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 114,800***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 11,000	
Bonding			3%	$ 3,000	
Contractor Overhead and Profit			15%	$ 17,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 34,000	
				Total Construction Subtotal	***$ 180,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 27,000	
Engineering - Construction Contract Administration			5%	$ 9,000	
Engineering -- Inspection			8%	$ 14,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 3,500	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 4,000	
				Total Project Costs (rounded)	**$ 240,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: 1st Street to 2nd Street Replacement

Project Identifier: 2.9

Location: Manhole OLD-010 to OLD-007

Need for Project:
- Pipe has reached end of useful life and requires replacement.

Objective:
- Install a new pipe in same alignment.

Design Considerations:
- CIP Project 1.9 is adjacent to project extent. Consider combining projects.
- Assumes connect to new manhole in 1st Street from CIP 1.9. New manholes upstream of this connection
- Bypass pumping will likely be needed.
- Consider cast in place pipe (CIPP) or slip lining the pipe segment under the canal.
-Will require permitting with ACHD

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
8-inch Pipe - Excavation, Backfill	600	LF	$135	$ 81,000	
48-Inch, Concrete Manhole	3	EA	$6,125	$ 18,400	
Reconnect Services (existing)	16	EA	$1,000	$ 16,000	
Roadway Restoration (Full Lane)	600	LF	$75	$ 45,000	
Traffic Control w/ Flaggers	600	LF	$20	$ 12,000	
Bypass Pumping	1	LS	$25,000	$ 25,000	
				Construction Subtotal	***$ 197,400***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 20,000	
Bonding			3%	$ 5,000	
Contractor Overhead and Profit			15%	$ 30,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 59,000	
				Total Construction Subtotal	***$ 312,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 47,000	
Engineering - Construction Contract Administration			5%	$ 16,000	
Engineering -- Inspection			8%	$ 25,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 6,000	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 6,000	
				Total Project Costs (rounded)	**$ 420,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: Old Valley Force Main Upsize Phase 1

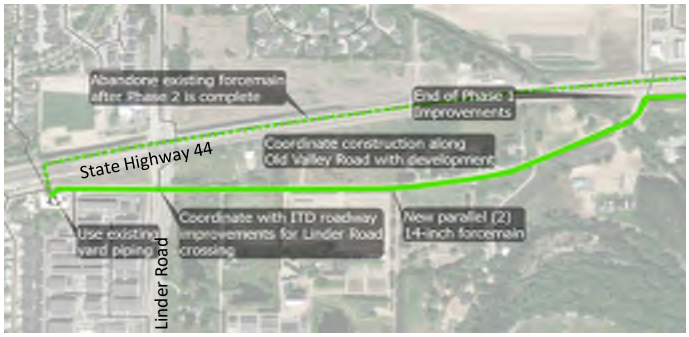
Project Identifier: 3.1

Location: Old Valley Road

Need for Project:
- The current pumping capacity at the Old Valley Lift Station cannot meet projected buildout flows.

Objective:
- Increase the size of the discharge forcemain to increase the capacity of the existing pumps to exceed projected buildout flows.

Design Considerations:
- Phase 1 consists constructing parallel (2) 14-inch force mains from the valve vault to the end of Old Valley Road where it intersects Highway 44.
- Project should be completed as development occurs along Old Valley Road or in coordination with planned roadway improvement projects to minimize construction costs.
- Assumes existing force main(s) can be used during construction to eliminate need for bypass pumping
-Requires permitting with ACHD.
- Flow trigger for this project is as peak hour flows approach the current firm capacity of 1,850 gpm.



General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
14-inch Pressure Pipe - Excavation, Backfill	6,800	LF	$170	$ 1,156,000	
Connect to Existing Force Main	2	EA	$6,500	$ 13,000	
Cleanout & Valve Station	3	EA	$30,000	$ 90,000	
Roadway Restoration (Full Lane)	500	LF	$75	$ 37,500	
				Construction Subtotal	***$ 1,296,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 130,000	
Bonding			3%	$ 32,000	
Contractor Overhead and Profit			15%	$ 194,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 389,000	
				Total Construction Subtotal	***$ 2,042,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 306,000	
Engineering - Construction Contract Administration			5%	$ 102,000	
Engineering -- Inspection			8%	$ 163,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 34,000	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 41,000	
				Total Project Costs (rounded)	**$ 2,690,000**

EA = each, LF = linear foot, LS = lump sum

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Project Title: Old Valley Force Main Upsize Phase 2

Project Identifier: 3.2

Location: South of State Highway 44

Need for Project:
- The current pumping capacity at the Old Valley Lift Station cannot meet projected buildout flows.

Objective:
- Increase the size of the discharge forcemain to increase the capacity of the existing pumps to exceed projected buildout flows.

Design Considerations:
- Phase 2 consists of constructing the parallel (2) 14-inch force mains from the end of Phase 1 to the existing gravity manhole at the WWTP site.
- Recommended that the Project be completed in coordination with the City of Eagle greenbelt extension in the corridor.
- Assumes the north force main can be used during construction to eliminate need for bypass pumping
- Abandon north force main and parallel 6-inch force mains after new parallel (2) 14-inch force mains are constructed and operational.
-Likely require permitting/coordination with ITD and ACHD.

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
14-inch Pressure Pipe - Excavation, Backfill	12,600	LF	$170	$ 2,142,000	
Connect to Existing Force Main	1	EA	$6,500	$ 6,500	
60-Inch, Concrete Manhole	1	EA	$10,000	$ 10,000	
Roadway Restoration (Full Lane)	200	LF	$75	$ 15,000	
Cleanout & Valve Station	6	EA	$30,000	$ 180,000	
Abandon Existing Pipeline	9,900	LF	$30	$ 297,000	
				Construction Subtotal	***$ 2,650,500***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 265,000	
Bonding			3%	$ 66,000	
Contractor Overhead and Profit			15%	$ 398,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 795,000	
				Total Construction Subtotal	***$ 4,175,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 626,000	
Engineering - Construction Contract Administration			5%	$ 209,000	
Engineering -- Inspection			8%	$ 334,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ -	
Surveying			LS	$ 252,000	
Environmental & Permitting			LS	$ 40,000	
Legal, Administrative, and Funding			2%	$ 84,000	
				Total Project Costs (rounded)	**$ 5,720,000**

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Project Title: Palmer Lift Station Upgrades

Project Identifier: 3.3

Location: Palmer Lift Station

Need for Project:
- Projected future flows exceed the current firm capacity of the lift station.

Objective:
- Upsize the current three smaller pumps to their buildout design capacity meet projected buildout peak hour flows

Design Considerations:
- Future peak inflow to Palmer LS is projected to be 1,340 gpm
- Assumes replacing existing three smaller pumps to have a new capacity of 720 gpm each.
- Electrical equipment was sized for pumps larger than the current pumps. There is not anticipated to be electrical upgrades needed.

General Line Item	Estimated Quantity	Unit	Unit Price	Item Cost (Rounded)	Total Cost (2023 Dollars)
Goods and Services					
Palmer Pump Upsize	3	EA	$50,000	$ 150,000	
				Construction Subtotal	***$ 150,000***
Additional Elements (estimated % of above)					
Mobilization and Administration			10%	$ 15,000	
Bonding			3%	$ 4,000	
Contractor Overhead and Profit			15%	$ 23,000	
Prevailing Wages			0%	$ -	
Contingency			30%	$ 45,000	
				Total Construction Subtotal	***$ 237,000***
Plans and Contract Documents					
Engineering Design and Bid Phase Services			15%	$ 36,000	
Engineering - Construction Contract Administration			5%	$ 12,000	
Engineering -- Inspection			8%	$ 19,000	
Geotechnical Investigation			LS	$ -	
SCADA Integration			LS	$ 30,000	
Surveying			LS	$ -	
Environmental & Permitting			LS	$ -	
Legal, Administrative, and Funding			2%	$ 5,000	
				Total Project Costs (rounded)	**$ 340,000**

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Unit Items	Unit	Unit Price (2023)
PVC Pipe (Gravity), S		
8-inch Pipe - Excavation, Backfill	LF	$ 135
10-inch Pipe - Excavation, Backfill	LF	$ 140
12-inch Pipe - Excavation, Backfill	LF	$ 145
15-inch Pipe - Excavation, Backfill	LF	$ 153
18-inch Pipe - Excavation, Backfill	LF	$ 158
21-inch Pipe - Excavation, Backfill	LF	$ 186
24-inch Pipe - Excavation, Backfill	LF	$ 215
27-inch Pipe - Excavation, Backfill	LF	$ 230
30-inch Pipe - Excavation, Backfill	LF	$ 250
PVC Pipe (Pressure)		
Small Diameter Force Main - Directional Drilling	LF	$ 100
4-inch Pressure Pipe - Excavation, Backfill	LF	$ 80
6-inch Pressure Pipe - Excavation, Backfill	LF	$ 100
8-inch Pressure Pipe - Excavation, Backfill	LF	$ 110
10-inch Pressure Pipe - Excavation, Backfill	LF	$ 120
12-inch Pressure Pipe - Excavation, Backfill	LF	$ 150
14-inch Pressure Pipe - Excavation, Backfill	LF	$ 170
16-inch Pressure Pipe - Excavation, Backfill	LF	$ 200
Connect to Existing Force Main	EA	$ 6,500
Cleanout & Valve Station	EA	$ 30,000
Concrete Structures		
48-Inch, Concrete Manhole	EA	$ 6,125
60-Inch, Concrete Manhole	EA	$ 10,000
72-Inch, Concrete Manhole	EA	$ 14,000
Connect to Existing Manhole	EA	$ 2,100
Reconnect Services (existing)	EA	$ 1,000
New Sanitary Service Line (Excavation, Backfill, Pipe, Surface Repair)	EA	$ 10,000
Lift Stations		
Small Lift Station (<10 hp pumps)	EA	$ 600,000
Private Sewer Connection w/ Grinder Pump	EA	$ 15,000
Surface Repair		
Roadway Restoration (Full Lane)	LF	$ 75
Roadway Restoration (Half Lane)	LF	$ 50
Asphalt Surface Restoration	SY	$ 93
Concrete Surface Repair	LF	$ 300
Gravel Surface Repair	LF	$ 10
Sod Surface Repair	LF	$ 35
Native Surface Repair - Top Soil Replacement	LF	$ 10
Concrete Pedestrian Ram	EA	$ 2,850
Misc.		
Traffic Control w/o Flaggers	LF	$ 10
Traffic Control w/ Flaggers	LF	$ 20
Abandon Existing Pipeline	LF	$ 30
Special Crossings: (includes casing & installation of carrier pipe)		
Boring (36" casing)	LF	$ 1,800
Boring (24" casing)	LF	$ 1,400
Boring (18" casing)	LF	$ 1,200
Rock Excavation	LF	$ 70
Other		
Fred Meyer Pump Upsize	EA	$ 35,000
Fred Meyer Electrical Upgrades	LS	$ 40,000

Unit Items	Unit	Unit Price (2023)
Ashbury Pump Upsize	LS	$ 35,000
Ashbury Electrical Upgrades	EA	$ 40,000
Bypass Pumping	LS	$ 25,000
Palmer Pump Upsize	EA	$ 50,000
8 to 12-inch pipe, CIPP Repair	LF	$ 50