NEWPORT WASHINGTON
2023 GENERAL SEWER PLAN

October 2023

Prepared by

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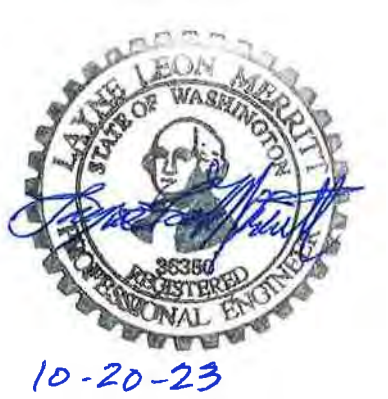
Certification

This 2023 General Facility Plan for the City of Newport has been prepared under the direction of the following Registered Professional Engineers in compliance with the Washington Department of Ecology Requirements for Engineering Reports, WAC 173-240-060



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EXECUTIVE SUMMARY

ES-1 Purpose, Background, & System Ownership

The City of Newport (Newport) is preparing the General Sewer Plan (GSP) to comply with RCW 90.48.110 and WAC 173-240-050. Newport is positioned for growth and needs to evaluate the condition of the sewer collection system and their capacity to meet future growth to continue providing sewer service, including receiving and treating wastewater from Oldtown, Idaho. This plan identifies improvements for consideration for the sewer collection system. The wastewater treatment plant is being evaluated in the Wastewater Facility Plan.

The work to prepare the GSP is being funded by the Department of Ecology (DoE) Centennial Clean Water Grant Funding program.

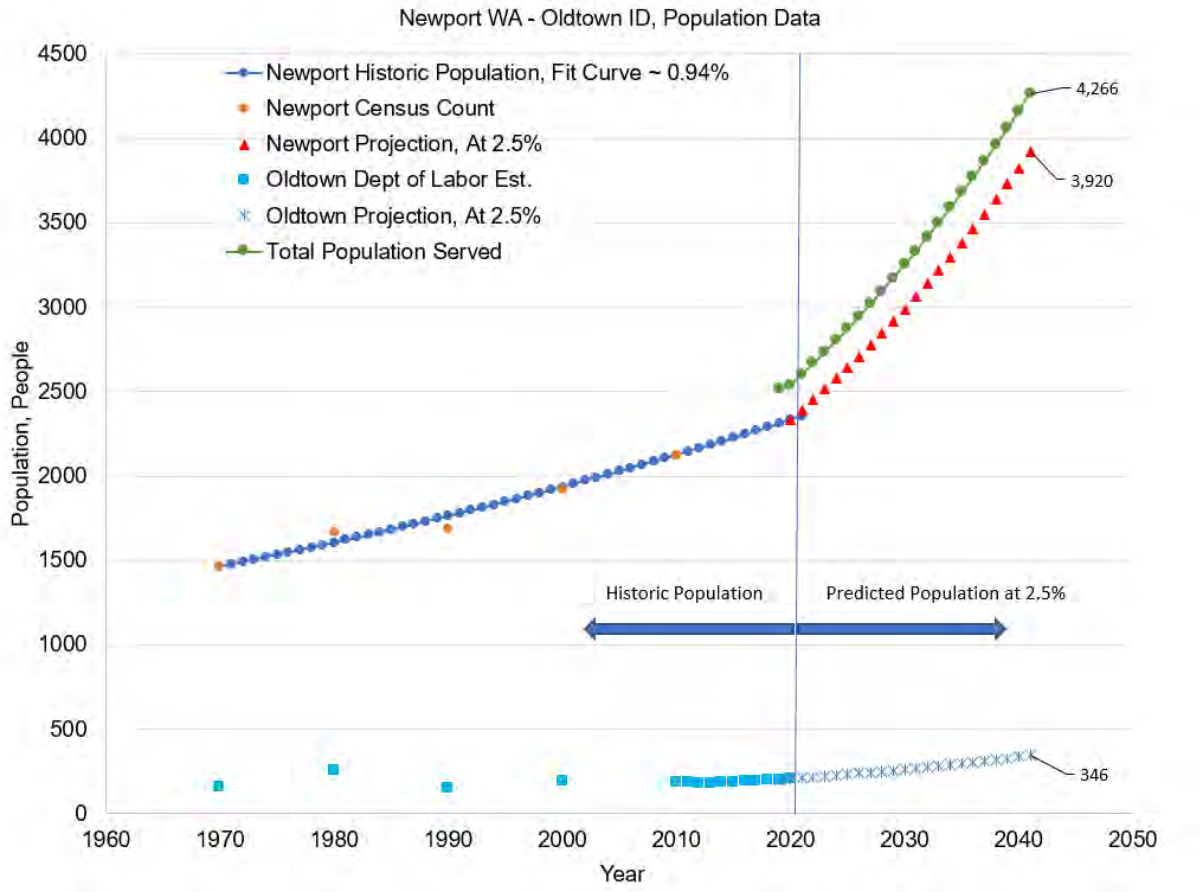
Newport owns, operates, and maintains the City's wastewater collection network and its wastewater treatment facility. The Public Works Office is located at 200 S. Washington Avenue, Newport, WA 99156. Newport operates a discharge permit to the Pend Oreille River under NPDES Permit WA002232.

The West Bonner Water and Sewer District (WBWSD) owns, operates, and maintains the wastewater collection network in Idaho. The WBWSD's wastewater is discharged into Newport's collection system at a single point. The WBWSD's collection system is not part of this study/evaluation other than flow discharged to the Newport system, items incidental to analyzing flow from Old Town, and the contract between the two communities.

ES-2 Population

Given growth rates experienced by communities in the area, Newport's historical growth rate and recent area trends, Newport expects to average an annual growth rate of 2.5% over the 20-year planning period. Oldtown Idaho's growth rate is also expected to average 2.5%. Historic and predicted population estimates are graphically shown in **Figure ES-1**.

Figure ES-1: Historic and Future Population Estimates



ES-3 Existing System Evaluation

Newport owns and maintains the wastewater collection system within Newport's city limits. The system generally consists of manholes, gravity pipes, clean outs, lift stations, and force main pipes. Newport's sewer collection system receives sewer flow from Oldtown, Idaho on Union Avenue, north of Walnut Street (Highway 2). **Table ES-1** provides a summary of Newport's sewer collection system assets.

Table ES-1: Sewer Collection Infrastructure Overview (Newport, WA)

Feature	Quantity (Approximate)
Gravity Pipes	62,636
Reinforced Concrete	37,401
6-inch	325
8-inch	30,777
10-Inch	823
12-Inch	642
15-Inch	3,678
18-Inch	1,156
Material Unknown	25,235
4 or 6-inch	2,835
8-inch	22,119
Diameter Unknown	281
Pressure Pipes	3,135
Material Unknown	3,135
6-Inch	2,644
8-Inch	491
Manholes	238
Lift Stations	4

A hydraulic model of the existing collection system facilities was developed including the Newport's network of pipes, manholes, and lift stations with sufficient known data for modeling.

The existing system model scenario indicates there are no hydraulic bottlenecks in the existing system with existing flows. Instead, existing deficiencies relate to the aging infrastructure nearing the end of its useful life. This is seen in inflow and infiltration into the collection system and CCTV inspection results.

A hydraulic analysis of the existing system has been performed using anticipated future flows. The evaluation of this analysis indicates system deficiencies that will need to be corrected by the City to facilitate the anticipated future development. Deficiencies are summarized in **Table ES-2**. Construction of the South Union Ave (Railroad Crossing) project is not necessary until the new South Bench Lift Station has been constructed and new development necessitates the improvements to the railroad crossing.

Table ES-2: Planning Period Development Projects

Location	Existing Size	Issue
Pleggers and Bings lift stations	Duplex pumps, 250 GPM (EA)	South Bench area is targeted for an influx of new residential development. These two lift stations are under capacity, limited by topography of the drainage basin, and reaching the end of their useful life. These two lift stations will be replaced by the future South Bench Lift Station
South Union Ave (Railroad Crossing)	8 in pipe	Pipe over capacity. Pipe d/D (projected depth of flow divided by pipe diameter) ranges from 0.78 to 1.07

ES-4 Inflow and Infiltration (I/I)

While influent flows at the wastewater treatment plant (WWTP) do not suggest an I/I issue that exceeds plant capacity, the I/I does create challenges with meeting discharge limits when medium to large storm events occur. Observations from City staff and field investigations as part of this study have indicated that areas of the collection system need improvements to reduce known sources of I/I.

J-U-B ENGINEERS, Inc (J-U-B) and Newport staff performed a visual inspection of the collection system, on March 3, 2022, to locate readily identifiable sources of I/I. This date corresponds to a rain on snow event and several partially submerged manhole lids were observed. Segments of the collection system were CCTV inspected as part of this GSP, with additional cleaning and CCTV work anticipated as part of the ongoing collection system maintenance and improvement plan. An account of the observed lids is provided in **Figure ES-2.**

Figure ES-2: Manhole cover partially submerged during storm event (various locations)

There are several other locations where manhole lids are present with multiple holes drilled into them. These locations are provided in **Figure ES-3**. It is assumed these holes were added to the lids to assist with the drainage of stormwater.

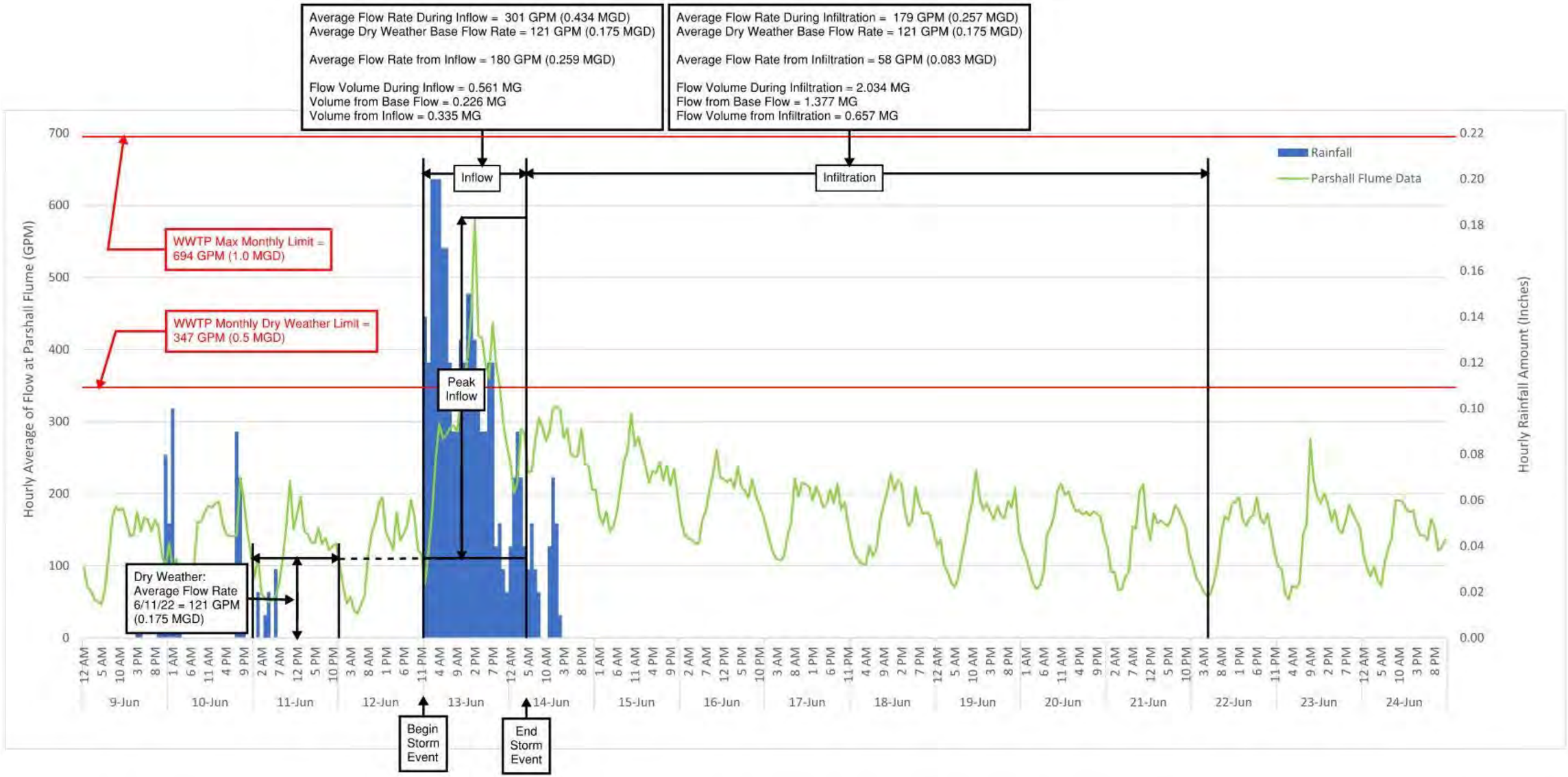
Figure ES-3: Manhole covers with additional holes drilled in the lid (various locations)

There are known groundwater and surface water interactions in Newport that occur during the wet season. These occurrences typically manifest themselves as surface water that infiltrates back into the ground and floods basements. One such area is the vicinity of Spruce and Willow Streets. Previous Newport administrations allowed basement sump pumps to be connected to the collection system and known locations of these connections have been observed as a significant source of I/I. An example of such a spring source is illustrated in **Figure ES-4**.

Figure ES-4: Example of clear flow piped into the sewer collection system

A large storm event has been analyzed to provide a quantitative estimate of the effects of I/I recorded at the Parshall Flume. The event occurred on June 13, 2022 and Newport experienced a daily rainfall amount of approximately 2.8-inches. **Figure ES-5** provides an annotated illustration of the response to the rain event as recorded at the Parshall Flume. It should be noted that this storm is even larger than the planning criteria design storm for Newport. The 100-year, 24-hour precipitation amount for Newport is two and a half to three inches of rain per isopluvial maps published by Washington Department of Transportation (WSDOT). I/I reduction projects are discussed in greater depth in this **Chapter 5** and a number of projects intended to reduce I/I flow through the collection system are included in the Capital Improvement Plan (CIP).

Figure ES-5: Inflow and Infiltration example in 2022



ES-5 Capital Improvement Plan

The collections system CIP is organized into the following categories, as shown in **Table ES-3**:

- System Expansion Projects – Required to serve new areas within the Urban Growth Area (UGA)
- Development Driven Capacity Projects – Required to address anticipated insufficient hydraulic capacity of existing pipes under future flows from anticipated new development
- I/I Mitigation Projects – Required to reduce I/I currently conveyed by the collection system to the WWTP and to provide additional hydraulic capacity for sewer flows
- Effluent Loading Projects – Required to reduce maintenance intensive issues with wastewater quality in the collection system
- Lift Station Operational Improvements – Improve daily operation of the lift stations and provide more tools to troubleshoot future problems should they arise

Table ES-3: Collection System Capital Improvement Summary

ID	Collection System Improvement Description	Year Anticipated	Total for Planning Purposes
System Expansion Projects			
SE. 1	Lift Station on 8th (South Bench)	2025	$ 4,051,000
Development Driven Capacity Projects			
DD. 1	Union Avenue Railroad Crossing Upsizing	2025	$ 1,481,000
I/I Mitigation Projects			
II. 1	Replace Manhole Lids	2024	$ 225,000
II. 2	Replace Brick Manholes (30 EA)	2024	$ 802,000
II. 3	Address Stormwater at Low Areas (Fea, Cass, Alley, Spruce, N Spokane)	2025	$ 1,879,000
II. 4	Willow Ave Storm Drain Conveyance	2025	$ 899,000
II. 5	Shared Side Sewer Elimination (Fir and Larch Blocks)	2025	$ 1,699,000
II. 6	Storm Pump Station (Spruce/Calispel)	2025	$ 2,041,000
II. 7	Full System Cleaning, Additional Flow Monitoring and Pipe Camera Inspections to identify remaining areas	2026	$ 843,000
II. 8	CIPP Sewer Main, MH 3100 to 2200 (Union Avenue)	2027	$ 1,842,000
II. 9	Other I&I Areas as Identified and Prioritized by Field Investigations	2027	$ 2,037,000
II. 10	Sewer Main Replacement, Various Locations	2033	$ 5,063,000
II. 11	Spot Repairs, Various Locations	2033	$ 540,000
Effluent Loading Projects			
EF. 1	Install Grease Interceptor at Businesses	2025	$ 285,000
Lift Station Operational Improvements			
LS. 1	Riverbend Pump Station Backup Generator	2026	$ 182,000
LS. 2	Lift Station SCADA System (Riverbend & Calispel)	2027	$ 128,000
	TOTAL		$ 23,997,000.00

CHAPTER 1 - BACKGROUND INFORMATION

This chapter conforms to the requirements of WAC 173-240-050 § (3)-(a) through § (3)-(c). Sections of this chapter discuss the purpose and need for the General Sewer Plan (GSP); who will own, operate, and maintain the systems discussed; and the existing and proposed service boundaries. **Appendix A** includes the Ecology review checklist which guided the completion of this general sewer plan.

1.1 Purpose

The City of Newport (Newport) is preparing the GSP to comply with RCW 90.48.110 and WAC 173-240-050. Newport is positioned for growth and needs to evaluate the condition of the sewer collection system and their capacity to continue providing sewer service, which includes receiving and treating wastewater from within and around Oldtown, Idaho (Oldtown). This GSP identifies improvements necessary for the sewer collection system. The wastewater treatment plant (WWTP) is being evaluated in the Wastewater Facility Plan.

The work to prepare this GSP is being funded by the Department of Ecology (WSDOE) Centennial Clean Water Grant Funding program.

1.2 System Owner and Operator

Newport owns, operates and maintains the WWTP. The WWTP serves the City of Newport WA and parts of Idaho managed by the West Bonner Water and Sewer District (WBWSD).

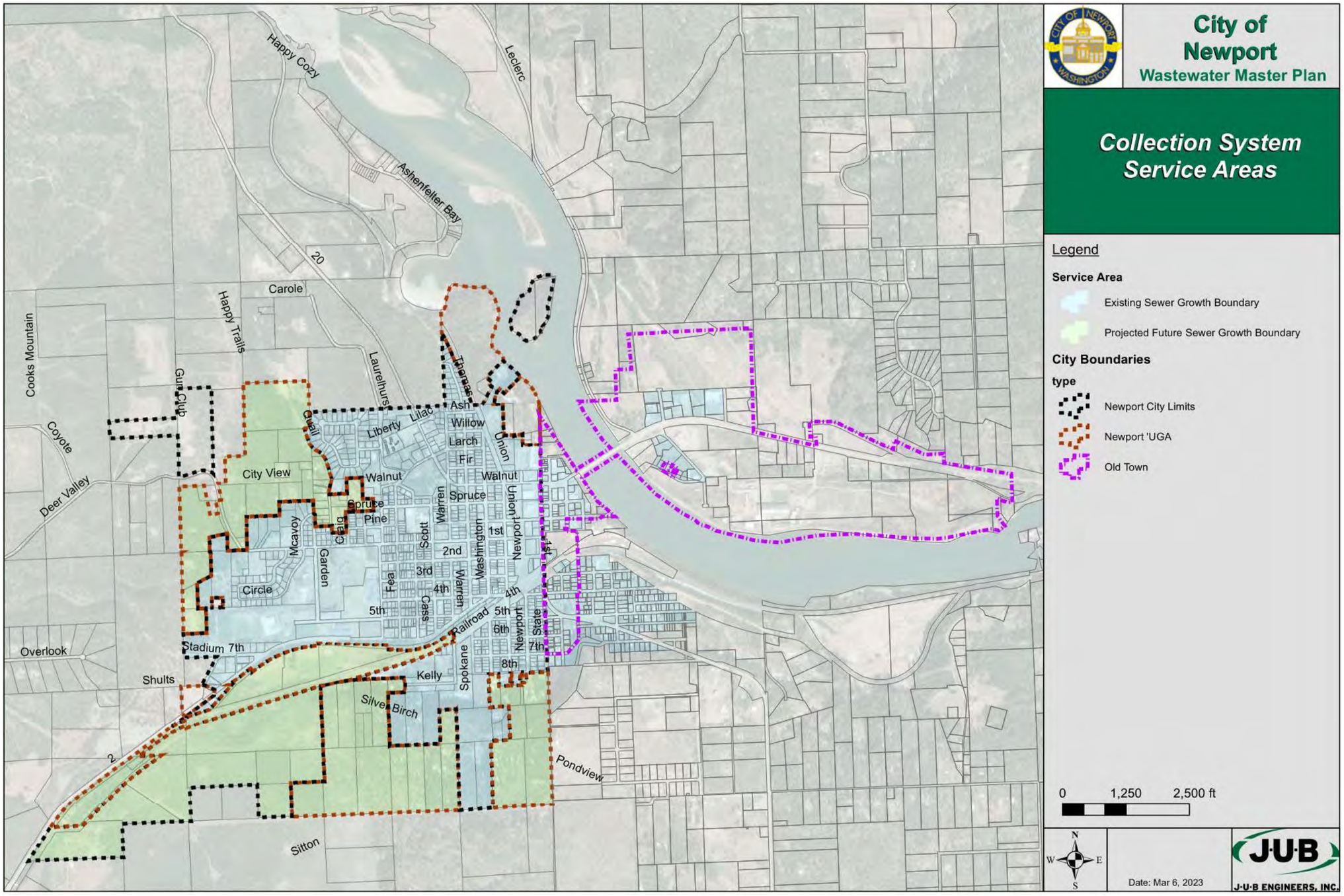
Newport owns, operates, and maintains the wastewater collection system within the City boundary. The Public Works Office is located at 200 S. Washington Avenue, Newport, WA 99156. Newport operates a discharge permit to the Pend Oreille River under NPDES Permit WA002232.

The West Bonner Water and Sewer District (WBWSD) owns, operates, and maintains the wastewater collection network in Idaho. The WBWSD's wastewater is discharged into Newport's collection system at a single point. The WBWSD collection system is not part of this GSP other than flow discharged to the Newport system, items incidental to analyzing flow from Old Town, and the contract between the two communities.

1.3 Service Area Boundaries

The current service area boundary for the wastewater collection system includes the city limits for Newport, Washington, and flow received from the WBWSD within and near Oldtown, Idaho, as shown in Figure 1-1**.** Newport does not own or operate the wastewater collection network for WBWSD.

Figure 1-1: Service Area Boundaries



1.3.1 On-Site Septic Systems

Based on Newport Municipal Code Chapter 13.16 (See **Appendix B**), all residents within Newport City limits are expected to be connected to the Newport's wastewater collection, treatment, and disposal system. Some exceptions are given when sewer service is not within 200 feet of the property line or other exceptions listed in NMC Chapter 13.16.

1.3.2 Existing Sewer Service Area

The sewer service area includes the Newport city boundary and receives flows collected from the WBWSD. Each entity operates and maintains their own sewer collection system.

1.3.3 Proposed Sewer Service Area

Sparsely populated and/or vacant lots on the north and west sides of the existing sewer service area within Newport provide the opportunity for infill and new development. Additionally, southern portions of the Urban Growth Area (UGA) have been identified for a large single-family housing development at a preliminary planning level. It is anticipated this development will occur in the 20-year planning period, adding to the existing service area.

Oldtown also has opportunity for growth, located north of Highway 2 on the east side of the Pend Oreille River.

The future growth considered in this report is further discussed in **Sections 2.2 and 4.4.** Refer to **Figure 3-1** for a delineation of the existing and projected sewer service areas.

1.4 Service Area Characteristics

1.4.1 Location

Newport is located along Highway 2, about 47 miles north of Spokane, Washington. Other location information is summarized in

1.4.2 Zoning

Newport currently uses eight different zoning types[1] to determine land use, as summarized in **Table 1-1** and shown in **Figure 1-2**. Open Area represents forested areas not having been designated with one of the eight mentioned zoning descriptions.

[1] Newport Municipal Code, Chapter 17.02 https://www.codepublishing.com/WA/Newport/

Table 1-1: Existing Zoning in Newport

Code	Zoning Description
R-1	Single Family Residential
R-2	Single Family Residential
R-3	Multi-Family Residential
R-4	Mobile Home Residential
PF	Public Facilities
C-1	Commercial
C-2	Commercial Highway
I	Industrial

Error! Reference source not found. shows the urban growth area and the planned future land use inside the urban growth area.

Figure 1-2: Zoning Map for the City of Newport, WA

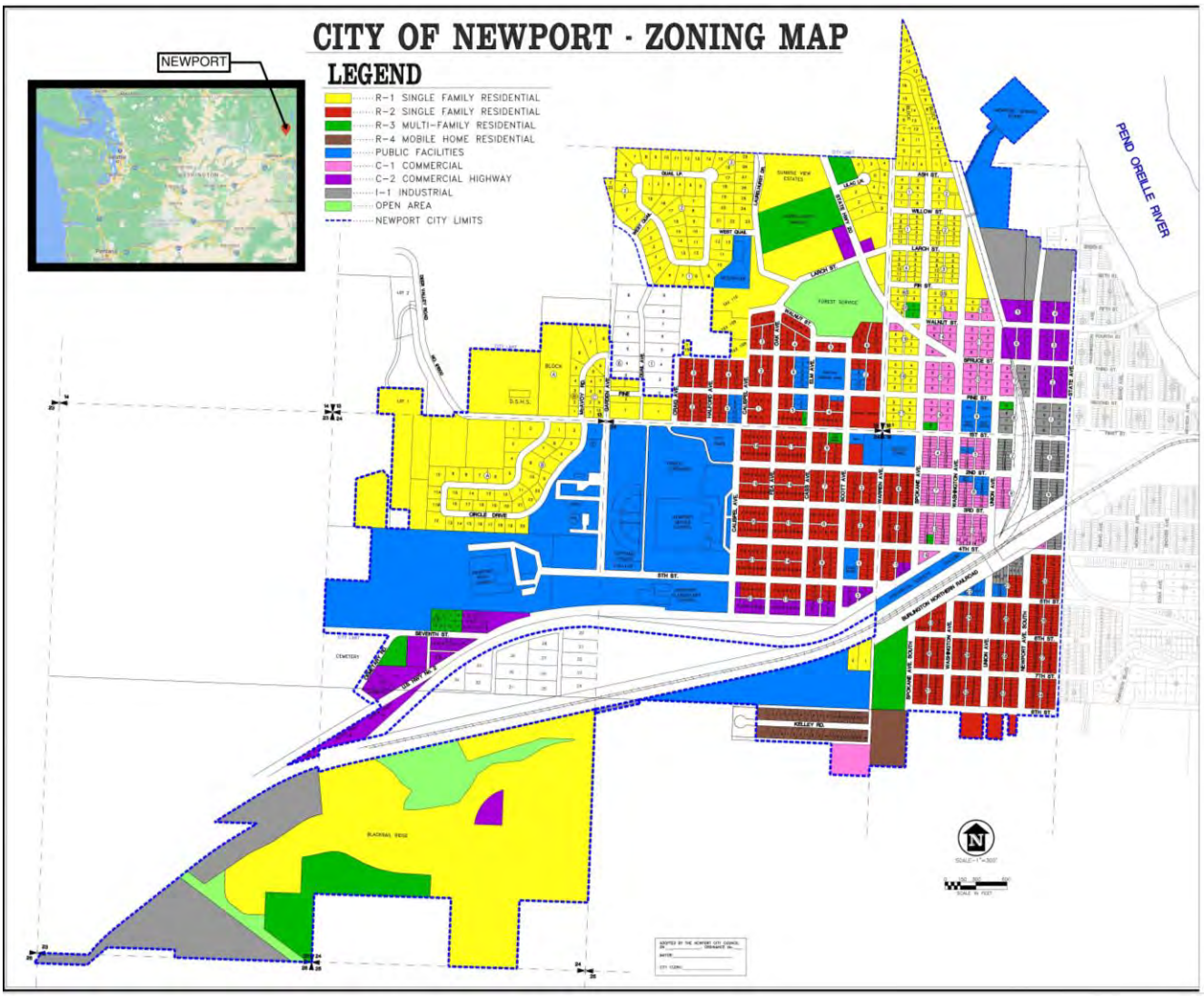
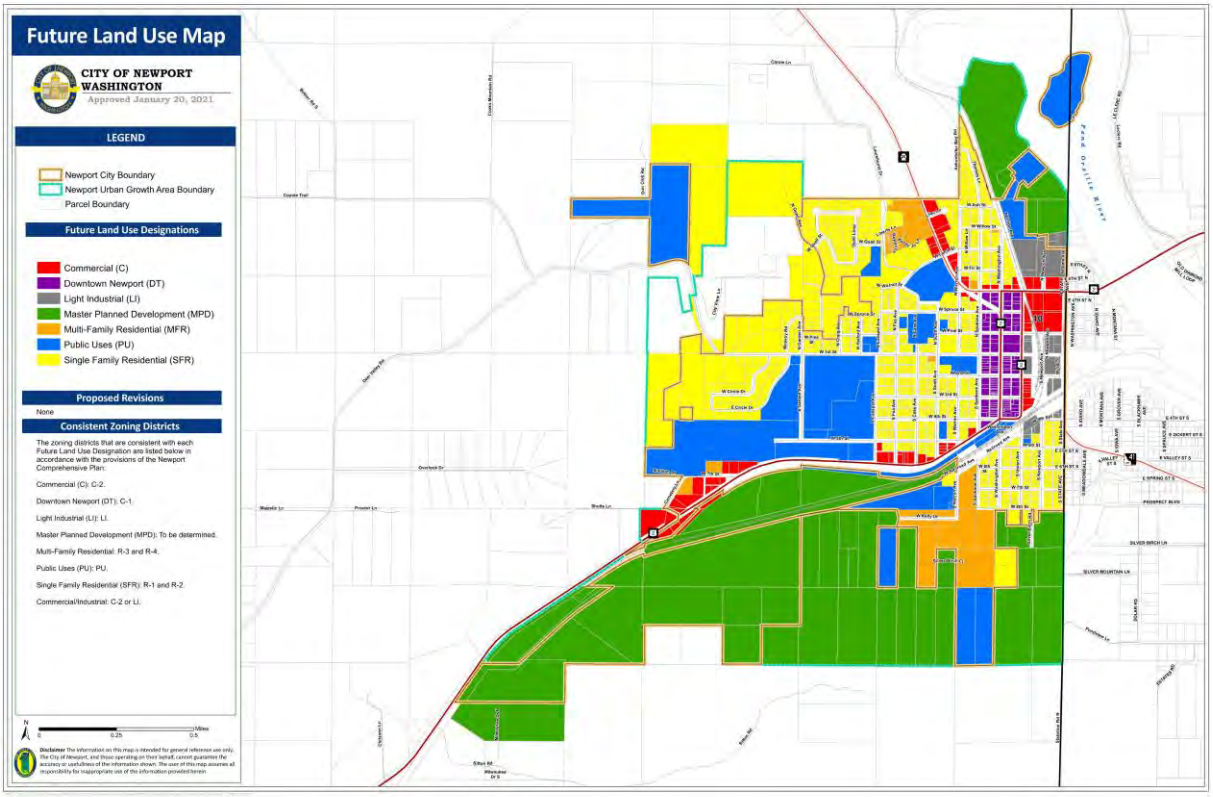


Figure 1-3: Future Land Use Map for City of Newport, WA



1.4.3 Climate

Newport is located in a semi-arid climate within the rain shadow of the Cascade Mountain Range. The mean annual temperature[2] is 44.8 °F. Average daily temperature is 66.0 °F in July and 25.0 °F in January. Average annual precipitation is 24.7 inches and average annual snowfall is 54 inches. Most precipitation occurs from November through May.

1.4.4 Cultural Resources

There are approximately 23 historical properties within Newport, and three are on the national historical register[3]. The properties listed include Newport City Hall, Pend Oreille County Courthouse, Roxy Theater, Hope Congregational Church, depots, firehouses, homes, and barns.

The Washington Department of Archaeology and Historic Preservation's WISAARD database identified four sites that are eligible for listing on the National Historic Register

[2] Western Regional Climate Center, Station 455844 for the City of Newport, WA
[3] DAHP WISAARD https://wisaard.dahp.wa.gov/Map

of Places (NRHP) in the future service area. Sewer in these areas is anticipated to occur as private development. None of the proposed improvements done by the City to alleviate system deficiencies would occur in the vicinity of the eligible sites.

Based on the predictive model in WISAARD, the majority of the City of Newport contains areas that are Very High Risk and High Risk of discovering cultural resources, and a survey is highly advised.

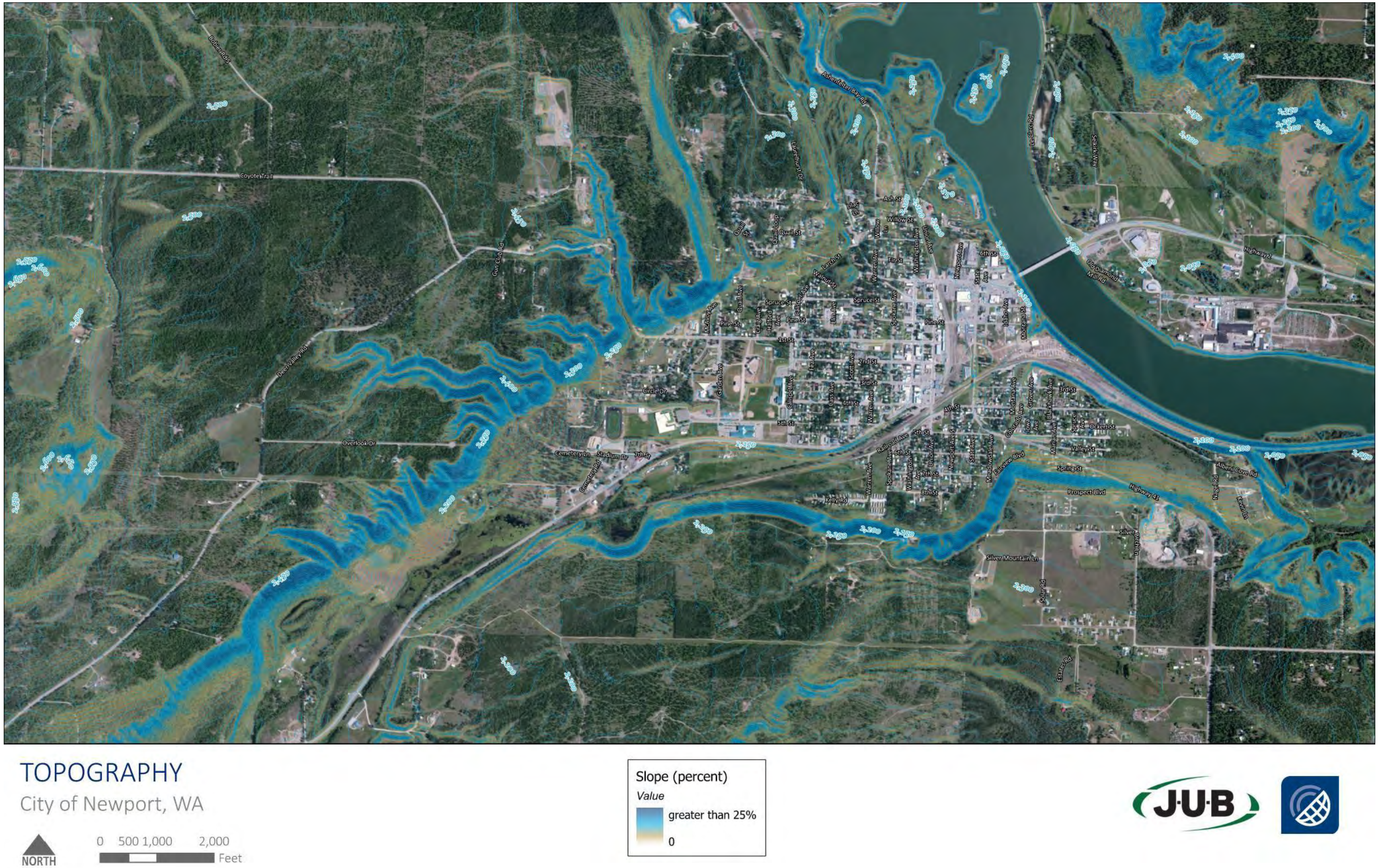
The nearest Tribal lands belong to the Kalispel Tribe and are located northwest of Newport, near Cusick, Washington.

1.4.5 Topography and Geography

Newport is located on the west bank of the Pend Oreille River. The east boundary of Newport is shared with the west boundary of Oldtown. Newport sits in the Pend Oreille River Valley, with hills and forested areas located to the north, west, and south. The topography generally slopes downward to the east, towards the Pend Oreille River. The center, more developed part of Newport is between elevations 2110 and 2180 feet above sea level, with slopes ranging between 1% and 6%. The surrounding hills are above the 2,300-foot elevation, with slopes greater than 10% in most areas. The Pend Oreille River water surface elevation is typically between 2030 and 2035 feet, depending on the time of the year.

The collection system is generally laid out to follow the topography. There is a sewer trunk along Highway 2 flowing from west to east and a trunk along Union Ave flowing from south to north. The core of the city (north of Highway 2 and west of Union Ave) does not have a single distinct trunk through it, but sewer collector pipes flow from west to east. Lift stations are installed to serve localized depressions in the existing grade. **Figure 1-4** illustrates the topography and drainage of Newport.

Figure 1-4: Topography and Drainage Map for the City of Newport



1.4.6 Soils

Newport is set on gravelly silt loam and silt loam, with the Pend Oreille River on the east boundary of city limits. Some well bore holes have reported encountering granite at 100- or 150-feet depths below ground surface in some areas, with a majority of bore holes encountering topsoil, sand, gravel, and silt closer to the surface.

Depth to groundwater depends on the location in Newport and the proximity to the Pend Oreille River but is generally encountered 50 feet or more below ground surface.

1.4.7 Water Bodies

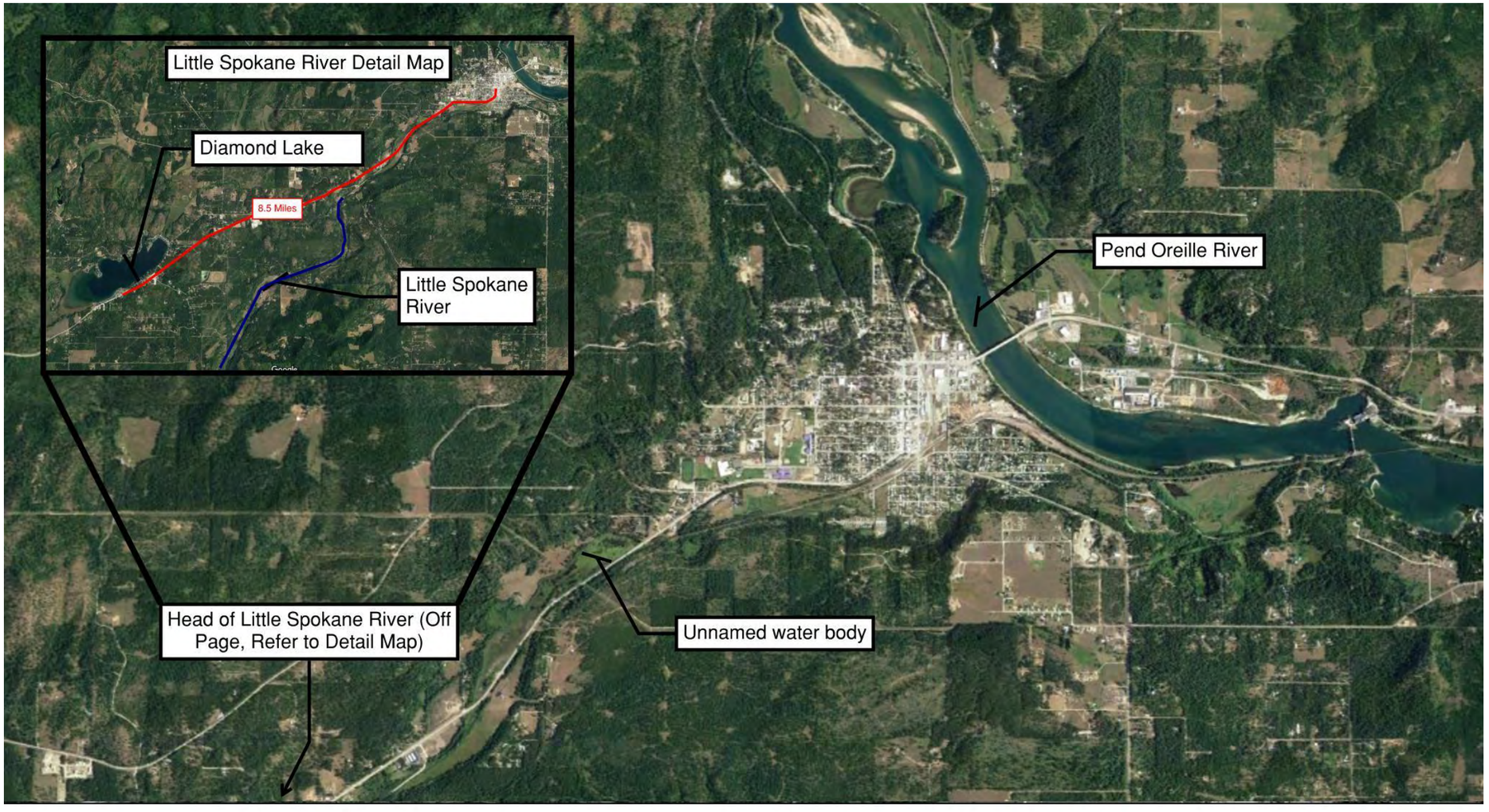
According to the FEMA FIRM maps, most of Newport is located within "Zone X"[4], which are areas within the 500-year flood plain, areas within the 100-year flood plain with average depths of less than 1 foot or with drainage area less than 1 square mile, and areas protected by levees from 100-year floods. There are portions of the west side of Town which are identified as "Zone A"[5], which are areas inundated by the 100-year flood, but no base flood elevations determined.

Newport is located within the Pend Oreille Water Resource Inventory Area (WRIA 62) and is on the border of the Little Spokane WRIA (WRIA 55). The wastewater collection and treatment facility currently discharge into the Pend Oreille River under NPDES Permit WA0022322. The Pend Oreille River is located along the east boundary of Newport (WRIA 62). The Pend Oreille River near Newport is 303(d) listed as temperature impaired. Just upstream of Newport, the Pend Oreille River was formerly 303(d) listed for pH, and an approved TMDL has since been implemented. The headwaters of the Little Spokane River is located to the southwest of Newport (WRIA 55). The Little Spokane River is 303(d) listed for Dissolved Oxygen due to excessive nutrients. Other categories include Temperature (Category 4A), Bacteria (Category 1), and Ammonia-N (Category 1). There are several lakes near Newport, including Diamond Lake (WRIA 55), Lake Pend Oreille (Idaho), and other smaller unnamed water bodies. Some initial discussions explored the concept of discharging Newport treated effluent to the Little Spokane River basin. Due to the impairment of the basin and the lack of an established waste load allocation for the waterbody, this discussion was considered as beyond the scope of this current effort and a concept that would have to be pursued with significant study and coordination among agencies and entities at a future time.

Figure 1-5 illustrates the water bodies described above and their spatial relation to Newport.

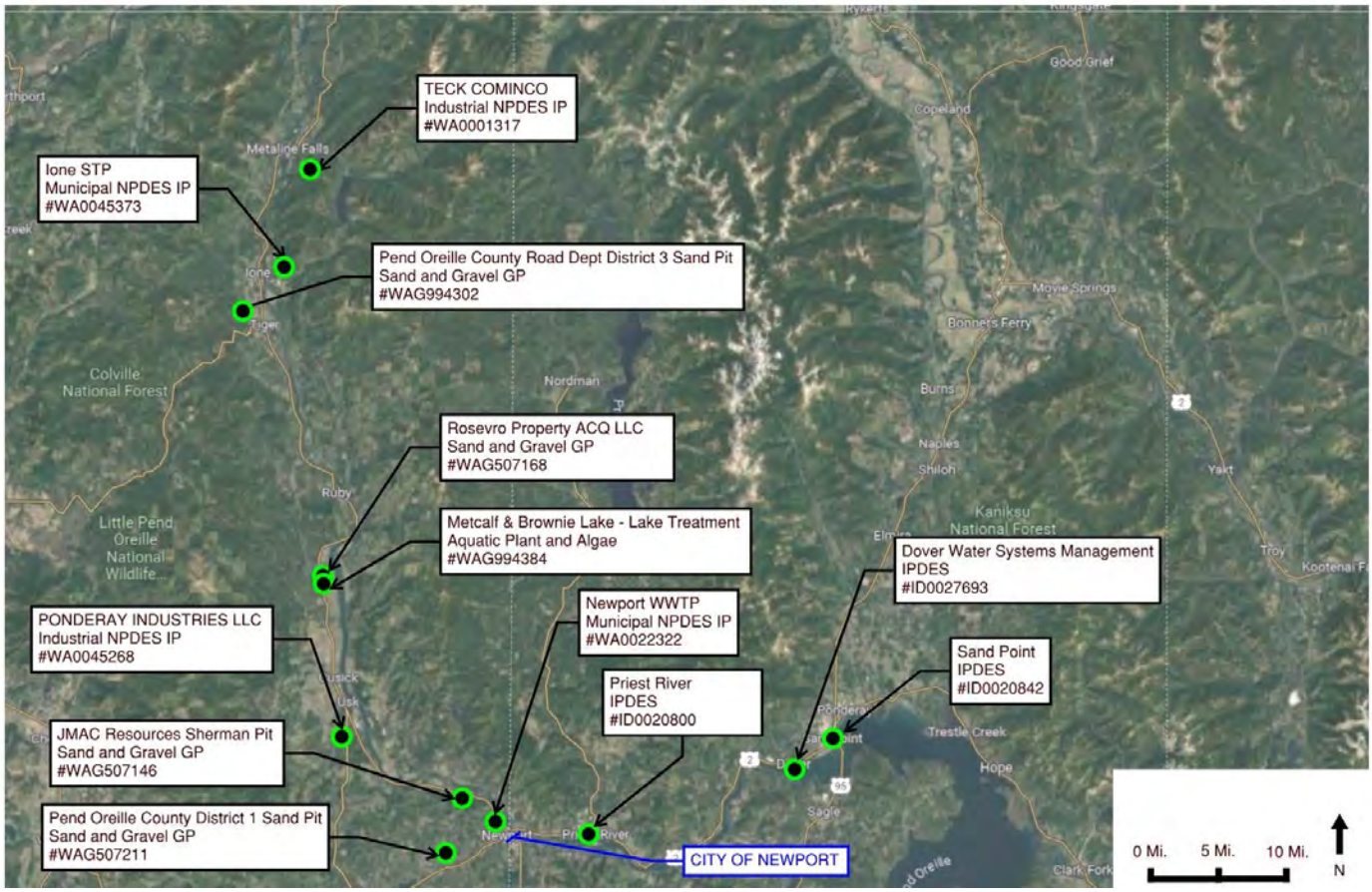
[4] FEMA FIRM Panel 53051C0890C
[5] FEMA FIRM Panel 53051C0895C.

Figure 1-5: Water Bodies Map for the City of Newport, WA



The Idaho Department of Environmental Quality Issued Permits and Water Quality Certifications data base and the Washington Department of Ecology Water Quality Permitting and Reporting Information System (PARIS) were searched for upstream and downstream discharges to the Pend Oreille River. The results are illustrated in **Figure 1-6**.

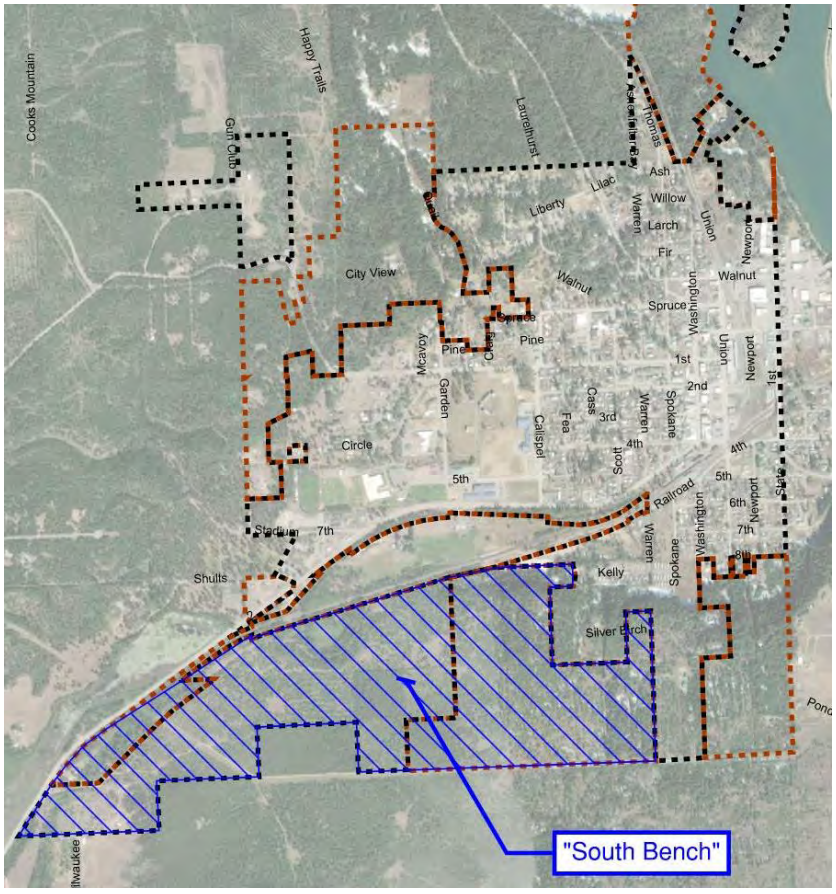
Figure 1-6: Adjacent Dischargers



1.4.8 Water Systems

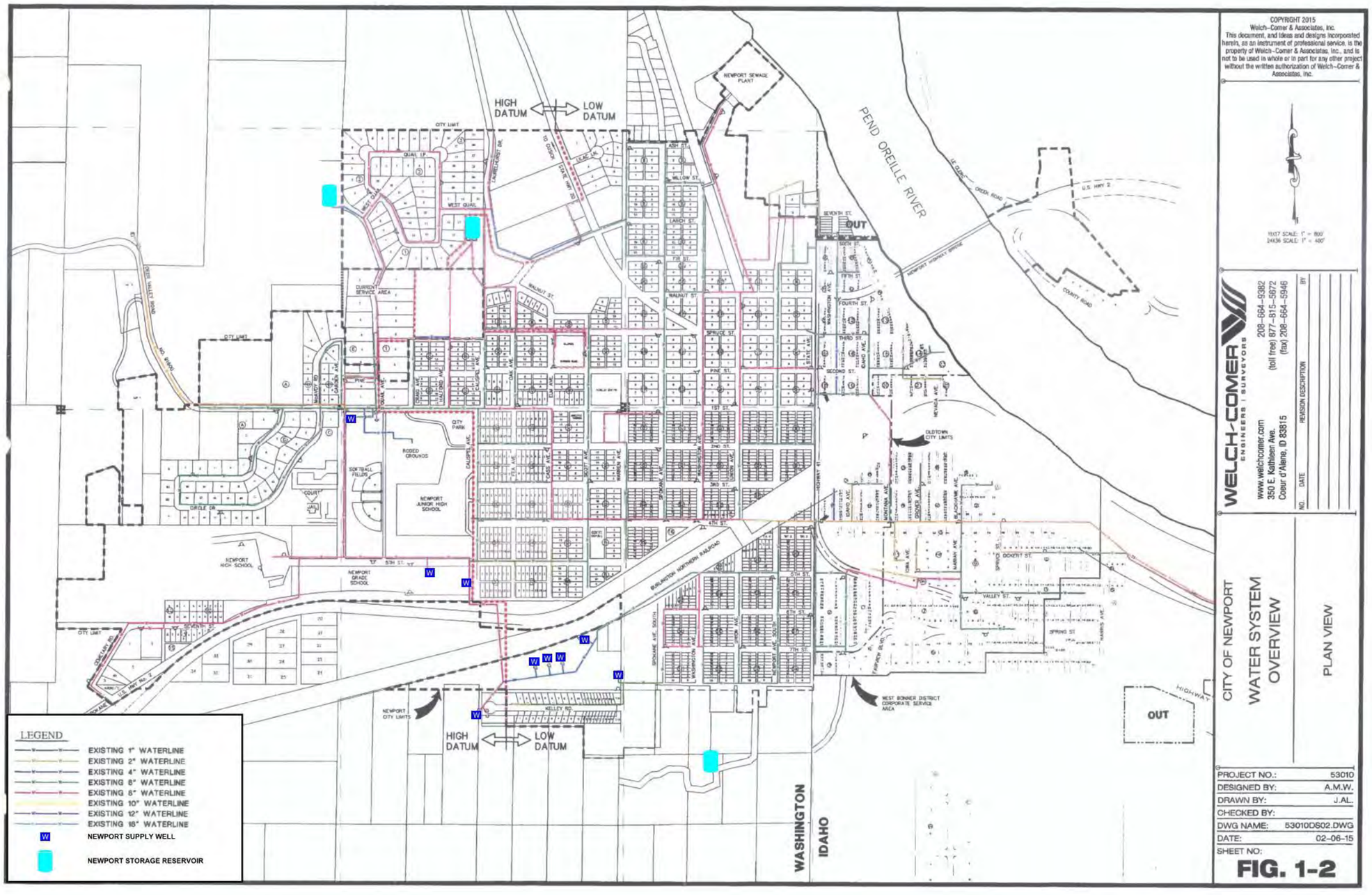
There is one municipal and one private water district located in the sewer service area boundary. Newport operates the municipal water system (Water System ID #59350D) providing service to parcels in Washington, and the West Bonner Water and Sewer District (WBWSD) operates the private system providing water service to parcels in Idaho in and near Oldtown. Newport supplies daily municipal water needs through twelve wells located within the City. Newport and WBWSD share an emergency intertie that provides Newport supply from the Idaho Springs source. In addition to the wells, the City of Newport is served by a 1.2-million-gallon steel reservoir in the northwest corner of the city, a 0.9-million-gallon concrete reservoir in the north central portion of the city and a 0.5-million-gallon steel reservoir in the south portion of the city on the South Bench. The area of town locally referred to as the "South Bench" is illustrated in **Figure 1-7.**

Figure 1-7: South Bench of Newport



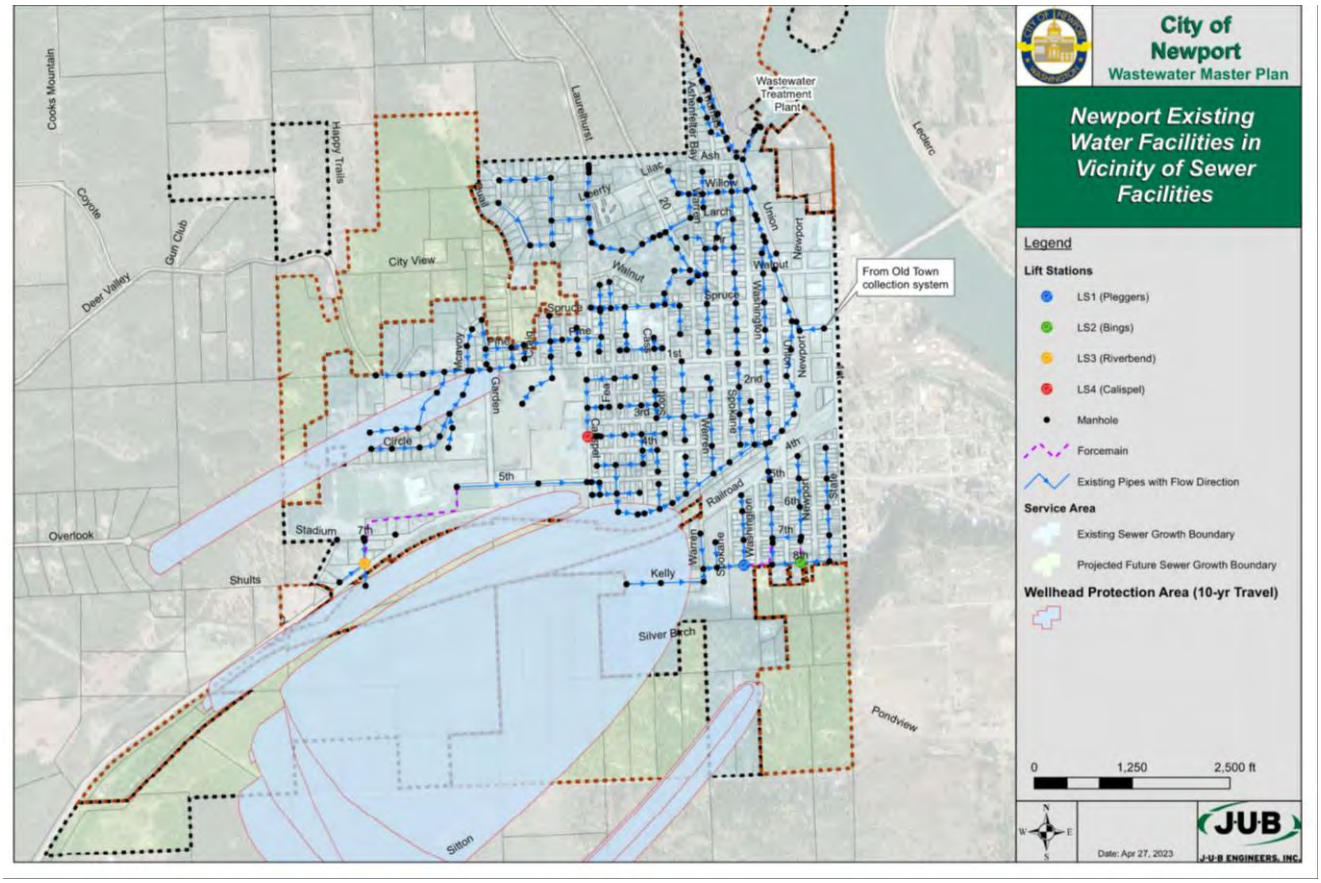
A map of Newport's water system was extracted from the Water System Plan (May 2015) and is presented in **Figure 1-8**.

Figure 1-8: Water System Map for the City of Newport



Well Head Protection Areas retrieved from Washington Geospatial Open Data Portal are presented in **Figure 1-9**. Small portions of the existing sewer collection system are located within the 10-year Well Head Protection Areas. These sewer lines serve small residential developments located around the outskirts of town, where newer sewer infrastructure is typically found.

Figure 1-9: Well Head Protection Area



1.5 Sewer Intertie Contract

Newport receives sewerage from the WBWSD via an intertie at the east end of Willow Street. The WBWSD is discharging flow to the Newport system and is therefore covered under the Newport Wastewater Treatment Plant NPDES permit. The roles, costs, and capacity limitations of the shared system are delineated in Agreement 181312 entered between the communities in 1983.

- Each party is responsible for the conducting the operations and maintenance of their own collection system.
- Newport reserves the right to use any measure authorized by law to collect delinquent fees from users who are connected to the District's sewage collection system.

- The City and District will enact and enforce ordinances to prevent discharges to the system containing excess non-sanitary containments (fats, oils, grease, other debris).
    - The quality of sewage discharged to the system shall not exceed Washington Department of Ecology and Federal Environmental Protection Agency standards.
- The City and District shall hold and save each other harmless from any liability arising from maintenance or repair activities.
- Newport shall maintain the treatment plant in compliance with all applicable laws and regulations.
- Flow meter at intertie is to be operated by the City and made available to WBWSD for inspection.
- City and District agree to provide and enforce ordinances and/or resolutions adequate to protect the existing system.
- District may request additional services by the City and pay for actual costs incurred as determined by the City's adopted schedule of rates.
- The share of system costs due by Old Town are calculated as a percentage of their flow contribution.
    - $\frac{1}{12}\ x\ \frac{a}{b}\ x\ Fiscal\ Year\ O\&M\ Budget\ x = Estiamted\ WBSD\ annual\ billing$
    - a = Metered flow from WBSD for 12-month period.
    - b = Total metered flow through wastewater treatment plant.
    - Budget year = January 1st to December 31st
    - Percentage of flow calculated = July 1st to June 30th
- The City and WBWSD agreed to permitting WBSD 122,000 Gallons per Day in capacity.
- Future upgrades at the wastewater treatment plant are to be negotiated between the entities on a percentage basis.
- Other terms can be found in the agreement which is provided in **Appendix C**.

1.5.1 Agreement Update

An updated agreement should include WBWSD's responsibility to:

- Evaluate, identify, and address Inflow and Infiltration in the collection system.
- Provide right of entry and inspection permissions for Newport to inspect the WBWSD system.
- Require the reporting of any Sanitary Sewer Overflows by WBWSD.
- Require WBWSD to provide a list of industrial and commercial operations that may impact the quality of wastewater received by the Newport wastewater treatment plant.
- Require WBWSD to allow the City of Newport to perform inspections of the grease traps within the WBWSD service area.

CHAPTER 2 - POPULATION TRENDS AND FORECAST

This chapter documents the population trend as indicated by available records, and the estimated future population for the stated design period in conformance with WAC 173-240-050 § (3)-(e). A brief description of the method used to determine future population trends and the concurrence of any applicable local or regional planning agencies is provided.

2.1 Historical Growth

Between 1970 and 2010 Newport's population[6] grew from 1464 to 2126 which is a growth rate near 0.94% per year. Oldtown[7], which is also served by Newport, grew from 161 to 201 between 1970 and 2020 at a growth rate of 0.44%.

2.2 Projected Growth Rate and Population Projections

Projecting Newport's historical growth rate of 0.94% would predict a population at the end of the planning period in 2041 of 2840 people. Projecting Oldtown's historical growth rate of 0.44% would predict a population at the end of the planning period of 221 people. The total population served based on historical growth rates is 3061 people.

The Washington State Office of Financial Management (OFM) Official Population Estimates predicts a population of 2282 in the year 2041, which is a 0.23% growth rate. Utilizing this growth rate places Newport's estimated population in 2019 at 2190, which means the allocated population growth over the planning period is only 92 people. Newport believes the OFM population prediction is too low for providing future wastewater services based on known development activity currently in process.

Newport expects to average an annual growth rate of 2.5% over the 20-year planning period. This expectation is based on recent area trends and growth rates experienced by other communities in the area. Some examples of other communities close to Newport include Deer Park, WA at 2% annual growth rate, Sandpoint, Idaho at 1.8% growth, and Kootenai and Ponderay, Idaho, at 3.00% and 3.55%. Based on these growth patterns in nearby communities and the observed recent interest in Newport, an annual growth rate of 2.5% is anticipated for Newport. Oldtown Idaho's growth rate is also expected to average 2.5%.

The population of Newport and Oldtown is estimated to be 3920 and 346 people, respectively for a total service population of 4266 at the end of the planning period.

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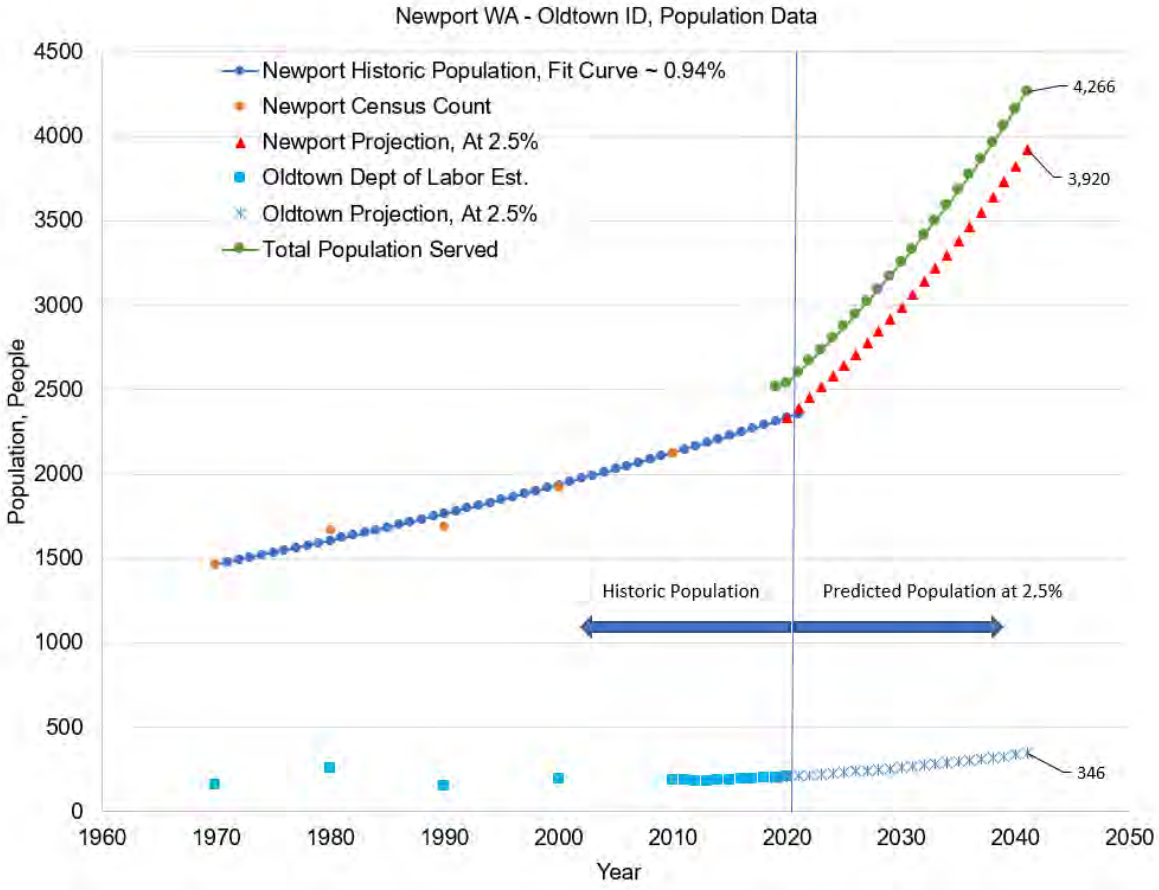
[6] Newport's Comprehensive Plan, 2021
[7] US Census Data

Historic and predicted population estimates are graphically shown in **Figure 2-1**.

Figure 2-1: Historic and Future Population Estimates



CHAPTER 3 - COLLECTION SYSTEM EVALUATION

This chapter documents existing domestic and industrial wastewater facilities within twenty miles of the general plan area and within the same topographical drainage basin containing the general plan area In conformance with WAC 173-240-050 § (3)-(f),. The major components that make up the WWTP were evaluated to assess their condition and ability to continue providing reliable service. This section also summarizes hydraulic modeling efforts for existing and future scenarios in Newport.

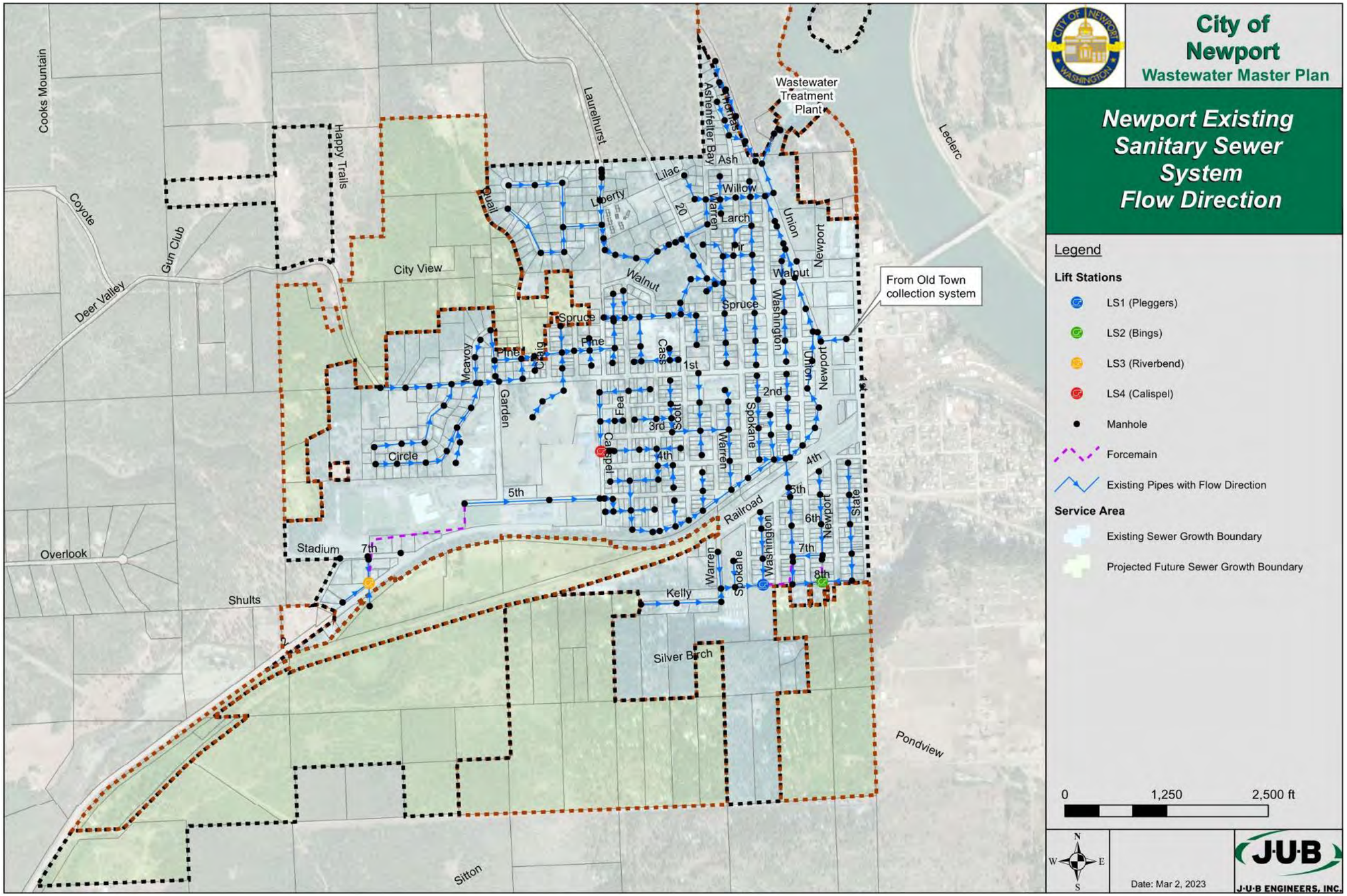
3.1 Wastewater Collection System Overview

Newport owns and maintains the wastewater collection system within city limits. The system generally consists of manholes, gravity pipes, clean outs, lift stations, and force main pipes. Newport's sewer collection system receives sewer flow from Oldtown, Idaho at Union Avenue, north of Walnut Street (Highway 2). **Table 3-1** is a summary of Newport's sewer collection system assets. **Figure 3-1** is an overview of Newport's existing sewer collection system. **Appendix D** contains a keyed map numbering each pipe in the collection system and a table presenting attribute information from the keyed pipe figure. Attribute information includes pipe size, slope, capacity, and year of the last CCTV inspection..

Table 3-1: Overview of Newport's Sewer Collection Infrastructure

Feature	Quantity (Approximate)
Gravity Pipes	62,636
Reinforced Concrete	37,401
6-inch	325
8-inch	30,777
10-Inch	823
12-Inch	642
15-Inch	3,678
18-Inch	1,156
Material Unknown	25,235
4 or 6-inch	2,835
8-inch	22,119
Diameter Unknown	281
Pressure Pipes	3,135
Material Unknown	3,135
6-Inch	2,644
8-Inch	491
Manholes	238
Lift Stations	4

Figure 3-1: Newport Collection System Overview - WAC 173-240-050 § (3)(d)(ii)



3.1.1 Summary of Flow Contributions and Sources

Newport's collection system currently receives domestic wastewater from Newport and the West Bonner Water and Sewer District (WBWSD) in Oldtown, Idaho. The combined flow is measured by a Parshall Flume (WA Meter) at the Newport WWTP headworks and recorded daily by staff. The Parshall Flume is shown in **Figure 3-2**. Oldtown flow is measured by a Parshall Flume (ID Meter) near the Idaho border and recorded daily by staff as well. Newport's flow is estimated by calculating the difference between the combined flow and Oldtown's flow. Oldtown's flow is totaled annually and used for annual financial invoicing between Newport and WBWSD. **Table 3-2** provides a summary of the annual flows as measured by WA Meter at the WWTP. The contract between WBWSD and Newport permits WBWSD to use up to thirty percent of Newport's system capacity. The usage currently averages approximately sixteen percent[8]. It is expected that a new version of this agreement will be executed during this planning period. Potential changes, if any, to this agreement are unknown at this time.

Figure 3-2: Parshall flume (ID Meter) measuring flow from Oldtown (WBWSD)

[8] City of Newport Comprehensive Plan Approved January 20, 2021

Table 3-2: Historical Annual Flows for Newport and the WBWSD

Year	WA Flow Meter, Gallons per Year	ID Flow Meter, Gallons Per Year	Newport Flow Portion	WBWSD Flow Portion
2017	86,867,472	14,375,000	83.5%	16.5%
2018	82,133,862	12,538,000	84.7%	15.3%
2019	77,736,968	12,890,000	83.4%	16.6%
2020	75,429,004	11,494,000	84.8%	15.2%
2021	77,441,728	12,601,000	83.7%	16.3%

Newport has 78 commercial sewer connections and 692 residential sewer connections. Residential sewerage flow includes mobile homes, apartments, and single-family housing. Commercial sewerage flow includes a variety of businesses, restaurants, schools, the hospital, places of worship, and public buildings (City, County, State, Federal). There are currently no industrial sewerage connections within Newport. Refer to Chapter 6 for additional discussion of industrial sewage.

3.1.1.1 Septic Tank Discharge

Septic tank pump trucks and service are not allowed to dump at the WWTP. With the primary treatment system offline and due to the challenge of additional headworks screenings, the operators do not consider septic dumping viable at the WWTP.

3.1.1.2 Oldtown, Idaho Wastewater Infrastructure

Oldtown operates their own collection system, which feeds into Newport's sewer collection and treatment system. The sewer collection assets for Oldtown includes approximately 97 manholes, 23,927 linear feet of gravity and pressure sewer pipes, and two lift stations.

Newport's sewer collection system receives sewer flow from Oldtown at Union Avenue, north of Walnut Street (Highway 2). Flow from Oldtown is measured by ID Meter that is owned and operated by Newport.

Figure 3-3 provides an overview of the Oldtown collection system. **Table 3-3** presents a summary of the known pipeline attribute information in Oldtown.

Figure 3-3: Old Town Collection System Overview - WAC 173-240-050 § (3)(d)(ii)

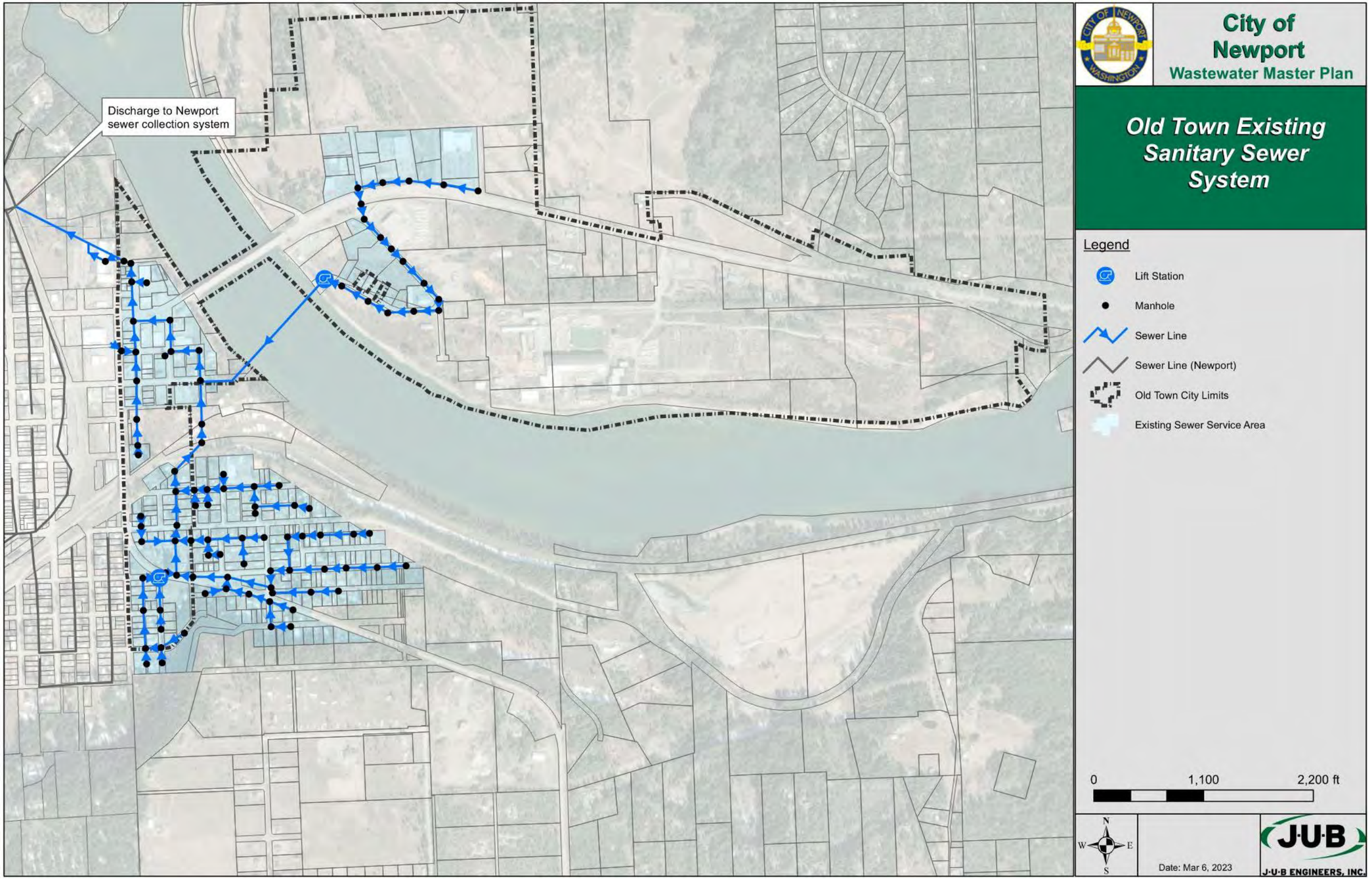


Table 3-3: Overview of Oldtown's Sewer Collection Infrastructure

Feature	Quantity (Approximate)
Gravity Pipes	23,927
PVC	3,862
8-inch	68
10-inch	1,219
12-Inch	1,529
15-Inch	1,046
Ductile Iron	188
18-Inches	188
Unknown Material	19,877
Unknown Diameter	19,877
Pressure Pipes	1,785
Ductile Iron	1,699
18-Inches	1,699
Unknown Material	86
Unknown Diameter	86
Manholes	97
Lift Stations	2

3.1.2 Collection Pipe System

Newport's sewer collection includes a pipe network of approximately 64,515 linear feet of gravity sewer pipe and 3,168 linear feet of lift station force main pipe. Most of the gravity piping is constructed of reinforced concrete sewer pipe circa the 1950's. Sewer drawings from the 1950s through 2020 were used to develop collection system mapping. Sewer details are lacking in some areas of town, pipes with an unknown material and size are limited to subdivision developments on the outskirts of the sewer system. It is typical of modern subdivision developments to be constructed with entirely 8" PVC sewer pipe.

A peak flow storage structure for combined sanitary and storm flows was constructed in 1980 along the main 15" trunk line between Washington Avenue and the railroad north of Walnut Street. The storage structure includes 168 linear feet of a seven-foot inner diameter concrete pipe with a valve manhole for controlling main flow and overflow. The system has a storage capacity of approximately 48,000 gallons. The storm diversion structure is activated by adjusting a diversion gate upstream. Current staff have never used this structure, it could be used to moderate storm-related peak flows. Operation and cleaning, however, would likely be labor intensive.

Inspection of the collection system indicates that some manholes have heavy deposits of fats, oils, and grease in the flow channels. It is assumed this is due to an inadequate number of grease interceptors or oil and water separators being installed on connections from businesses. Section 13.16.040 of Newport Municipal Code states that grease interceptors are to be installed in conformance with the latest Uniform Plumbing Code at the judgment of the Sewer Superintendent.

Portions of the collection system were CCTV inspected and the results of the inspection are summarized in **Table 3-4**. Heavy deposits of grit, gravel, grease, and sand have been observed within the 18-inch trunk main between 4th Street and Walnut Street. In some locations, the pipeline appears to be greater than 50% full of deposited gravel materials. This sewer was partially cleaned out (as budget allowed) during inspection efforts in 2021. These deposits are believed to be caused by local businesses discharging to the sewer in violation of Newport Municipal Code because there are not adequate sediment traps. Section 13.16.050 of Newport Municipal Code adopts the public sewer discharge standards of 40 CFR 403.5 and WAC 173-216-060. Included in this is the prohibition of any discharge to the public sewer system containing solid pollutants that could cause obstruction to the flow in sewers or otherwise interfere with operation.

Other pipes in the collection system have been observed to have root intrusion, cracks, bellies, deformation, and deficiencies at the interface of pipe and manhole.

3.1.3 Manholes

Approximately 236 manholes are present within the collection system. The majority of these manholes are brick originally constructed in the 1950's. These manholes are subject to root intrusion and water infiltration. Newer manholes located within areas of more recent development are precast concrete. The typical condition of a brick lined manhole in areas of ponding during a storm event is shown in **Figure 3-4.**

The majority of manhole lids are known to not have gaskets. A number of manhole lids have multiple holes drilled into the lids for stormwater drainage which is not allowed but nonetheless present. Other manholes have been buried under asphalt or are under buildings and storage yards.

Newport has a limited stormwater collection system in the downtown core serving roadway areas along the highway, described further in Section 3.4. Other portions of the road system use drywells for collection and disposal of stormwater. Some of these drywells are plugged and need to be replaced. The plugged drywells create a significant source of inflow to the sanitary sewer collection system – There are documented instances of stormwater draining through sewer manhole lids directly into the sewer as a result of inadequate drywells. Inflow and infiltration are discussed in depth in **Chapter 5.**

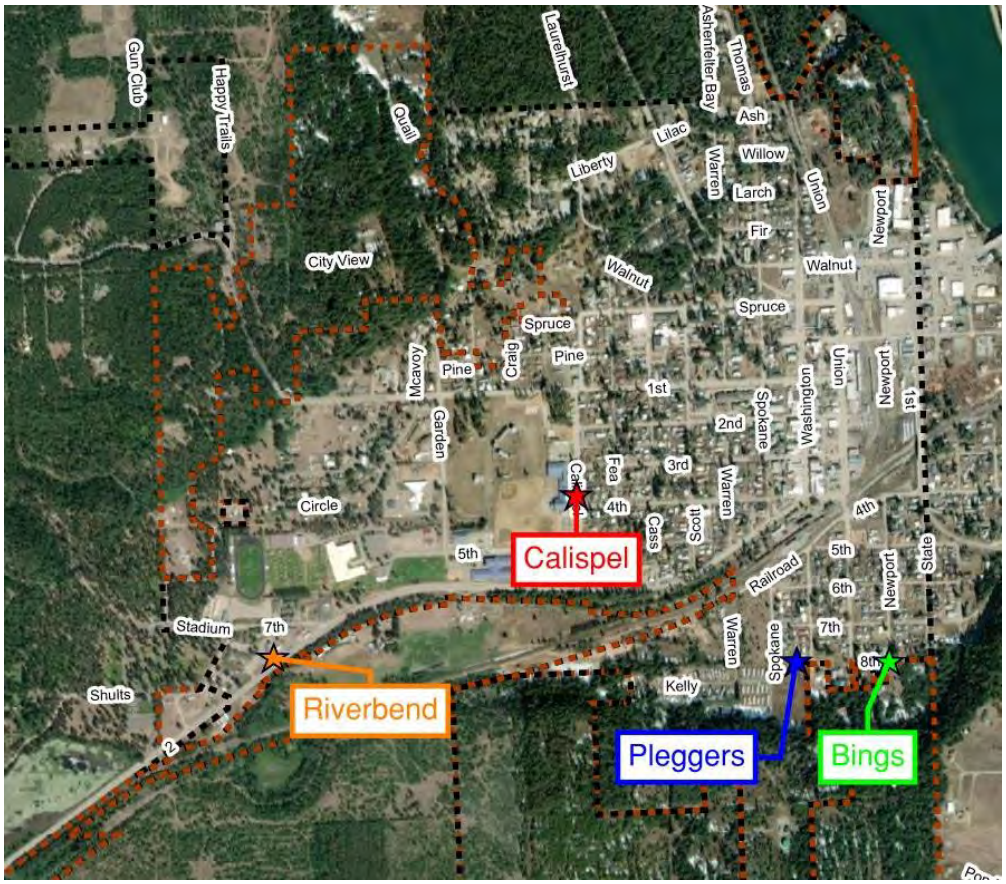
Figure 3-4: Example of brick lined manhole in the City of Newport.

Newport plans to install manhole lid gaskets and replace the lids that have multiple holes with bolt-down lids as part of their maintenance plan, prioritizing the manholes that are in low spots of roadways and known areas of inflow and infiltration issues.

3.1.4 Lift Stations

Newport currently operates four lift stations, and approximately 3,168 linear feet of six-inch force main sewer pipe. The force mains convey wastewater from localized low areas and discharge into the gravity collection system. Lift station locations are shown in **Figure 3-5.**

Figure 3-5: Lift Station Locations



3.1.4.1 Bings Lift Station

The Bings lift station is located on 8th Street between Spokane Avenue and Washington Avenue. This lift station receives flow from three city blocks and the Lazy Acres Mobile Home Park. Flow is pumped through a six-inch force main approximately 690 linear feet to a gravity flow manhole on 7th Street between Washington Avenue and Union Avenue. The control panel and interior of the Bings lift station are shown in **Figure 3-6** and **Figure 3-7**.

Figure 3-6: Bings lift station service meter and control panel.

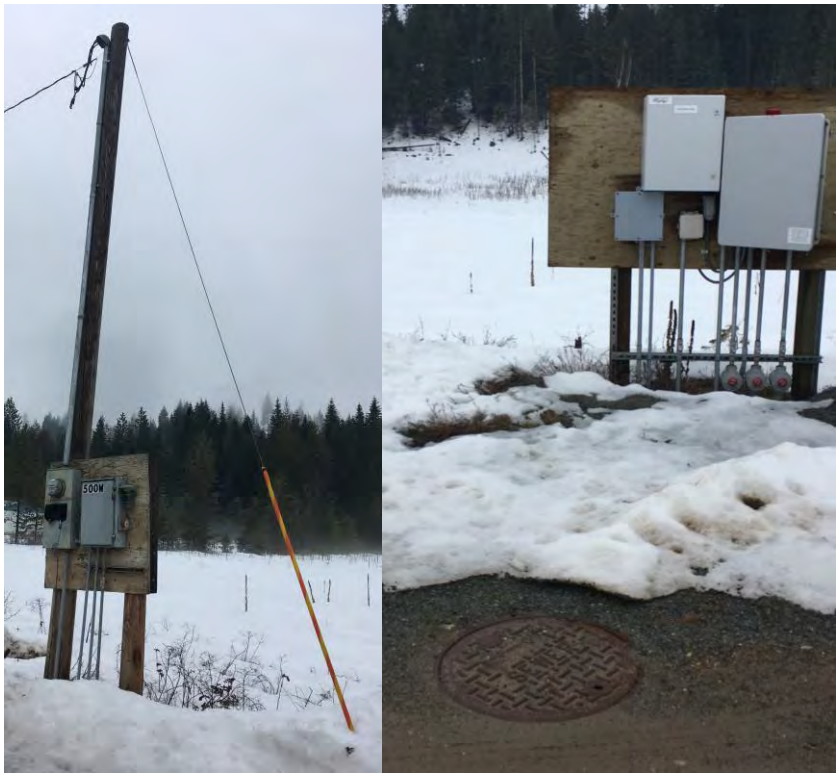


Figure 3-7: Interior of Bings lift station.

3.1.4.2 Pleggers Lift Station

Pleggers lift station is located on 8th Street at Silver Birch Lane. This lift station receives flow from approximately four city blocks, serving single family homes. Flow is pumped through a six-inch force main approximately 280 linear feet to a gravity flow manhole on 7th Street between Union Avenue and Newport Avenue. This lift station does not have a run time meter. The control panel and interior of the Pleggers lift station are shown in **Figure 3-8** and **Figure 3-9**.

Figure 3-8: Pleggers lift station electrical meter and control panel.

Figure 3-9: Interior of Pleggers lift station.

3.1.4.3 Riverbend Lift Station

The Riverbend Lift Station is located along Highway 2 near the southwest entrance into Newport. This lift station receives flow from three restaurants, an apartment complex, and local businesses. Flow is pumped through a six-inch force main approximately 1,780 linear feet to a gravity flow manhole on 5th Street near Newport High School. The control panel and interior of the Riverbend lift station are shown in **Figure 3-10** and **Figure 3-11**.

Figure 3-10: Riverbend lift station control panel and power supply.

Figure 3-11: Interior of Riverbend lift station

3.1.4.4 Calispel Lift Station

The Calispel lift station is located on Calispel Avenue between 3rd Street and 4th Street. This lift station serves the Sadie Halstead Middle School and three city blocks, serving single family homes. Flow is pumped from the lift station to the nearby manhole in the alley way through an eight-inch force main approximately 104 linear feet. This lift station does not have a run time meter. The control panel and interior of the Riverbend lift station are shown in **Figure 3-12** and **Figure 3-13**.

Figure 3-12: Calispel lift station control panel and power supply

Figure 3-13: Interior of Calispel lift station

3.1.4.5 Lift Stations Overview

Based on staff feedback, these lift stations have presented challenges to operate and maintain and have had regular maintenance issues. A significant amount of time is spent maintaining these lift stations and troubleshooting the electrical systems and controls. The Riverbend Lift Station is the only lift station with a typical hatch access, while the other three lift station wet wells are accessed through a standard manhole lid. The wet wells accessed via manhole lids are all located in or on the edge of roadways. Wet well orientation and an abundance of instrumentation and control equipment being housed in the wells makes confined space entry and general maintenance at Calispel, Pleggers, and Bings challenging.

A lift station documentation/inspection form has been prepared and included in **Appendix E.** These forms are not intended to provide an in-depth condition assessment of the lift stations, but rather are presented to aid staff with record keeping and checking that lift stations are equipped with typical equipment found at modern lift stations.

Newport is planning to decommission both Bings and Pleggers lift stations and to construct the new South Bench lift station. The proposed South Bench lift station will combine the service areas currently served by Bings and Pleggers, as well as provide additional capacity for proposed development to the south.

The city owns a parcel of land to construct the lift station, but force main alignment requires an easement through approximately 280 linear feet of privately owned property. Preliminary plans for this replacement lift station were prepared by James A. Sewell and Associates, LLC. (2020). The plans propose a 96-inch diameter precast concrete wet well with a traffic rated aluminum access lid. The design features two additional vaults, one for typical wastewater force main valving and one for a magnetic flow meter. The proposed 20-horsepower pumps are situated in a duplex submersible configuration. Since the preliminary design of this lift station, additional areas of growth have been identified, necessitating a review of the required capacity of the lift station.

3.1.5 CCTV Inspection

In May of 2022, J-U-B ENGINEERS, Inc (J-U-B) contracted with Big Sky Industrial Services, Inc to complete CCTV inspections of select lines in the collection system. Complete CCTV inspection reports can be found in **Appendix F**. Lines were selected based on feedback from staff regarding suspected condition of existing lines that have not been recently CCTV inspected. Many of the lines targeted for CCTV inspection were not able to inspected as cleaning gravel and other debris from the main trunk along Union Avenue consumed budget set aside for inspection.

The CCTV inspected lines are shown in **Figure 3-14**. A summary of the inspection findings at each segment is presented in **Table 3-4**.

Figure 3-14: Gravity Sewer Lines Inspected by CCTV (May 2022)

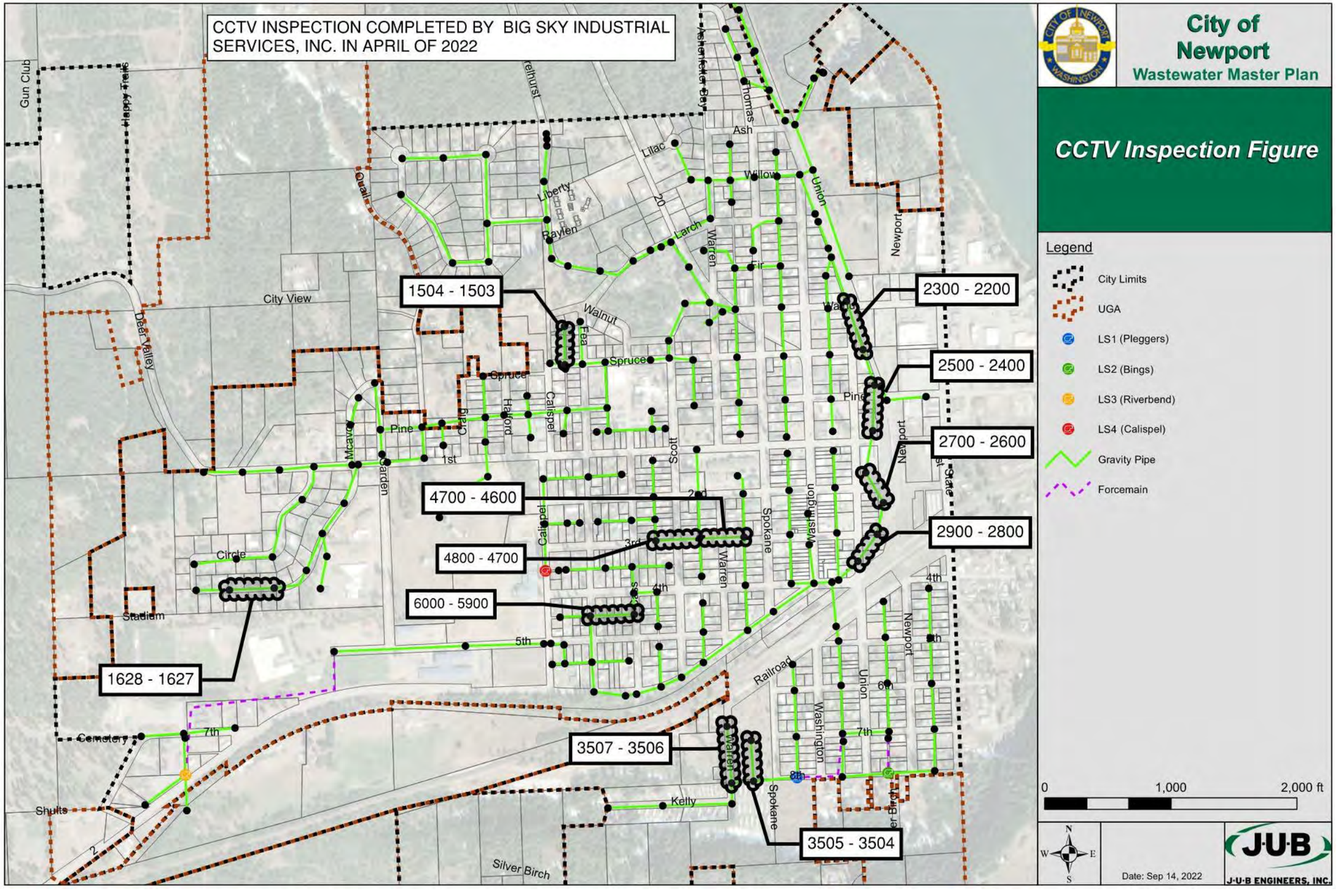


Table 3-4: CCTV Inspection Findings

Date (2022)	Session	From Manhole #	To Manhole #	Survey Direction	Length Surveyed (ft)	Pipe Material	Pipe Size (in)	Pipe Defects/Notes	Target Manhole Reached?	Target Manhole Notes	Lateral Notes	Laterals Observed	Surface Damage	Broken	Point Repair	Infiltration	Protruding Lateral	Cracks	Joint/Grade/ Deformation€	Roots	Gasket Visible	Standing Water	Grease/Debris
4/12	4	1504	1503	Up	20.1	PVC	8	45's in the run, lost traction after 20 feet	No	Lost traction after two 45's	9 (L)	1	0	0	0	0	0	0	0	0	0	0	0
4/12	5	1628	1627	Up	302.4	Concrete	8	Light standing water, belly, roots in joints	Yes		16 (L), 57 (R), 116 (L), 177 (R), 218 (L), 285 (L)	6	0	0	0	0	0	0	1	1	0	4	0
4/28	1	2300	2200	Up	384.8	Concrete	15	Belly, lots of flow from lateral	Yes	lots of holes in manhole lid, brick lined	154 (L)	1	0	0	0	1	0	0	0	0	0	0	0
4/27	3	2500	2400	Up	340	Concrete	15	Belly	Yes		40 (L)	1	0	0	0	0	0	0	0	0	0	1	0
4/27	2	2700	2600	Down	261.2	Concrete	12	Crack in pipe, camera under water	No	Camera under water, not able to access manhole	91 (L), 215 (R), 236 (R)	3	0	0	0	0	0	1	0	0	0	1	0
4/27	1	2900	2800	Down	91.9	Concrete	15	Grease, debris stopped inspection	No	Debris stopped inspection	None observed	0	0	0	0	0	0	0	0	0	0	1	2
4/12	1	3505	3504	Up	321	Concrete	6	Standing water, gasket visible, cracks in pipe	No	3505 is a cleanout	None observed	0	0	0	0	0	0	1	0	0	6	1	0
4/12	2	3507	3506	Up	211.9	PVC	6	Changed from concrete to PVC, slight oval/shape deformation, light standing water, grease, lost traction	No	Lost traction	None observed	0	0	0	0	0	0	0	1	0	0	1	1
1/26	1	4700	4600	Down	333.9	Concrete	8	Crack in pipe, roots, broken/repair	No	Close to end of inspection	261 (L capped)	1	0	1	1	0	0	3	0	0	0	0	0
1/26	2	4800	4700	Down	337.8	Concrete	8	Crack in pipe, grout	Yes		None observed	0	0	0	1	0	0	2	0	0	0	0	0
4/12	3	6000	5900	Down	335.3	Concrete	8	Cracks in pipe, roots in joints, laterals, roots, light standing water	Yes		75 (R), 78 (L), 80 (L), 112 (L), 126 (L), 152 (L capped), 161 (R), 187 (R capped), 217 (L), 266 (R), 292 (L capped)	11	0	0	0	0	0	4	0	21	0	1	0

3.2 Performance and Design Criteria

3.2.1 Pipes and Flow

The design criteria listed in **Table 3-5** is to be used for future system planning. The residential unit flow is based on the Newport's water meter data from October 2021. Water usage during this month is a good indication of wastewater generated because little to no water is used for irrigation.

Table 3-5: Collection System Planning Criteria

Parameter		Value
Residential Unit Flows		191 Gallons/Unit (1 Unit = 2.3 people per household)
Manning Pipe Roughness Coefficient		0.013
Minimum Sewer Velocity		2.0 feet per second
Gravity Pipeline Capacity		Under capacity when d/D_{full} > 80%

All collection system improvement projects or extensions shall meet the requirements and guidelines of the WSDOE Criteria for Sewage Works Design (Orange Book), current edition. Additionally, these projects or extensions shall comply with the WSDOT Standard Specifications for Road, Bridge and Municipal Construction, with APWA General Special Provisions and with the WSDOT Standard Plans, current editions. The City of Newport is developing additional ordinances, design criteria and details which will amend or replace portions of the above-referenced standards, but the above-referenced standards will apply until the new requirements are enacted.

3.2.2 Lift Stations

3.2.2.1 Station Capacity

Lift station pumps and wet well capacities should be sized in accordance with the requirements and guidelines in the WSDOE Criteria for Sewage Works Design (Orange Book), current edition. Sizing calculations should be completed to verify that wet well cycle times do not exceed 10 minutes at design average flows, that pumps are not cycled too frequently causing premature pump failure, and that one pump can deliver the peak hourly flow at the station. Force mains should be sized to maintain self-cleaning velocities with a minimum velocity of two feet per second.

3.2.2.2 Configuration

Lift stations should be submersible wet well lift stations with duplex submersible pumps suitable for wastewater applications and mounted on stainless steel rails to allow removal and reinstallation without entry into the wet well. Additionally, a flow meter should be provided at each lift station.

3.2.2.3 Valve Vault

Isolation and check valves on the pump discharge pipes should be in a separate but adjacent below-grade concrete vault with an access hatch. A port for launching force main cleaning equipment should also be included in the piping appurtenances. A flow meter should be present either in the valve vault or in a separate vault, as site constraints allow.

3.2.2.4 Bypass Pumping Capability

Appropriate valves and fittings should be provided to facilitate bypass pumping of the lift station with a temporary pump.

3.2.2.5 Confined Space Entry Safety System

A concrete pad and davit crane should be constructed adjacent to the access hatch to facilitate removal of the pumps for maintenance.

3.2.2.6 Site Security

The prevention of unauthorized entry to all sewage lift stations is critical to both protecting the station from vandalism and damage as well as preventing potential injuries to the public. When possible, lift stations should be provided with a fenced enclosure. At locations where fencing is not practical, the existing access hatch padlocks should be carefully maintained, and all above-grade electrical and telemetry panels and switches should be provided with padlocks.

3.2.2.7 Emergency (Standby) Electrical Power

The WSDOE requires that an emergency power source be provided at sewage lift stations unless sufficient storage is available within the lift station given the history of power outages.

3.2.2.8 Electrical Equipment

Each lift station should be provided with a main disconnect, phase protection, and an over-current protection device either a fusible switch or circuit breaker that is rated as Suitable for Use as Service Entrance (SUSE). An interlock transfer switch that can safely switch from normal power to standby power should be provided after the main disconnect. It may be possible to combine this equipment into a single unit or piece of equipment. The transfer switch should be rated for fault closing duty and be operable

from the exterior of the enclosure to avoid flash or fault hazard to the operator. The transfer switch should be multi-pole, double throw to avoid the possibility of feedback to the utility circuits when operating from the generator power source; interlocked breakers or contactors should not be used for this purpose. PLC electrical controls should be located above ground in a safety enclosure and padlocked to prevent vandalism.

3.2.2.9 Wet well Level Controls and Alarms

Each lift station should have pressure transducer level switches for low/high level alarms and “pump stop”, “start lead”, and “start lag” operating controls. These switches should be linked to the SCADA system.

3.2.2.10 Telemetry System

Each lift station should be equipped with a remote telemetry unit that is linked to the SCADA system.

3.2.3 Lift Station Deficiencies

The deficiencies of the existing lift stations are summarized in **Table 3-6**.

Table 3-6: Summary of Lift Station Deficiencies

LS1 - Pleggers	LS2 - Bings	LS3 - Riverbend	LS4 - Calispel
Deficiencies • No flow meter on force main • No wet well fall protection • Site is not secured by fence or other means • Wet well accessed from roadway • No discharge pressure gauge	Deficiencies • No flow meter on force main • No wet well fall protection • Site is not secured by fence or other means • Wet well accessed from roadway • No discharge pressure gauge	Deficiencies • No flow meter on force main • Site is not secured by fence or other means • No discharge pressure gauge	Deficiencies • No flow meter on force main • No wet well fall protection • Site is not secured by fence or other means • Wet well accessed from roadway • No discharge pressure gauge
Recommendation • Pressure gauges on pump discharge piping • Flow meter on force main	Recommendation • Pressure gauges on pump discharge piping	Recommendation • Pressure gauges on pump discharge piping	Recommendation • Pressure gauges on pump discharge piping

• Flow meter on force main	• Flow meter on force main Flow meter on force main	• Flow meter on force main Flow meter on force main	• Flow meter on force main Flow meter on force main

3.3 Wastewater Treatment System

3.3.1 Background and Design Criteria

Newport operates an oxidation ditch WWTP on the north end of the city limits with chlorine disinfection that discharges to the Pend Oreille River. The plant provides wastewater treatment services to Newport and the West Bonner Water and Sewer District and was constructed in 1954. This information is summarized in the NPDES Permit WA002232 Fact Sheet[9] for Newport,

Newport upgraded the plant to secondary treatment with a design flow of 280,000 gallons/day in 1974. The upgrade included the addition of an aeration basin, a secondary clarifier, a pump house, and a final chlorine contact tank.

The plant was again upgraded in 1984 with a new design flow of 500,000 gallons/day. This upgrade included a second secondary clarifier, a new oxidation ditch, as well as an additional sludge pump house. Newport converted the old aeration basin to an aerobic digester at this time.

The headworks were upgraded and a sludge de-watering facility with a filter fabric belt press was added in 2004.

When Newport's WWTP is fully operational the combined facilities function as an oxidation ditch type WWTP that provides pretreatment, primary and secondary treatment, and effluent disinfection. Treated effluent is discharged to the Pend Oreille River. Settled solids and biological solids generated within the treatment plant are stabilized via anaerobic and aerobic digestion, respectively. Stabilized solids are dewatered and hauled off-site for beneficial use via land application by third parties. Screened material and grit removed in the preliminary treatment unit process are hauled to a landfill for disposal. Automated portions of the facilities can be controlled and monitored in a control building. Limited constituent analysis can be performed by staff in a laboratory located in the control building. The condition and proposed improvements to the WWTP is described in the Wastewater Facility Plan.

The latest National Pollutant Discharge Elimination System (NDPES) Waste Discharge Permit for Newport is Permit No. WA-0022322.

Design criteria for the Newport WWTP is summarized in **Table 3-7**.

Table 3-7: Design Criteria for Newport Wastewater Treatment Plant

Parameter	Design Quantity
Average Daily Flow – maximum month	0.5 MGD
Monthly Maximum Flow	1.0 MGD
BOD5 loading for maximum month	1330 lb/day
TSS loading for maximum month	920 lb/day
Design population equivalent	4,500

A summary of the condition of each unit process is included **Table 3-8**.

Table 3-8: Summary of Observed Unit Process Conditions

Item	Observed Conditions
Influent Flow Meters	• Measures inflow between 0.059 MGD to 5.700 MGD • Recording log antiquated
Receiving Station	• Not in use for septic haulers to dump • May need to be regraded to block storm water flow from entering (I/I)
Headworks	• The channel upstream of the bar rack where sampling occurs accumulates grit and solids, which impact the sampling process. This channel needs to be re-shaped. The sampler, located outside the building, has experienced freezing and needs to be enclosed or moved indoors. • Normal operation for bar rack, but upstream channel gates are very difficult to operate and require replacement. • The original mechanical fine screen had issues with warping and not being fully efficient, requires replacement with a newer version of the screen. • Second mechanical fine screen installed, 2.0 MGD capacity per screen. • The electrical controls for the screens require that both screens be shut off if service is required. The controls need to be updated so that one screen can continue to run while the other screen is offline. • Vortex grit chamber operating well, some difficult priming, pump piping needs support. • Heating system is problematic and requires replacement. • Configuration of building makes maintenance of equipment difficult and potentially hazardous to workers due to challenging access and lack of lifting equipment. Reconfiguration of the building and the addition of a traveling bridge crane would resolve these concerns. • The retaining walls on the exterior of the building are deteriorated in several sections and require repair. • An air gap skid system is needed for the domestic water feed into the building to prevent cross-contamination of the drinking water system.
Primary Clarifier	• Offline, not in use • Would require extensive rehabilitation to resume use. • All components need replacement

Item	Observed Conditions
Secondary Treatment – Oxidation Ditch	• Functions well, plenty of capacity. • Concrete outlet structure damaged, in need of repair • 40-hp aerator/mixer does not have variable speed control, often works harder than needed, not efficient, requires upgrade. • Aerator shed needs replacement. • Grating on the inlet distribution box is badly corroded and needs replacement. • No backup power in event of power outage. • Foam spray system is inadequate and needs replacement.
Secondary Clarifier(s)	• Concrete in both clarifiers is serviceable. • Aeration basin concrete damage preventing proper function of outlet weirs. • Metal weirs should be replaced or resurfaced and reinstalled level. • Secondary clarifiers cannot be taken offline for maintenance. • Mechanical parts of secondary Clarifier #1 need to be replaced. • Mechanical parts of secondary Clarifier #2 need to be resurfaced.
Chlorine Contact Basin	• Adequately sized for use during planning period. • Concrete is cracked, but does not interfere with operation • Auto-sampler freezes in the winter. • Reduction of spike inflow and infiltration (max day flow) would help regulate performance. • Flow paced dosing recently installed
River Outfall	• Discharges below low water level for Pend Oreille River. • No issues noted. • Slope erosion concerns.
Primary Sludge Pump Station	• Pumps outdated, not in use, and cannot be maintained. Confined space to access. • Replacement or rehabilitation should be coordinated with work on the Primary Clarifier.
Anaerobic Digester	• Not in use, solids need to be removed. • All components need to be replaced
Activated Sludge Pump Station 1 and 2	• Groundwater leaks into pump room. Sump pump often plugs and fails. Basement walls require sealing. • Numerous valves do not work well, requiring repairs or replacement. • Poor ventilation in pump room, must be upgraded to meet Class 1, Division 1 requirements • Sump pump system requires upgrades for capacity. • No SCADA monitoring system. • No backup power, could affect rest of WWTF. • The restroom in Pump Station #2 has rotting/moldy wall, deteriorated flooring and requires a complete remodel. • Confined space entry measures are required for safe ingress/egress and extraction. • The gas chlorination system will require upgrades if not replaced with UV disinfection equipment.
Aerobic Digester	• Steel building covering the aerobic digester is badly corroded, needs replacement. Walkways are connected to the building and will also require replacement. • The decant pipe system needs to be replaced and the waste line supports need to be replaced. • The digester lift station currently only has one pump and requires an upgrade with two pumps on a rail system. • Concrete basins have not been inspected for leaks.

Item	Observed Conditions
Belt Filter Press	• Conveyor leaks and drops solids. Spray boxes need to be upgraded to a more effective model. • Polymer room heaters do not work. Main area heaters also need to be replaced. • Spray nozzles plug. • The pressure bladder tank requires replacement. • Lift station pumps and rails are due for replacement. • Polymer system and control panel upgraded in 2021. • The sludge thickener system is now longer functional and requires repair and upgrade. • An external domestic water feed line is needed, with air gap skid system for backflow prevention. • An overhead traveling bridge hoist is needed to lift and replace heavy equipment items. • The floor drains need to be repaired. • The wall around the conveyor system needs to be repaired.
Yard Piping	• No deficiencies reported. • Due for inspection.
Electrical Service	• Facility processes do not currently have backup power during power outages. • Two feeds come from the single power utility and do not provide backup to each other. Combination into a single feed will facilitate backup power provisions.

Five alternatives were evaluated to address the needs of the Newport wastewater treatment facility. A summary of these improvements is presented in **Table 3-9**. Alternative B, Repair and Upgrade Existing Facilities, was determined to be the least cost alternative and was selected as the preferred alternative for implementation. The following table outlines the improvements included in Alternative B.

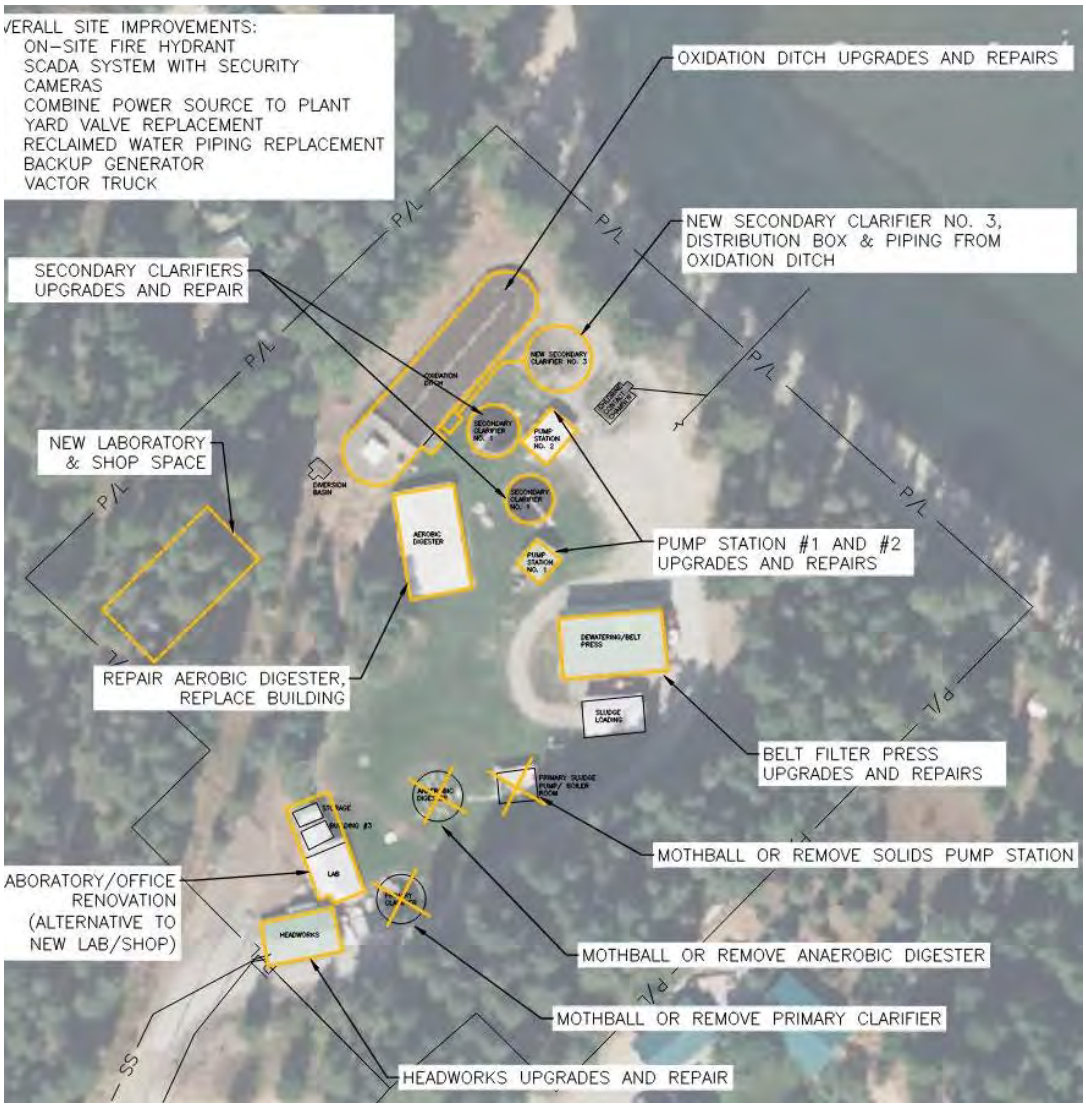
Table 3-9: Alternative B Summary of Improvements

Improvement Area	Improvements
Overall Site Improvements	• Onsite domestic fire hydrant • SCADA system with security cameras • Combine power sources into one feed • Yard valve replacement throughout plant • Reclaimed water system replacement, including piping and filtration • Backup generator • Vactor truck
Headworks	• New influent fine screen • Electrical improvements of independent screen operation • Replace/support grit chamber piping
Belt Filter Press	• Replace heaters • Replace 1100 gallon pressure tank • Upgrade shower boxes on gravity and press section • Domestic water feed line • Air gap skid system • Upgrade lift station with new pumps

Improvement Area	Improvements
	• Sludge trailer
Existing Oxidation Ditch	• Upgrade drive, gear box, paddle system • Replace building over drive system • New control panel with VFD for drive system w/DO control • Construct backup aeration system on opposite end of basin • Replace grating on influent distribution box • Repair outflow distribution box
Secondary Clarifiers	• Clarifier #1 equipment replacement • Clarifier #1 concrete inspection and repairs • Clarifier #2 equipment replacement • Clarifier #2 concrete inspection and repairs • Reshape Clarifier #2 trough and level weir
New Clarifier #3	• Construct new clarifier with appurtenant equipment • Upgrade piping and valving for new clarifier operation • Upgrade chlorination system • Electrical and instrumentation
Pumphouse #1	• Replace piping and valving • Ventilation with monitoring for basement area • Excavate and seal basement walls with drainage • New sump pump system (WAS line and flows from PH #2) • Replace conduits with water issues • Overhead hoist in basement • Construct basement extension for entrance with overhead building extension • Underdrain with outlet pipe • Yard piping modifications • Electrical and instrumentation
Pumphouse #2	• Replace 8" valves RAS-AUX-WAS • Ventilation with monitoring for basement area • Excavate and seal basement walls with drainage • New sump pump system (WAS line and flows from PH #2) • Replace conduits with water issues • Overhead hoist in basement • Construct basement extension for entrance with overhead building extension • Underdrain with outlet pipe • Yard piping modifications • Electrical and instrumentation
Aerobic Digester	• Demolish existing structure • Construct new building with overhead hoist • Building lighting • Digester lift station upgrade for dual pumps on rails
New Shop/Office/Lab	• Clearing and grubbing • Site excavation • Steel shop/lab/office building, 50'X100' • Finish office/lab space, 30'X50' • Extend 8" water line to shop • Fire hydrant • Extend sewer line to shop/office/lab • Crushed surfacing top course for driveway • Hot mix asphalt for driveway

Figure 3-15 presents an overview of the proposed improvements.

Figure 3-15: Selected Alternative B, Treatment Plant Repairs and Upgrades



3.4 Storm Drain System

Newport's storm drainage consists of drywells dispersed throughout the City and a limited network of conveyance piping in the downtown core of town. The storms flows are piped to the Pend Oreille River along US Highway 2 and discharge on the west side of the river under bridge. The conveyance system was constructed during previous highway improvement projects and is maintained by the City of Newport. A map of the storm drain system is included in **Figure 3-16**.

Figure 3-16: Newport Storm Drain System

CHAPTER 4 - HYDRAULIC EVALUATION

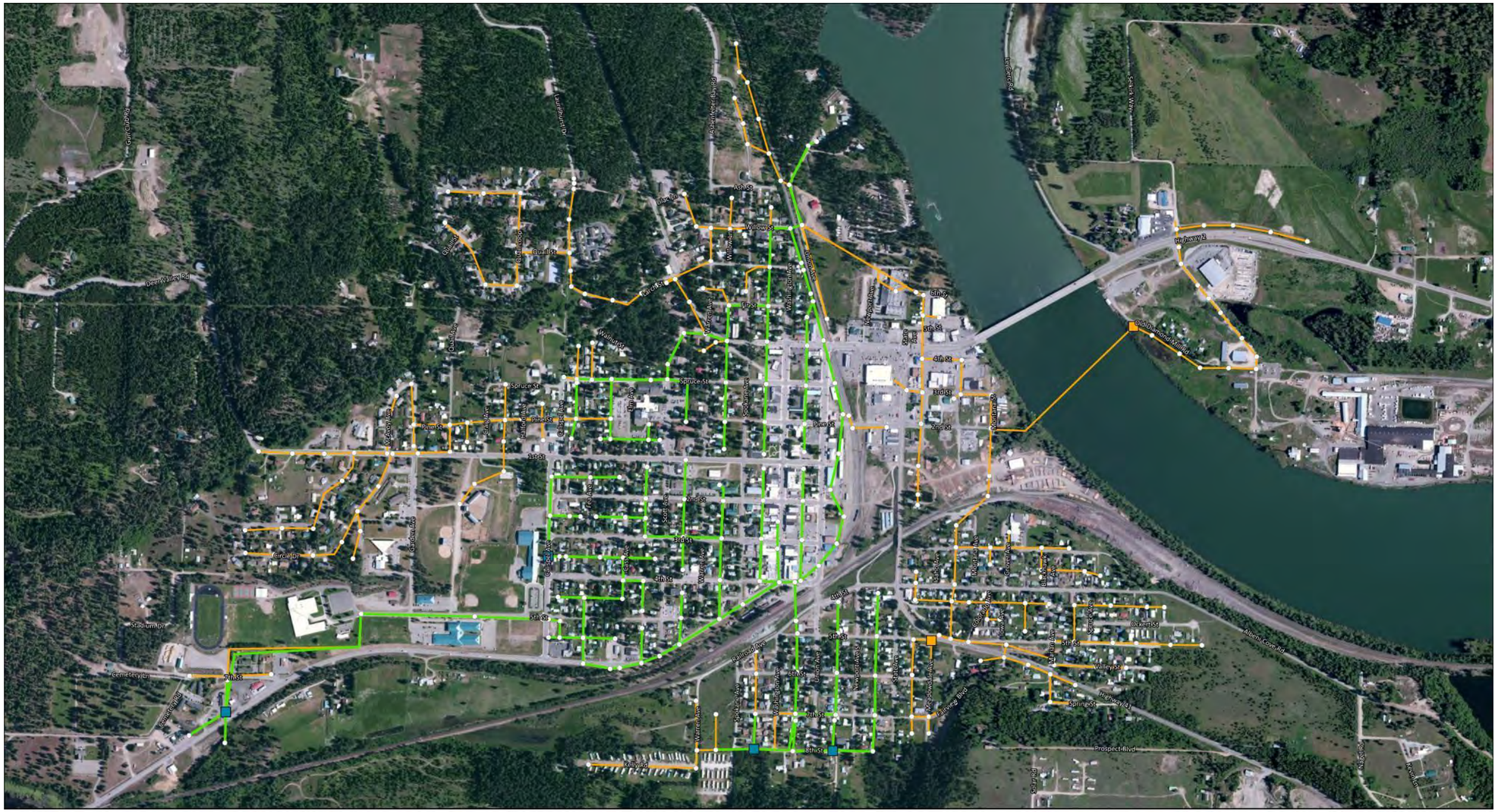
A hydraulic model of the existing collection system facilities was developed for this GSP. The hydraulic model includes Newport's network of pipes, manholes, and lift stations. The modelled pipe network of the collection system is limited to the portion installed during the 1950's, which is due to the availability of as-built records. Modelling of the newer portion of the system, for which as-builts records are not available, is reliant upon input of flows at the nodes. The following sections document the preparation and analysis of the model:

- **Section 4.1** Setting up the Model
  - Documents information retrieved and assumptions made to build the geometry of the model and assign base flow from system users.
- **Section 4.2** Calibrating the Model
  - Documents the process of calibrating the model to 'field verify' model results against available flow data measured in the collection system.
- **Section 4.3** Existing System Model and Analysis
  - Documents hydraulic deficiencies of the existing system with existing flows applied to the system – How the system performs right now with no improvements.
- **Section 4.4** Future Growth During Planning Period
  - Documents the distribution of future growth and flows in the model.
- **Section 4.5** Planning Period Development Model and Analysis
  - Documents hydraulic deficiencies of the existing system with flow from development anticipated in the planning period applied to the existing system – How the system is anticipated to perform at the end of the planning period without upgrades to the existing system.
- **Section 4.6** Recommended Hydraulic Capacity Improvements
  - Recommended improvements to the existing system to meet design criteria under anticipated planning period flows.

4.1 Setting up the Model

Existing Pipes and manholes were identified, mapped and added to the City's GIS database. Modeled components and system details were added to the hydraulic model based on available as-built records and field observations. **Figure 4-1** illustrates the pipes and manholes that were modeled versus pipes that were not modeled, which are mapped in GIS but lacked sufficient data to model (no components in Idaho were modeled).

Figure 4-1: Collection System Modeled Pipes



All four lift stations currently operating in Newport were modeled. Lift station and force main data were added to the hydraulic model based on available as-built records and information from staff. Any missing information was assumed to match a similar lift station. Pump operational setpoints for each lift station were unavailable and assumed values were used. Lift station model input data are summarized in **Table 4-1**.

Table 4-1: Lift Station Model Input Data

Lift Station Name	Pump Flow
Pleggers	72 GPM[1]
Bings	52 GPM[1]
Riverbend	228 GPM[1]
Calispel	164 GPM[1]

1. *Measured value*

Different scenarios in the modeling software are used to look at how the system responds under storm events and with proposed improvements. The scenarios are as follows

- Existing – Used to evaluate performance of existing system
- Drycal – Used to calibrate dry weather flows in the model with observed data from a period of dry weather
- Wetcal – Used to calibrate wet weather flows in the model with observed data from a storm event
- Base – Used to evaluate the existing system with flows from projected future growth added
- Improvements – Used to model the improvements needed to meet the planning criteria with flows from projected future growth added
- Phasing – Used to analyze when development will trigger the need for improvements

Domestic water meter data were utilized to provide a method for allocating the sanitary sewer flows for the Existing Scenario. Sanitary flows were based on recorded water meter data from October 2021. October was selected because most of the metered water used is for potable use only, without irrigation use, and discharged to the sewer collection system, which is a sound indicator of base sanitary sewer flows in the collection system. This method yields a more accurate representation of the existing base domestic flows throughout the system. It has been conservatively assumed that no onsite sewer systems are present within the study area. All parcels with water meter data were assigned flows for the Existing Scenario.

Model node service areas were assigned by identifying every parcel that drained towards the node. Wastewater flow at each node was modeled by injecting flow from the service area into the upstream manhole in the hydraulic model.

Peak day wastewater flow was estimated by applying weekend and weekday diurnal curves. The diurnal curves for each land use type were based on typical historical modeling efforts done by J-U-B at other municipalities. These were then adjusted during calibration efforts to match flow monitoring results and represent the unique flow characteristics of Newport.

4.2 Calibrating the Model

Calibration of the model was performed to modify assigned flow values to match flow monitoring data to account for Newport's specific land use. Sewer flows were monitored by staff at the WWTP between June 6th, 2022 and July 11th, 2022. From this monitoring period both wet weather and dry weather events were captured. Dry weather periods are those that contain no significant rain or snow events. These periods were isolated and considered representative of Newport's sanitary sewer flows.. The wet weather events were isolated and analyzed to quantify the combined effect of rainfall derived infiltration and inflow.

All flow monitoring data from Fridays, Saturdays, and Sundays, or other data that was suspect of not being accurate, were excluded from calibration. Saturday and Sunday are excluded as they typically do not share the same diurnal curve pattern as weekday flows. Fridays are excluded due to past experience and that they usually show a diurnal curve characteristic that lies somewhere between the typical weekend and typical weekday.

The Existing Scenario calibrated without significant changes to the base assumptions or parameters and provided a high level of confidence in the Existing Scenario results. The dry weather calibrated model results differed from the WWTP flow monitor by nine percent for the average flow, and five percent for the peak flow. The wet weather calibrated model results differed from the WWTP flow monitor by two percent and three percent for the peak flow.

4.3 Existing System Model and Analysis

The existing system with existing flow applied was evaluated for potential hydraulic deficiencies during a design storm event. Two measures of flow conditions in the collection system were used for evaluation of the Existing Scenario: flow depth over pipe diameter (d/D) and reserve capacity of the pipe. Depth over diameter is used to identify the extents of surcharging through dynamic routing of flows through connected reaches and includes backwater effects from downstream pipe segments. Reserve capacity is determined solely by a Manning's equation analysis on a reach-by-reach basis. This illustrates the difference between the maximum observed flow through a pipeline if it were not hydraulically limited by any downstream deficiencies and the maximum potential flow through the pipeline. A reserve capacity approaching zero

indicates that the pipeline is conveying as much flow as the pipeline's diameter and slope will tolerate. Therefore, this information can be used to identify individual pipes that could be the root cause of the surcharging or limited capacity but does not include the backwater effects from downstream pipe segments.

A pipe with a d/D ≥ 0.8 is considered over capacity for evaluation of the existing system with existing flows applied, because it demonstrates the pipe has less than 10% capacity remaining for future growth or the accumulation of sediment. No modeled segments experienced a d/D greater than 0.8. This demonstrates there are no deficiencies within the existing collection system under existing flows as modelled. **Figure 4-2** and **Figure 4-3** show Depth Over Diameter (d/D) and Reserve Capacity for the Existing Scenario for the sewer collection system, illustrating that all pipelines provide sufficient capacity.

Figure 4-2: Existing System Scenario Depth Over Diameter

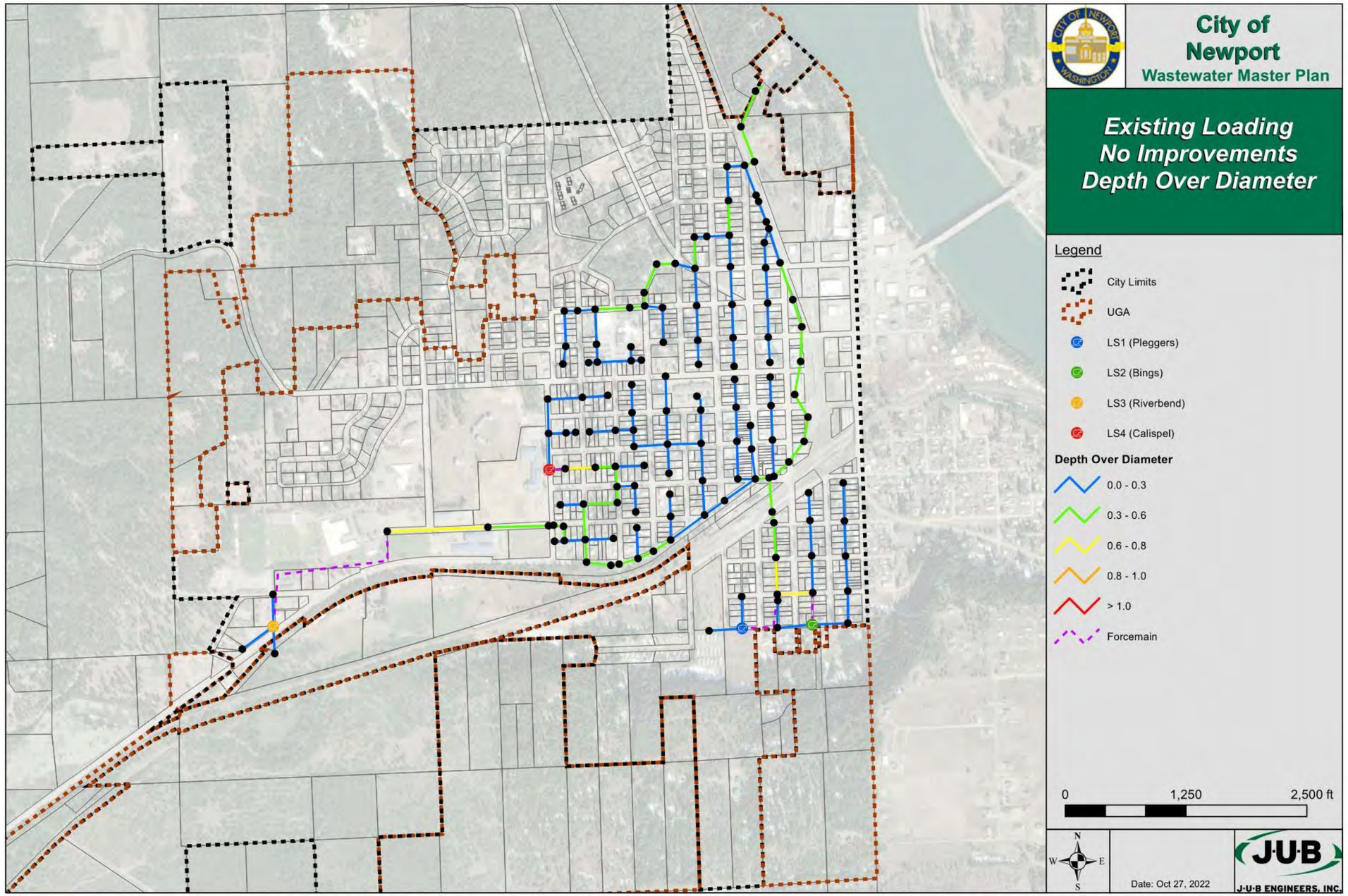
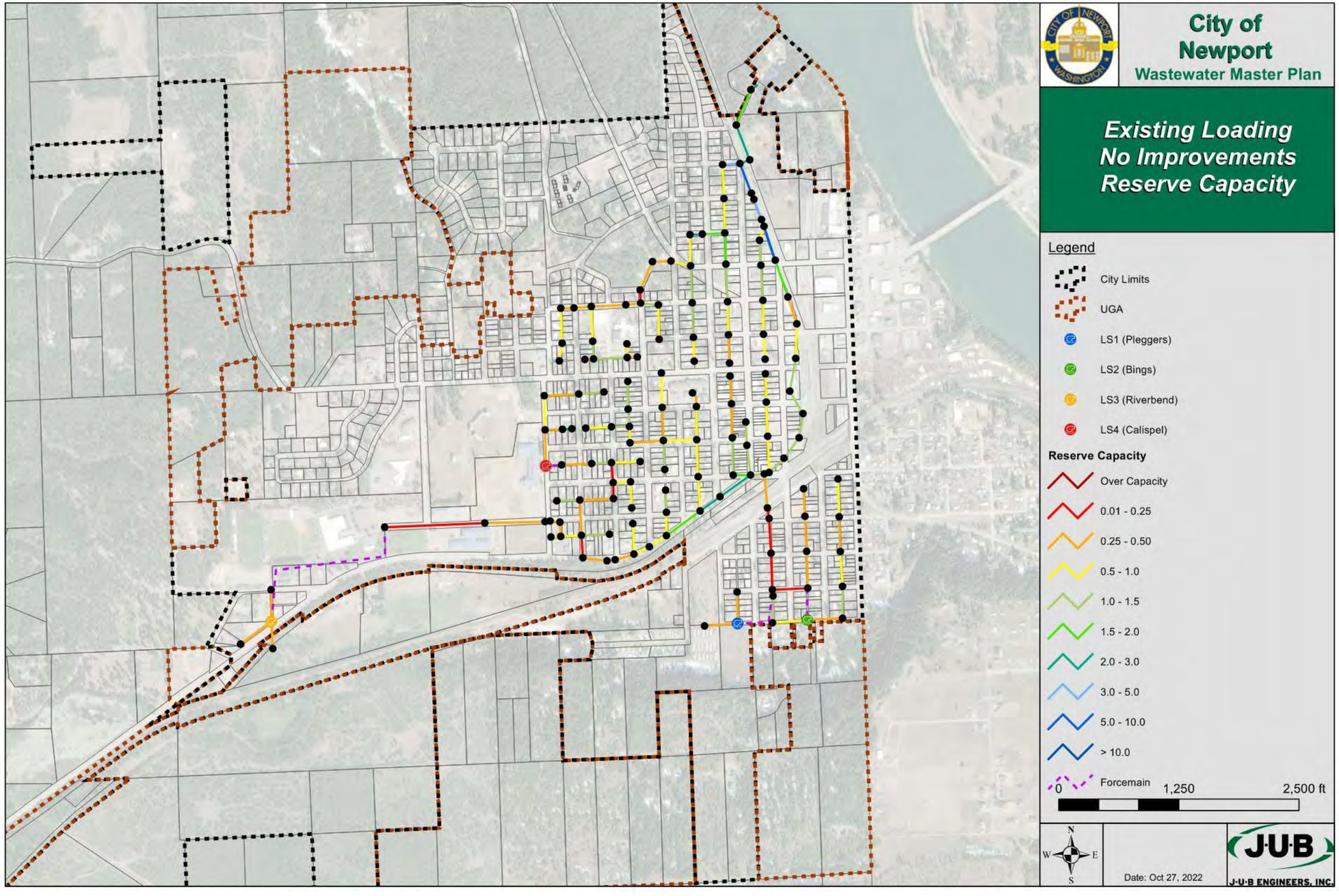


Figure 4-3: Existing System Scenario Reserve Capacity



4.4 Future Growth During Planning Period

Assumptions must be made about where future growth and infill will occur in Newport during the planning period to allow analysis of the capacity of the system to absorb new sewer users and to recommend improvements to the system. Growth patterns were provided by City staff based on their experience, planning efforts, and expectations of future growth. The future system analysis also included the proposed South Bench Lift Station because it is expected that the Pleggers and Bings lift stations will be decommissioned and replaced during the planning. **Figure 4-4** highlights areas of the collection system model that were amended (See **Table 4-2**) and added service areas where flow that was added to reflect application of the planning period growth flows. **Table 4-2** provides a description of the changes highlighted in the figure.

Figure 4-4: Future Growth Allocation Key

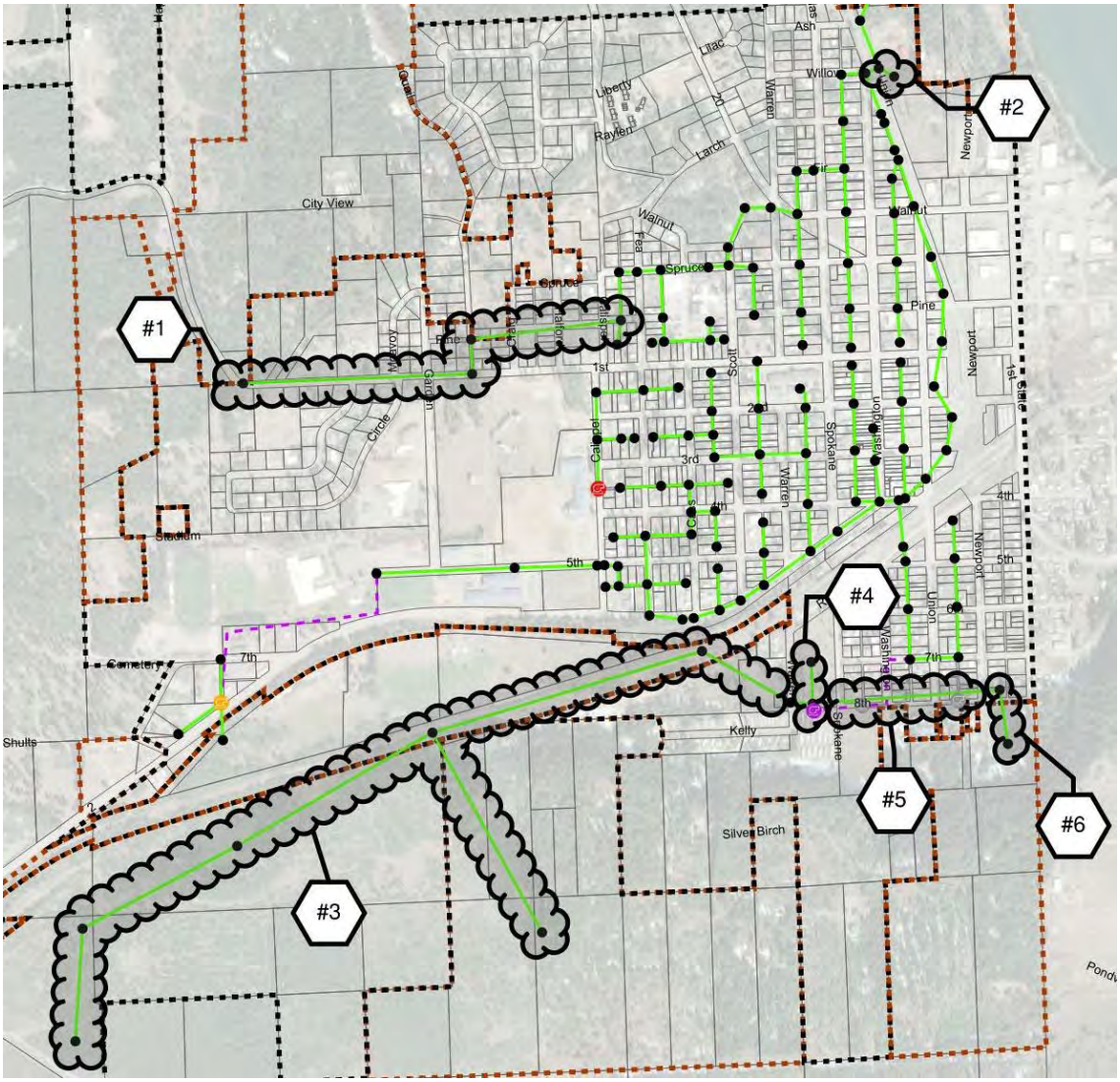


Table 4-2: Future Growth Summary

Figure 4-4 Keynote	Description	Population Increase	AADF Increase (MGD)
#1	Modeled trunk extension into future service area (incomplete data, used assumed minimum slope and 8" pipe). Added single family development flow at end of trunk	23 people (10 ERU[1])	0.002
#2	Increased flow discharged from intertie with Oldtown	73%	0.020
#3	Added flow from two large single-family developments on South Bench	1440 people (626 ERU)	0.120
#4	Added flow from apartment complex	221 people (96 ERU)	0.018
#5	Abandoned Pleggers and Bings lift stations, added new South Bench lift station, redirected flow from Pleggers and Bings (Abandoned) to South Bench lift station	None	None
#6	Added flow from townhomes	46 people (20 ERU)	0.004
	Total	1730 people (752 ERU)	

1. *ERU = Equivalent Residential Unit*

The projected increase in population through the 20-year planning period, as described in **Chapter 2**, is 1,730 people. With the assumption of 2.3 people per household, this corresponds to an increase of approximately 752 ERUs. The flow rate discharged from Oldtown into the Newport collection system was increased by 73% to provide a percentage-based increase of the existing flow rate. This percent increase is based on the project population increase of Oldtown as discussed in **Chapter 2**.

4.5 Planning Period Development Model and Analysis

The Planning Period Development Model Scenario d/D and Reserve Capacity are illustrated in **Figure 4-5** and **Figure 4-6**, respectively. These figures show the future growth summarized above applied to the existing infrastructure.

Figure 4-5: Planning Period Development Scenario Depth Over Diameter

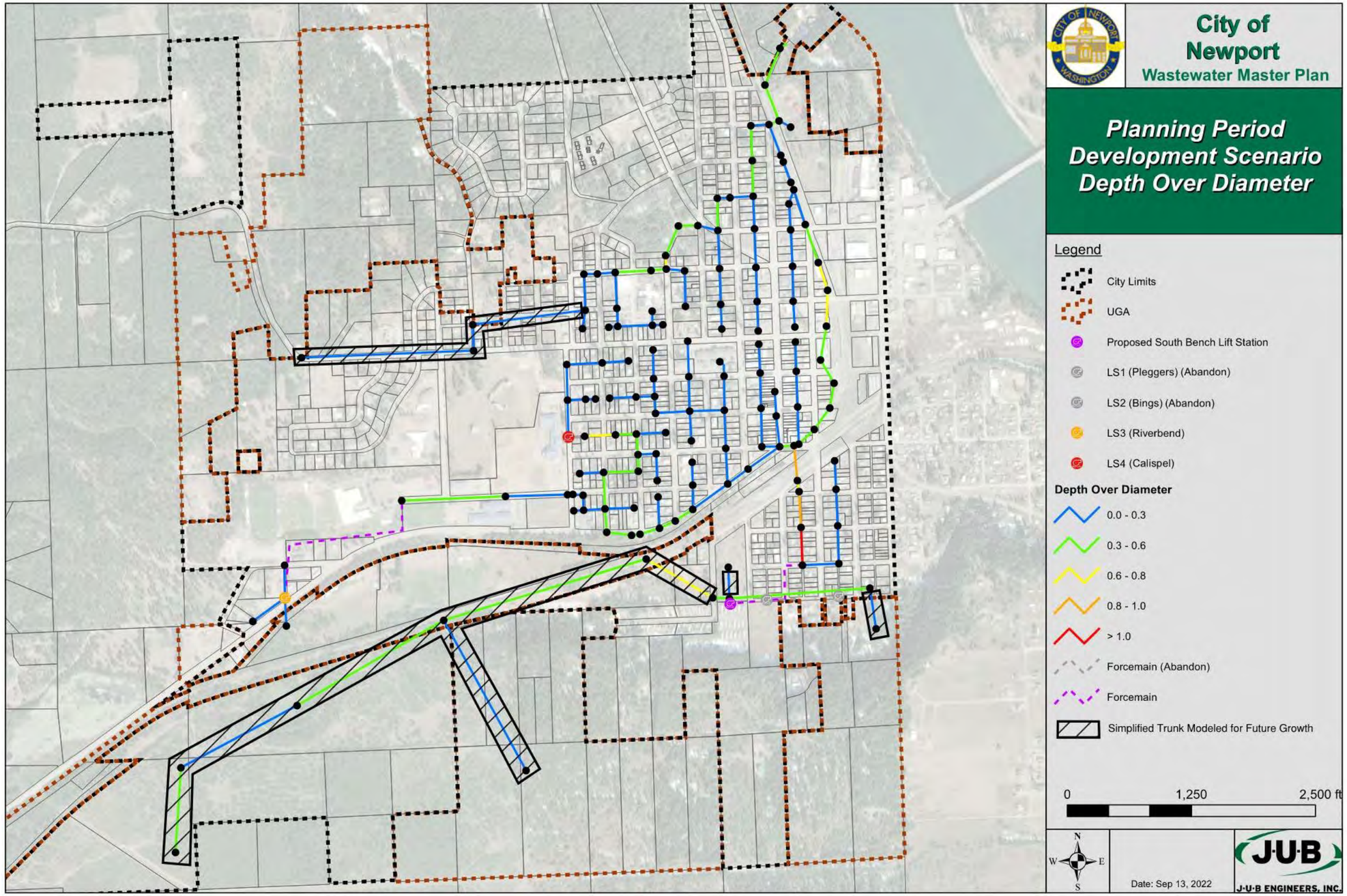


Figure 4-6: Planning Period Development Scenario Reserve Capacity

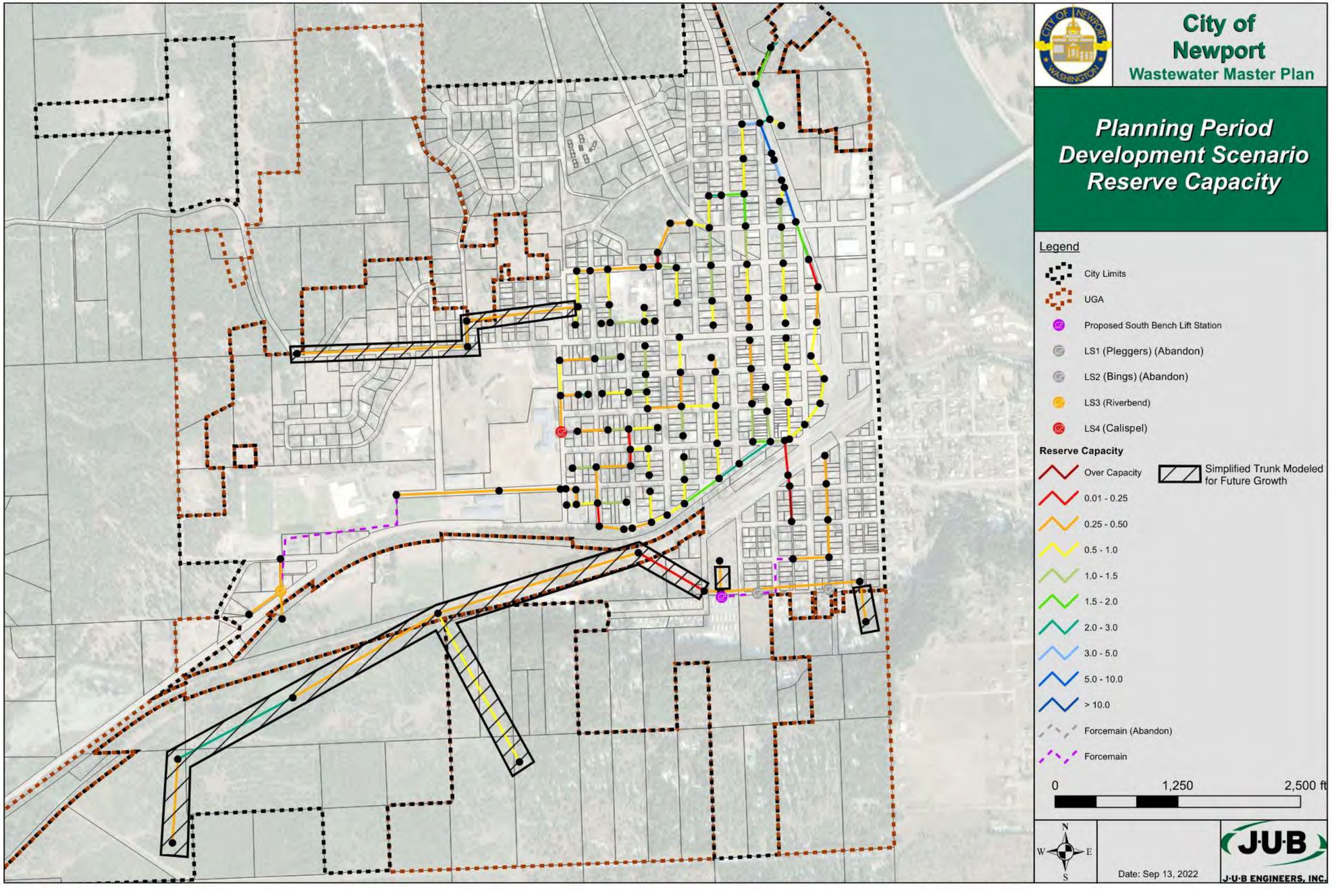


Figure 4-5 (d/D Figure) illustrates that new development on the South Bench accompanied by a lift station adequately sized to convey the additional flows from the South Bench push the railroad crossing on Union Avenue to be undersized with a d/D ranging from 0.8 to 1.0.

4.6 Recommended Hydraulic Improvements

The existing system model scenario indicates there are no hydraulic bottlenecks in the existing system with existing flows. Instead, existing deficiencies relate to the aging infrastructure nearing the end of its useful life. Refer to **Section 10.1** for additional discussion on replacing aging infrastructure within the system).

An evaluation of the collection system hydraulic model with flows from anticipated future developments reveals deficiencies that Newport needs to correct before the anticipated development occurs. Deficiencies are summarized in **Table 4-3**. Phasing of the projects is discussed in subsequent sections of this chapter and summarized in the Capital Improvement Plan (CIP) chapter of this report.

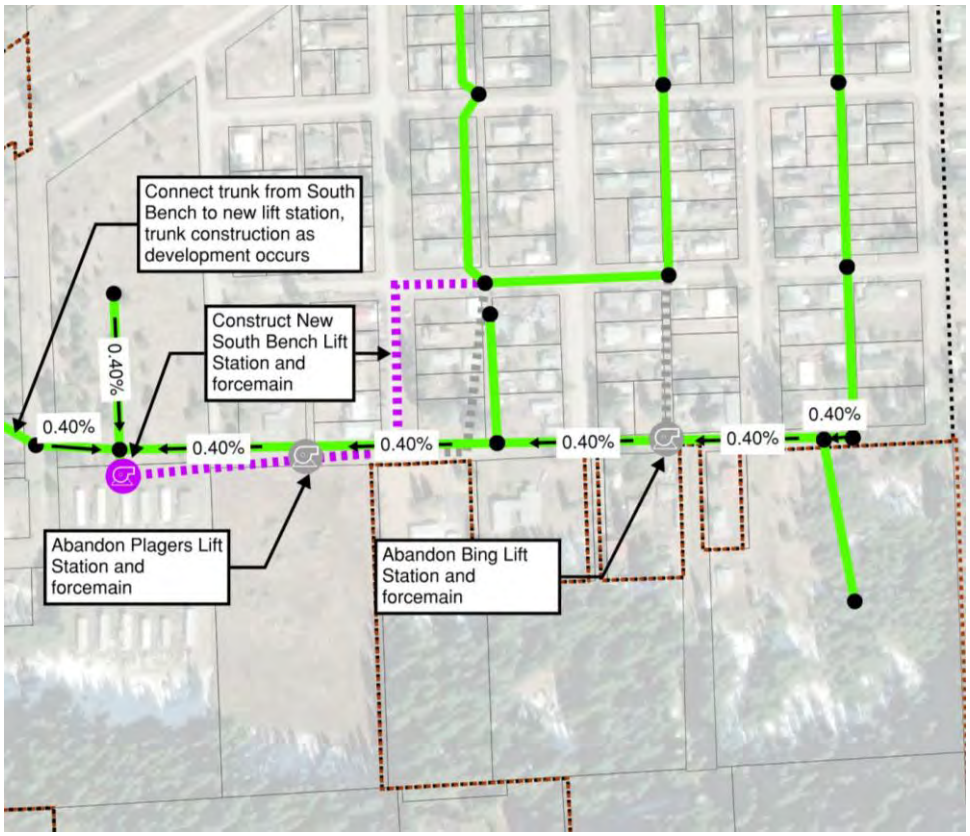
Table 4-3: Planning Period Development Projects

Location	Existing Size	Issue
Pleggers and Bings lift stations	Duplex pumps, 250 GPM (EA)	South Bench area is targeted for an influx of new residential development. These two lift stations are under capacity, limited by topography of the drainage basin, and reaching the end of their useful life
South Union Ave (Railroad Crossing)	8 in pipe	Pipe over capacity. Pipe d/D ranges from 0.78 to 1.07

4.6.1 Pleggers and Bings Lift Stations

Discussions regarding large residential development on the South Bench and the potential addition of two smaller multifamily residential developments on currently vacant lots necessitate major improvements to the Pleggers and Bings lift stations. Because the existing lift stations are limited by topography of the drainage basin and generally reaching the end of their useful life, the recommended improvement to address hydraulic capacity of the southern part of city limits is to construct a new lift station to replace Pleggers and Bings and able to serve the South Bench. In addition to serving existing sewer users, this lift station will allow for new development on the South Bench. **Figure 4-7** shows a graphic of the proposed project for the list station replacement.

Figure 4-7: South Bench Lift Station Project Diagram



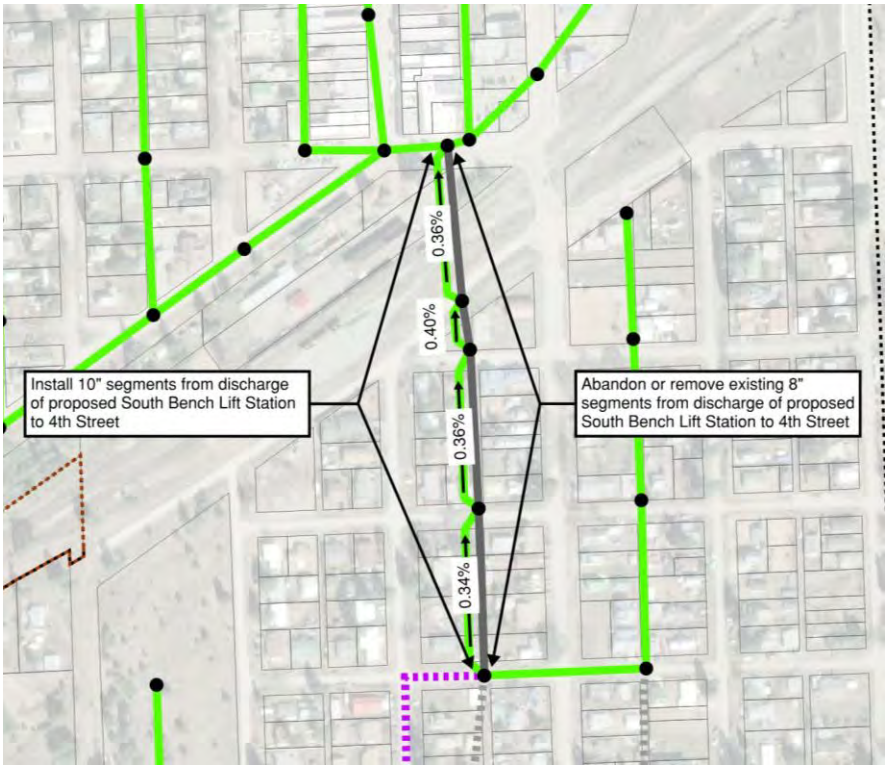
Peak inflow to the proposed lift station wet well under modeled growth of the planning period is 0.353 MGD (250 GPM, rounded up). The proposed lift station has a relatively small static head and flow rate, so the potential for phasing was not explored - It is recommended the lift station be initially constructed to future growth capacity of proposed South Bench development. As design of the development advances and final sewer alignments are selected, it is recommended the model be re-evaluated with information from proposed design to confirm the flow rate of the lift station.

4.6.2 Union Ave Railroad Crossing Upsizing

The gravity trunk from West 7th Street to 4th Street is nearing capacity with existing flows and is undersized to serve future flows. The new users increase the daily flow quantity, and the proposed new lift station sends larger slugs of wastewater through the gravity trunk sewer (under the railroad). The model was adjusted in a Future Growth Phasing Scenario to determine what number of ERUs added to the basin causes this gravity trunk to be considered undersized. Adding approximately 290 ERUs results in the new pump station sending slugs large enough to make the sewer main under capacity. The total modeled development of the South Bench included 742 ERUs. The population increase of 290 ERUs (667 people assuming 2.3 people per household), as

documented in Chapter 2, is anticipated to occur prior to the year 2032. A graphic of the proposed project is presented in **Figure 4-8.**

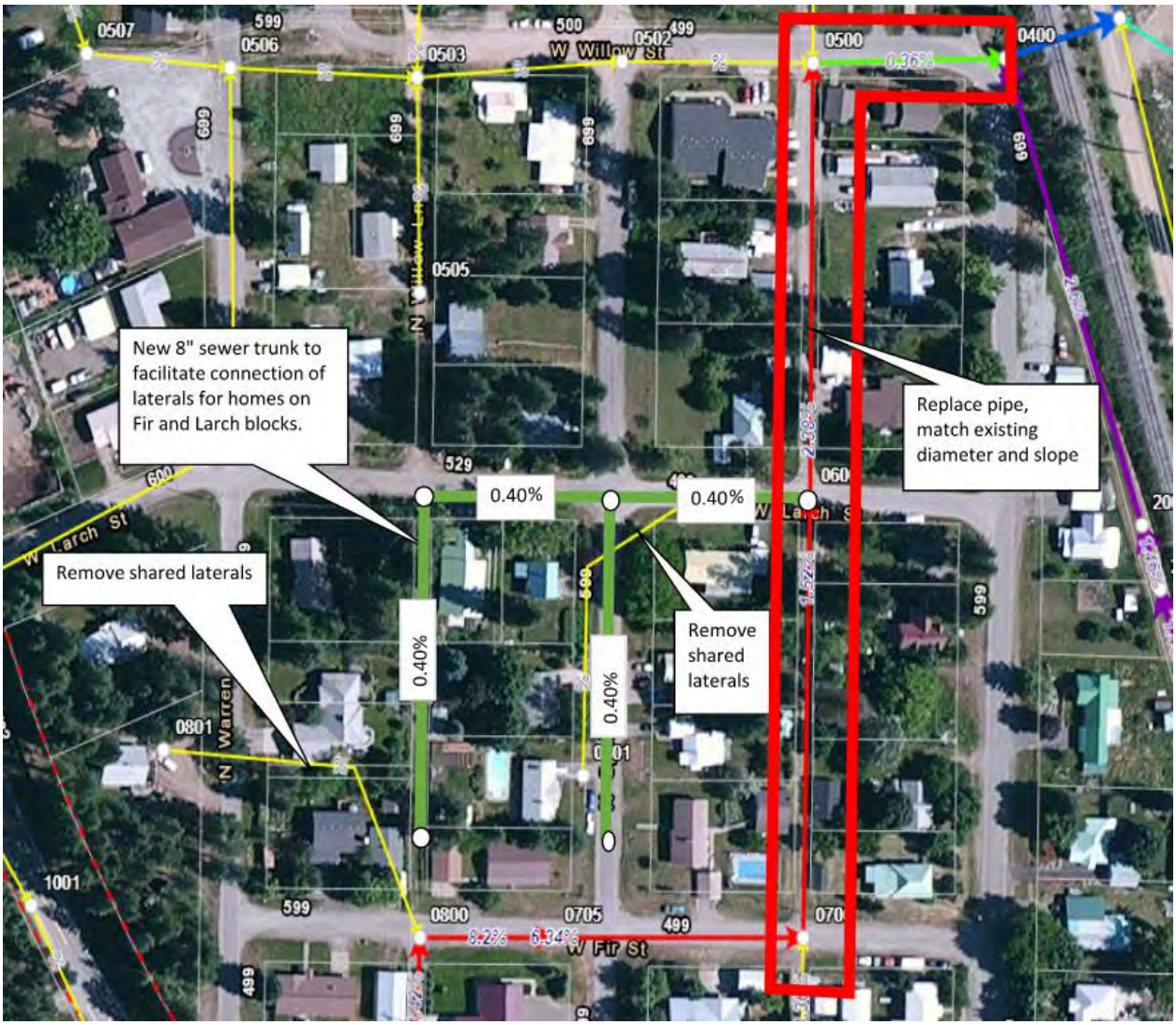
Figure 4-8: South Union Ave (Railroad Crossing) Project Diagram



4.6.3 Shared Side Sewer Elimination

The blocks surrounded by West Fir Street to the south, West Larch Street to the north, North Warren Avenue to the west, and North Washington Avenue to the east are serviced by shared side sewer lines. These lines feature bends without manholes and have plugged with debris in the past. Concern was expressed by City operations staff about their ability to maintain these lines should future issues occur. These lines have a high probability of infiltration, being constructed of Orangeburg pipe, which is made from layers of ground wood pulp fiber and asbestos fibers compressed with and bound by a water-resistant adhesive then impregnated with liquefied coal tar pitch. This pipe is highly susceptible to deterioration and failures have been noted by City staff in responding to maintenance calls on these lines. The depths of all adjacent manholes are not known, but there appears to be adequate fall in topography to allow for the laterals to be replaced with 8-inch sewer mains. A complete survey of the area, including lateral depths, should be done to confirm the possibility of gravity connections to a new trunk line. **Figure 4-9** illustrates a likely alignment of the proposed sewer main extension.

Figure 4-9: Shared Side Sewer Elimination Project Diagram



4.6.4 Summary of Recommended Hydraulic Improvements

- Update the system model with final sewer alignment data from the proposed South Bench development. Revaluate projected flows from the development.
- As funds become available, begin design of 250 GPM South Bench lift station
- By 2030 or as development necessitates, begin design of 10” South Union Ave Railroad Crossing
- Implement repair and replacement programming with recommendations presented in **Section 10.1**.

4.6.5 Recommendations for Future Modeling Efforts

It is typical of hydraulic modeling efforts to make assumptions about the system. These assumptions may fill in for data that is not economically or otherwise feasible to collect

at the time of creating the model but may be collected in the future to update the model. Revisiting the model to refine it may result in a higher accuracy and degree of confidence in the model results. It is recommended that Newport begin collecting the data points presented below. Model updates and increased accuracy will be beneficial to facilitate growth and further analyze potential deficiencies.

Recommended data to collect for future modeling efforts:

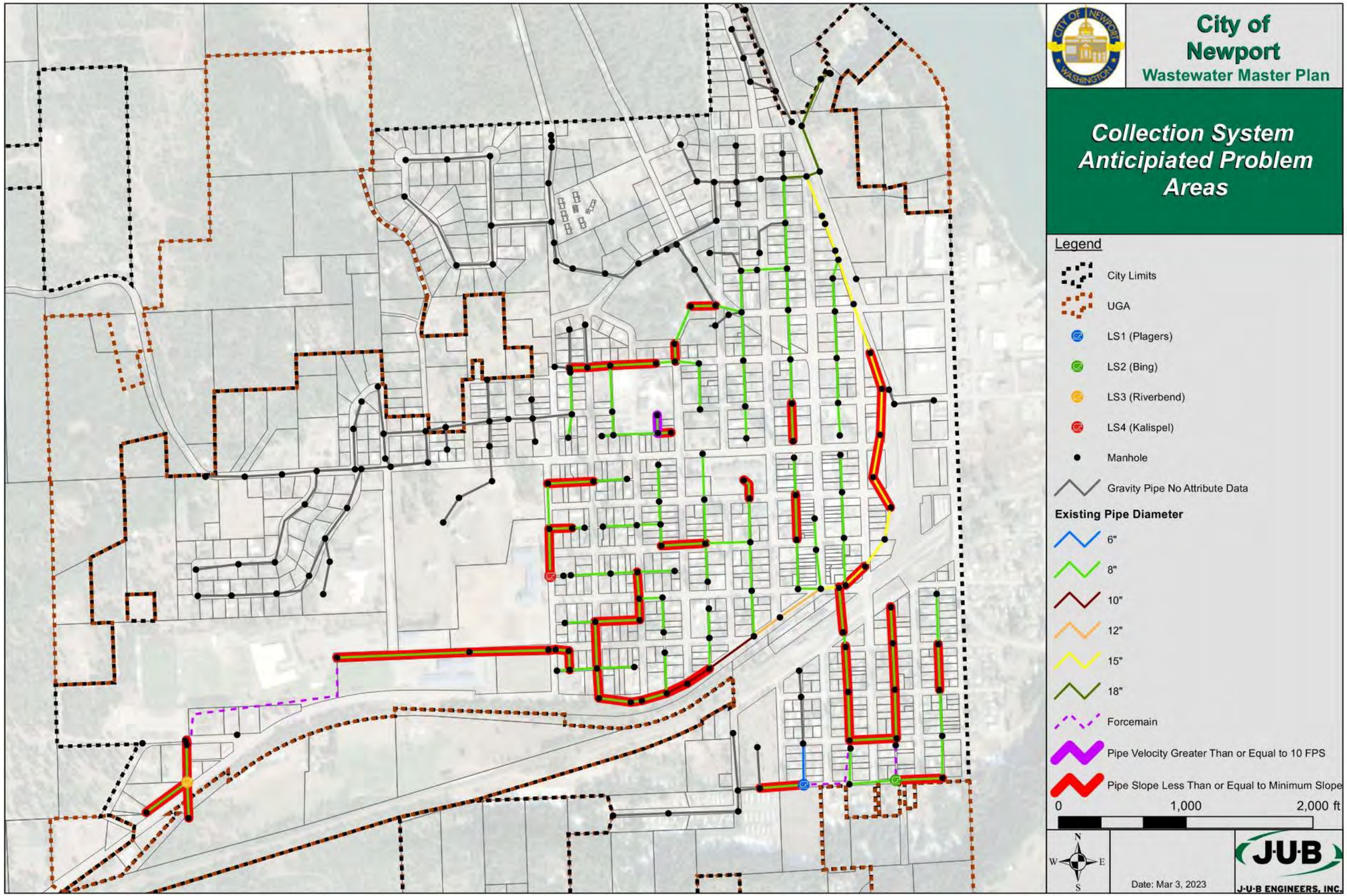
- Record the operational setpoints of each lift station (pump on/off, alarm conditions, overflow elevation, etc.)
- Measure wet well dimensions and perform draw down test to estimate pump performance (flow). Install pressure gauges on force mains near pump discharge to estimate energy requirements (horsepower from pressure and flow). Record pump amp draw when running to gauge motor performance over time.
- Verify and record pump rates at each lift station. The design point (GPM and TDH) of each pump should be recorded and pump draw down tests should be conducted to verify the flow rate
- Acquire complete invert elevations on the trunk that development in the northwest corner of town will connect to. Refer to **Figure 4-1** for pipes that did not have complete invert elevation data
- Maintain and increase calibration frequency of Parshall Flume instrumentation to the manufacturer's specification
- Assign flows in the model using a complete 3 – 4 years of water meter data (current model uses 1 partial year of data)
- Utilize temporary, portable flow monitors to calibrate the model at key locations throughout the City
- Document parcels that are served by the City's water system but are not connected to the sewer system (septic users)
- An asset management program that records:
    - Pipe material
    - Pipe age
    - Location of historically observed sanitary sewer overflows
    - Cleaning and CCTV inspection frequency of each pipe
    - CCTV inspection results

4.6.6 Sewer Cleaning

The Orange Book recommends designing sewers with a velocity not less than 2.0 feet per second when flowing half full. This is intended to provide a self-cleansing effect and minimize solids settling in the sewer. Segments of the collection system that do not provide this minimum slope are anticipated to be segments that require the most frequent maintenance. Conversely, velocities that are too large can also be problematic

as flow moves faster than solids through the system. A velocity of greater than 10 feet per second could also trigger more attentive maintenance. **Figure 4-10** illustrates pipe segments with a slope at or below minimum and a modeled maximum velocity of greater than 10 feet per second. As ongoing I/I mitigation efforts gradually reduce flows through the collection system, sewer pipelines with shallow slopes (red in the **Figure 4-10**) and pipelines with steep slopes (purple in **Figure 4-10**) may require more frequently cleaning.

Figure 4-10: Anticipated Problem Areas - Pipe Slope and Flow Velocity



CHAPTER 5 CHAPTER 5 – INFILTRATION AND INFLOW ANALYSIS

This chapter provides a discussion of infiltration and inflow (I/I) problems and a discussion of actions that will alleviate these problems in the future in conformance with WAC 173-240-050 § (3)-(g).

5.1 Overview

Infiltration is the term for groundwater that enters the system through faulty joints, cracks, service connections, and leaky manhole barrels. Inflow accounts for water that enters the system during a storm event through manhole lids and miscellaneous connections to roof drains and storm drainage structures. I/I can affect the sewer system by increasing the volume of flow that must the collected and treated at the WWTP. This results in reduction of efficiencies in biological processes and increases the cost of unit processes that are sized based on detention time. Minimizing I/I is desirable to reduce system costs, improve system efficiencies, and maximize capacity of the collection system.

The historical flows recorded at the wastewater headworks are below the design capacity of the existing WWTP. There are, however, significant I/I impacts that approach the capacity of the plant and the rapid increase in flows has made regulation of the treatment processes problematic, resulting in discharge violations. The City collection system does not feature any sanitary sewer overflows (SSOs) or combined sewer overflows (CSOs). The City does not allow cross connections to the sewer system, but references in past design reports would indicated that roof drain connections could exist, particularly in the downtown area of older construction, and further investigations are recommended.

5.2 Flows

Historical flows for the NEWPORT WWTP (Permit Number WA0022322) are recorded in the WSDOE Water Quality Permitting and Reporting Information System (PARIS).

Influent flow data from January 2016 through December 2020 were reviewed to determine recent trends. Influent flow data are shown in **Figure 5-1**. The data set from January 2016 through December 2020 were analyzed to determine the conditions discussed in the previous section, which are summarized in **Table 5-1**. Of note is the decline in gallons per capita per day due to water conservation efforts mainly due to more efficient household fixtures.

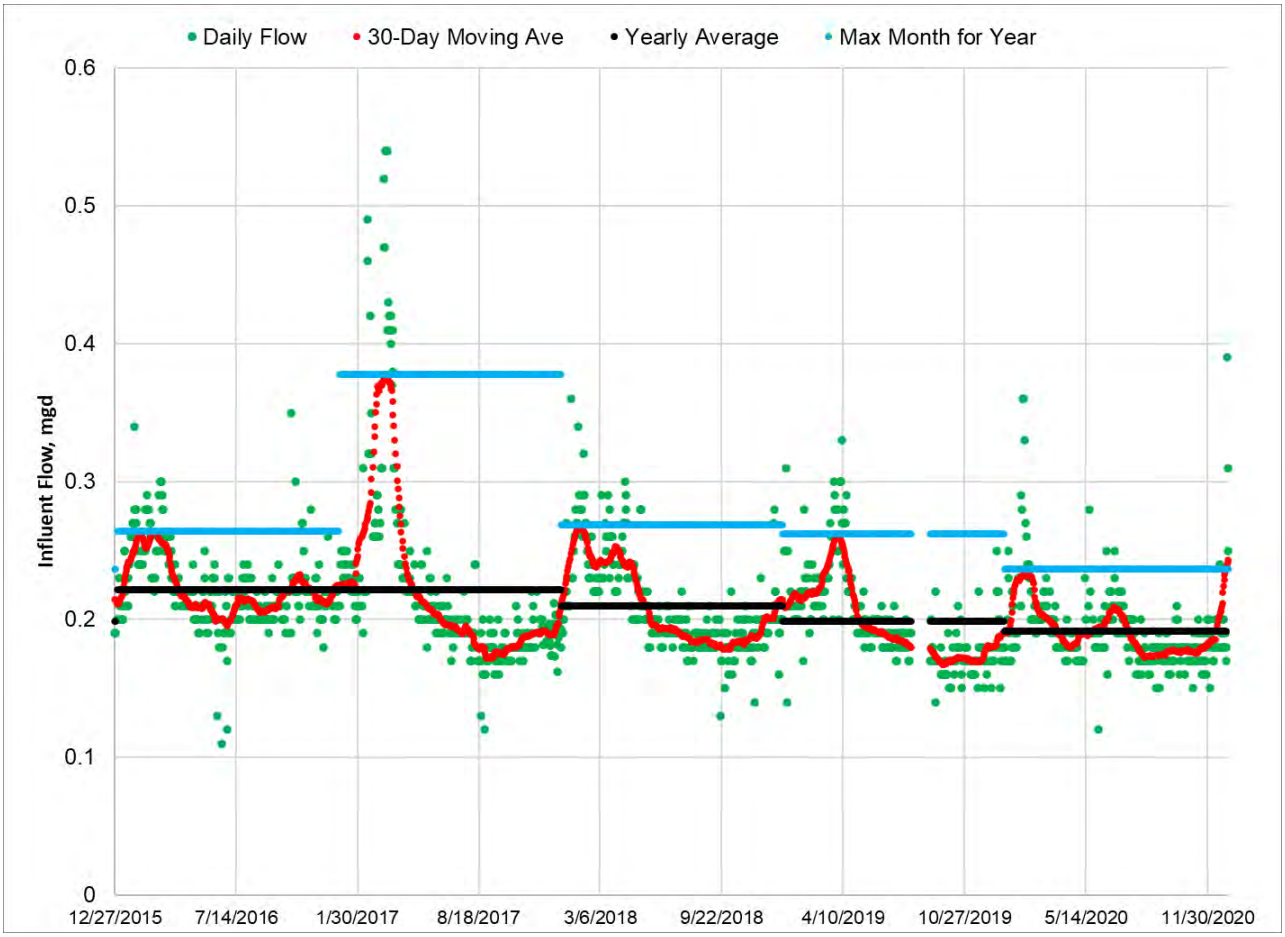
Table 5-1: Flow Summary by Year

Item	2016	2017	2018	2019	2020	Probable Existing 2022[(b)]
Annual Average Day Flow (mgd)	0.22	0.22	0.21	0.20	0.19	0.20
Population Equivalent (gpcd) [(a)]	95	93	88	82	78	82
Maximum Month Flow (mgd)	0.26	0.38	0.27	0.26	0.24	0.26
Peaking Factor	1.19	1.71	1.28	1.32	1.24	1.32
Peak Day Flow (mgd)	0.35	0.54	0.36	0.33	0.36	0.40
Peaking Factor	1.58	2.44	1.71	1.66	1.88	2
Peak Hour Flow (mgd)	0.67	0.66	0.63	0.60	0.57	0.60
Peaking Factor	3	3	3	3	3	3

[(a)] *Based on an estimated population, Newport+Oldtown, See General Sewer Plan*

[(b)] *Largest of last two years. Peak day and peak hour flows were rounded up to nearest 1/10th.*

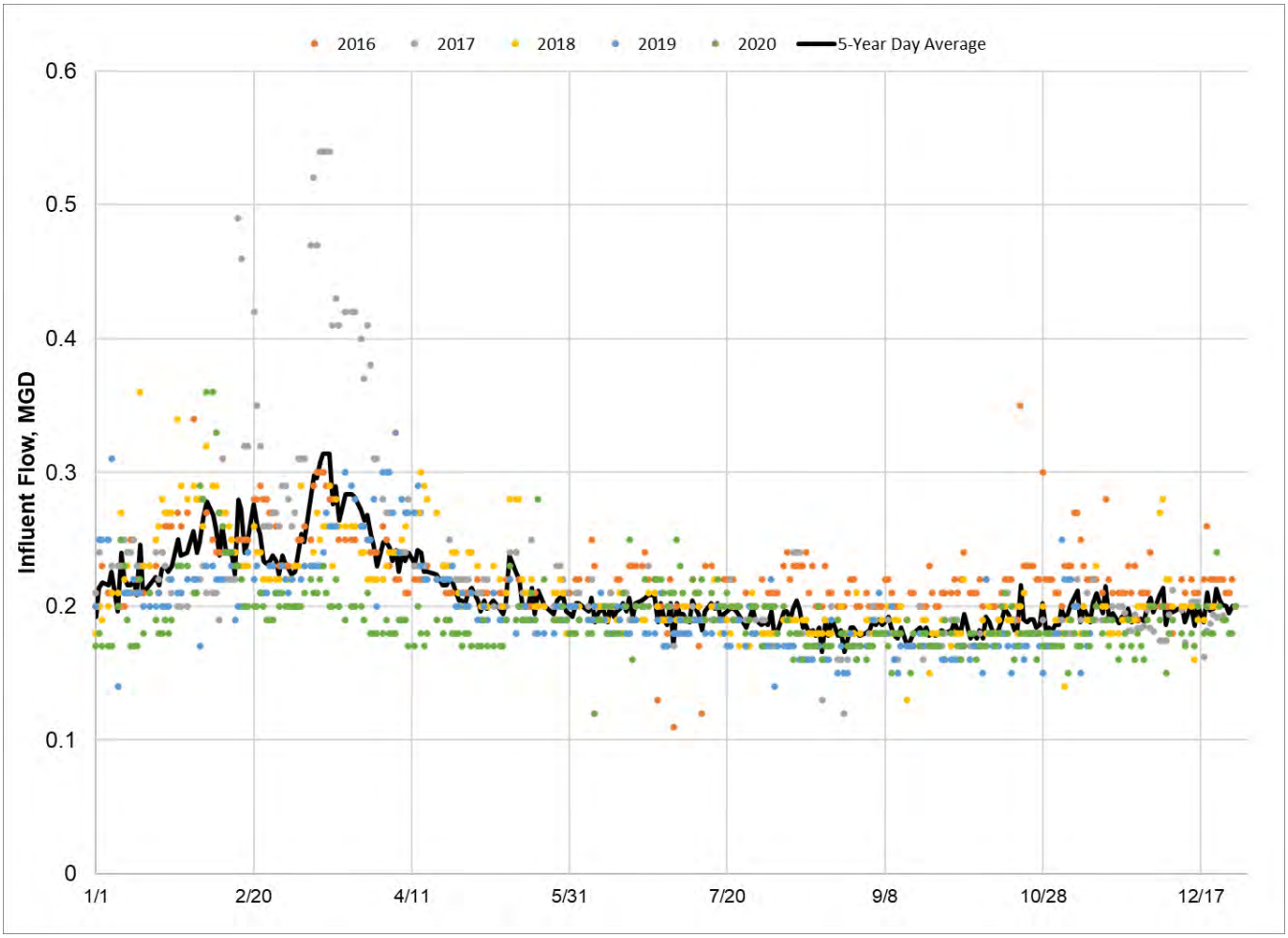
Figure 5-1: Influent Flow (2015-2020)



The average daily flow varies seasonally as shown in **Figure 5-2**. Flows are generally higher during January, February and March and lowest during July, August and September (average = 0.24 and 0.19 MGD respectively). The average daily flow during the wet season is 28% greater than the dry season. The wet season flow amounts to a ~22 gallon per person per day increase for a total wastewater contribution of 99 gpcd during the wet season compared to a 77 gpcd contribution during the dry season. Peak day flows from direct inflow contributions result in a per capita flow of 221 gpcd. While inflow and infiltration extraneous flow contributions are significant, the flows are not considered excessive per EPA guidance[10]. However, the City recognizes that extraneous flow due to inflow and infiltration has negative impacts on the WWTP and is actively investigating sources of inflow and infiltration to reduce extraneous flows. Reducing extraneous flow to the WWTP will make capacity available for users and reduce operational difficulties.

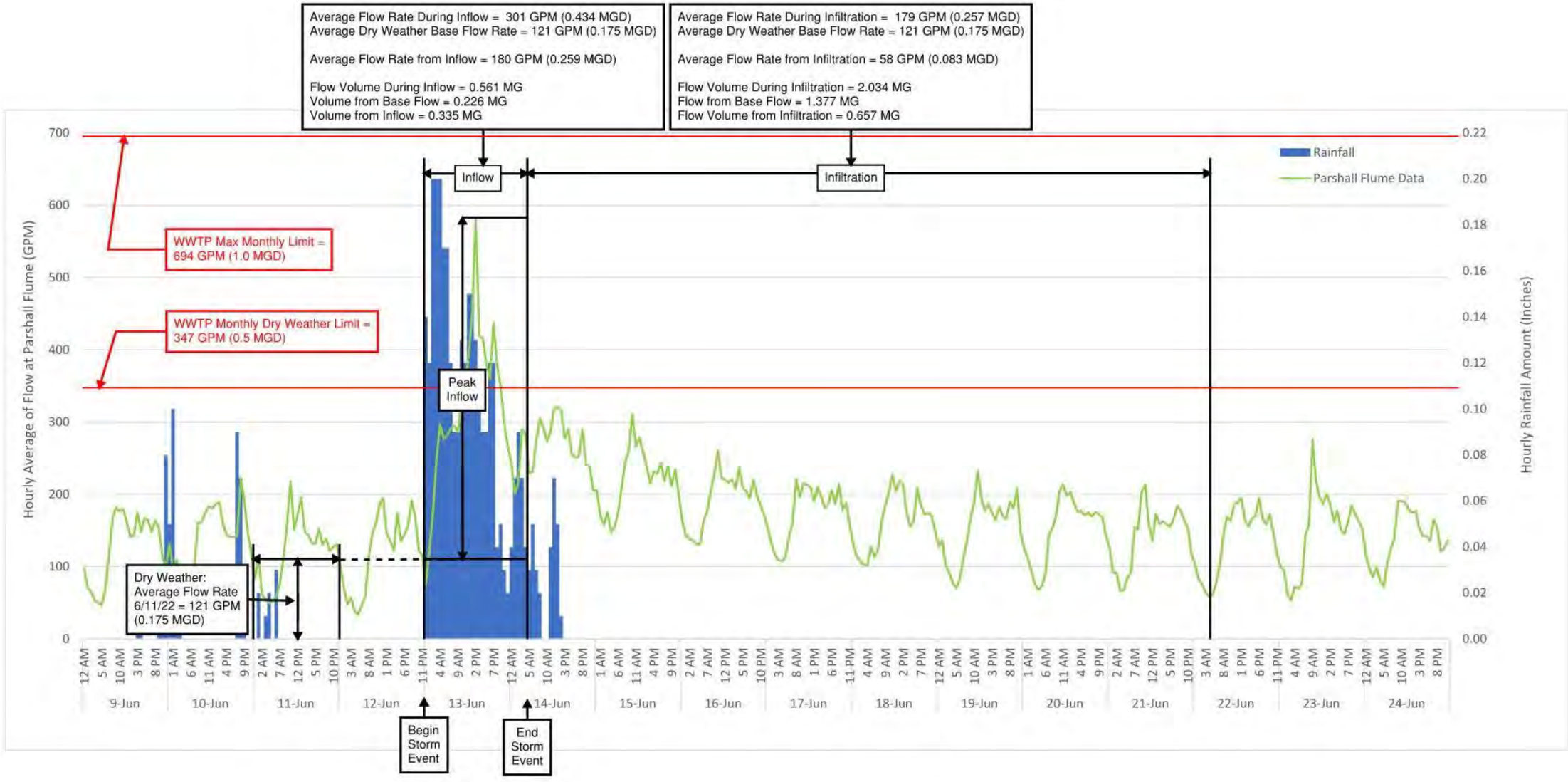
[10] EPA Infiltration/Inflow Analysis and Project Certification, US EPA, May 1985, Ecology Publication No. 97-03

Figure 5-2: Influent Flow Seasonal Variation



To provide a quantitative estimate of the effects of I/I recorded at the Parshall Flume, a large storm event was analyzed. The event occurred on June 13, 2022 and Newport experienced a daily rainfall amount of approximately 2.8 inches. **Figure 5-3** provides an annotated illustration of the response seen at the Parshall Flume to the rain event. It should be noted that this storm event is larger than the planning criteria design storm for Newport.

Figure 5-3: Inflow and Infiltration Observed June 2022



5.3 Field Assessment

Influent flows at the wastewater treatment plant (WWTP) increase significantly due to I/I and, observations from City staff have indicated numerous areas of the collection system that need improvements to reduce known sources of I/I.

J-U-B ENGINEERS, Inc (J-U-B) and Newport staff performed a visual inspection of the collection system, on March 3, 2022, to locate readily identifiable sources of I/I. This date corresponds to a rain on snow event and several partially submerged manhole lids were observed. Segments of the collection system were CCTV inspected as part of this GSP, but much of the budget for inspection was instead dedicated to cleaning gravel and debris from the trunk on Union Avenue. An account of the observed lids is provided in **Figure 5-4**.

Figure 5-4: Manhole cover submerged during storm event (various locations)

There are several other locations where manhole lids are present with multiple holes drilled into them. These locations are provided in **Figure 5-5**. It is assumed these holes were added to the lids to assist with the drainage of stormwater.

Figure 5-5: Manhole covers with additional holes drilled in the lid (various locations).

There are known groundwater and surface water interactions in Newport that occur during the wet season. These occurrences typically manifest themselves as surface water springs that infiltrate back into the ground and flood basements. One such area is the vicinity of Spruce and Willow Streets. Previous Newport administrations allowed basement sump pumps to be connected to the collection system and known locations of these connections have been observed as a significant source of I/I. An example of such a spring source is illustrated in **Figure 5-6**.

Figure 5-6: Example of clear flow piped into the sewer collection system.

A complete report summarizing findings during the field assessment can be found in **Appendix G**. Specific locations where there appears to be a significant source of I/I are described in the following sections.

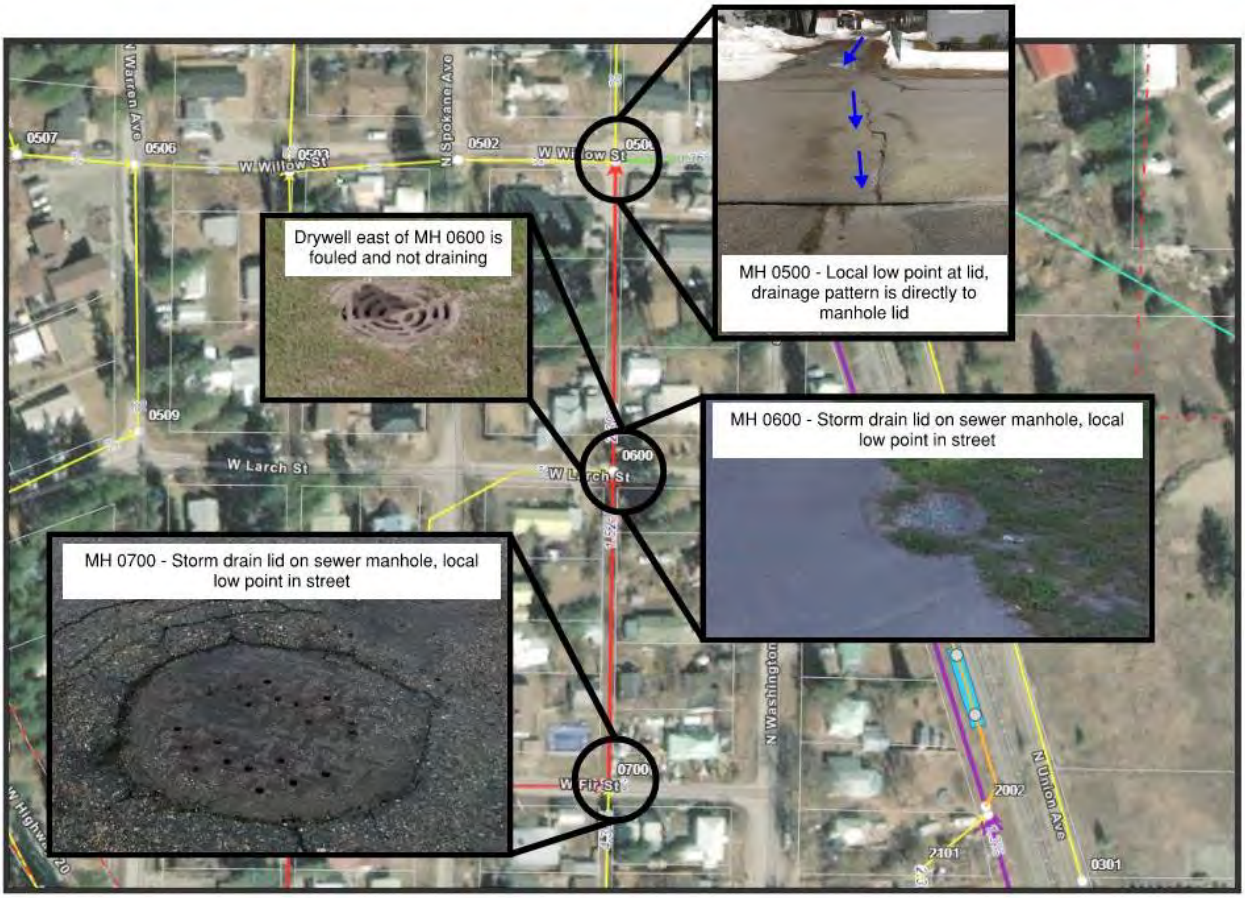
5.4 Identified Sources of Inflow and Infiltration

This section outlines suspected major sources of I/I identified during field investigations conducted as part of the GSP. The sources listed below are specific, but due to the nature of I/I mitigation efforts, cost estimates are kept general in the CIP. This provides Newport flexibility to mitigate higher priority sources of I/I as they are discovered. The figures below illustrate locations that are good candidates for prioritizing the use of I/I mitigation funds.

5.4.1 Alleyway Between North Washington Avenue and North Spokane Avenue

As shown in **Figure 5-7**, the alleyway between North Washington Avenue and North Spokane Avenue from West Willow Street to the north to West Fir Street to the south has manhole lids situated in localized low points. Drainage from the alleyway and adjacent parcels meander towards sewer manholes and drains directly into the sewer system. Poor roadway grading and a fouled drywell are the cause of this drainage pattern.

Figure 5-7: Alleyway Between N. Washington Avenue and N. Spokane Avenue



5.4.2 South Fea Avenue

As shown in **Figure 5-8,** South Fea Avenue from the alleyway south of 4th Street to the alleyway north of 5th Street has manhole lids situated in localized low points. Drainage from the alleyways and adjacent parcels meanders towards sewer manholes and drains directly into the sewer system. Poor roadway grading is responsible for the deficiency.

Figure 5-8: South Fea Avenue

5.4.3 Cleanout on West Spruce Street

As shown in **Figure 5-9**, a manhole located at the intersection of West Spruce Street and an alleyway between North Calispel Avenue and North Fea Avenue was observed as having a roughly equal amount of flow coming from the larger sewer basin along West 1st Street and coming from the single cleanout on the west end of West Spruce St. The cleanout is connected to a storm drain system.

Figure 5-9: Cleanout on West Spruce Street

5.4.4 West Larch Street and West Walnut Street

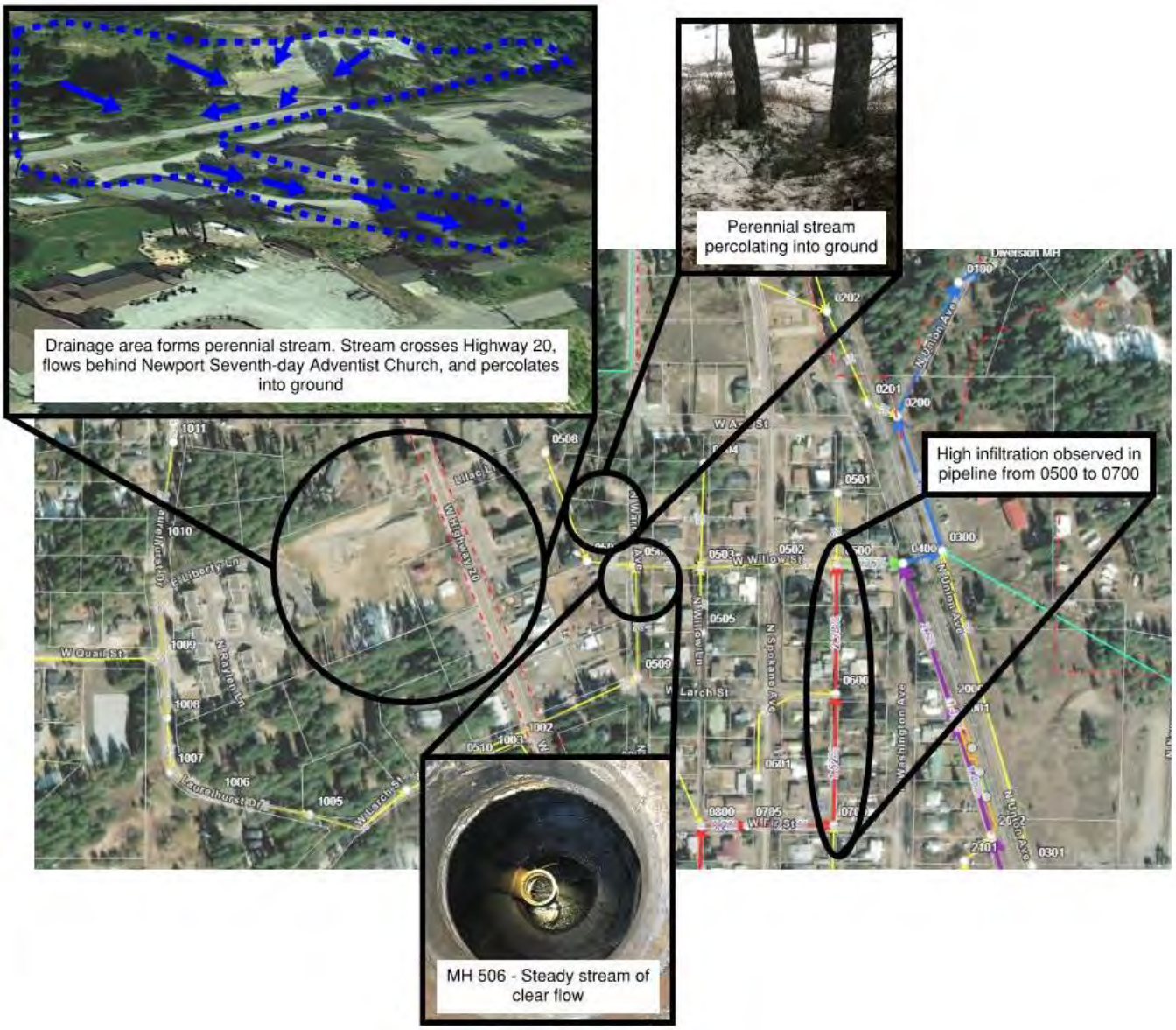
As shown in **Figure 5-10**, a manhole at the intersection of West Walnut Street and West Larch Street receives runoff from the uphill West Walnut Street. Poor roadway grading is responsible for the deficiency. An existing drywell on West Walnut Street may receive the flow, but the drainage pattern leads to the sewer manhole rather than the drywell.

Figure 5-10: West Larch Street and West Walnut Street

5.4.5 North Warren Avenue and West Willow Street

As shown in **Figure 5-11**, a significant stream dissipates on a lot on the west side of North Warren Avenue during the wet winter to spring period of the year. Based on comments by the homeowner at the end of the stream, the previous public works staff directed this homeowner to connect a basement drain transporting the infiltrated stream water to the sewer system.

Figure 5-11: North Warren Avenue and West Willow Street



5.4.6 South Cass Avenue, North of West 5th Street

The manhole shown in **Figure 5-12** is situated adjacent to a low spot in South Cass Avenue. As stormwater ponds on the roadside, it drains into the sewer system through the manhole lid.

Figure 5-12: South Cass Avenue, North of West 5th Street

5.4.7 Alley Between South Scott Avenue and South Cass Avenue

As shown in **Figure 5-13** a manhole on West 3rd Street has a storm drain lid installed and is situated in a low point of the alleyway.

Figure 5-13: Alley Between South Scott Avenue and South Cass Avenue

5.5 Summary of Identified Sources

These major deficiencies that were discovered during field assessment of the collection system as part of this report are summarized in **Table 5-2** with an estimated I/I flow rate during storm events.

Table 5-2: Summary of Key Deficiencies

Deficiency Location	Estimated I/I Peak Flow (GPM)
Alleyway Between Washington Ave and N Spokane Ave (**Figure 5-7**)	30 to 60
S Fea Ave (**Figure 5-8**)	20 to 40
Cleanout on W Spruce St (**Figure 5-9**)	25
W Larch St and W Walnut St (**Figure 5-10**)	10 to 20
N Warren Ave and W Willow St (**Figure 5-11**)	20
S Cass Ave, North of W 5th Street (**Figure 5-12**)	2
Alley between S Scott Ave and S Cass Ave (**Figure 5-13**)	3
TOTAL	110 to 180

5.6 I/I Mitigation Plan

It should be noted that locating and rectifying sources of I/I can be difficult to quantify and the best decisions about how to reduce I/I into the sewer system are often made in the field by operators. The above-mentioned figures identify specific deficiencies that Newport may immediately begin remedying. In addition, it is recommended that Newport further pursue I/I investigation and mitigation efforts through the 20-year planning period. To summarize the I/I mitigation steps, a flow chart is included in **Figure 5-15**.

Mitigating the sources of I/I presented above may result in an inflow reduction of upwards of 110 to 180 gallons per minute during peak flow events. Infiltration is more difficult to locate and quantify through field observations from the surface. A conservative reduction in infiltration of 15% could be achieved through modest rehabilitation/replacement efforts of existing pipes. The effects of these I/I reductions are overlaid with the actual flow data observed during the large rain event in June 2022 in **Figure 5-14**.

Figure 5-14: Inflow and Infiltration Event in 2022 with Hypothetical Reduced Flow

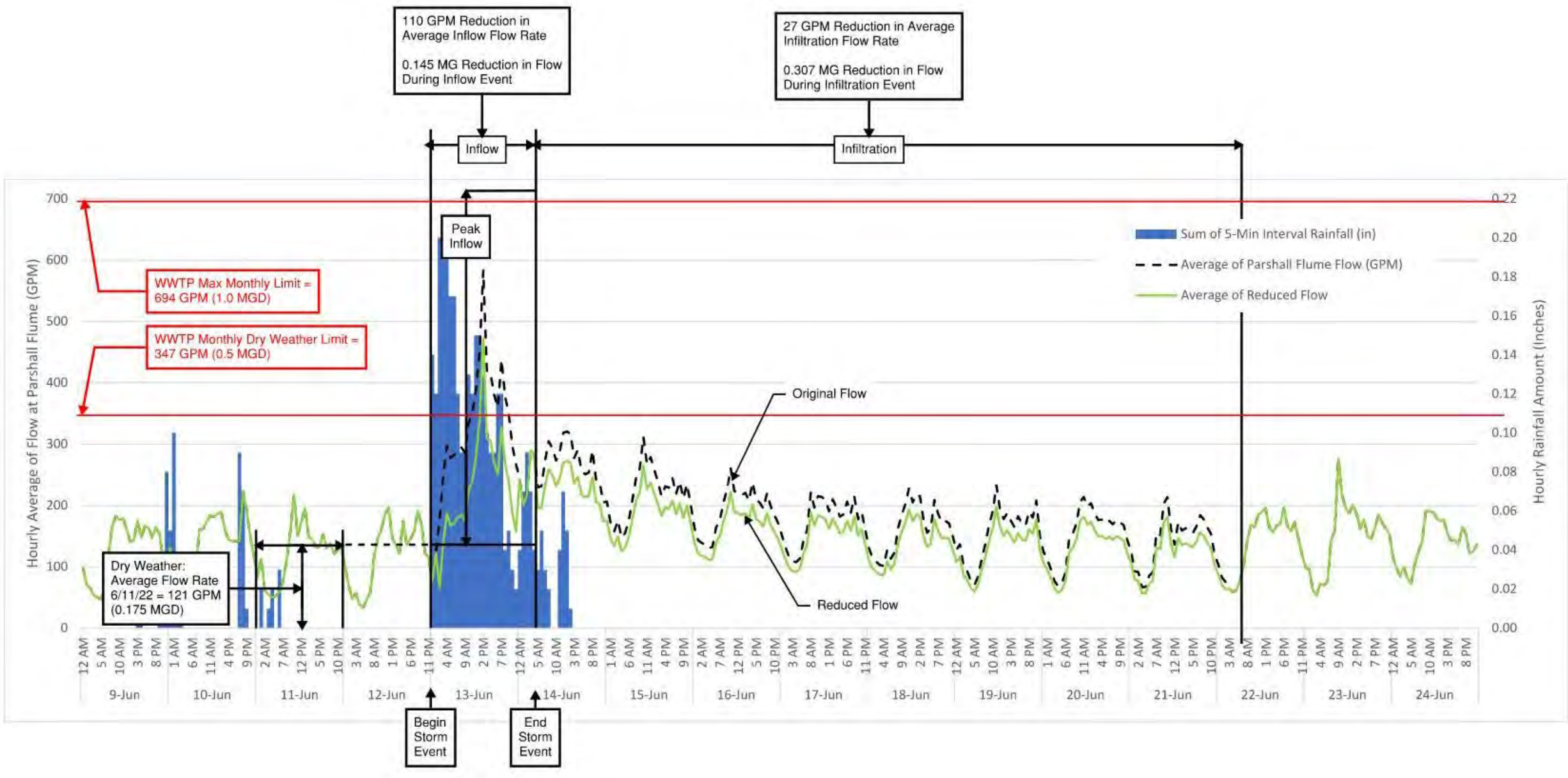
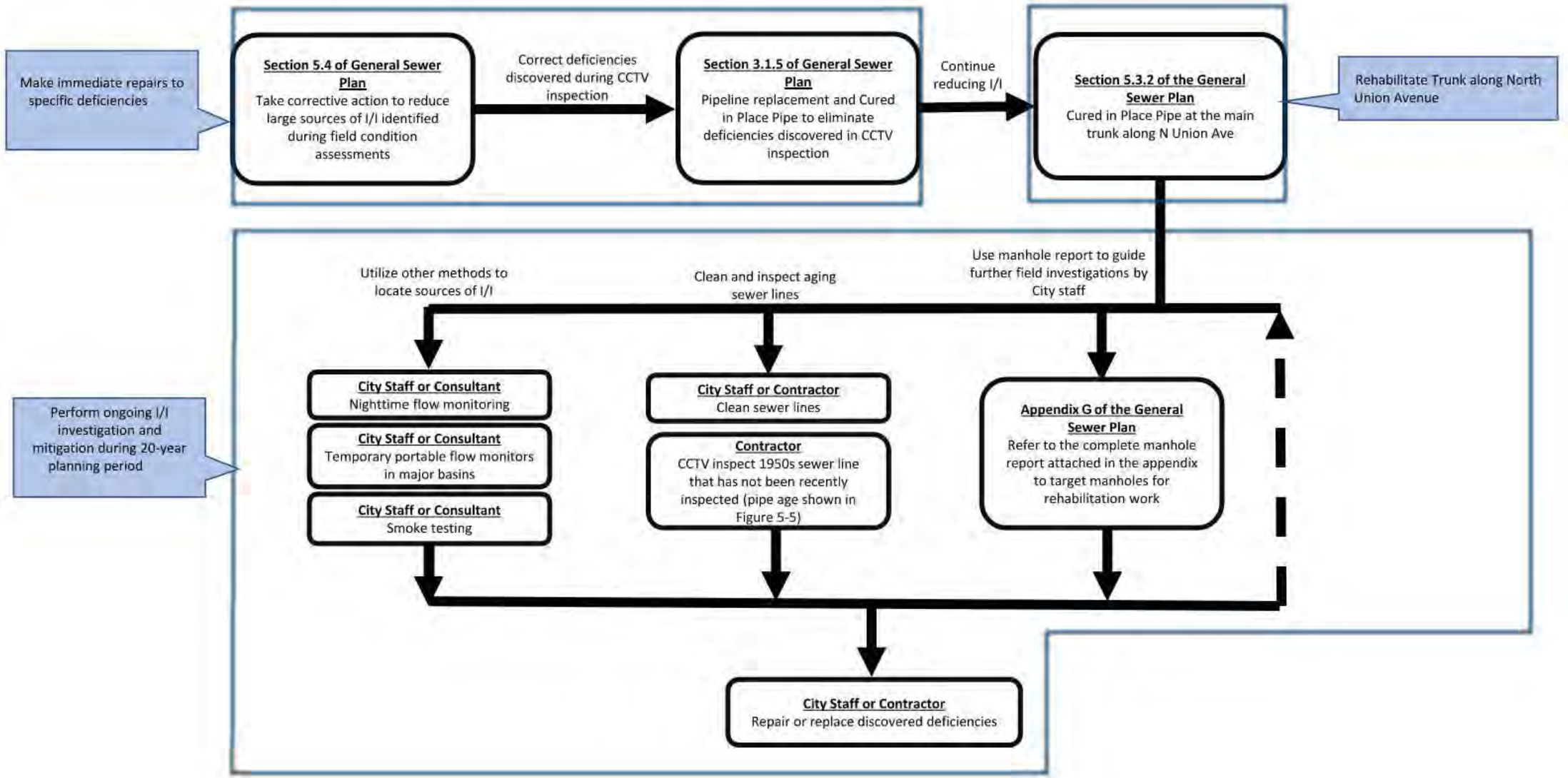


Figure 5-15: I/I Mitigation Flow Chart



Many repair assumptions are necessary to create a cost estimate and incorporate these repairs into the CIP. Assumptions serve as a starting point for Newport's plan to implement I/I mitigation. I/I mitigation efforts will evolve over the course of the 20-year planning period. Estimated I/I mitigation projects are described below:

- Replace Manhole Lids
    - Replace any manhole lids having more 'pick holes' than necessary. For Capital Improvement Plan budgeting purposes, it is assumed Newport will replace 100 manhole lids
- Replace Brick Manholes
    - Replace brick manholes with precast concrete manholes featuring proper gaskets and lids. For CIP budgeting purposes, it is assumed Newport will replace 30 brick manholes.
- Address Stormwater at Low Areas (Fea, Cass, Alley, Spruce, N Spokane)
    - Replace approximately 1800 feet of sewer pipe with cracks and leaky joined and replace associated manholes. Raise manhole lids that are in local low spots and regrade the road surface.
- Willow Ave Storm Drain Conveyance
    - Large amount of runoff from Highway 20 form a perennial stream. The stream dissipates near the west end of W Willow Street. Convey stream away from sewer main for disposal via infiltration. This project will construct approximately 300 feet of new stormwater pipe to a new infiltration facility and replace approximately 400 feet of sewer pipe.
- Shared Side Sewer Elimination (Fir/Larch Blocks)
    - Shared side sewers constructed of problematic Orangeburg pipe require replacement in the blocks between Warren Avenue and Spokane Avenue and Fir Street and Larch Street. This involves the construction of approximately 1000 feet of new sewer main with associated manholes and the replacement of approximately 960 feet of sewer lateral pipe.
- Replace from MH 0700 to 0400
    - Pipe from MH 0700 to 0400 is in a depression in the City's topography, and poor pipe condition allows inflow and infiltration into the system. This project involves the replacement of approximately 900 feet of sewer main and associated manholes and is recommended for completion in conjunction with Shared Side Sewer Elimination (**Section 4.6.3**) for cost savings.
- Storm Pump Station (Spruce/Calispel)
    - To address the deficiency previously identified in **Figure 5-9**, it is anticipated construction of a storm pump station will be necessary. The pump station is anticipated to discharge to a perennial stream that drains to an existing pond on a nearby parcel owned by the United States Forest Service and percolates into the ground. Alternately, this flow could be pumped to the area of the RV Park and rodeo grounds and infiltrated.
- Full System Cleaning and Additional I/I Identification Efforts (such as smoke testing, video inspections and flow monitoring)

    - This additional I/I identification effort will focus on identifying any roof drains connected to the sanitary sewer and additional pipe sections and manholes requiring replacement or rehabilitation.
- I/I Reduction Projects Identified During Additional Investigations
    - These improvements would target the areas prioritized through the additional I/I investigations.
- Cured in Place Pipe Sewer Main, MH 3100 to 2200
    - Sections of pipe that are allowing I/I into the system, but do not have structural defects, and appear to be in reasonable condition at connections to manholes are good candidates for Cured in Place Pipe repair technology. For CIP budgeting purposes, it is assumed Newport will rehabilitate from manhole 3100 to 2200 (2,600 lineal feet).
- Sewer Main Replacement, Various Locations
    - As Newport staff performs ongoing I/I investigations, funds will be needed to address miscellaneous deficiencies that are discovered.
- Spot Repair, Various Locations
    - As Newport staff performs ongoing I/I investigations, funds will be needed to address miscellaneous deficiencies that are discovered.

Each of these items listed above can be found in the CIP.

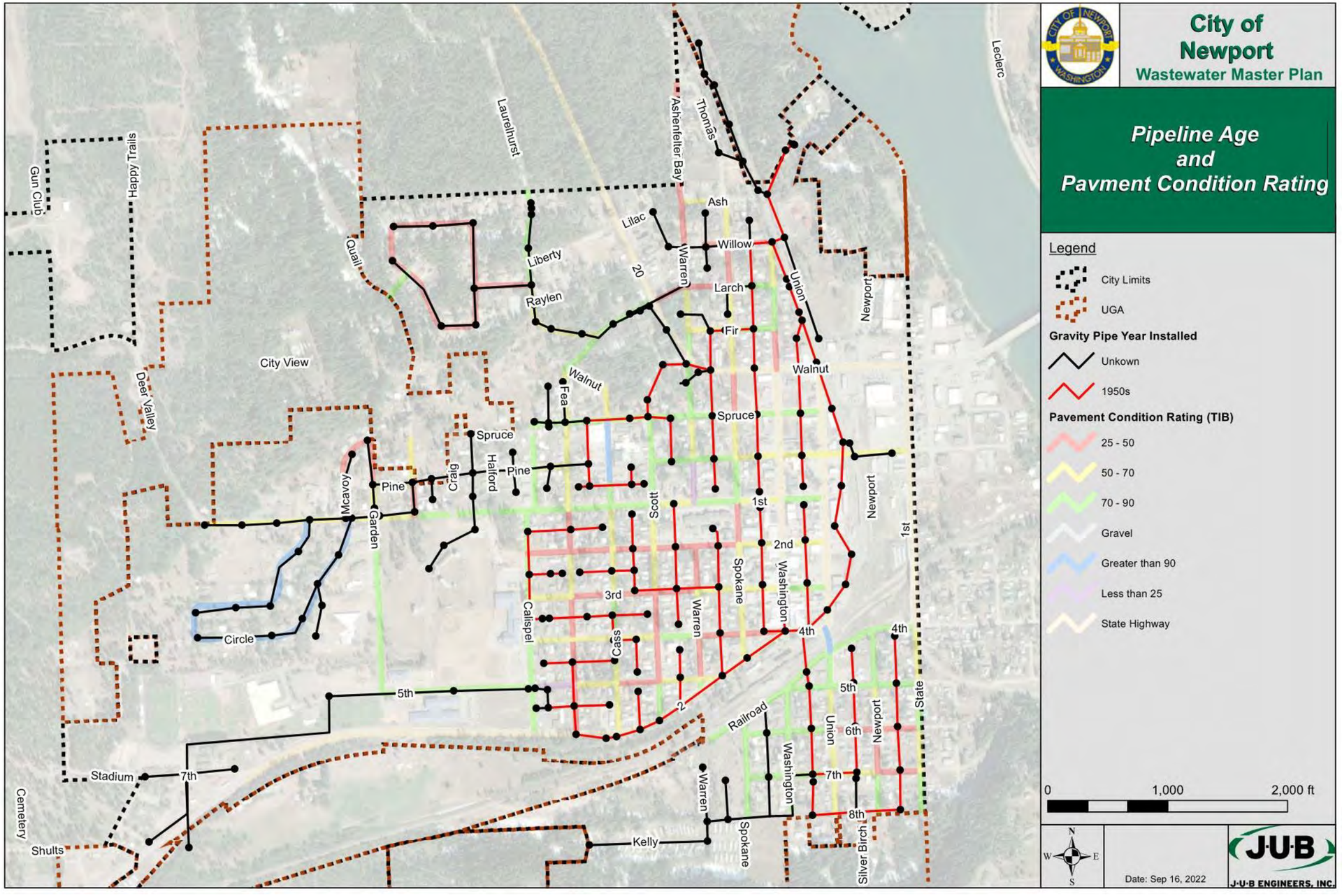
5.6.1 I/I From Interconnection with Oldtown

Newport and the West Bonner Water and Sewer District are currently drafting a new agreement for the terms of use of Newport's sewer system by Oldtown. It is recommended that Newport include a provision limiting the peaking factor that may be present in Oldtown flows to better control potential I/I from the Oldtown system. The current Annual Average Daily Flow in Newport is calculated to be 0.20 MGD. The Peak Day Flow in Newport is calculated to be 0.40 MGD. This results in a peaking of 2.0 between the Annual Average Daily Flow and the Peak Day Flow. It is recommended that the agreement limit Oldtown to a peaking factor (Annual Average Daily Flow to Peak Day Flow) of less than 2.0.

5.6.2 Opportunity for Cost Savings

Newport should consider other projects that make sense to perform in conjunction with sewer work when determining the timeline for replacing or rehabilitating portions of the sewer collection. Combining sewer projects with roadwork may reduce costs as the road surface is already torn up. **Figure 5-16** overlays the known pipe ages with the Transportation Improvement Board's pavement condition rating for Newport and is provided for Newport's reference during planning efforts.

Figure 5-16: Estimated Pipe Age and Pavement Condition Rating



5.6.3 Ongoing CCTV Inspection and Smoke Testing

Appendix D containing a keyed map of the collection system and table of attribute information shows the year of installation and year of last CCTV inspection for gravity pipes in the collection system. Approximately 3,600 lineal feet of gravity pipe were CCTV inspected during preparation of this Sewer Plan. It is recommended that the City continue CCTV inspecting the collection system to collect condition data on all pipelines 8-inches or larger. The City should prioritize older pipes found in the central downtown area, known problem areas, and pipelines in the vicinity of water system facilities. Refer to **Section 7.1.1** for discussion of water supply sources in the vicinity of sanitary sewer facilities.

The following schedule presented in **Table 5-3** is recommended to complete an initial CCTV inspection of the entire collection system on a 6-year cycle. In addition to CCTV inspection work, the entire collection system should be smoke tested as funds allow.

Table 5-3: CCTV Inspection Schedule

Year	CCTV Inspection	Cost ($2.5/LF, 6% Annual Inflation)
2022	3,600 LF, inspected during GSP	------
2023	12,000 1950s	$31,800
2024	12,000 1950s	$33,600
2025	12,000 1950s	$35,400
2026	12,000 Newer	$37,200
2027	12,000 Newer	$39,000

CHAPTER 6 – INDUSTRIAL WASTEWATER

This chapter lists establishments producing industrial wastewater, the quantity of wastewater and periods of production, and the character of the industrial wastewater insofar as it may affect the sewer system or treatment plant in conformance with WAC 173-240-050 § (3)-(i). Considerations for future industrial expansion are given.

6.1 Current Industrial Discharges

There are no current industrial discharges into the Newport and Oldtown sewer collection system. Only commercial and residential customers are on file.

6.2 Future Industrial Expansion

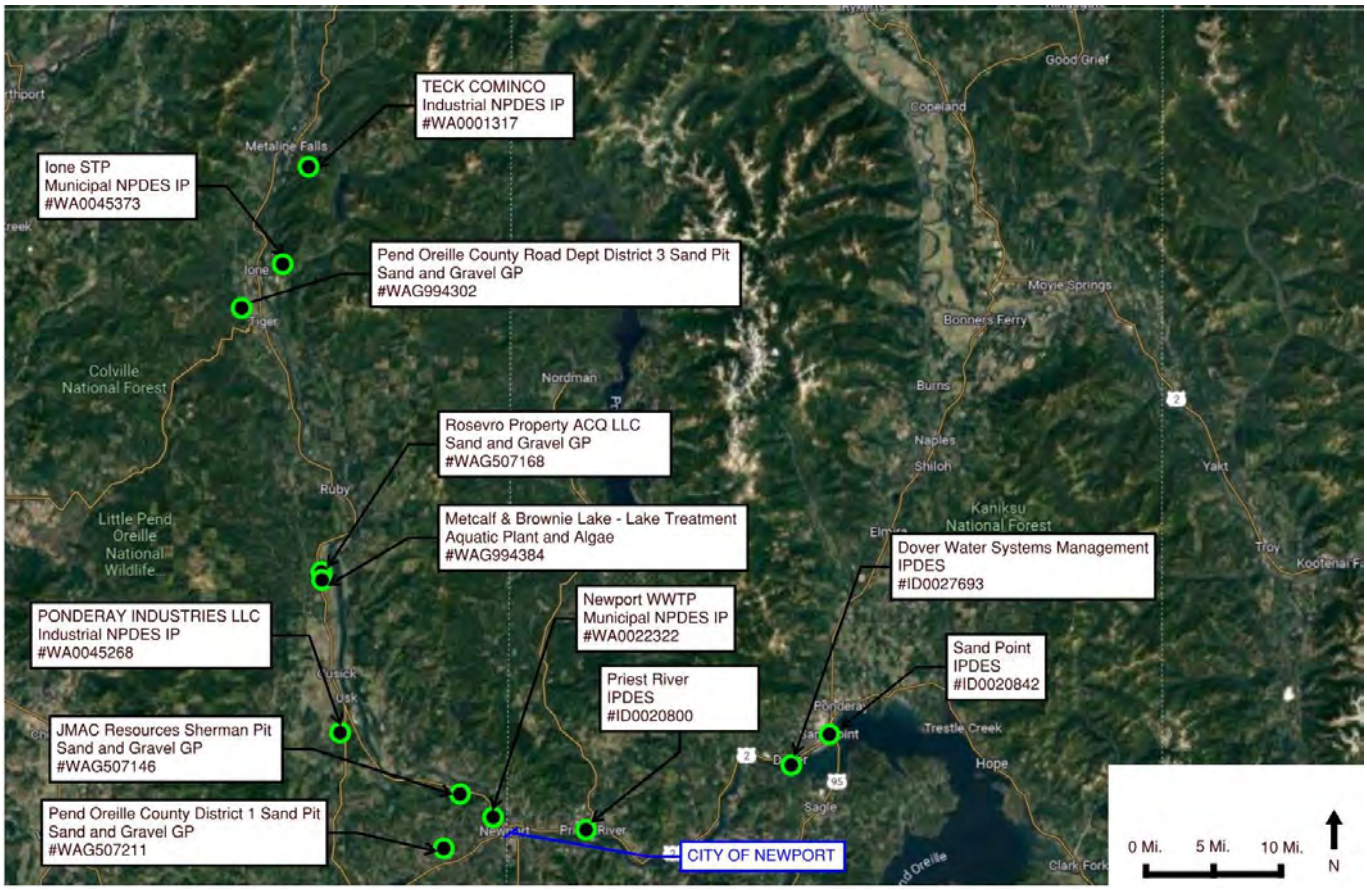
Newport does not expect any heavy industrial dischargers to locate in Newport or Oldtown. Should a heavy industrial discharger want to locate in Newport, their wastewater flows impact on the collection system and WWTF will need to be evaluated at that time.

Light industrial or light manufacturing facilities may locate in Newport without impacting wastewater collection or treatment facilities; however, their discharge will have to be evaluated at that time. Any new industrial development will be required to meet pre-treatment requirements as established via the Clean Water Act to protect Newport from potential upsets.

6.3 Adjacent Discharges

The Idaho Department of Environmental Quality Issued Permits and Water Quality Certifications data base and the Washington Department of Ecology Water Quality Permitting and Reporting Information System (PARIS) were searched for upstream and downstream discharges to the Pend Oreille River. The results are illustrated in

Figure 6-1: Newport Water Supply Sources



CHAPTER 7 – WATER SUPPLY SOURCES

This chapter discusses the location of all existing private and public wells, or other sources of water supply, and distribution structures as they are related to both existing and proposed domestic wastewater treatment facilities in conformance with WAC 173-240-050 § (3)-(j).

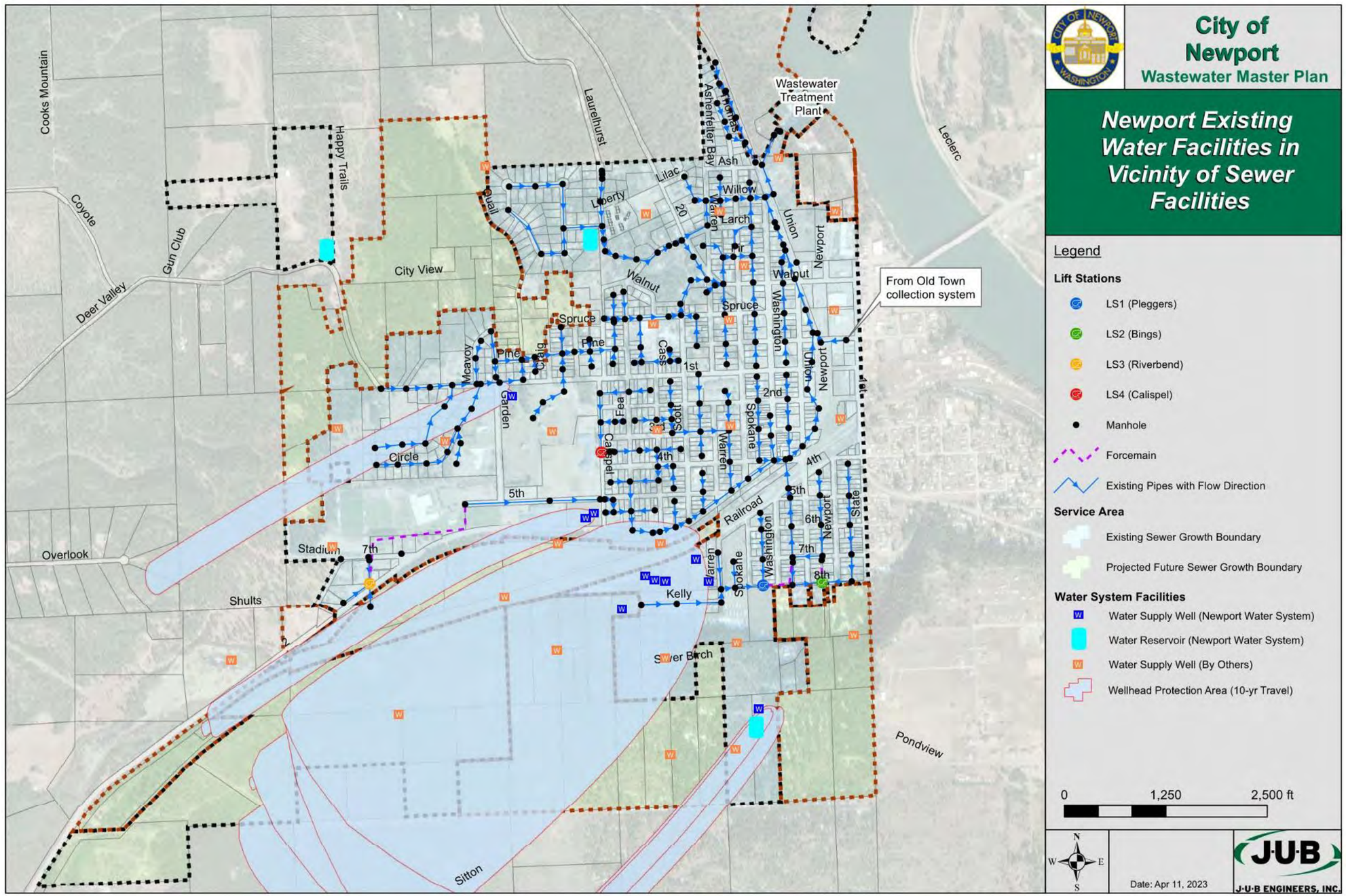
7.1 Newport Water System

Newport operates its own water system (Water System ID# 59350D). The latest Water System Plan is from 2015, revised in 2016, by Welch-Comer and Associates, Inc.

7.1.1 Groundwater Wells

Groundwater wells provide Newport's water supply. Newport's wastewater facilities do not impact the water supply since the wastewater is discharged to the Pend Oreille River. Oldtown is also served by ground water wells. Newport's wastewater facilities do not impact Oldtown's water supply since the wastewater is discharged to the Pend Oreille River. Known groundwater wells retrieved from WSDOE Washington State Well Report Viewer are illustrated in **Figure 7-1.**

Figure 7-1: Newport Water Supply Sources



CHAPTER 8 – FINANCIAL ANALYSIS

8.1 Overview

Newport has a sewer fund for sewer collection and wastewater facility plant expenses. Budgets, rates, and non-revenue sewer project financing methods are described herein.

8.2 Operating Budget

The operating budget for the sewer system is summarized in **Table 8-1** for 2016 to 2021. Salaries and benefits cover expense for multiple staff who maintain and operate the wastewater treatment facility. There have been significant capital outlay expenses in 2018, 2019, and 2020 to replace critical pumps at the wastewater treatment plant and at the collection system lift stations in order to continue provide sewerage service to the community.

Table 8-1: Sewer Operating Budget (2016-2021)

CATEGORY	2016	2017	2018	2019	2020	2021
SALARIES AND BENEFITS	$373,412.30	$376,160.52	$354,379.46	$379,197.73	$353,500.19	$341,453.98
OFFICE & OPERATING SUPPLIES	$27,182.06	$34,747.37	$32,150.89	$25,498.23	$19,668.21	$40,387.98
FUEL CONSUMED	$3,024.24	$4,676.81	$5,231.23	$1,817.82	$1,482.78	$3,721.30
PROF. SERVICES - LEGAL FEES	$7,920.00	$8,100.00	$8,100.00	$8,100.00	$8,100.00	$8,100.00
PROF. SERVICES - AUDIT FEES	$3,635.90	$0.00	$4,041.75	$1,678.78	$4,094.23	$0.00
PROF. SERVICES - SLUDGE HAULING	$24,083.45	$28,816.17	$22,076.73	$25,906.74	$22,003.74	$23,493.71
PROFESSIONAL SERVICES	$1,553.57	$2,250.08	$13,314.26	$21,558.94	$1,895.91	$7,835.85
COMMUNICATIONS	$6,839.11	$7,287.85	$7,976.52	$7,513.70	$8,741.35	$9,046.22
TRAVEL	$692.99	$913.07	$855.80	$935.16	$106.09	$747.61
ADVERTISING	$0.00	$504.76	$87.72	$58.43	$57.33	$1,415.43
LIABILITY INSURANCE	$15,817.12	$18,413.25	$14,510.72	$16,501.43	$55,141.39	$45,399.95
PUBLIC UTILITIES	$46,773.23	$49,839.96	$46,402.54	$42,074.65	$36,529.76	$41,904.06
PUBLIC UTILITIES - WATER	$2,750.08	$2,730.89	$2,800.18	$5,692.59	$3,546.29	$5,113.36
REPAIR & MAINTENANCE	$39,546.72	$42,490.54	$33,274.23	$77,175.77	$53,579.30	$50,289.62
MISCELLANEOUS EXPENDITURES	$2,034.33	$3,373.13	$2,152.37	$1,639.58	$1,148.34	$3,065.53
MAINT. AGREEMENT - COMPUTER	$2,307.79	$2,516.97	$3,330.00	$4,161.45	$4,770.71	$3,716.10
MAINT. AGREEMENT - COPY MACH.	$375.84	$423.08	$572.09	$534.48	$613.01	$777.95
DOE PERMIT	$4,285.19	$2,781.68	$5,088.08	$3,688.98	$2,388.96	$4,012.42
UTILITY B&O TAX	$10,735.63	$12,277.31	$11,393.18	$12,409.49	$11,153.26	$14,833.21
CAPITAL OUTLAY	$0.00	$0.00	$120,479.52	$100,692.13	$242,235.53	$7,361.19
DOE SEWER MASTER PLAN	N/A	N/A	N/A	N/A	N/A	$92,159.60
TOTAL	$572,969.55	$598,303.44	$688,217.27	$736,836.08	$830,756.38	$704,835.07

8.2.1 Debt Service

Newport has bonds, vehicle leases, and buyout/liabilities listed on their Schedule 9 form. The three bonds shown in **Table 8-2** are related to water and sewer improvements, including 2004 improvements to the wastewater treatment plant. One vehicle lease is shown in **Table 8-3**. Employee buyout and pension liabilities are shown in **Table 8-4**.

Table 8-2: Schedule 9 Bond Summary (as of 2020)

Bond Description	Issue Date	Maturity/ Payment Due Date	Annual Payment	Ending Balance as of 12/31/2020
2013 Spruce Street W/S Rev	12/27/2013	12/27/2053	$3,438	$185,779
2004 WWTP Upgrade Rev	12/15/2004	12/15/2044	$30,868	$1,342,333
2019 South Bench W/S Rev	12/27/2019	12/26/2059	$58,764	$3,116,236

Table 8-3: Schedule 9 Lease Summary (as of 2020)

Lease Description	Issue Date	Maturity/ Payment Due Date	Annual Payment	Ending Balance as of 12/31/2020
2020 JD Backhoe & Loader	10/7/2022	11/7/2026	$60,991	$273,353

Table 8-4: Schedule 9 Buyout/Liability Summary (as of 2020)

Buyout and Pension Description	Ending Balance as of 12/31/2020
CE Employee Buyout	$54,964
Street Employee Buyout	$19,620
Water Employee Buyout	$23,526
Sewer Employee Buyout	$25,828
Net Pension Liability	$251,949
OPEB Liability	$575,656

8.3 Sewer Rates

There are approximately 869 service accounts for residential and commercial connections in the Newport sewer collection system. There are some service accounts with multiple connections. A summary of the sewer connections by account type are summarized in **Table 8-5**.

Table 8-5: Newport Sewer Account Summary

Sewer Account Type, Water Meter Size	# of Sewer Connections
Commercial, 3/4"	110
Commercial, 1"	26
Outside Commercial, 1"	1
Commercial, 1-1/2"	5
Commercial, 2"	36
Outside Commercial, 2"	1
Commercial, 3"	2
Commercial, 4"	2
Residential, 3/4"	682
Outside Residential, 3/4"	3
Residential, 1"	1

Sewer user rates inside and outside city limits are established in Chapter 13.20 of the City of Newport Municipal Code[11]. Each connection to the sewer collection system is subject to a monthly rate set forth by the City's fee schedule. Monthly rates are calculated upon the water meter size servicing the property and on one equivalent residential unit (ERU), which is the equivalent of 10,000 gallons usage per month. Rates within City limits are summarized in **Table 8-6**. Rates outside City limits are summarized in **Table 8-7**. Late fees and interest for past due accounts are summarized in the City's fee structure. Monthly overage rates for sewer are based on water meter readings between October 15th and May 14th, outlined in **Table 8-8**.

[11] Newport Municipal Code, Chapter 13.20 https://www.codepublishing.com/WA/Newport/

Table 8-6: Water and Sewer Rates, Effective January 15, 2022

Meter Size	Water	Sewer	Water Tax (18%)	Sewer Tax (16%)	Bill Total	Allowed Usage
Residential ¾"	$45.51	$59.96	$8.19	$9.59	$123.25	10,000 gallons
Commercial ¾"	$45.51	$59.96	$8.19	$9.59	$123.25	10,000 gallons
Commercial 1″	$59.16	$77.95	$10.65	$12.47	$160.23	13,000 gallons
Commercial 1 ½"	$90.02	$119.92	$16.38	$19.19	$246.51	20,000 gallons
Commercial 2″	$122.88	$161.89	$22.12	$25.90	$332.79	27,000 gallons
Commercial 3″	$182.04	$239.84	$32.77	$38.37	$493.02	40,000 gallons
Commercial 4″	$241.20	$317.79	$43.42	$50.85	$653.26	53,000 gallons
Commercial 6″	$364.08	$479.68	$65.53	$76.75	$986.04	80,000 gallons

Table 8-7: Outside Water and Sewer Rates, Effective January 15, 2022

Meter Size	Water	Sewer	Water Tax (18%)	Sewer Tax (16%)	Bill Total	Allowed Usage
Residential ¾"	$56.89	$74.95	$10.24	$11.99	$154.07	10,000 gallons
Commercial ¾"	$56.89	$74.95	$10.24	$11.99	$154.07	10,000 gallons
Commercial 1″	$73.95	$97.44	$13.31	$15.59	$200.29	13,000 gallons
Commercial 1 ½"	$113.78	$149.90	$20.48	$23.98	$308.14	20,000 gallons
Commercial 2″	$153.60	$202.36	$27.65	$32.38	$415.99	27,000 gallons
Commercial 3″	$227.55	$299.80	$40.96	$47.97	$616.28	40,000 gallons
Commercial 4″	$301.50	$397.24	$54.27	$63.56	$816.57	53,000 gallons
Commercial 6″	$455.10	$599.60	$81.92	$95.94	$1,232.56	80,000 gallons

Table 8-8: Water and Sewer Overage Calculations, as of January 15, 2022

Utility	Tier with Description	Rate Inside City	Rate Outside City
Water	Tier 1: Base water rate per 1000 gallons + 50% for 30,000 gallons after allowed gallons	$8.06	$10.07
	Tier 2: Base water rate per 1000 gallons + 150% for next 50,000 gallons after Tier 1	$13.43	$16.78
	Tier 3: Base water rate per 1000 gallons + 250% for additional after 50,000 allowed in Tier 2	$18.80	$23.49
Sewer	Tier 1: Base sewer rate per 1000 gallons + 50% for 30,000 gallons after allowed gallons	$10.43	$13.04
	Tier 2: Base sewer rate per 1000 gallons + 150% for additional after 30,000 allowed in Tier 1	$17.38	$21.73

Connection fees must be paid at the time of connection and does not include the actual costs for meters, material, labor and administration which will be added to the connection fees. The meter must be paid for before the meter is installed. The

connection fee rates for Newport are summarized in **Table 8-9**. Sewer connections are expected to be permanent and are subject to approval of the sewer superintendent. Connections are expected to be completed prior to completion of the building or occupancy of the structure.

Table 8-9: Connection Fees for Newport, Effective January 15, 2022

Water Meter Size	Water	Sewer
Residential ¾"	$3,000	$5,000
Commercial ¾"	$3,000	$5,000
Commercial 1″	$4,000	$7,000
Commercial 1 ½"	$6,000	$10,000
Commercial 2″	$8,000	$13,000
Commercial 3″	$12,000	$20,000
Commercial 4″	$16,000	$27,000
Commercial 6″	$24,000	$40,000

8.3.1 Sewer Fees from West Bonner Water and Sewer District

Since Newport receives flow from WBWSD, operation and maintenance costs for the wastewater treatment facility are shared proportionately to flows received from WBWSD. The costs of debt service for improvements at the wastewater treatment plant are also shared with WBWSD. These costs are calculated based on the proportion of flows from WBWSD. **Table 8-10** summarizes the historical share for operation and maintenance costs from 2015 to 2021. These annual dues are typically invoiced monthly.

Table 8-10: Historical O&M Costs Shared with WBWSD

Year	Actual Sewer Costs	Actual Plant Costs	WBWSD Share %	WBSD Annual Share $
2015	$514,161.22	$351,339.37	18%	$63,241.09
2016	$572,969.55	$425,576.83	17%	$72,348.06
2017	$598,303.44	$450,315.58	17%	$76,553.65
2018	$688,217.27	$523,882.19	15%	$78,582.33
2019	$736,836.08	$564,856.39	17%	$96,025.59
2020	$830,756.38	$637,380.07	15%	$95,607.01
2021	$704,835.07	$505,304.25	16%	$80,848.68

8.4 Non-Revenue Sewer Project Financing Methods

Non-revenue funding is available for capital improvements projects when sewer rates cannot cover these expenses, described in the following sections.

8.4.1 Water Quality Combined Funding Program

The WSDOE offers funding through the Water Quality Combined Funding Program (WQC) for projects that improve and protect water quality. The program combines state and federal funding sources to provide grants and loans to these projects, including a septic tank elimination program. The maximum grant ceiling varies from year to year, reaching as high as $5,000,000 to $7,000,000 in recent years. Loan interest rates are typically less than 2% and depend on financial hardship and year term for loans. WSDOE WQC funding applications are normally due each year in October, with funds available the following fall after final offers are circulated. It is recommended that project scheduling for this funding source start early for sequencing design and construction with funding availability.

According to recent guidance documents, Newport would qualify for hardship funding since their sewer rates exceed the low- to moderate-income thresholds set by WQC funding (threshold at $56.18 per month per rate payer).

8.4.2 Public Works Trust Fund (PWTF) Loan

This program was established by state legislature in 1985 to provide a long-term source of funds for local governments for the repair and reconstruction of public works facilities. This program, which is administered by the Department of Community, Trade and Economic Development (CTED), provides loans for low interest rates, depending on loan length and the level of local financing participation. Minimum local participation is required of the non-grant portion of the project. Maximum loan amount varies per applicant, depending on the funding year. The application date for PWTF construction loans is general sometime in spring for funds to be available the following spring.

8.4.3 Rural Development Loan and Grant

Rural Development (RD, formerly the Farmers Home Administration) is an agency of the US Department of Agriculture. The RD Water and Waste Disposal program is primarily a loan program, but provides grants if needed, to prevent utility rates from becoming exceedingly high. RD uses several methods to arrive at the maximum feasible utility rate, up which it then determines the required loan and grant amounts. RD applications are accepted year-round on a fund-available basis.

There is no funding cycle, but it generally takes several months to arrange this funding source. Loan security is normally a revenue bond ordinance, with loan repayment from utility rates, although repayment from taxes (as in a General Obligation bond) can also be used for RD loans. The interest rate on a loan would likely be about closer to 5% for a 30 or 40-year term loan if a RD grant is included in the funding package. RD requires that the utility use rates provide for an annual reserve income in addition to annual debt services.

8.4.4 Revenue Bonds

Revenue bonds issued by Newport provide a means of borrowing funds to finance capital improvements to the system. These bonds constitute a lien against the earnings of the utility. Such bonds may be used for varying terms and interest rates, depending on the needs of Newport and the municipal bond market at the time of issuance. Interest earned by bondholders is generally not taxable income, reducing the interest rate required by bond purchases. Debt service is paid out of system revenues. The issuer is usually required to maintain utility rates at a sufficient level to pay for the annual debt service plus a given percentage which often goes into a reserve fund. Current interest rates for revenue bonds may vary for a 20-year term.

8.4.5 General Obligation Bonds

General Obligation (GO) bonds by be issued by municipalities to finance capital improvements such as water, sewer, streets, and drainage projects. Bonds are repaid with taxes collected against real property within the jurisdiction. Since property may be sold by the jurisdiction to collect unpaid property taxes, these types of bonds offer greater security to bondholders than revenue type bonds, and therefore generally require lower interest rates. GO bonds may be issued up to a maximum amount of a percentage of the jurisdictions' total assessed valuation without voter approval. Greater amounts require voter approval. Maximum GO bond indebtedness is limited by state statute.

Utilizing of GO bonds for revenue utilities, such as water and sewer, is not generally recommended because most municipalities should reserve their GO bonding capabilities for non-revenue items.

8.4.6 Community Development Block Grant

The Washington State Commerce Department of Community, Trade and Economic Development administers the CDBG program. These FUND funds are available for water and sewer projects for low to moderate income areas with limited financing ability and public health and safety concerns. These grants are designed to fund local wastewater, water, and economic development projects for moderate- to low-income communities. Applications are due in the summer each year, with recipients notified the following fall. The maximum amount for a single grant may vary each funding cycle. According to the 2019 HUD date, Newport is approximately 60% low- to moderate-income percentage, which makes Newport eligible to receive a grant from CDBG State Commerce funding.

8.4.7 Federal Congressional Line Item Appropriation

These funds are earmarked in the Federal budget for specific projects. Because they are special appropriations, they have no firm criteria. Seeking these funds usually is accompanied by communication with legislators and letter writing campaigns, where the needs for funding assistance is expressed. In general, these funds require a reasonable amount of local match.

8.4.8 Washington State Legislative Appropriation

These funds are earmarked in the State budget for specific projects. Because they are special appropriations, they have more relaxed conditions than many other funds. Seeking these funds usually is accompanied by communication with legislators and letter writing campaigns, where the needs for funding assistance is expressed. In general, these funds require a reasonable amount of local match.

8.4.9 Transportation Improvement Board (TIB)

Where projects are under roadways, there is an opportunity to partner with Washington Station Transportation Improvement Board. Annual applications are due in August and the City can coordinate with the TIB Engineer to coordinate roadway improvements when sewer improvements are planned.

CHAPTER 9 – ALTERNATIVES CONSIDERED

9.1 South Bench Lift Station

Development south of Highway 2 is situated in a low point relative to the majority of the gravity collection system in the City. Lift station(s) are needed to pump flow from this southern area of the City to the gravity collection system, eventually draining to the wastewater treatment plant. This is currently accomplished by two small, outdated lift stations. The existing lift stations are not situated in low points, hence the need for two rather than one. In addition, the lift stations are situated too high to receive gravity flow from any development which may occur on the South Bench. Alternatives considered to increase capacity, level of service, reliability, and facilitate development on the South Bench are discussed below.

9.1.1 Add South Bench Lift Station and Upgrading Existing Pump Station

A new lift station would be constructed to receive flow from development on the South Bench. This lift station would pump flow through a short force main discharging to a 10-inch diameter gravity sewer on W 8th St. The gravity sewer would drain to the existing Pleggers list station; However, the Pleggers lift station would need significant capacity and operational improvements. Upgrading the lift stations to current standards would include replacing nearly all components – wet well with hatch access, pumps, force main, and control equipment. In addition to essentially replacing the existing Pleggers lift station, there would be additional operation and maintenance efforts associated with continuing to operate the two existing lift stations and a new third lift station to serve the South Bench area in the basin.

9.1.2 Add South Bench Lift Station and Decommission Existing Pump Stations (Selected)

The selected option decommissions both existing lift stations, installs a new lift station in a low point south of Highway 2 with an accompanying force main, regrades gravity pipes to convey flow to the new lift station, and abandons the Pleggers and Bings lift stations. A project diagram is presented in **Chapter 4**.

9.1.3 Do Nothing

No development of sewer services on the South Bench may occur without an additional pump station to pump flow to a point where it may drain by gravity to the wastewater treatment plant.

9.2 South Union Avenue Railroad Crossing

As development occurs on the South Bench, the sanitary sewer railroad crossing on Union Avenue will become undersized. No records documenting the existing condition of the pipeline were available at the time of preparing this report. Alternatives considered to increase capacity are discussed below.

9.2.1 Parallel Pipes

This option would keep the existing crossing in service and construct a parallel pipe. However, the cost to upsize the new pipe to allow the existing pipe to be abandoned is minimal compared to maintaining the old main and gaining a new railroad crossing. Providing a single pipeline reduces the collection system maintenance and potential for inflow and infiltration originating at the crossing. If a single pipeline were installed to convey flows through the crossing, the old pipeline may be plugged and remain in place as a backup crossing requiring minimal effort to recommission.

9.2.2 Replace Pipe in Place (Selected)

This option would evaluate the condition of the existing crossing conveyance pipe and casing for the installation of a larger diameter pipe through pipe bursting. A project diagram is presented in **Chapter 4**.

9.2.3 Do Nothing

If the City were to do nothing the railroad crossing would become the limiting factor prohibiting future growth on the South Bench. The railroad crossing was not inspected as part of these planning efforts, but assuming the pipeline is in good condition, the crossing could convey another 290 ERUs (742 ERUs total anticipated in South Bench development during the planning period).

9.3 I/I Mitigation (Union Avenue/Railroad Trunk)

Mitigating I/I is a high priority to the City of Newport. An overall “do nothing” option was not considered for I/I mitigation efforts as the City has expressed desire to lower I/I flows the wastewater treatment plant. Raising manhole lids, re-grading roadways, installing sealed manhole lids, removing the sump pump connection, and other miscellaneous I/I projects are straight forward with a clear best solution. A larger I/I project considered in

this report addresses the trunk along Union Avenue and the Railroad. Replacement and rehabilitation options were considered for this trunk and discussed below.

9.3.1 Replace Trunk Along Union Avenue and Railroad

A capital improvement project to replace the main sewer trunk along Union Avenue and the railroad tracks (from south to north) was explored as a method of providing additional capacity and reducing I/I into the approximately 2,500-foot trunk. Replacing the main also would provide the City with the opportunity to realign the main, so that it follows North Union Avenue, rather than meandering behind and underneath several existing structures. After considering replacement of the main, modeling results indicated there is no capacity issues in the existing 15-inch trunk and there will not be capacity issues in the planning period.

9.3.2 Rehabilitate Trunk Along Union Avenue and Railroad (Selected)

Because the main does not experience capacity issues and is not anticipated to experience capacity issues in the planning period, cured in place pipe (CIPP) installation was also considered. The cost of CIPP installation was estimated to be 2.5x less expensive than replacing the main ($3.2 Million versus $1.5 Million). CIPP would mitigate I&I flows into the pipe and make the pipe easier to maintain. This would be completed in conjunction with manhole replacement or lining.

9.4 Summary of Alternatives

The alternatives discussed above are summarized in **Table 9-1.**

Table 9-1: Summary of Alternatives

Project	Cost	Advantages	Disadvantages
Pleggers and Bings Lift Stations			
New South Bench Lift Station to replace existing lift stations	$3,697,000	• Reduces total number of lift stations in collection system • City already owns parcel suitable for lift station siting. • Allows for development on South Bench	• New force main required

Add South Bench Lift Station and Upgrade Existing Lift Stations	$4,050,000	• Potential to save cost by reuse of existing force main, pending favorable inspection results • Allows for development on South Bench	• Upgrading Pleggers to a modern lift station capable of conveying flows from South Bench development would include replacing every component of the lift station, and inspecting the force main to evaluate potential for reuse • Lift stations would be in R-O-W rather than an established parcel owned by the City. • Adds to the total number of lift stations maintained by the City • City still has to maintain the dated Bings lift station
Do Nothing	N/A		• No development on South Bench may occur • Aging components in lift station
Union Ave Railroad Upsizing			
Parallel Pipes	$1,625,000	• Redundancy in railroad crossing	• Old crossing is a potential source of I/I and should be lined if kept in place
Remove	$1,353,000	• Removes 50+ year old gravity pipe from system	• No redundancy in crossing
Do nothing	N/A		• Lift station upsizing and development of South Bench cannot occur
Shared Side Sewer Elimination			
Do Nothing	N/A		• Operators do not have access for cleaning, inspection • Historical issues at shared laterals

Union Ave/Railroad Trunk I/I Mitigation			
Replace and realign	$3,174,000	• Realigns pipeline to not be under existing structures	• Significant surface restoration through downtown, and along state highway
Cured in Place Pipe	$1,497,000	• No/minimal disruption to downtown or highway traffic	• Segments of trunk remain under existing structures
Do Nothing	N/A		• Continue to allow I/I into system from the trunk

CHAPTER 10 – CAPITAL IMPROVEMENT PLAN

10.1 CIP Overview

The Capital Improvement Plan (CIP) schedules prioritized improvements that are necessary to achieve the City's infrastructure goals to continue providing wastewater collection and treatment services. The age of existing infrastructure is of particular concern. Much of the collection system infrastructure is nearing the end of its useful life and allows I/I to inundate the wastewater treatment plant during storm events. Because of this, I/I mitigation projects are included as an integral part of the capital improvement plan in addition to system expansion, capacity improvements, and collection system improvement projects. See the Wastewater Treatment Plant Facility Plan for the proposed treatment plant CIP.

The collections system CIP is organized into the following categories:

- System Expansion Projects – Required to serve new areas within the UGA
- Development Driven Capacity Projects – Required to address anticipated insufficient hydraulic capacity of existing pipes under future flows from anticipated new development
- I/I Mitigation Projects – Required to reduce I/I being conveyed by the collection system to the wastewater treatment plant and to provide additional pipeline hydraulic capacity for sewer flows
- Effluent Loading Projects – Required to reduce maintenance intensive issues with wastewater quality in the collection system
- Lift Station Operational Improvements – Improve daily operation of the lift stations and provide more tools to troubleshoot future problems should they arise

The design life for each CIP project is dependent on the type of improvement. The proposed changes assume the following design life:

- Pipeline Improvements/Replacement Projects – 50 Years
- Lift Station Project – 20 Years

Appendix H contains the CIP summary in **Table 10-1** for each project. All capital costs are in 2022 dollars, with an inflation escalation provided. The opinions of probable cost are for budgetary purposes only and further refinement of the cost opinions will be required during subsequent preliminary engineering and design phases for each CIP project.

A user rate analysis has been completed to calculate the impacts to user rates due to the improvements outlined in the preceding section. Sample worksheets for this user rate analysis are included in **Appendix I**.

Table 10-1: Collection System Capital Improvement Summary

ID	Collection System Improvement Description	Estimated Construction Cost (Pre-tax)	Contingency @ 30%	Prevailing Wages and AIS/BABAA @ 15%	Sales Taxes @ 7.7%	Engineering Design Fees	Engineering Construction Fees	Administration Fees	Estimated Costs in Current Dollars (2023)	Year Anticipated	Years Out	Annual Inflation @ 6%	Total for Planning Purposes	Proposed Payment Method comments
System Expansion Projects														
SE. 1	Lift Station on 8th (South Bench)	$ 1,788,000	$ 536,000	$ 349,000	$ 206,000	$ 288,000	$ 432,000	$ 6,000	$ 3,605,000	2025	2	$ 446,000	$ 4,051,000	Developer/City Split
Development Driven Capacity Projects														
DD. 1	Union Avenue Railroad Crossing Upsizing	$ 654,000	$ 196,000	$ 128,000	$ 75,000	$ 105,000	$ 158,000	$ 2,000	$ 1,318,000	2025	2	$ 163,000	$ 1,481,000	Developer/City Split
I/I Mitigation Projects														
II. 1	Replace Manhole Lids	$ 171,000	*$ 26,000*	$ -	$ 15,000	$ -	$ -	$ -	$ 212,000	2024	1	$ 13,000	$ 225,000	Ecology
II. 2	Replace Brick Manholes (30 EA)	$ 375,000	$ 113,000	$ 73,000	$ 43,000	$ 60,000	$ 91,000	$ 1,000	$ 756,000	2024	1	$ 46,000	$ 802,000	Ecology
II. 3	Address Stormwater at Low Areas (Fea, Cass, Alley, Spruce, N Spokane)	$ 829,000	$ 249,000	$ 162,000	$ 95,000	$ 134,000	$ 200,000	$ 3,000	$ 1,672,000	2025	2	$ 207,000	$ 1,879,000	Ecology
II. 4	Willow Ave Storm Drain Conveyance	$ 397,000	$ 119,000	$ 77,000	$ 46,000	$ 64,000	$ 96,000	$ 1,000	$ 800,000	2025	2	$ 99,000	$ 899,000	Ecology
II. 5	Shared Side Sewer Elimination (Fir and Larch Blocks)	$ 751,000	$ 225,000	$ 146,000	$ 86,000	$ 121,000	$ 181,000	$ 2,000	$ 1,512,000	2025	2	$ 187,000	$ 1,699,000	Ecology
II. 6	Storm Pump Station (Spruce/Calispel)	$ 900,000	$ 270,000	$ 176,000	$ 104,000	$ 145,000	$ 218,000	$ 3,000	$ 1,816,000	2025	2	$ 225,000	$ 2,041,000	Ecology
II.7	Full System Cleaning, Additional Flow Monitoring and Pipe Camera Inspections to identify remaining areas	$ -	$ -	$ -	$ -	$ 750,000	$ -	$ -	$ 750,000	2025	2	$ 93,000	$ 843,000	Ecology
II. 8	CIPP Sewer Main, MH 3100 to 2200 (Union Avenue)	$ 724,000	$ 217,000	$ 141,000	$ 83,000	$ 117,000	$ 175,000	$ 2,000	$ 1,459,000	2027	4	$ 383,000	$ 1,842,000	Ecology
II. 9	Other I&I Areas as Identified and Prioritized by Field Investigations	$ 800,000	$ 240,000	$ 156,000	$ 92,000	$ 129,000	$ 193,000	$ 3,000	$ 1,613,000	2027	4	$ 424,000	$ 2,037,000	Ecology
II. 10	Sewer Main Replacement, Various Locations	$ 1,402,000	$ 421,000	$ 273,000	$ 161,000	$ 226,000	$ 339,000	$ 5,000	$ 2,827,000	2033	10	$ 2,236,000	$ 5,063,000	Ecology/City Split
II. 11	Spot Repairs, Various Locations	$ 150,000	$ 45,000	$ 29,000	$ 17,000	$ 24,000	$ 36,000	$ -	$ 301,000	2033	10	$ 239,000	$ 540,000	Ecology/City Split
Effluent Loading Projects														
EF. 1	Install Grease Interceptor at Businesses	$ 175,000	$ 53,000	$ -	$ 18,000	*$ 7,000*	$ -	$ -	$ 253,000	2025	2	$ 32,000	$ 285,000	Private
Lift Station Operational Improvements														
LS. 1	Riverbend Pump Station Backup Generator	$ 75,000	$ 23,000	$ 15,000	$ 9,000	$ 12,000	$ 18,000	$ -	$ 152,000	2026	3	$ 30,000	$ 182,000	City Forces
LS. 2	Lift Station SCADA System (Riverbend & Calispel)	$ 50,000	$ 15,000	$ 10,000	$ 6,000	$ 8,000	$ 12,000	$ -	$ 101,000	2027	4	$ 27,000	$ 128,000	City Forces
	TOTAL	$ 9,241,000.00	$ 2,748,000.00		$ 1,056,000.00	$ 2,190,000.00	$ 2,149,000.00	$ 28,000.00	$ 19,147,000.00			$ 4,850,000.00	$ 23,997,000.00	

Note that the highlighted I/I Mitigation Projects (II.1 through II.9) have been selected for implementation in a priority first phase of improvements.

CHAPTER 11 – COMPLIANCE STATEMENTS

11.1 Compliance with Water Quality Management Plans

Collection system improvements do not discharge to any water bodies with prior treatment and will not affect local Water Quality Management Plans in effect.

11.2 Compliance with SEPA

In order to qualify the identified collection system improvements for WSDOE funding, the State Environmental Policy Act (SEPA) will be followed. This will include preparation of a SEPA Checklist, public notice, State Environmental Review Process (SERP) Checklist, Federal Cross Cutter Checklist, SERP Cover Sheet, Biological Assessment, and Cultural Resources Survey.

Appendix J includes the SEPA Checklist and Determination of Non-Significance for this planning document.